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ALA Fellows - 2024



ALA Council – 2024



2024 ALA Council and Post-Graduate Members



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---	---	--

<i>Corresponding</i>	<i>Emeritus</i>	<i>Associate</i>
KORN, Gustavo KWON, Seong Keun KWON, Tack-Kyun LEE, Seung-Won LOPEZ-GUERRA, Gerardo NERURKAR, Nupur SATO, Kiminobu SATO, Kiminori WANG, Chi-Te	FORD, Charles MARAGOS, Nicolas METSON, Ralph MYERS, Eugene <i>Honorary</i> TITZE, Ingo	BRANSKI, Ryan ERICKSON-DIRENO, Elizabeth HAPNER, Edie JIANG, Jack MURRY, Thomas SIVASANKAR, Preeti THIBEAULT, Susan

<i>Post-Graduate</i>		
ALNOURI, Ghiath ABU-GHANEM, Sara BAIRD, Brandon BENSOUSSAN, Yael BHATT, Neel BLOOD, Timothy BORN, Hayley CATES, Daniel CHADWICK, Keith CLARY, Matthew CRAWLEY, Brianna DEWAN, Karuna DWYER, Christopher FRITZ, Mark GAO, William GARBER, David GIBERT, Mark	HOWELL, Rebecca HRELEC, Candace HUSAIN, Inna KAVOOKJIAN, Hannah KAYE, Rachel KIRKE, Diana KUHN, Maggie KUPFER, Robbi LAW, Anthony LIN, R Jun MA, Yue MARONIAN, Nicole MCGAREY, Patrick MEENAN, Kirsten MISONO, Stephanie MORRISON, Robert NAUNHEIM, Matthew	Paknezhad, Hassan PANOSSIAN, Haig RANDALL, Derrick RAPOPORT, Sarah ROHLFING, Matthew ROMAK, Jonathan ROSOW, David SCHIFFER, Breanne SILVA MEREIA, Valeria SZYMANOWSKI, Adam TIBBETTS, Kathleen TIERNEY, William TRACY, Lauren TRITTER, Andrew VAHABZADEH-HAGH, Andrew WOOD, Megan Yiu, Yin

MINUTES OF THE BUSINESS MEETING

REPORT OF THE SECRETARY

The membership prior to the April 2024 election included 123 Active members, 77 Emeriti member including Corresponding Emeritus, 32 Corresponding members, 1 Honorary members, 11 Associate members and 107 Post-Graduate Members for a total membership of 351 Fellows and members.

Drs. James Daniero, Pavan Mallur, Amy Rutt and Douglas Van Daele were elected to Active Fellowship; Drs. Ihab Atallah and Kiminibu Sato were elected to Corresponding Fellowship; Dr. Elizabeth Erickson-DiRenzo was elected to Associate Fellowship. Drs. Mark Persky and Frederick were elevated to Emeritus status.

After induction of the nominees, the 2024 roster reflects 122 Active members, 72 Emeriti members, 34 Corresponding members, 1 Honorary members, 12 Associate and 109 Post-Graduate members, for a total membership of 350 Fellows and members. A total of 15

individuals (Drs. Baird, Bracken, Blood, Davis, Hrelec, Jacks, Meenan, Romak, Ryan, Shaha, Shuman,

Szymanowski, Tracy, Tritter, and Wang) became Post-Graduate Members

These totals also reflect that we were notified that two members, Drs. Evans and Yanagisawa who passed away prior to this report.

The Secretary also reported that in 2025, footprints for 2026 and 2027 meetings will be held in Phoenix and Seattle, respectively. He confirmed that COSM is moving toward convention center with the hope of reduced costs. The interview for the SLC Executive Director is moving along with candidates who have requested consideration to replace outgoing director, Dr. Grillone.

As this was his last year as secretary, Dr. Blumin expressed his appreciation for support given to him during his tenure.

Respectfully submitted,
Joel H. Blumin, MD
Secretary

REPORT OF THE TREASURER

The Treasurer's report and financial statements were prepared with the assistance of AME, our accounting partner.. The Treasurer stated that the relationship between the ALA administrator and AME continues to work efficiently.

Dr. Buckmire reported that the finances of the Association continues to show positive revenue from the investment portfolio and payment of dues. We have received several donations resulting in the naming of three funds within the past year. Dues continue to be the major source of income but approximately 10% of the membership remain delinquent for the last year. This number is reduced due to the continuing efforts of our Administrator. I encourage each fellow to pay any delinquent

amount so his/her membership remains in "good standing." The Council continues to maximize the Association's assets by controlling expenditures while maintaining the high level of services for the fellowship.

The Council continues to review expenses by eliminating the majority of expenses for the Winter Council Meeting by convening via Zoom.

The major fundraising is the annual Sustainers Fund Campaign. Each member is encouraged to donate as these funds will allow the Association to create and fund additional research grants such as the inaugural grant for Post-Graduate

Respectfully submitted,
Robert Buckmire, MD
Treasurer

REPORT OF THE EDITOR

Transactions

Dr. Kost reported that there was positive feedback from visitors to the website who viewed the 2023 Transactions. With the historical Transactions dating back to 1897, the accessibility of the electronic copies continues to be a favorite to our members as well as others who log in. Each document may be downloaded as a PDF and printed.

ALA Website

The traffic during the past year has increased dramatically. Visits to the site continue to rise and multiple search engines are being used. The majority of visits were from the United States with others from Asia, South America, and the UK.

She encouraged members to visit the website as new content is constantly added. To obtain a temporary password, log in to

[Member's Area | American Laryngological Association \(alahns.org\)](https://www.alahns.org).

Dr. Kost informed members to update his/her profile with the accurate email address. This will assist in providing digital newsletter and ballots and other member related information in a timely manner.

Publication

Dr. Kost reported a very high rate of manuscripts submitted for the 2023 annual meeting was received. Submitted manuscripts to the Laryngoscope reached a 40.16% acceptance rate. This rate also includes some manuscripts that originally were submitted for a poster presentation. This is indicative of the excellent quality of posters that increased the value to the contributor.

Respectfully submitted,
Karen M. Kost, MD
Editor

REPORT OF THE HISTORIAN

Dr. Merati reported on the overlaps with the PGM report by sharing that two of our most "historical" developments with the ALA membership occurred this year in that arena. Past-Presidents Berke and Ossoff committed significant resources to support the endeavors of our PGM community. Dr. Ossoff is funding the inaugural Post-Graduate Member Best Paper award. Dr. Berke's contribution will support the Post-Graduate Member Breakfast Symposium that is held during the annual meeting. Both of these will allow this group's growth to expand. The Association continues to welcome these expressions of support and passion for our beloved ALA.

Since our 2023 annual meeting, we were informed of the passing of two Fellows. Dr. John Evans, a long time Corresponding Emeritus Fellow departed ALA fellows, Drs John Evans and Dr. Eiji

Yanagisawa. The administrative office was informed that Dr. Evans past on March 23, 2022 at his home in the UK. Dr. Yanagisawa, a regular attendee at the annual meeting until his health failed, and an Emeritus Fellow died on February 1, 2024.

Finally, as a way of reminding our members about the lifespans of our work he honored those who served as our ALA Presidents from 10, 20, 30, 40 , and 50 years ago.

1974: Joseph Ogura
1984: Gabriel Tucker
1994: H Bryan Neel
2004: Robert Ossoff
2014: Gaelyn Garrett

Respectfully submitted,
Albert Merati, MD
Historian

RECIPIENTS OF THE DE ROALDES AWARD

Established in 1907, a medal is presented to an individual in recognition of outstanding accomplishments in the field of Laryngology.

1928 Chevalier L. Jackson
 1931 D. Bryson Delavan
 1934 Harris P. Mosher
 1937 Lee Wallace Dean
 1943 Ralph A. Fenton
 1949 George M. Coates
 1951 Arthur W. Proetz
 1954 Louis H. Clerf
 1959 Albert C. Furstenberg
 1960 Dean M. Lierle
 1961 Frederick T. Hill
 1966 Paul H. Holinger
 1970 Francis E. LeJeune
 1973 Lawrence R. Boies
 1976 Anderson E. Hilding
 1979 Joseph H. Ogura
 1982 John J. Conley
 1985 John A. Kirchner
 1985 Charles M. Norris
 1987 Walter P. Work
 1988 DeGraaf Woodman
 1989 John F. Daly



1990 Joseph L. Goldman
 1991 William Montgomery
 1992 M. Stuart Strong
 1993 Douglas P. Bryce
 1994 Paul H. Ward
 1995 Hugh F. Biller
 1996 Byron J. Bailey
 1997 George A. Sisson Sr.
 1998 Stanley M. Blaugrund
 1999 Jerome C. Goldstein
 2000 Thomas C. Calcaterra
 2001 Eugene N. Myers
 2002 Robin T. Cotton
 2003 Gayle E. Woodson

2004 Robert H. Ossoff
 2006 Stanley M. Shapshay
 2007 Frederick McGuirt, Sr.
 2008 Robert T. Sataloff
 2009 Andrew Blitzer
 2010 Marshall Strome
 2011 Gerald Healy
 2012 Robert T. Sataloff
 2013 James L. Netterville
 2014 Marvin P. Fried
 2015 C. Gaelyn Garrett
 2016 Steven M. Zeitels
 2017 Steven Gray
 (Posthumously)
 2018 Michael S. Benninger
 2019 Bruce Pearson
 2020-21 Charles N. Ford
 2022 Peak Woo
 2023 Sid Khosla (Posthumously)
 2024 Roger Crumley

RECIPIENTS OF THE CASSELBERRY AWARD

The Casselberry Award has been established to encourage the advancement of the art and science of Laryngology. The Award is given for outstanding manuscripts or accomplishments in Laryngology and consists of a cash prize and a certificate from the Association. Competition for this Award will be limited to those persons whose abstracts are selected for consideration for inclusion in the Annual Scientific Program. Those wishing to compete for the Award must submit their entry on an American Laryngological Association abstract form followed by the submission of a manuscript by the designated deadline. The winner of the Award will be chosen by a committee and the Casselberry Award will be presented the Annual Scientific Meeting.

1923	George Fetterolf and Herbert Fox	1962	Hans von Leden	2018	Seong Keun Won, Young Hawn Choi, Tae Ho Kim, , In Gu Kim, Jin H Lee
1928	Ralph A. Fenton and O. Larsell	1966	John A. Kirchner and Barry D. Wykle		
1929	Richard A. Kern and Harry P. Schenck	1968	Joseph H. Ogura	2021	Mark Lee, Ted Mau, Lucian Sulica
1929	Edward H. Campbell	1985	H. Bryan Neel III		
1931	Arthur W. Proetz	1987	Joseph J. Fata	2022	Neha Reddy, PatrickSchlegel, Yoonjeong Lee, Dinesh Chhetri
1934	Anderson C. Hilding	1991	James A. Koufman		
1936	Francis E. LeJeune and Joel J. Pressman	1993	Frank E. Lucente		
		1994	Ira Sanders		
1939	H. Marshall Taylor and Brian T. King	1998	Steven M. Zeitels	2023	Hye Rhyn Chung, Yoongeog Lee, Neda Reddy, Zhaoyan Zhang, Dinesh Chhetri
1940	French K. Hansel	1999	Clarence T. Sasaki		
1941	Noah D. Fabricant	2006	Kiminori Sato		
		2009	Randal Paniello		
1946	Paul H. Holinger	2010	Priya Krishna, Michel Regner, Steve Abramowitch	2024	Sang-Yoon Han, Seong Jeong, Seo Young Kim, Seong Keun Kwon

RECIPIENTS OF THE GABRIEL F. TUCKER AWARD

Established in 1987, a medal is presented to an individual for significant contributions, either to the field of pediatric laryngology or to the Association, or both.

1987	Seymour R. Cohen	2001	Donald B. Hawkins	2015	Dana Thompson
1988	Charles F. Ferguson	2002	James S. Reilly	2016	Michael Rutter
1989	Blair Fearon	2003	Ellen M. Friedman	2017	Paolo Campisi
1990	Gerald B. Healy	2004	C. Martin Bailey	2018	Noel Garabedian
1991	John A. Tucker	2005	William P. Potsic	2019	Marshall Smith
1992	Bruce Benjamin	2006	Amelia F. Drake	2020-21	Ellen Deutsch
1993	John N. G. Evans	2007	Colin Barber	2022	Craig Derkay
1994	Joyce A. Schild	2008	Seth Pransky	2023	J. Paul Willging
1995	Robin T. Cotton	2009	William Crysdale	2024	Reza Rahbar
1996	Haskins K. Kashima	2010	Charles M Myer, III		
1997	Lauren D. Holinger	2011	Mark Richardson		
1998	Philippe Narcy	2012	George Zalzal		
1999	Bernard R. Marsh	2013	Andrew Inglis		
2000	Trevor J.I. McGill	2014	Linda Brodsky		

RECIPIENTS OF THE NEWCOMB AWARD

1941	Burt R. Shurly	1971	Daniel C. Baker, Jr	1998	Andrew Blitzer
1942	Francis R. Packard	1972	Alden H. Miller	1999	Hugh F. Biller
1943	George M. Coates	1973	DeGraaf Woodman	2000	Robert W. Cantrell
1944	Charles J. Imperatori	1974	John J. Conley	2001	Byron J. Bailey
1947	Harris P. Mosher	1975	Francis W. Davison	2002	Gerald B. Healy
1948	Gordon Berry	1976	Joseph L. Goldman	2003	Steven D. Gray
1949	Gordon B. New	1977	F. Johnson Putney	2004	Charles W. Cummings
1950	H. Marshall Taylor	1978	John F. Daly	2005	Roger L. Crumley
1951	John D. Kernan	1979	Charles F. Ferguson	2006	Charles N. Ford
1952	William J. McNally	1980	Charles M. Norris	2007	Robert H. Ossoff
1953	Frederick T. Hill	1981	Stanton A. Friedberg	2008	Gayle E. Woodson
1954	Henry B. Orton	1982	William M. Tribble	2009	Marvin P. Fried
1955	Thomas C. Galloway	1983	Harold G. Tabb	2010	Diane Bless
1956	Dean M. Lierle	1984	Daniel Miller	2011	Jamie A. Koufman
1957	Gordon F. Harkness	1985	M. Stuart Strong	2012	Steven M. Zeitels
1958	Albert C. Furstenberg	1986	George A. Sisson	2013	Lauren Holinger
1959	Harry P. Schenck	1987	John S. Lewis	2014	Marvin P. Fried
1960	Joel J. Pressman	1988	Douglas P. Bryce	2015	Robert T. Sataloff
1961	Chevalier L. Jackson	1989	Loring W. Pratt	2016	Nicholas Maragos
1962	Paul H. Holinger	1990	William W. Montgomery	2017	Gerald Berke
1963	Francis E. LeJeune	1991	Seymour R. Cohen	2018	Peak Woo
1964	Fred W. Dixon	1992	Paul H. Ward	2019	Robert T. Sataloff
1965	Edwin N. Broyles	1993	Eugene N. Myers	2020-21	James Netterville
1966	Lyman G. Richards	1994	Richard R. Gacek	2022	Ernest Weymuller
1967	Joseph H. Ogura	1995	Mark I. Singer	2023	Gaelyn Garrett
1968	Walter P. Work	1996	H. Bryan Neel III	2024	Shigeru Hirano
1969	John A. Kirchner	1997	Haskins K. Kashima		
1970	Louis H. Clerf				

RECIPIENTS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION AWARD

1988	Frank Netter	2000	Geza J. Jako	2014	Robert T. Sataloff
1989	Shigeto Ikeda	2001	Eugene N. Myers	2015	Robert H. Ossoff
1990	Hans Littmann	2002	Catherine D DeAngelis	2016	Gerald Berke
1991	Arnold E. Aronson	2003	William W Montgomery	2017	Roger Crumley
1992	Michael Ter-Pogossian	2004	David Bradley	2018	Eiji Yanagisawa
1993	C. Everett Koop	2005	Herbert Dedo	2019	Peak Woo
1994	John C. Polanyi	2006	Christy L. Ludlow	2020-21	Nobuhiko Isshiki
1995	John G. Batsakis	2007	John A. Kirchner	2022	Edie Hapner
1996	Ingo Titze	2008	Gerald B. Healy	2023	Andrew Blitzer
1997	Matina Horner	2009	Stanley M. Shapshay	2024	Charles N. Ford
1998	Paul A. Ebert	2010	Clarence T Sasaki		
1999	Bruce Benjamin	2011	Lawrence DeSanto		
2000	M. Stuart Strong	2012	Minoru Hirano		
		2013	Harvey Tucker		

RECIPIENTS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION RESIDENT RESEARCH AWARD

1990 David C. Green	2001 Andrew Verneuil	2014 Boris Paskhover
1991 Timothy M. McCulloch	2002 Dinesh Chhetri	2015 Andrea Park
1991 Ramon M. Esclamado	2003 Andrew Karpenko	2016 Andrew M. Vahabzadeh Hagh
1992 David H. Henick	2004 Ichiro Tateya	2017 Ian-James Malm
1993 Gregory K. Hartig	2005 Samir Khariwala	2018 Molly Naunheim
1994 Sina Nasri	2007 Idranil Debnath	2019 Justin Ross
1995 Saman Naficy	2008 Tara Shipchander	2020 Ioan A. Lina
1996 Manish K. Wani	2009 David O. Francis	2021 Melissa Zheng
1997 J. Pieter Noordzij	2010 David O. Francis	2022 Evan Compton
1998 Michael E. Jones	2011 Jeffrey Houlton	2023 Benjamin M. Laitman
1999 Alex J. Correa	2012 Lowell Gurey	2024 Delaney Sheenan
2000 James C. L. Li	2013 Yaniv Hamzany	

RECIPIENTS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION YOUNG FACULTY RESEARCH AWARD

1991 Paul W. Flint	2005 Dinesh Chhetri	2015 Nao Hiwatashi
1992 Yasuo Hisa	2006 Suzy Duflo	2016 Ryo Suzuki
1993 Jay F. Piccirillo	2007 Tack-Kyun Kwon	2017 Astha Malhotra
1994 Hans J. Welkoborsky	2008 Bernard Rousseau	2018 Catherine Sinclair
1995 Nancy M. Bauman	2009 Tsunehisa Ohno	2019 Yue Ma
1997 Ira Sanders	2010 I-Fan Theodore Mau	2020 Yi-An Lu
1998 Kiminori Sato	2011 David Francis	2021 Yael Bensoussan
2000 Steven Bielamowicz	2012 Mika Nomoto	2022 Gary Gartling
2001 John Schweinfurth	2013 Seung Won Lee	2023 Matthew Naunheim
	2014 Jennifer Long	2024 Gary Gartling

SEYMOUR H. COHEN RESEARCH GRANT AWARD

The Seymour H. Cohen Award, established in 1999, with a bequest by the Cohen family. The Award is to be given to an outstanding candidate who must perform basic science research in the area of pediatric laryngology and/or pediatric neurolaryngology and be a citizen of the United States or Canada. The material must be approved and accepted for presentation at an Annual Meeting. The scope of the Award is limited to citizens of the United States of America and Canada. Should multiple candidates collaborate in the research, all authors must comply with the citizenship requirements. Dr. Cohen wish was for this Award only to be used for the funding of research in pediatric laryngology and/or pediatric neurolaryngology.

1999 Russell A. Faust, MD, PhD	2017 Matthew Clary, MD
2000 Chapman McQueen, MD	2019 Philip Weissbrod, MD
2001 Yolanda D. Heman-Ackah, MD	2020 Rupali Shah, MD
2009 Swapna C handran, MD	2021 Ricardo Gottardi, MD
2014 Christopher T. Johnson, MD	2022
	Pranati Pillutla, MD
2015 Gregory R. Dion, MD	2023 Pranati Pillutla, MD
2016 Alexander Hillel, MD	2024 Laura Matrk, MD

THE EUGENE MYERS MD INTERNATIONAL PAPER AWARD

The Eugene N. Myers Award for International Laryngology, funded by Dr. Eugene Myers, is given on an annual basis associated with the annual meeting. A scientific submission (oral or poster) that represents excellence in scientific contribution to the field of laryngology with the first author based outside of the United States and Canada.

2023 Enrique Díaz-Ocampo

2024 Seung-Won (Steve) Lee

THE ROBERT H. OSSOFF DMD, MD POST-GRADUATE MEMBER BEST PAPER AWARD

Funded by Dr. Robert H. Ossoff, the Post-Graduate Member Best Paper Award is given at the annual meeting after a review and selection from submitted manuscripts by the PPG Steering Committee. Eligibility for this award is limited to Post-Graduate Members (PGM) who request consideration when submitting the abstract.

2023 Bhatt Neel

2024 Yael Bensoussan

THE MEMORIAL AND LARYNGOLOGICAL RESEARCH FUNDS

The Council earnestly requests that Fellows of the Association give consideration to making a special bequest to these important funds, or to becoming a Benefactor.

MEMORIAL FUND DONORS

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H. Marshall Taylor
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John A. Tucker
Francis L. Weille
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Woodman
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President's Address

Continuing the Legacy of the ALA

Dinesh K. Chhetri, MD
Los Angeles, California

Dear Fellows and Members of the ALA,

I extend a warm welcome to each of you as we gather for our 145th Annual Meeting. It is with deep humility and immense pride that I stand here as your 142nd President. Being part of an organization with a legacy spanning 145 years is a profound honor, and a testament to the dedication and excellence of our collective efforts.

Allow me to introduce our esteemed Guest of Honor, *Dr. Gerald Berke*. Dr. Berke is currently Professor and Chair Emeritus of the Department of Head and Neck Surgery at the University of California, Los Angeles. He earned his MD at the University of Southern California, followed by Residency at UCLA under the guidance of Dr. Paul Ward.

Dr. Berke's illustrious research career in laryngeal physiology spans three decades, marked by productive research that has significantly enriched our understanding of voice production. Notably, he conducted the pioneering functional larynx transplant in an animal model at the UCLA Laryngeal Physiology Laboratory. He has received all the ALA awards, including the deRoaldes, American Laryngological, and James E. Newcomb Awards. These achievements, combined with his leadership roles, including Presidency of the ALA in 2002 and the Triological Society in 2010, underscore his enduring commitment to advancing our field. Dr. Berke is also known for his passion for songwriting and music.



As with any successful organization, our members and contributors are the most important pieces to success and a lasting legacy.

The ALA has a rich tradition of recognizing those who have contributed to laryngology or our organization. This year I have had the privilege to recognize individuals who have contributed immensely to our field and my personal growth as well.

I extend my deepest thanks to the Program Committee Members, Jennifer Long, Anais Rameau, Sunil Verma, Nausheen Jamal, and VyVy Young, for their outstanding work in planning this meeting. Their dedication and effort in selecting and crafting the scientific program are evident in the high quality of scientific presentations, honored lectures, and panels. Please be sure to visit the poster session tomorrow evening as well. The ALA

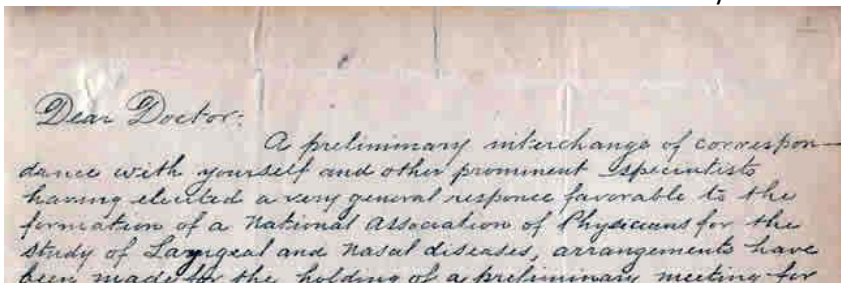
posters require manuscript submission and are of high quality. I also thank all the session moderators, discussants, the presenters, and attendees.

I extend heartfelt thanks to our council members for their unwavering support and guidance over the past year, and for their exceptional leadership in upholding the ALA Legacy. While the ALA leadership structure may sometimes be perceived as traditional, a glimpse at this photo would dispel any such notion, as I am sure you would agree. This snapshot captures us during the last Summer Council meeting, graciously hosted by our Administrator Maxine at her home in Nashville, Tennessee.



Over the past year, I have had the opportunity to reflect deeply on what ALA means to me and consider how we can all contribute to its enduring Legacy. I've grown to deeply appreciate our organization, recognizing the timeless mission and values that have stood the test of time. The ALA traces its roots back to a historic gathering of throat physicians who, through the innovative use of a dental mirror and light source, were able to gain significant new insights into laryngeal disease by visualizing the larynx *in vivo*.

On May 10th, 1878, Dr. Frank Davis of Chicago sent out this letter inviting a select group of physicians to meet at the Tifft House in Buffalo, NY, with the purpose of "perfecting an organization." This language mirrors the sentiments and language used by the Founding Fathers of the US Constitution, who aimed "to form a more perfect union" among the people. Similarly, our founding laryngologists shared a vision of creating a national organization that could benefit from collaborative strength. Like-minded in their pursuit, they established a tradition of annual meetings where scientific insights are exchanged in a collegial atmosphere, fostering innovation through respectful discourse and diverse opinions. These founding principles continue to guide our mission and lend resilience to our Association to this day.



The ALA holds a prominent position in the advancement of Laryngology, steeped in a rich history. The introduction of indirect laryngoscopy in Europe during the 1850s, followed by

its adoption and refinement in America during the 1860s-1870s, marked a revolutionary moment in the field. This innovation led to the emergence of a distinct specialty focused on laryngeal disorders, separate from chest disorders. Our members have been at the forefront of advancing the assessment and treatment of laryngeal disease, contributing significantly to the field's progress.

The Transactions of the ALA capture the rich history of our organization. I'm thrilled to announce that our goal set last year to digitize all the ALA Transactions has been achieved. You can now access all the ALA transactions on our website. Personally, I've found the documented history of Laryngology in the ALA transactions to be fascinating. I encourage you to visit our website and explore these documents for an enjoyable journey into the history of Laryngology itself, which I have found both enlightening and enjoyable to read.

Speaking of the history of Laryngology, I would like to present a presidential citation to *Dr. Steven Zeitels* in recognition of his exceptional contributions to the field. Dr. Zeitels currently holds the Eugene B. Casey Professorship of Laryngeal Surgery at Harvard Medical School and serves as the Director of the Massachusetts General Hospital Voice Center. He earned his MD from Boston University and completed his residency training at Tufts University, where the CO₂ laser was first introduced to Laryngology. Dr. Zeitels is a prolific surgical innovator, having developed or contributed to development of numerous surgical instruments and lasers. He has authored over 200 scientific publications and book chapters and has mentored over 40 Laryngology Fellows. His contributions have been recognized with several prestigious awards, including the ALA Casselberry Award in 1998 and both the ALA James E. Newcomb and deRoaldes awards.

I have had the pleasure of getting to know Steve over the past year and found we both share a profound passion for Laryngology and its rich history. Our conversations are always delightful, as his enthusiasm and extensive knowledge about our field are truly inspiring. His home resembles a museum dedicated to Laryngology, brimming with historical artifacts and documents that illuminate the development of our specialty. I hope that in the future, we can all benefit from his diligent work and have the opportunity to appreciate the wealth of information and artifacts he has gathered, not only about the history of Laryngology but also about the ALA itself. Thank you, Steve, for your unwavering dedication to Laryngology, its history, and your enduring love for our specialty.

The ability to visualize the larynx, which united us at the inception of the ALA, remains central to our shared mission of evaluating and treating laryngeal disorders. The larynx, a complex and inaccessible organ, continues to captivate us with its intricate voice production mechanisms, challenging our understanding and sparking our curiosity. For the past two decades, I have dedicated my career to exploring the intricacies of the larynx in pursuit of comprehending its voice production mechanisms. However, much remains to be uncovered, especially regarding surgical interventions aimed at restoring normal voice function amidst various laryngeal disorders. The ALA's unwavering support for laryngeal research is a cornerstone in advancing our field.

I would like to present a presidential citation to *Dr. Roger Crumley* in recognition of his significant impact on my research career, a contribution he may not fully realize. Dr. Crumley is Professor and Past Chairman at the University of California, Irvine. He earned his MD and completed his residency at the University of Iowa. His leadership roles include serving as President of the Triological Society in 2003 and of the ALA in 2008. He is also a recipient of the ALA Award and the James E. Newcomb Award. Dr. Crumley has been a steadfast presence

within the ALA community, and it was during his presidency that the ALA Sustainer's Fund was established. The legacy he left remains strong and appreciated to this day.

Roger has remained a constant presence at our meetings, offering invaluable advice and wisdom. His fascination with laryngeal physiology, particularly regarding reinnervation, was evident as he showed interest in my experiments using an animal model. One encounter with him during my early days as an assistant professor left a lasting impression when he candidly said to me that something he regretted is that he did not do more research. This statement resonated with me deeply, as it highlighted the humility and dedication of a highly successful laryngologist I admired. It inspired me to stay committed to my academic goals and pursue research tirelessly.

I urge our senior members to take note of the research endeavors undertaken by our younger colleagues, and to encourage them to stay on this path. The pursuit of research often entails failures and disappointments, and having someone we respect and admire to motivate us to persevere can make all the difference.

The ALA is also about supporting each other as we progress through various stages of our careers, facing inevitable challenges and learning from our mistakes. As a small community with a limited number of colleagues to consult and receive feedback from, this support is invaluable.

I would like to present a presidential citation to *Dr. Joel Blumin*, who has walked the career path alongside me. Joel is Professor and Chief of the Division of Laryngology at the Medical College of Wisconsin in Milwaukee. A California native, he ventured to the University of Iowa for medical school, where he was introduced to otolaryngology and laryngology under the mentorship of Harry Hoffman and Tim McCulloch. He returned to California for his residency in Head & Neck Surgery at UCLA, where he had the privilege of learning from a post-retired Paul Ward and the new Chair, Gerald Berke. Joel's interest in laryngology blossomed, leading him to become the inaugural UCLA laryngology fellow. He is a co-author of over 125 scientific manuscripts, book chapters, and other publications. Additionally, he serves as an Associate Editor for *The Laryngoscope*, and serves currently as our humble ALA Secretary.

Joel was a few years ahead of me during residency and fellowship at UCLA, and as we embarked on our careers, we often discussed our aspirations. We envisioned attaining full professorships and gaining membership into the ALA as the pinnacle of success. However, upon achieving these milestones, we realized that they were merely the starting points of a lifelong journey in Laryngology, one that would enable us to make a meaningful impact on our cherished organization. Thank you, Joel, for always being approachable and offering valuable advice without judgment, and for your dedicated service to the ALA.

Ever since the founding of our association in 1878, there has always been a discussion about increasing the ranks of our membership. Since joining the ALA requires the demonstration of scholarly work, we must continue focusing on enhancing the pathways to membership for our post-graduate members. The ALA Council has prioritized supporting the needs of PG Members in many ways, including (a) Highlighting Post-graduate Members on the website with their own unique landing page, (b) Facilitating the successful transition from PG Membership to Active Membership through mentorship programs, (c) Supporting an annual PG Member breakfast symposium, (d) Providing funds for the best PG Member oral presentation at the annual meeting and (e) Creating a lasting structure for the PG Membership through the PG Membership Steering Committee (PGMSC). I also encourage all PG Members to do their part and participate in collective activities and engage with the Steering Committee to make the most of these opportunities.

The post-graduate membership program was initiated in 2008, with the first cohort joining in 2009. As this graph illustrates, the number of PG members is now almost equal to that of active members, indicating our success in training and encouraging laryngology fellows to join our ranks as post-graduate members. Another notable trend highlighted by this chart is the rapidly increasing proportion of female members in both the post-graduate and active categories. This growth reflects our success in mentoring through our fellowship program. Moving forward, our next initiative should focus on improving the conversion rate from PG members to active members, ensuring that our organization continues to grow and diversify.

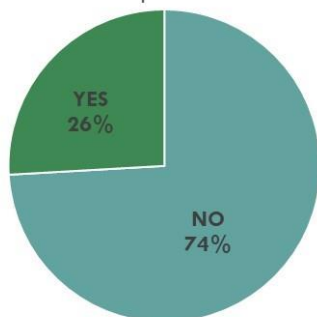


The following graph illustrates another positive trend in our association's diversity, especially notable from 2010 onwards. This growth is promising for the future of our organization, reflecting our commitment to inclusivity, and fostering a diverse community within the field of laryngology.

2024 Member Survey

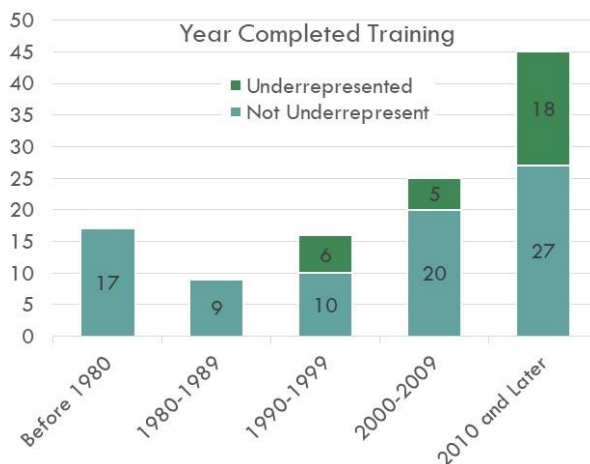
Diversity, Equity, and Inclusion

Do you identify as someone from a cohort that is underrepresented in the field*?



n=112

*Based on gender, race/ethnicity, LGBTQIA, disability status, etc.



I am delighted to announce the inaugural *Robert H. Ossoff Post-Graduate Member Best Paper Award*, generously endowed by the esteemed Dr. Ossoff himself. Bob is past president of the ALA in 2004, and his gracious contribution perpetuates the excellence within our community. This award is presented to the Post-graduate Member presenting the best paper at our Annual Meeting, and we are excited to present the first award this year.

I am thrilled to announce additional exciting news. As part of the successful 2024 Development Campaign, Dr. Gerald Berke has generously pledged an endowment fund to sustain the ongoing endeavors of the Post-Graduate Member Breakfast Symposium. Dr. Berke's mentorship has positively impacted more than thirty laryngology fellows thus far, and with this remarkable contribution, we are poised to uphold the esteemed legacy of the ALA while bolstering the activities of the Post-graduate Member Breakfast Symposium. Thank you Dr. Berke!

Beyond our steadfast dedication to post-graduate members transitioning into active membership, the ALA should remain deeply committed to fostering excellence in Laryngology fellowship programs. Our collaborative mentorship during residency plays a pivotal role in guiding aspiring professionals toward laryngology fellowships. The ALA has established comprehensive guidelines for the Laryngology Curriculum. I would recommend that a standing Education Committee be created to regularly review and enhance the curriculum to ensure its relevance and efficacy. Additionally, the ALA actively supports the provision of an online curriculum for Laryngology Fellows, aimed at broadening their perspectives through exposure to diverse viewpoints.

I would like to present a Presidential Citation to *Dr. Brad DeSilva*. Dr. DeSilva is a Clinical Professor in the Department of Otolaryngology-Head and Neck Surgery at Ohio State University. He completed his MD, Residency, and Fellowship from OSU. He currently serves as Vice-Chair for Education, and directs the Laryngology Division, Laryngology fellowship, and Residency Program. He was instrumental in developing the Laryngology Fellow Online Curriculum in 2020 and has coordinated this curriculum for the past four years to standardize Laryngology fellowship education and improve networking and collaboration amongst the Laryngology fellows. Thank you, Brad for showing your love for our specialty and commitment to the training of our fellows. These efforts are significant for our specialty, and I appreciate your dedication.

Although laryngology originated in Europe, it really flourished in America. However, the world of laryngology has become truly global. Our membership map shows we have corresponding and associate members from all corners of the world, and our international colleagues have made many advancements in the field. To further enhance our international engagement, we should extend invitations and propose collaborations with esteemed international laryngologists, inviting them to join our organization and co-sponsoring a range of enriching laryngology activities. This collaborative approach not only fosters knowledge exchange but also strengthens our collective efforts towards advancing laryngology on a global scale.

The *Eugene N. Myers MD International Award in Laryngology* is an example of our positive efforts to engage globally. This award was established in 2022 with a generous endowment from Dr. Myers, who served as ALA president in 1989. The award is presented annually to the scientific submission that represents excellence in scientific contribution to the field of laryngology from a first or senior author based outside of North America. Dr. Myers is still actively making his presence known in society meetings and I particularly enjoyed our discussions during the AHNS meeting in Montreal last year. We are grateful to Dr. Myers for his vision and support.

I would like to present Presidential Citations to two esteemed international colleagues whom I deeply admire for their friendship and significant contributions to the field of laryngology on a global scale. *Dr. Nupur Nerurkar* is a highly respected laryngologist who leads the Bombay Hospital Voice & Swallowing Center, where she also serves as the Director of the

laryngology fellowship program. Her impressive credentials include being an ALA corresponding member, a past president of the Association of Phonosurgeons of India, executive committee member of the International Association of Phonosurgeons, and a founder and board member of the International Association of Trans Voice Surgeons. One of Dr. Nupur's remarkable achievements is the Bombay Annual Phonosurgery course, now in its 17th year, which has garnered acclaim for its ability to attract renowned international guest speakers and educate a vast audience in India on laryngology. Her dedication and resilience over the past two decades have been instrumental in advancing laryngology in India, and the over 41 Laryngology fellows she has trained to date are poised to continue the legacy of teaching and innovation in the field.

Another individual I admire is *Dr. Shigeru Hirano*, to whom I would like to present a Presidential Citation. Shigeru is Professor and Chair of the Kyoto prefectural university of Medicine. His academic journey included experiences as a research fellow in 1999 at UCLA under Dr. Gerald Berke, and in 2001 at the University of Wisconsin, Madison, under Dr. Charles Ford. He is a corresponding member of the ALA, and an advisory board member of the International Association of Phonosurgeons. Dr. Hirano has made significant contributions to laryngology research, particularly in tissue engineering and regenerative medicine of the larynx, as well as anti-aging and maintenance of the larynx. While he could not attend our meeting this year Dr. Hirano has been a consistent presence at nearly all ALA meetings. I have always cherished my interactions with him and hold profound respect for his research endeavors. Our admiration for Dr. Hirano is further evidenced by his selection for the Newcomb award this year. The triad of knowledge generation and transfer over generations includes teaching, learning, and research.

Research is the most essential pillar, as scientific inquiry fuels advancements that shape the trajectory of our specialty. To this end, the ALA has awarded two research grants annually. The Laryngological Research Fund was established in 1940 and the Seymour R. Cohen Grant was established in 1999, and the grant amount has remained the same over the years. While these grants have remained steadfast in their support, there is a pressing need to bolster our dedication to research endeavors further by increasing the amount and number of ALA grants. A standing research and development committee could be dedicated to these efforts. I am pleased to share the exciting news that the council's recent decision includes the creation of a new early investigator research award. This initiative, made possible by transferring \$300,000 from the Sustainers Fund to establish the new Research Award Fund, is a significant step forward in our commitment to advancing research. It is worth noting that the Sustainers Fund is generously fueled by membership donations and underscores the collective support and dedication of our members to the advancement of our field. This new early investigator research award heralds a promising avenue for nurturing emerging talent and driving impactful discoveries in laryngology.

Let us remember that we owe much to our mentors and we continue their legacy. My journey to becoming a Laryngologist at UCLA was made possible by Dr. Gerald Berke, ALA President in 2002, who continued the legacy of Dr. Paul Ward, ALA President in 1995, who continued the legacy of Dr. Joel Pressman, ALA President in 1966. When I graduated from residency and began my fellowship, Dr. Berke was the ALA President, introducing me to the ALA early in my career.

I am honored to present a presidential citation to someone I consider the greatest mentor of all time, *Dr. Maie St. John*. Dr. St. John is currently the Professor and Thomas C. Calcaterra Chair at UCLA. She earned her MD and PhD from Yale University and completed her residency at UCLA. Her academic and professional achievements are exemplary. She is a

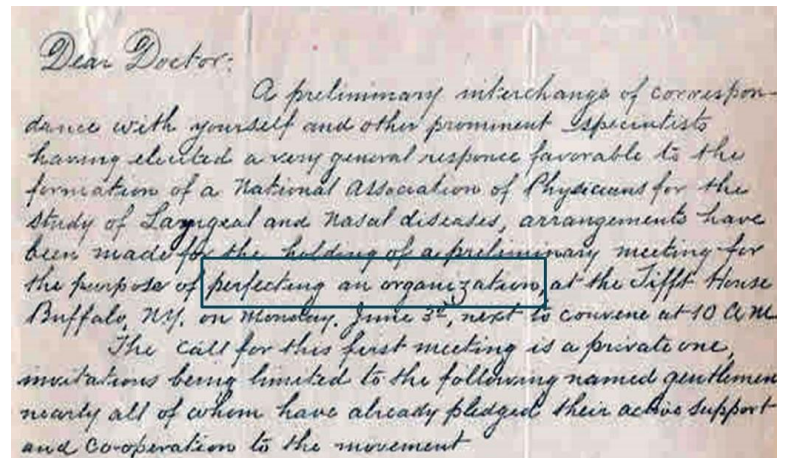
member of the AHNS council, has served as the Triological Society Western Section Vice President, and is an esteemed member of the ALA. Maie and I began our academic careers together at UCLA two decades ago. Her CV lists over a hundred mentees she has positively impacted, and she is just getting started. She has shown me with action that love, kindness, and gratitude are the essential guides for overcoming all the challenges we face every day. Dr. St. John not only talks the talk but walks the walk. She is an extraordinary mentor and my work sister, always watching over me.

I leave you with some concluding thoughts. Our Association has embarked on a strategic review process to assess our strengths, threats, opportunities, and weaknesses. We have gathered feedback from our members, and yesterday the council dedicated many hours to analyzing this data. You have charged the ALA council to focus on member engagement, membership criteria, education, research, advancing DEI, enhancing organizational effectiveness and fostering collaboration and partnerships. We look forward to the leadership of the next ALA President and his Council in accomplishing this important work in the coming year.

Reflecting on the ALA's remarkable history to date, I envision a future where the organization continues to lead in advancing the field of Laryngology. Our unwavering commitment to research and innovation will drive new discoveries and treatment methodologies, further enhancing patient care. The ALA will remain a cornerstone of professional development, fostering a collaborative environment where members support one another through various career stages and challenges. By upholding our tradition of excellence, we will continue to attract and mentor the next generation of leaders in Laryngology, ensuring that our organization's legacy of impactful contributions to the field endures.

The founders of this association convened with the goal of perfecting an organization. I can confidently affirm that their vision endures, and we, along with those who follow us, will continue to strive for the perfection of this association.

Thank you and enjoy the 145th annual meeting!



Dear Doctor:

A preliminary interchange of correspondence with yourself and other prominent Laryngologists having elicited a very general response favorable to the formation of a National Association of Physicians for the study of Laryngeal and Nasal diseases, arrangements have been made for the holding of a preliminary meeting for the purpose of perfecting an organization at the Tiffet House Buffalo, N.Y. on Monday, June 3rd, next to convene at 10 A.M.

The call for this first meeting is a private one, invitations being limited to the following named gentlemen nearly all of whom have already pledged their active support and co-operation to the movement

INTRODUCTION OF THE GUEST OF HONOR

Gerald S. Berke, MD

Los Angeles, California

Dinesh K. Chhetri, MD

Los Angeles, California

Gerald S. Berke, MD, is currently Professor and Chair Emeritus of the Department of Head and Neck Surgery at the University of California, Los Angeles. He earned his MD at the University of Southern California, followed by Residency at UCLA under the guidance of Paul Ward, MD. His illustrious research career in laryngeal physiology spans three decades, marked by productive research that has significantly enriched our understanding of voice production.

Notably, he conducted the pioneering functional larynx transplant in an animal model at the UCLA Laryngeal Physiology Laboratory. He has received all the ALA awards, including the deRoaldes, American Laryngological, and James E. Newcomb Awards. These achievements, combined with his leadership roles, including Presidency of the ALA in 2002 and the



Triological Society in 2010, underscore his enduring commitment to advancing our field. Dr. Berke is also known for his passion for songwriting and music.

Joel H. Blumin MD
Milwaukee, Wisconsin

Joel H. Blumin, MD, FACS is the Chief of the Division of Laryngology & Professional Voice and Professor of Otolaryngology & Communication Sciences at the Medical College of Wisconsin in Milwaukee, WI. He is a native of California and grew up in the Los Angeles area but ventured to the University of Iowa for medical school where he first was exposed to otolaryngology and laryngology under the training of Harry Hoffman, MD and Timothy McCulloch, MD. He went back home for residency in otolaryngology-head & neck surgery at UCLA and was privileged to learn from a post-retired Paul Ward, MD and the new Chair, Gerald Berke, MD. His interest in laryngology blossomed and he became the inaugural fellow in laryngology under the mentorship of Gerald Berke, MD at UCLA. Following his training, he has been on the faculties of the University of Pennsylvania and Medical College of Wisconsin.

Dr. Blumin practices the full spectrum of clinical laryngology – taking care of patients with airway, swallow, and voice disorders, as well as those with cancers of the larynx. He has a special interest in laryngeal dystonia and has been active with the National Spasmodic Dysphonia Association/Dysphonia International over the last 25 years. He regularly collaborates with Nikki Johnston, PhD in the laboratory looking at epithelial defense. He is a co-author of



over 125 scientific manuscripts, book chapters, and other publications and has presented over 250 papers, lectures, and workshops. He has been a co-author on papers that have won the Broyles-Maloney award (twice) and the Harris Mosher award. He has been in leadership with committee service for the Medical College of Wisconsin and many of our national societies including the Academy, ABEA, and the ALA, where he currently is serving as your council's secretary. He is an Associate Editor for *The Laryngoscope* and oversees manuscript submission in bronchoesophagology.

Roger L. Crumley, MD, MBA
Irvine, California

Roger Crumley, MD, MS, MBA, is Professor and Past Chairman at the University of California, Irvine. He earned his MD and completed his residency at the University of Iowa. His leadership roles include serving as President of the Triological Society in 2003 and of the ALA in 2008. He is also a recipient of the ALA Award and the James E. Newcomb Award.

Dr. Crumley has been a steadfast presence within the ALA community. Dr. Crumley was also the co-founder of the Neurolaryngology Study Group (NSG), an international think tank for physicians and other scientists interested in neural disorders of the larynx. He was instrumental in having noted speakers present during the NSG meeting as a part of the ALA meeting.

It was during his presidency that the ALA Sustainer's Fund was established. To date, this fund has generated more than \$300 thousand earmarked for additional laryngology research opportunities. The legacy he left remains strong and appreciated to this day.

Dr. Crumley's career highlights include election to a 12 year term on the American Board of Otolaryngology (the ABMS



certifying organization for Otolaryngology-HNS), as well as serving as President of 3 national societies in Otolaryngology: American Academy of Facial Plastic & Reconstructive Surgery (1995); Triological Society (the senior scholastic society in Otolaryngology-HNS) (2003); and American Laryngological Association (2008).

Brad deSilva, MD
Columbus, Ohio

Brad deSilva, MD is a Clinical Professor in the Department of Otolaryngology-Head and Neck Surgery at Ohio State University Wexner Medical Center. He serves as Vice-Chair for Education and Director of the Laryngology Division within the department. Along with these roles, he is the current Residency Program Director and Laryngology Fellowship Director. He developed the Laryngology Fellow Online Curriculum in 2020 and has coordinated this curriculum the past 4 years as a way to standardize Laryngology fellowship education and improve upon networking and collaboration amongst the Laryngology fellows.

Dr. deSilva received his Bachelor of Science degree from the University of Kentucky and completed his Doctor of



Medicine and residency training in Otolaryngology-Head and Neck Surgery at Ohio State University. He completed his Laryngology fellowship under the direction of L. Arick Forrest, MD at Ohio State University.

Shigeru Hirano, MD, PhD

Kyoto, JAPAN

It is with great pleasure to present this next president's citation to Dr. Shigeru Hirano who was indicted as a Corresponding Fellow in 2012. In 1999, he was a research fellow at UCLA under Dr. Berke and followed that at the University of Wisconsin – Madison with a research and laryngology fellowship.

Shigeru is the son of one of the true innovators in our specialty, walking proudly in his father's footsteps. He then returned to Kyoto where he has become the premier laryngologist and an Associate Professor of Otolaryngology at Kyoto University. Since 2016 he has served as the professor and chair at Kyoto Prefectural University of Medicine in Japan

Shigeru has an extensive publication record, with a majority of manuscripts in laryngology and voice. His basic science interest in the histologic uniqueness of the human larynx and his descriptions of the macula flava have added immensely to our overall understanding of the larynx and voice. He is an Active Member on the ABEA and an international member of the AAO. Dr. Hirano



also serves on the advisory and editorial boards of the Voice Foundation. He has author/co-authored numerous papers at our annual meeting. Unfortunately, Dr. Hirano was unable to attend this year's meeting as he is a candidate for the Board of Directors of Japan Society of ORL.

I am pleased to present this award in absentia to Dr. Shigeru Hirano.

Nupur Kapoor Nerurkar, MBBS, MS(ENT)

Mumbai, INDIA

Dr. Nupur Kapoor Nerurkar is a laryngologist heading the Bombay Hospital Voice & Swallowing Center. She is the DNB Co-ordinator of the ENT Department and Director of the laryngology fellowship program as well as the course director of the annual phonosurgery workshops being conducted at Bombay hospital since the past 17 years.

Nupur is a past president of the association of phonosurgeons of India, fellow of the ALA, ABEA, founder and board member of the International Association of TransVoice Surgeons and executive committee member Of the International Association of Phonosurgeons.



Maie St. John, MD, PhD
Los Angeles, California

A highly renowned surgeon, scientist and educator, Dr. St. John is Professor and Chair of the Department of Head and Neck Surgery and Professor of Bioengineering at UCLA. She holds the Thomas C. Calcaterra, M.D., Chair in Head and Neck Surgery. Dr. St. John's laboratory studies the mechanisms of tumor progression, incorporating the results of their research into the development of novel therapeutics.

She received her B.S. from Stanford, an M.D. and Ph.D. from Yale, and completed residency and postdoctoral training at UCLA. Dr. St. John is an outstanding educator who has provided mentorship to numerous trainees, and serves as a member of several prestigious organizations including the Executive Council of the AHNS, the ACS Board, the American Board of Otolaryngology, and NIH study sections.

She has been the recipient of multiple awards for teaching and research. Dr. St. John's clinical expertise is in intraoperative tumor margin



delineation in the resection of head and neck cancers to allow for precision surgery. Dr. St. John's work has led to clinical trials and patent applications, and has been consistently funded by the NIH, charitable foundations, and industry. She is a prolific author and a sought-after lecturer internationally.

Steven M. Zeitels, MD
Boston, Massachusetts

Steven M. Zeitels, M.D. is the Eugene B. Casey Professor of Laryngeal Surgery at Harvard Medical School and the Director of the Massachusetts General Hospital (MGH) Voice Center. In 2004, the first endowed Chair in Laryngeal Disease at Harvard was created for him. In 2004 he also re-established the Laryngeal program at MGH, which had not been present since Harris Mosher in the 1920s, who served as the President of the ABO from 1924-1947. Zeitels has authored more than 200 scientific articles, book chapters, and videos on larynx and pharynx surgery as well as presenting over 300 papers and lectures. Since 1997, he has trained 40 Post-Residency Fellows in Laryngeal Surgery, many of whom have created their own fellowship programs. He has been a visiting professor at >35 departments, universities, & and hospitals in the US and abroad.

Dr. Zeitels is widely regarded as a productive surgical innovator having designed numerous procedures and instruments and holds 6 patents for these innovations. He pioneered office-based laryngeal laser surgery and has done voice restoration microsurgery on



19 Grammy-Award- winning performers, who have garnered >90 awards.

He is the recipient of more than 75 awards and honors including: ALA 1998 Casselberry Award; ABEA 2005 Chevalier Jackson Lecturer; ALA 2011 Presidential Citation; ALA James E. Newcome Award in 2013; ABEA Broyles Maloney Award and the Chevalier Jackson Award, respectively in 2014 and 2015; and the ALA 2016 deRoaldes Award & Medal.

PRESENTATION OF THE DEROALDES AWARD

Roger L. Crumley, MD, MBA

Irvine, California

Norman Hogikyan, MD

Ann Arbor, Michigan

I have the great honor of presenting the deRoaldes Award for 2024. The list of past awardees reads like a “who’s who” of Laryngology, and this years awardee is no exception.

This laryngologist taught us to think differently about laryngeal denervation and reinnervation, and in doing so he inspired the clinical and research endeavors of many laryngologists. He served the ALA as President and established The Sustainer’s Fund. He is a role model for collegiality and a wonderful ambassador for our field.

On a personal note, I remember when I was a young resident over 3 decades ago I attended a meeting where he was speaking on a panel about vocal fold paralysis. I went up after the session to ask him a question, mostly because I just wanted to meet him. I had the distinct sense of being a peasant approaching royalty. I don’t remember my question, but I do



remember how he treated me. He listened and engaged with me in conversation; he made me, a young resident he had never met before, feel important.

I have never forgotten that. I am of course speaking of Roger Crumley.

INTRODUCTION OF THE GABRIEL F. TUCKER AWARD

Reza Rahbar, MD

Boston, MA

Alessandro deAlarcon, MD, MPH

Cincinnati, OH

The Gabriel F. Tucker MD Award was established in 1987 by its namesake, Dr. Gabriel Tucker and his family. This award is presented to an individual who has made significant contributions to the field of pediatric laryngology or to the Association or both.

This year's recipient, Reza Rahbar, MD, has practiced pediatric otolaryngology at Boston Children's Hospital (BCH), Harvard Medical School since 1998. He is recognized as an expert in pediatric airway disorders and head-neck tumors nationally and internationally. Dr. Rahbar co-directs two multidisciplinary programs in this regard: The Center for Airway Disorders and the Program for Head-Neck Surgery. He also serves as Associate Chief and Chair in Airway Disorder in Pediatric Otolaryngology at Boston Children's Hospital, and Professor of Otolaryngology at Harvard Medical School.

Dr. Rahbar has authored/co-authored more than 200 peer-reviewed articles and book chapters. Additionally, he was the past Councilor at Large of the American Broncho-Esophagological Association (ABEA) and this year is the President of the American Society of



Pediatric Otolaryngology. Internationally, he is the founder of IPOG (International Pediatric Otolaryngology Group) that is an organization with members from more than 300 Children's Hospital and/or pediatric otolaryngology departments in the world to provide management protocol and consensus on rare and complex Pediatric ORL disorders.

I am honored to present the Gabriel F. Tucker, MD Award to our 2024 recipient, Dr. Rahbar.

PRESENTATION OF THE JAMES NEWCOMB AWARD

Shigeru Hirano, MD, PhD

Kyoto, JAPAN

Nausheen Jamal, MD

Galveston, Texas

This year's recipient for the 2024 James Newcomb Award has been involved in numerous areas of this Association as evident by his attendance at our annual meeting and contributing to both oral and poster presentations. He completed a research fellowship at UCLA under Dr. Berke in 1999 that was followed with another fellowship in research and laryngology at the University of Wisconsin – Madison in 2001.

Dr. Shigeru Hirano was inducted as a Corresponding Fellow in 2012. Dr. Peak Woo, in 2016, selected him to present the State-of-the-Art Lecture.

Dr. Hirano is the son of one of the true innovators in our specialty, walking proudly in his father's footsteps. Since 2016, he has served as the professor and chair at Kyoto Prefectural University of Medicine in Japan. He is an Active Member on the ABEA and an international member of the AAO. Dr. Hirano has author/co-authored numerous papers at our annual



meeting. Unfortunately, Dr. Hirano is unable to attend to accept his award in person as he is attending the annual meeting of the Japan Society of Otorhinolaryngology where he is a candidate for its Board of Directors. On his behalf, Dr. Chhetri is accepting the 2024 James Newcomb Award

**PRESENTATION OF THE
AMERICAN LARYNGOLOGICAL ASSOCIATION AWARD**

Charles N. Ford, MD, DDS

Madison, Wisconsin

Thomas Carroll, MD

Boston, Massachusetts

Dr. Charles N. Ford Jr., Emeritus Professor of Surgery and Otolaryngology at the University of Wisconsin, Madison, is a physician-surgeon-scientist and this year's recipient of the American Laryngological Association Award. Dr. Ford leaves a legacy that includes novel surgical approaches to true vocal fold scar and glottic insufficiency and extensive research and publications that have had a major influence on laryngology. Dr. Ford helped set the standard for the routine use of laryngeal videostroboscopy for the assessment of voice disorders. He developed new instrumentation for awake, vocal fold therapeutic interventions which helped to launch the modern era of office-based laryngeal procedure intervention.

Dr. Ford has been an inspiration to hundreds of trainees, and his vision of the interprofessional model of care for voice disorders as best practice is now the model of care in many institutions. Among his numerous accomplishments, Dr. Ford is the former



President of the American Bronchoesophagological Association and the Society of University Otolaryngologist-Head and Neck Surgeons. He has been a stalwart contributor to The Voice Foundation. The voice world is indebted to Dr. Ford for his contributions.

**INTRODUCTION OF THE 2024
STATE-OF-THE-ART LECTURER**

Ingo Titze, PhD
Salt Lake City, Utah

Dinesh Chhetri, MD
Los Angeles, California

Ingo R. Titze is a vocologist with formal education in physics (PhD), electrical engineering (MSEE), and music. He has directed the National Center for Voice and Speech for 31 years. He is an Emeritus Distinguished Professor at the University of Iowa and currently holds adjunct appointments in Otolaryngology, Music, and Biomedical Engineering at the University of Utah. He is the 1996 recipient of the ALA

Award, an Honoree of the American Speech Language Association, and a Gold and Silver Medalist of the Acoustical Society of America. The Voice Foundation has named the Sundberg-Titze award in his honor. Dr. Titze has authored five books, edited three books, and published over 500 journal articles. He continues to be an active singer.

ALA State of the Art Lecture

Discovering the Amazing Physical Phenomena in Laryngeal Sound

Production: Successes and Challenges

Ingo R. Titze, PhD

Vocology is the study of vocalization. It parallels audiology, the study of hearing, and partners with laryngology the way audiology partners with otology. Vocology includes vocalization across all species. Much of human vocalization is understood by studying nature's variety.

We have two primary objectives when we produce sound vocally. One is to get enough sound to the listener. If the listener is at a considerable distance, then it's a matter of getting maximum acoustic power transferred from the source into the vocal tract and out of the mouth. Semi-occlusions of the vocal tract will be discussed that facilitates maximum power transfer. The other objective, maximum information transfer, carries us in the opposite direction, namely balancing the intensity across vowels and consonants. This limits the sound power delivered to the listener.

I will also touch upon recent developments in computational simulation and machine learning. Finally, a topic that interests me right now is vocalization for general health. This is more than giving a message to somebody vocally, but it is sound production to keep various organs in the body well-functioning.

Updates on vocal fold morphology

We all know the famous work by Minoru Hirano regarding multiple tissue layers in the vocal fold. Beginning at the medial surface, the epithelium graduates to a superficial layer, then a ligament, and finally the thyroarytenoid muscle. Depending on which of these layers dominates in longitudinal tension will determine the pitch.

What I want to talk to you about today is something brand new, a hypothesis that has not been introduced in the literature. The question is: does the epithelium by itself ever



become the primary tension bearer, and if so, what vocalization will result? As vocologists have studied other species, they have learned that some mammals have developed a vocal membrane, or a vocal lip. Basically, the epithelium is extended outward from the body of the vocal folds such that the epithelium and the superficial layer have considerable independence in vibration. The smaller mass in vibration can then produce very high pitches, some that we as humans may not be able to reach easily. I will explain the direction in which humans can go with their anatomy, not with geometrical adaptations, but with selective vibration of the existing epithelium by itself.

A model of three pitch control mechanisms has been proposed. In Mechanism 1 (M1), the dominant pitch control tissue layer is the muscle. The muscle can contract and stiffen for short vocal fold lengths where the more medial layers, the ligament and mucosa, are lax enough that they don't dominate the frequency. They serve to create the converging-diverging shapes that allow self-oscillation to take place. In Mechanism 2 (M2), there is a

higher possibility that the ligament becomes the tension-bearing layer for fundamental frequency.

Now I am proposing something new, the possibility that the epithelium is the dominant tissue for determining extremely high fundamental frequencies. The vocal fold epithelium has never been dissected because it is a small fractional of a millimeter in thickness. However, estimates have been made by excising the epithelium together with variable fractions of the superficial layer. By using different depth of the superficial layer in a stress-strain curve, the stress-strain relation of the epithelium is predictable. With that approach, the epithelium has been estimated to be the stiffest layer for very high whistle-like fundamental frequencies. We call this Mechanism 3 (M3).

The tissue stresses generally grow exponentially with strain, the fractional elongation. Plotted logarithmically, the curves become straight lines. This is shown in a figure divided into three parts, with M1 being muscle dominant, M2 being ligament dominant, and M3 being epithelium dominant for fundamental frequency control. For M3, the stress is now in the Mega-Pascal range.

The frequency ranges up to about 500 Hz for the M1 mechanism, up to about 1500 Hz for M2, and above 3000 Hz for M3. When classical singers perform pitches in the F6 to B6 range, between 1000 and 2000 Hz, they transition from M2 to M3. When singers approach fundamental frequencies above 2000 Hz, they are solidly in M3. There will not be any vowel perception because the first and second resonance of the vocal tract are not energized. The sound is similar to a tone we get from a flute or some other wind instrument. However, the presence of harmonics suggests vocal fold vibration exists, not just aerodynamic whistling with turbulent air resonated by a cavity.

Update on Source-Filter Interaction

In the linear source-filter theory, the source frequencies produced at the vocal folds are filtered downstream in the airway such that

at the lips only the phase and amplitude of any source frequencies are changed. This modification of the amplitudes and phases of the frequency components creates different sound qualities and an inventory of vowels and consonants. However, energy is assumed to flow in one direction only, from the source to the lips.

In nonlinear (interactive) theory, the source frequencies can be altered by the filter. Energy flows backwards. In Level 1 interaction, the backwards waves change the airflow at the glottis without changing vocal fold movement. A ripple and peak flow skewing is seen on the glottal flow waveform. In Level 2 interaction, the vocal fold tissue movement is also altered with backward propagating pressures. The glottal area waveform can then change also.

There is the amazing possibility that an entire glottal source spectrum of harmonics frequencies can be produced by nonlinearity, even though no contact occurs between the vocal folds. The glottal area can be perfectly sinusoidal. With this perfectly sinusoidal movement, linear theory would predict only one frequency at the output. The airflow would be proportional to the glottal area. With interaction, however, multiple frequencies are produced at the source. Nonlinearities in the system are responsible for these source frequencies. Feedback is one type of nonlinearity.

Update on Semi-Occluded Vocal Tract Exercises

Semi-occluded vocal tract exercises have become very popular. Those of you who work with speech language pathologists in your clinic will see a lot of clients using straws, tubers, and masks to semi-occlude the vocal tract. Semi-occlusions offer an acoustic and aerodynamic energy feedback that helps the vocal folds to vibrate. The phenomenon is not new in nature.

Alpacas, llamas, and goats hum for short range communication. For humming, the semi-occlusion is at the nostrils, and the lips are closed.

Frogs don't open their mouths. Rather, they just blow up their neck. There is a lot of interaction going on between sound in the airway and sound at the sound source. Doves don't open their beak very much when they coo. Again, a similar kind of radiation occurs from the neck.

So, if we spend more time looking at nature, we find that there are solutions for efficient vocalization that have developed over long periods of time. When animals want to get the sound over long distance, then the objective is to radiate as much sound as possible from the beak, the lips, or the mouth. However, animals tune their systems during short-range communication for vocal efficiency, optimizing wherever is necessary to meet the target for all conditions.

There are two basic kinds of semi-occlusion, an oral semi-occlusion and a nasal semi-occlusion.

For an oral semi-occlusion, the velum is completely closed, and the lips are partially open. For a nasal semi-occlusion, the velum is open and the lips are closed. In both cases, a steady pressure in the upper airway is produced, and reflections heighten the acoustic pressures. These aerodynamic and acoustic pressures can help organize the vocal folds in their vibration. It has been shown that well over 90% of all the acoustic energy that is produced by the sound source never leaves the airway. It can help or hinder vocal fold vibration.

The benefit begins with an overall widening of the airway. This is very important because if the airway is widened first, then there is a better chance of producing wide-narrow contrast at various locations. Specifically, the upper portion of each vocal fold is spread apart, and as a result, the medial surface of the vocal folds can be brought together in a more parallel configuration. Parallel vocal fold surfaces are easiest to get into vibration, as opposed to convergent or divergent surfaces in a pre-phonatory setting.

Amplitude and collision forces are greatly reduced in SOVT exercises, allowing lung

pressure and fundamental frequency to be taken to very high values.

Maximum vocal power is transferred from the source to the airway with a lower glottal resistance and a higher airway resistance. Normally, when the vocal tract is open, the greatest resistance in the entire airway is the glottal resistance. To get maximum power through the vocal tract to the listener, a balance between the glottal resistance and the resistance in the vocal tract needs to be established.

So, after having mastered the reduction of glottal resistance, there needs to be a way to increase the upper airway resistance. A likely place is the larynx canal, or the epilarynx region. We don't yet know what muscular structure is available to create a narrow region right above the glottis, the resistance of which can deliver maximum power transfer.

Contrast between maximum power transfer and rapid information transfer

For rapid and clear information transfer, a separation between the source and the filter is desirable because the speaker wants to create all words and phonemes with clear articulation, not to be highly influenced by the source. In speech, we lower fundamental frequency, and we don't want to create an excessive amount of source-filter interaction because that may confuse the message.

We rely on the carrier modulation principle, valid in any kind of communication delivered electronically or otherwise. There is always a carrier and a modulation. The modulation is the information that we pass on. We want separation between the carrier and the modulation. That happens when the fundamental frequency is down around 100-200 Hz, but the vowel and consonant information (formant structure) is 5 to 10 times higher than that in frequency. So, speech benefits from lowering the fundamental frequency. The fundamental frequency in speech is in the low 10-20 % region of the voice range profile. But that is not necessarily good

for maximum power transfer. We need to figure out a way to spend more time in the higher frequency ranges with singing and calling, so that we can learn how to balance the source with the filter in a more efficient way for a variety of vocalizations.

Update on Computer Simulation

Computer simulation of human and animal vocalization has been developing rapidly. In my view, it should be the first medium of experimentation for a novel question. It presents no risk to the welfare

of humans or animals. Predictability is outstanding, but accuracy is never better than the data upon which it is built. Computational approaches are now half a century in development.

Most of the effort has gone into modeling tissue mechanics with finite-element approaches. We now learn that the aerodynamic and acoustic components are more of a challenge than previously thought. The simple Bernoulli approaches to glottal aerodynamics are insufficient for complex glottal shapes.

When there is partial vocal fold contact, pressure patterns are vastly different from those obtained with one-dimensional flow, when the glottis is fully open. A high-fidelity Navier-Stokes solutions shows pressure gradients in multiple directions in the glottis, but the solution is computationally expensive. We are trying to use neural network approaches to simplify this calculation. Navier-Stokes solutions with vortices and turbulence take something like two weeks of computation for a few cycles of vibration, even on an array of supercomputers. So, we are looking for shortcuts to get the effects of this varying pressure on the surfaces with pre-calculations.

With deep machine learning and pre-computation, we can also make a nice transformation from acoustic parameters to perceptual parameters. Interestingly, we generally use perceptual parameters, like pitch, loudness, register, and voice quality to describe vocalization. Yet, whenever we do simulations, we typically start in the acoustic domain. We need that transformation from perception to acoustics to control our models.

Update on Vocalization for General Health

The basic question is this: if you were a person stranded on an island without any human company whatsoever, would you have reason to continue to vocalize? Does self-induced vibration of body tissues in the head-neck region have a health benefit separate from person-to-person communication? What does transmission of tissue vibration do to other organs of the body?

It is hypothesized that larynx-produced vibration can assist in mixing and transporting fluids from organ to organ. It helps dislodge plaque and other deposits in fluid circulation. It reduces viscosity so that tissues become more liquid-like and less solid-like, and it can perhaps stimulate neural transmissions at synapses.

At the Pan American Vocology Association, I have organized a group of people to search the literature about vibration of nerves, blood vessels, skin, muscles, and ligaments to determine what vocal fold vibration can do to stimulate various organs of the body. We are looking for pathways in which self-generated vibration and sound from the larynx can deliver vibratory signals large enough to enhance healthy activity.

I thank you, Dr. Chhetri and the American Laryngological Association for inviting me to give you a little update on what has been and where we're going in voice research.

**INTRODUCTION OF THE FORTY-EIGHTH
DANIEL C. BAKER, JR. MD, MEMORIAL LECTURER**

Debara Tucci, MD, MS, MBA
Durham, North Carolina

Phillip Song, MD
Boston, Massachusetts

Dr. Debara Tucci is Director of the National Institute on Deafness and Other Communication Disorders at the National Institutes of Health, a position she has held since September 2019. In her work at NIH, she oversees the development and implementation of strategic priorities to advance science and population health related to the mission areas of hearing, balance, voice, speech, language, taste and smell.

Dr. Tucci began her career as a clinical audiologist at the University of Virginia (UVA) Health Sciences Center in Charlottesville for four years before earning a medical degree at UVA School of Medicine in 1985. She completed her residency training in otolaryngology-head and neck surgery at UVA and a postdoctoral fellowship in otology, neurotology, and skull base surgery at the University of Michigan, Ann Arbor. In 2013, Dr. Tucci earned an M.B.A. in business and health sector management from Duke University's Fuqua School of Business.

Prior to coming to NIH, Dr. Tucci was a longtime faculty member at Duke University, in the Department of Head and Neck Surgery & Communication Sciences. Dr. Tucci's research has focused on understanding the biological effects of hearing loss in animal models, on treatment of otologic disease, and on accessibility and affordability of hearing health

care. She partnered with the Duke Clinical Research Institute and colleagues to develop a national practice-based research network, and led a research team that implemented and studied outcomes and cost-benefit of adult hearing screening in primary care clinics at Duke. She has trained and mentored many resident physicians, junior faculty, and graduate students, both informally and through development of formal research training and mentoring programs. Current work as co-chair of the Lancet Commission on Global Hearing Loss allows her to pursue her passion for understanding and impacting hearing loss disability in diverse and underserved populations worldwide.

As the first woman in this role, she is a pioneer for her efforts in understanding the causes and impact of hearing loss. Her work extends to developing treatments for hearing restoration and addressing barriers to healthcare access. Dr. Tucci has established a national network of academic and community-based research sites. She has spearheaded multiple clinical trials and oversees numerous NIDCD grants aimed at training and mentoring the next generation of clinician-investigators in otolaryngology and communication science.

I am extremely pleased to introduce Dr. Tucci as the 2024 Daniel C. Baker MD Lecturer.

**FORTY-EIGHTH DANIEL C. BAKER, JR, MD
MEMORIAL LECTURE**

The Otolaryngologist Surgeon Scientists Career Development: It Takes a Village

Debra Tocci, MD, MS, MBA
Durham, North Carolina

The future of otolaryngology depends on research to advance patient care. I believe that we need to deliberately cultivate a scientific mindset in all practitioners, as well as nurture a cadre of surgeon scientists who are uniquely positioned to recognize a problem in the clinic, decide that they want to tackle this in the lab, go either to the basic science lab or a clinical lab, research it and then bring those discoveries back to the bedside. We know that it takes an average of 14 years before a discovery is implemented into clinical practice and we are thinking about is how to streamline that process so that what we discover by doing research applies to patients broadly and uniformly and translates quickly into improving evidence-based patient care.

We need to increase the pipeline and the impact of surgeon scientists, I believe, by increasing workforce diversity and inclusiveness and I'll talk a little bit about that. And then I think we also need to think about physicians as communicators with the public. The pandemic taught us that there can be a lot of mistrust in science and in medicine, but what we also saw is that people trust their personal physician. People have confidence in their own doctor to give them the absolute best advice. Physicians can show leadership by communicating with their patients about the ability of research to provide information that improves patient care. They can also communicate to patients the advantages of participating in clinical trials, which can provide the evidence needed to improve patient care.



So, what is the picture of NIH funding for surgeon scientists? We know that surgeon scientists are critically important. Nine Nobel Prizes have been awarded to surgeons for advances including the discovery of insulin and successful organ transplantation. We have a unique perspective as surgeons and that perspective helps us inform topics in patient-oriented research. However, we all know that the surgeon scientist workforce has been in decline in recent years.

This slide shows results of a study that was published in 2015 looking at the decade prior and the trends in NIH funding for funding of surgeons, particularly R awards and K awards. Over that decade, numbers of awards were found to be decreased by 30 to 40 percent. But if you look over that same time period, other types of awards have increased dramatically during that time period. So, the dark bar is the surgery funding portfolio and U grants are large multidisciplinary grants. What this study has

shown and what other data have shown is that surgeons are not just getting funding for K awards and R awards, but they're also participating in large multidisciplinary research projects, asking big questions. And so, I think that rather than just looking at a couple of different mechanisms, we need to look at all of the opportunities available, particularly for collaborative work, because surgeons can make unique contributions to these studies.

This slide shows some encouraging trends in research grants awarded to surgeon scientists. These data were compiled by Dr. Martha Zeiger and her team at NIH. These data paint a more nuanced picture than can be obtained from a cursory analysis of data from NIH Reporter. What Dr. Zieger and team found in this analysis, based on funding awarded in the past decade, is that the number of surgeon scientists has actually increased in number. Overall, we've seen an increase from a little over seven hundred to a little over 1,000 surgeon scientists. Not a huge number, but also not decreasing. And while basic science research still dominates, or about 75% have funding to do basic science, there's also a lot of clinical research, surgical education, health services, and as I mentioned, U mechanism grants. So, there's a lot out there that's possible, and this shows an encouraging trend.

Otolaryngology is shown in the arrow here, so we've had an increase over this decade from 91 to 114 funded surgeon scientists. This analysis highlights the versatility and the breadth of research that's taking place in our specialty.

I wanted to call attention to the two major research awards, career development awards that are used across NIH, and these are the workhorses for support of research training for clinician scientist by NIDCD. The first is the K08, and this is the Mentored Clinician Scientist Research Career Development Award for work in basic science, and then its partner program, the K23, is to fund patient-oriented work. Both of

these require 50% time commitment. The time requirement used to be 75% but that is no longer the case. In most cases, surgeons that are funded through K08 awards at NIH are required to have 50% time commitment. And so here I'm going to show you something about success rates. I think that this is really encouraging, and what I wanted to point out is that these are not success rates after the first application. These are success rates after as many applications as it took to get funding, and usually it's two, but it could be more. And so, on the left-hand side, we're seeing over the period of time between 2017 and 2023, the success rate of K applications, and in this graph, NIH-wide data are shown in orange, and NIDCD-specific data are shown in blue.

Overall, for the K08, 71% of applicants were funded by NIDCD, which exceeds the NIH average, and for the K23, almost 50% were funded. These are exceptionally good rates of grant funding success. And then we asked the question of all the K awards who got their grants, what percentage obtained an R01 award on a subsequent application? You can see this is about 50% for K08s and 65% for K23 grants. A lot of times we hear it's really difficult to get an NIH grant, but what I'm trying to point out here is it takes persistence, and it takes being informed about how to go through the process of getting the grant, how to revise it, how to listen to the recommendations of the reviewers and then make progress towards getting award funding.

I also am personally interested in trends of funding of early career female researchers, and so we looked at our data showing what percentage of K awardees are female. And so, for the K08 grant, on the left is NIDCD, and this shows that 37% are female, NIH-wide, it's about almost 40%. And then for the K23, the vast majority, 72%, are female, and about 60% for NIH as a whole. So, I think this shows that we have a really robust pipeline of funding.

So, there are some challenges. I think we're all aware of these, but I think we need to be deliberate in thinking about how to address these challenges. And foremost, in my mind anyway, is the gap between research training and eventual faculty appointment. And this gap is in place because usually we have early research training, usually in medical school or in the beginning of residency, and then there's a several year period of time, which includes the later years of residency, which are very clinically focused, with very intensive training, the clinical fellowship, which often doesn't have a lot of time for research, and then a faculty member ends up in a new institution and is thinking about starting a research program. So that's a difficult gap to breach. That is about five years usually of clinical training that exists between the time of intensive research training and then thinking about writing a grant, a K-Grant in general.

So, in thinking about this, we're always trying to problem solve about what we can do to make this an easier process. And so, I'll mention in a couple of slides that we do have a new NIDCD grant mechanism that's designed specifically to help with this problem. We won't solve the problem entirely, but it can help. And then the next thing to keep in mind is once you land in a faculty position, it takes more than a couple of years to get a K award funded. So, a lot of times I'll hear that a new faculty member has a startup package, and they have 'protected time' for a couple of years and then they're expected to transition into full-time clinical practice if they're not successful in getting a grant. A couple of years is not an adequate amount of time to get NIH funding, on average. So here you see on the left that for otolaryngology, it takes an average of three and a half years to get funded with a K award. So, this is something that we have to plan for. It takes patience and persistence. But as I've shown, the success rate is ultimately pretty high.

And this shows further how long it takes to get an R01. Dr. Mike Lauer, who's in charge of all extramural programs across NIH, did this analysis where he looked over the last 25 years at the average age of the R01 awardee, and found for all applicants the mean age during that time increased from 40 to 44. It's similar for males and females, but it's not similar by degree. So, PhDs tend to get funded earlier than MDs or MD PhDs, which makes perfect sense when you think about the fact that we have a much longer path to go before we get into our eventual faculty position because of the length of clinical training.

I think we need to be inclusive when we think about research training and research support. Our specialty, our societies, our departments are becoming more diverse, and this is a positive change. There are plenty of scientific studies that show that diverse teams produce better science. And so, we need to bring in all faculty, all practitioners into the research milieu. We know that investigators from underrepresented backgrounds are more able to engage diverse populations in clinical trials, and that investigators from underrepresented backgrounds ask different research questions and are more likely to address health disparities. We also need to think about global populations as we think about how to care for our patients here at home as well.

This slide shows some important studies illustrating the point about the advantages of a diverse workforce contributing to research. We know from research that gender diversity is important. So, in examining peer reviewed publications with gender heterogeneous authorship teams, these studies received significantly more citations than those of single sex teams. Ethnic diversity has a strong correlation with impact as well. And racial diversity has been looked at in a lot of different kinds of studies, but some of these have actually studied how small group discussions go with more diverse teams and

demonstrated that they tend to have more complex thinking and develop more novel solutions. NIH has taken this to heart. We have requirements for some of our grant mechanisms, including from the BRAIN program, to include a statement about diversity. And the required research team diversity can relate to many different factors, including geographic diversity or inclusion of small, less research-intense institutions with larger academic powerhouse institutions. There are a lot of ways to bring diverse thinking into the way that we approach problems.

This slide shows trends in NIH funding of diverse groups of investigators, showing for each on the bottom the application rates for grant awards and then the lines at the top are success rates. By gender, fewer women apply, but women are funded at a rate similar as men. For ethnicity, again, fewer Hispanics apply, but have equal success rates of funding. For underrepresented minorities, fewer apply, and we do have a gap. And we talk a lot about this gap between application rates for underrepresented minorities, and we have many, many programs in place to address this, and I think we're making progress. When this graph was done in 2018, there was a 7% disparity, and now I think we're down to five, so we're making some progress towards our goal of ending disparities in funding of applicants from underrepresented groups of investigators.

One of the initiatives that is designed to help with this problem is the Early-Stage Investigator Program (ESI). Early-Stage Investigators are defined as those within 10 years of their terminal degree, and for clinicians, this does not include their clinical training, so in other words, the 10 years begins at the end of clinical training or the end of fellowship. New investigators may also be prioritized for funding, and this group includes those with no prior funding as a PI. We have metrics for funding of these groups across NIH, and NIDCD tends to do

very well. So, this is hopefully going to bring in more women and more racial and ethnic minorities into our portfolios.

So, what are we doing to increase funding and career development for surgeon-scientists? This slide shows a suite of programs that have been developed since I came to NIDCD, and it is the hope of me and all the staff that I work with are that these programs can make a real difference. So, the first is the NIDCD's Mentored Research Pathway Program for Otolaryngology Residents. This is replacing the T32 program. So, the T32 program had been in place for a very long time, and we noted that there were some limitations of these programs and thought we could do better. So, we created a new program from scratch. It couldn't be called the T32 because that's an official government, NIH-wide mechanism. This mechanism is an R25 program. One of the changes from the T32 program is that rather than having an obligation to be 100 percent committed to research, it requires an 80 percent commitment to research for the residents. And so, the goal in doing it this way is to try to integrate the residents who are doing research into clinical practice, which we all have to do as we develop our careers as surgeon scientists. It also provides some funding for research support, such as a research technician who is able to continue the lab work the resident leaves the research experience and goes into clinical practice, so that hopefully they can continue their research while they're in the clinical years of training. And there are some other improvements as well. So basically, the idea is that it will allow customization of the research training program to meet the goals of the residency program.

Two other programs are designed to help develop the surgeon scientist and the broader clinician scientist workforce, including a mentoring network – these are intended to be national networks – that support clinician scientists with mentors and advisors. The other R25 program supports

development of the workforce through research experiences. We have received many applications for these programs, and I'm excited to see how these programs are developing. Then on the bottom and in green, I show analogous programs to develop a more diverse workforce. These aren't aimed only at surgeon scientists as much as the entire clinician scientist workforce. This is the new grant mechanism that I mentioned earlier. This program is designed to facilitate transition to independence and allow for a change of institution. The program provides five total years of support. There's a mentored phase for one or two years that would take place in the training institution. So, this could be at the residency institution or the fellowship or other training institution, and then the independent phase, allowing that individual to take grant funding with them to their new faculty position with funding for three or four years as a junior faculty member. This program should help to bridge that gap, so you don't have three and a half years to getting your K award funded. So, I'm very hopeful that this will have a lot of uptakes and a lot of impact.

I do not think a lot of people know about the NIH Loan Repayment Program. And this is a program where if you are engaged in clinical research or research that has any clinical applications, you are eligible. It will repay up to \$100,000 of your educational debt. And the success rate is quite high. I show in this slide the success rate at NIH, but the NIDCD success rate is even higher. You do not need to be NIH funded to apply for this, but you do need to devote at least 20 hours a week in a qualified research program. So, this is something that we should all keep in mind because educational debt is a barrier for many who chose to devote a significant amount of time to doing research. Here I show various predictors of success for development of research scientists. There are many paths to a successful career, and not all are required for all surgeon scientists. Publications, of course, are important. An

advanced degree, I personally think, is not that important; for example, I don't have a PhD, and many clinicians, scientists, and surgeon scientists do not have advanced degrees. But surgeon scientists have a perspective and knowledge that is critically important. It's important for clinicians to partner with basic scientists and PhD clinical scientists who have different sorts of expertise. We can all work together in a collaborative fashion to really lift us forward. Didactic coursework is not critically important, but we all must have the requisite knowledge to conduct our research. Informal coursework and other kinds of research training do not have to take place in a certain kind of format. So, there are various ways to get this kind of information.

The only thing in this list that is important, and indispensable, is mentorship. I don't think any of us could be successful as surgeon scientists without mentorship. There are many ways to get good mentorship. Some of the programs that I talked about earlier are formal ways to do that, but having all of us think about what kind of mentorship we need, whether it's in our institution or outside of our institution, and then being deliberate about cultivating that, I think is key.

So, these are the essential components. I'll wrap up this part of the talk. The department and the institution must be the right fit when you're looking for a faculty position. The leadership sets the tone and the culture and must provide adequate resources, and there also have to be collaborators. I think none of us do this alone. Support must be for the long term. The average age of the first R01 grantee is age 44. So, it's critically important to aim for starter grants before you apply for the big grants or to take advantage of some of the other programs that I talked about, and ALA and other organizations, other societies, provide these starter grants, and I think they're critically important for those of us starting out. And again, mentorship is

critically important. We really need to have that.

So, I wanted to tell you a little bit about NIDCD's budget, our portfolio, and the grant application process, just to try and demystify that a bit. And I must say before going to NIH a little under five years ago, I didn't know a lot of this information, so I imagine that I'm not alone.

There are twenty-four institutes and centers at NIH, and NIDCD is shown in red. We are one of the smaller institutes, and our budget is a little over a half billion dollars a year. But we are mightier than this because we collaborate across all these institutes. There are many trans-NIH programs in which we participate, including the BRAIN Initiative. There are many different programs that we leverage to benefit our grantees. And so, a lot of my time is spent trying to figure out how I can collaborate and leverage many kinds of resources across the agency. This is how our funding breaks down by mission area in the last year. Most of our funding goes to hearing, 7% for voice, 8% for speech, and 8% for voice with the otherwise breakdown that you see here. And this is not predetermined. This is based on just the grants that come in and the scores that they get. And so, this can change and varies a little bit over time but has not varied very much recently.

The budget that we have this year is shown here. The President's budget projects a small increase, but as you probably have heard, Congress gives us our budget, and they don't always pay any attention to the President's budget. So, we're still waiting to see what our budget will be going forward. When I first came on board at NIH, we were getting 3 to 4% increases a year, which was quite a bit. And this year we have a virtually flat budget, so it's created some challenges.

There are three grant cycles a year, as you may know, and we have three councils a year. And the councils are the bodies made up of people outside of NIH that that make recommendations to us for funding

decisions. We allocate a certain amount of money for the payline-driven grant awards that we make. And then we also hold out a small amount of money, \$4 million per council round, for high program priorities. And so, again, we look at early-stage investigators, new investigators, and investigators that are interested in pursuing research in areas that are priorities for us in our strategic plan.

The early stages of thinking of applying for a grant usually involve speaking with a program officer. So, I wanted to highlight that Dr. Lisa Kopf is the program officer for voice and speech, and that if you are intending to apply for a grant, it would be a good idea to speak with her. And then there are other aspects of the process, and you'll have access to these slides, and so you can use the links that are shown.

We supply quite a bit in the way of resources to potential grant applicants, and one of the resources that we have available on our NIDCD website is sample grant applications. There are a couple of things that really help when you're thinking about how to put together a grant. One is looking at how a good grant is put together, just so you have an idea of the organization. And the other is to review grants. One of the slides that I have is to try and encourage you to volunteer to review grants, and you can do that for NIH, for NIDCD, and especially if you're starting out volunteering to review grants for some of the societies and the smaller grants that we have, the core program that the academy has, it can be so, so helpful in figuring out how people are going to review your grant when you submit it.

And so, what this is, is NIH, the big NIH has tremendous resources to help teach people about the grant process, how to write grants, how to submit them, all of the different aspects. And it used to be before the pandemic that Mike Lauer, the head of the extramural program, would go to Chicago or New Orleans and hold a two-day workshop and a couple hundred people

would come. And then with the pandemic, they realized that they could not do that anymore. And so, they started to do these online grant prep courses, and they had, I think at the last one, a few thousand people tune in. The resources shown are on the NIH website. Again, there's a link here that you can use. And these are tremendous resources that can teach you about grant writing.

This slide shows the submission process. Basically, when a grant comes into the NIH, it is assigned to a NIH-wide study section through the Center for Scientific Review, or CSR. And the grant is assigned to a study section and reviewed in that study section, given a score, and then referred back to our institute. Some grants are reviewed within our institute, and that includes K awards, and all of the R25s that I mentioned, as well as some other awards. So, we do have our own review program as well. And then after that happens, we go through the grants to decide which ones meet the pay line, which ones we might be interested in funding outside of the pay line and take that information to our council, which then helps us go through these grants and gives recommendations about future funding decisions.

And I hear a lot from clinicians that the review process does not include a clinical perspective, that they think that it's biased towards basic science work. I think this probably used to be the case, but I will say that we've been in very intense conversations with the people that lead the NIH-wide study sections. They understand that this is important. They're making strides to involve as many clinician scientists as they can in review. We recommend reviewers to them all the time. But one thing that you can do is to volunteer to review. I'm making a plea to all of you, that we really need clinicians to help with the review process.

This slide gives more information on the voice and speech portfolio. So, we have a little under 8 percent total funding devoted to each of these topics, including genetic

causes of speech disorders, improving speech in individuals with neurologic disorders and regenerative medicine. It's quite an exciting portfolio.

We have across all of NIDCD seven large center grants. These are multi-PI grants, large, multi-million-dollar awards at institutions. So out of seven of those, two are related to laryngology. The first, Dr. Hillman, at Mass General, is "Clinical Research Center for the Improved Prevention Diagnosis and Treatment of Vocal Hyperfunction." And the second by Dr. Simonyan at Mass Eye and Ear is "Next Generation Clinical Phenotyping and Pathophysiology of Laryngeal Dystonia and Voice Tremor." These are very, very exciting programs.

I wanted to tell you at the end here a little bit about the NIDCD strategic plan and then how voice and speech may fold into this. So, we had a process of developing a strategic plan right after I came to NIDCD. We involved many people in the research community, federal partners, advocacy groups, cast a wide net to try and get a lot of grassroots participation in taking a new look at our strategic plan. We threw the old one out and we thought, how do we need to develop our research portfolio to really move forward to take better care of our patients? And so, I'll go through there six themes:

1. The first is sort of the bread and butter of NIDCD, which is to do basic science research to characterize cell populations and neural circuits. We also have a new emphasis on study of biopsied and post-mortem human tissue, both the collection of this tissue and related data and the study of human temporal bones and other tissue. We have more emphasis on immune mediated diseases. This is a big emphasis across NIH as a whole, but it certainly applies to our specialties as well.
2. The second theme is to develop and improve model systems to inform research. And so, this is not only in

- vivo models, but also new in vitro models to help accelerate basic studies and to provide the opportunity for high-throughput screening, for example, for drug treatments.
3. And a third goal is to develop better in silica or computer models. These highlight different ways of doing research past the usual animal studies. These two themes really focus on improved patient care. So, as you can imagine, this is a huge priority of mine to try to accelerate our ability to take better care of our patients. First, to promote a precision medicine approach to prevention, diagnosis, and treatment, accelerating the ethical use of genetic and phenotypic data. So high-value datasets have all of these data together and enroll large, large numbers of patients so that we can look critically at different subpopulations. I mentioned All of US earlier, and that's a prime example of a database that's going to be invaluable to our specialties. And then we can use this information to develop genetic and cellular therapies, identify and develop interventions that can target specific populations, really realizing the dream of precision medicine.
 4. And then the fourth theme, to translate and implement scientific advances into standard clinical care. We all know that a research study comes out, it makes a recommendation, but it takes years and years to be implemented into routine clinical practice. How can we improve that process? How can we accelerate the development of treatments, improve the dissemination and implementation of evidence-based practices to improve health-related outcomes and promote health equity and improve access to care? Again, this is a huge emphasis. How do we reach out to underserved communities to make sure that they have the access to the same kind of care that we give to more privileged patients?
 5. And then fifth, facilitate the use of and best practices in biomedical data science. This is a huge opportunity. Some of you know that the NIH began to require data sharing plans and all R01s, and so having an individual data sharing plan where somebody can look at the outcome of your study and have the raw data is valuable, they can replicate your study, they can look more carefully at some of your findings, but it doesn't, in and of itself, allow us to combine that data with other data sets and then look more broadly across the whole landscape. And what we need to do to enable us to do that is to have standardized outcome measures, standardized ways of reporting data for both basic and clinical research, and that is a huge focus currently. We need to encourage the use of data repositories that are so-called FAIR data, Findable, Accessible, Interoperable, and Reusable, for obvious reasons, and then develop artificial intelligence and machine learning algorithms that provide novel insights. So not a day goes by, I think that any of us don't hear about AI and machine learning, and these are unbelievably valuable tools that we can use to improve patient care.
 6. Then the last theme is to harness advanced technology to improve prevention, diagnosis, and treatment by implementing design principles to develop novel engineering solutions, enhance augmentative and alternative communication

capabilities, and develop specialized in vivo imaging capabilities to improve diagnosis and treatment. So, these are just some examples in the voice space of some things that are happening that I think are so exciting. There is a NIH-wide program called Bridge to AI, and this is a program that's really gotten a lot of attention across NIH using voice as a biomarker of health in building an ethically sourced bioacoustics database to understand disease, so being able to predict certain diseases by analysis of the voice.

Bioprintable composite materials and microfluidic tools for vocal full restoration and repair is an extremely exciting program in vocal ID creating personalized voices for people who have severely impaired speech by combining the speech of the impaired individual with the speech of a fluent talker who can then generate a voice artificially that sounds more like the speaker. What I thought about when coming to NIH and what we all should be thinking about is how can we envision a future, what goals should the fields otolaryngology and otolaryngology aspire to in the next 5, 10, and 15 plus years? We should set realistic but audacious goals and then look at what the incremental steps should be to achieve those goals. What are the current barriers to making progress? Do we have workforce deficiencies, technological limitations, and what are the opportunities that we have to overcome the barriers? Some examples might be developing further workforce, partnering with colleagues in aligned fields like engineering, or engaging in think tank meetings, for example, to try and brainstorm. But be deliberate and visionary in charting a path to future practice goals and establish and publicize strategic priorities for ALA and for otolaryngology in general.

And so, my last slide is, in summary, it takes a village. The contributions of surgeon scientists are critically important to advancing patient care. And I also believe that our future as a specialty depends upon the translation of scientific discoveries to care. But surgeons are uniquely challenged at every stage of our careers. So, we need to think about how to overcome some of those challenges in the training and the faculty environments and develop deliberate, thoughtful ways of doing collaborative work to sustain and grow this surgeon scientist workforce.

As I mentioned, I think it's critically important that there are starter grants to get people going. We need to think about ways to provide supplemental financial support. A K award does not provide a lot of salary. It's kind of a starter salary. So how can we supplement that so that it is truly a viable career option for a young faculty member? And how do we develop better resources for mentoring, guidance for grant preparation, and make sure that a faculty member has access to collaborators that can help fill out a whole research team that will help them to succeed?

Thank you very much for the opportunity to speak with you today.

EUGENE MYERS MD INTERNATIONAL PAPER AWARD**
Does Immediate Intralesional Steroid Injection Effectively Mitigate
Vocal Fold Scarring in a Rabbit Model?

Seung-Won (Steve) Lee, MD, PhD; *Jung-Dong, Bucheon*

Objectives: We evaluated the preventive effect of intralesional steroid for vocal fold scarring following vocal fold surgery in a rabbit model.

Study design: Animal model.

Methods: This study included 42 male New Zealand white rabbits: 14 received vocal fold scar surgery served with 532nm laser as controls (control group). The other 14 received the same vocal fold scar surgery with dexamethasone injection (Dexa group), and another 14 received the same vocal fold scar surgery with triamcinolone injection (Triam group). Histological and high-speed video analyses of vocal fold vibration were performed 4 weeks after scar surgery. The maximum amplitude of vocal fold vibration was used to assess vocal fold vibration. A real-time PCR study was also performed to evaluate the scar regeneration and remodeling.

Results: Vocal fold vibration analyses indicated that the maximum amplitude differences in the vibration of the Dexa and Triam group were significantly higher than the control group. The histological findings showed that collagen density ratios were significantly lower in the Dexa and Triam group compared to the control group. Real-time Polymerase Chain Reaction (PCR) analysis showed significant increases of HAS2 and MMP 9 in the Dexa and Triam group compared to the control group.

Conclusions: Based on the vocal fold vibration, histological findings, and real-time PCR results, intralesional steroid injection

Laryngeal Evoked Responses During Total Laryngectomy:
An In-Vivo Study of the Aging Larynx

Zaroug Jaleel, MD; Mohamed Aboueisha, MD; Vicente Martinez, PhD;
Greg Kinney, PhD; Kelson Adcock, BS; Hamzah Al-Awadi, MAMS;
David J. Cvancara, BS; Haris C. Baertsch, MD; Neel K. Bhatt, MD

Introduction: Aging causes visible changes in the larynx marked by bowed vocal folds and a persistent glottal gap during voicing. This condition is known as age-related vocal atrophy (ARVA). Individuals with ARVA experience a weak voice, communication challenges, and decreased quality of life. In general, motor evoked response studies provide key information about changes in nerve-to-muscle neurophysiology with aging. However, in vivo studies in the human larynx remains elusive. The purpose of this study was to perform laryngeal evoked response studies in aged individuals undergoing total laryngectomy.

Methods: Participants undergoing a total laryngectomy were recruited. Patients with a history of bilateral cricoarytenoid joint fixation or cachexia were excluded. During surgery, a bipolar hooked electrode was placed on the recurrent laryngeal nerve (RLN). A monopolar recording electrode was placed directly within the ipsilateral thyroarytenoid (TA) muscle through a vallecular incision. Following the laryngectomy, a portion of the RLN and TA muscle were harvested and analyzed.

Results: 6 patients were recruited for the study, mean age (69±13.3years). Mean(±SD) CMAP latency, peak amplitude, total duration and nerve conduction velocity was (3.15±0.63ms), (771.4±589.2µV), (9.68±1.74ms), and (17.75±5.3m/s) respectively. The mean(±SD) RLN axon count, myelin percentage and g-ratio were (503±176.5 axons), (81.6±3.2%), (0.40±0.044) respectively. Mean(±SD) TA muscle fiber number and fiber area was (567±158.8 fibers) and (381±188.1µM²) respectively.

Conclusions: Laryngeal evoked response studies can be feasibly performed in the larynx during total laryngectomy. This testing provides valuable neurophysiologic data and nerve/muscle tissue in human subjects. In vivo testing may provide a mechanistic understanding of age-related neuromuscular changes in the human larynx.

CASSELBERRY AWARD
Reconstruction of a Tracheal Defect Using A 3D Printed Leaf-Stacked Scaffold Implanted with Mesenchymal Stem Cell Spheroids

Sang-Yoon Han, MD, MS; Seong Jeon, MD, MS;
Seo Young Kim, MD, BS; Seong Keun Kwon, MD, PhD

Objectives: The mesenchymal stem cell (MSC) stimulates angiogenesis and anti-inflammatory responses, and stem cell spheroid can enhance these features. Cell attachment to tracheal scaffolds composed of polycaprolactone is problematic because of their hydrophobic nature, and surface modification is known to promote implanted cell attachment. The goal of this research was to assess our innovative 3D-printed leaf-stacked scaffold and MSC spheroid in tracheal regeneration.

Methods: In vitro study was performed on various scaffold to test cell attachment. The rabbits were divided into four groups based on the type of MSC implantation at the 3D-printed leaf-stacked scaffolds: no MSC implanted (no MSC group), single MSC implanted at the inner surface (single group), MSC spheroid implanted at the outer surface (outer spheroid group), and both single and outer spheroid (both group). Tracheal defects were created, and reconstruction was performed using each tracheal scaffold. 14 weeks later, the tracheas were harvested for structural and histological analysis.

Results: The leaf-stacked polycaprolactone membrane exhibited the best attachment of implanted MSC compared to polystyrene and plain polycaprolactone membrane. All subjects survived for 14 weeks. A higher number of mature vessels and larger M2/M1 ratios were observed in the outer spheroid group and the both group than the other groups. The single group and both group exhibited better mucosal regeneration than the other groups, while the no MSC group showed the poorest mucosal regeneration.

Conclusion: MSC spheroid implanted on leaf-stacked scaffold exhibited good neo-angiogenesis, mucosal regeneration, and an anti-inflammatory status, demonstrating the potential for promising tracheal regeneration.

Immunocytochemistry Assessment of Vocal Fold Regeneration after Cell-Based Implant in Rabbits

Larissa Nicolas, BS; Hanna Mandl, BS; Feng Schrader, BA; Jennifer L. Long, MD, PhD

Objective: Cell-based outer vocal fold replacement (COVR) offers a potential treatment for severe vocal fold scarring or cancer reconstruction. Previous work in rabbits using human adipose-derived stem cells (ASC) in fibrin suggested that a hybrid structure emerged by 2 months, containing both implanted and host cells. This project uses immunocytochemistry to better define the phenotypic fate of implanted cells and features of the extracellular environment.

Methods: Immunocytochemistry was performed on 4 micron sections collected from rabbits 2 months after COVR implantation or scar surgery. Cellular targets included Human Leukocyte Antigen (HLA), CD31, E-cadherin, and Smooth Muscle Actin (SMA). Extracellular targets included laminin and decorin.

Results: HLA was present in all implanted sections and was used to identify human cells. In adjacent sections, HLA-positive cells were identified expressing E-cadherin, SMA, or CD31. These 3 markers were also present in injured vocal folds not receiving COVR. Decorin and laminin were also present.

Conclusions: Implanted human ASC persist and express markers of epithelial, mesenchymal, and endothelial phenotypes after COVR in rabbits. Host cells also infiltrate the structure, producing a hybrid host-graft vocal fold. Mature extracellular matrix develops.

Hemodynamic Reliability of Transnasal Humidified Rapid Insufflation Ventilatory Exchange (THRIVE) for Microlaryngeal Surgery

Diana C. Lopez, MD, MS; Martina Nagy, BS; Matthew Nagy, MD, MS;
Emily Zhang, MD; Rebecca Nelson, MD; Amy Nowacki, PhD; Paul Bryson, MD, MBA;
Michael S. Benninger, MD; William S. Tierney, MD, MS, MS

Background/Objectives: To evaluate patient hemodynamic stability during microlaryngeal surgery with THRIVE, an apneic ventilation and oxygenation method garnering attention in Otolaryngology that affords unimpeded visualization of and access to the larynx. This is a retrospective cohort study comparing hemodynamic instability during microlaryngeal surgery in 152 THRIVE patients (n=50) to a control group of traditional ventilation, i.e. endotracheal intubation or jet ventilation, (n=102) patients. Surgeries were performed by one of three laryngologists at a single tertiary medical center.

Methods: The primary outcome was hemodynamic instability, defined by any perioperative severe hemodynamic event. Severe hemodynamic events met at least one of three criteria: severe hypertension (systolic blood pressure [SBP] > 180 mmHg, diastolic blood pressure [DBP] > 110 mmHg), tachycardia (heart rate > 100 beats per minute), or oxygen desaturation (SpO₂ < 90%). Potential correlations between patient characteristics (ASA score, BMI, age, gender) and hemodynamic changes were tested. Data was analyzed using student's t-tests, chi-squared analysis, and multivariate logistic regression.

Results: When adjusting for procedure, gender, ASA score, and BMI, no significant differences in odds of perioperative or operative severe hemodynamic event were appreciated between THRIVE and traditional ventilation groups (p values > 0.05). Immediately postoperatively, mean SBP was decreased by 10.8±23.9 mmHg in the THRIVE group but increased by 1.6±23.7 mmHg in the traditional ventilation group from pre-operative baseline (p<0.001).

Conclusion: Building upon a foundation that has supported THRIVE safety, this investigation suggests that THRIVE ascribes no increased odds for perioperative hemodynamic instability during microlaryngeal surgery.

445NM TruBlue Laser for Endoscopic Cricopharyngeal Myotomy and Zenker's Diverticulotomy: Proof of Concept and Safety of Use

Kevin Tie, MD; Regan C. Manayan, MD; Pavan Mallur, MD

Background: Treatment for Zenker's diverticulum and cricopharyngeal dysfunction have evolved to include flexible endoscopic approaches to myotomy. Currently there are no flexible modalities combining the precision cutting of fiber-based CO₂ laser and the hemostasis of knife electrocautery. Here we present the first series for use of fiber based 445nm laser for endoscopic cricopharyngeal myotomy / Zenker's Diverticulotomy. We examine the characteristics of use and safety with rigid esophagoscopy to determine feasibility of future transendoscopic use with flexible endoscopy.

Methods: Retrospective review

Results: The first seven cases for endoscopic Zenker's diverticulotomy (n=5) and cricopharyngeal myotomy (n=2) with TruBlue laser were reviewed. Rigid access was achieved exclusively with the Dohman Slimline diverticuloscope. Mean age was 77.4 years with 3 patients on anticoagulation that was stopped preoperatively. Of patients with diverticulum, sac ranged from 0.5 to 2.5cm in craniocaudal depth with a mean of 1.5cm +/- 0.71. Pulsed mode was used in 5 cases, with average settings of 6.20 watts, 60 millisecond pulse width, and 270 millisecond pulse time off. An average of 451 joules (J) was used. Complete myotomy with intact buccopharyngeal fascia and without bleeding limiting view was achieved in all 7 patients. Six patients were started on oral intake POD1 without evidence for leak. One patient developed acute subcutaneous emphysema following vigorous cough on POD0 which resolved after 7d of NPO and inpatient observation.

Conclusions: The 445nm TruBlue laser provides a fiber-based modality for cutting and hemostasis in endoscopic cricopharyngeal myotomy and Zenker's Diverticulotomy. It appears feasible for future use in flexible endoscopic approaches.

DYSPHONIA INTERNATIONAL TRAVEL GRANT AWARD
Neuromyectomy of the Thyroarytenoid Muscle for Treating Adductor Spasmodic Dysphonia: Outcomes, Complications and Recurrence

Domingos Hiroshi Tsuji, MD, PhD; Luiz Ubirajara Sennes, MD, PhD

In light of the inconveniences associated with botulinum toxin injections for treating adductor spasmodic dysphonia, we introduced a new technique in 2002: endoscopic neuromyectomy of the thyroarytenoid muscle using a CO2 laser and a custom-designed electrocautery tip. This presentation outlines the surgical procedure and reports long-term results, encompassing voice impact on quality of life, complications, and recurrence rates. Between October 2001 and January 2021, 56 patients underwent 85 surgical procedures, including reoperations.

Voice function in 32 patients was assessed using the VHI-30 questionnaire both pre- and post-treatment, and on self-reported improvement scores ranging from 0% to 100%. Postoperative follow-up varied from 18 to 211 months, with neuromyectomy performed once in 22 patients, twice in 8, and thrice in 2. The median preoperative VHI-30 score was 98, which improved to a median postoperative score of 21. Patients reported a median subjective improvement in voice quality of 90% (ranging from 60% to 100%).

Following the initial surgery in 56 cases, complications comprised one case of vocal fold bowing (corrected surgically), one case of supraglottic fibrin membrane formation (surgically removed), and 13 cases of granulomas at the wound site, two of them treated with surgery. In 29 reoperations, the only complication was granuloma in seven cases, spontaneously resolved.

Data from 48 patients indicate disease control rates of 50% after one procedure, 78% after two, and 89% after three, with an average time to relapse after the first procedure of 5.6 months (1–11 months). Long-term follow-up has shown promising results, with significant improvements in voice quality.

Glottic Reconstruction Subsequent to Cricoid Removal for Chondrosarcomas: ‘How I Do It’

Steven M. Zeitels, MD

Background/Objectives: Most laryngeal chondrosarcomas involve the posterior cricoid with a substantial number affecting the cricoarytenoid joint. However, these neoplasms rarely invade the arytenoid or glottic musculature. Since the base of the cricoarytenoid joint is the cricoid facet, resecting this structure radically alters the architectural integrity of the glottal valve, and consequently airway and voice function. The goal for glottic reconstruction after significant removal of the subglottic cricoid facet was to design a reliable technique for repositioning the arytenoid to optimize postoperative airway and voice function.

Methods: A retrospective review was done on 25 cricoid-chondrosarcoma patients who underwent surgical treatment. When necessary for glottic reconstruction, patients underwent repositioning of the arytenoid by affixing the muscular process to the inner aspect of the thyroid lamina. This 3-dimensional arytenoid repositioning should be done strategically and precisely. Based on the contralateral arytenoid position, the technique is described to align the ipsilateral arytenoid height, vocal-fold length, and lateral position. This facilitated the optimization of the glottal airway caliber while allowing for adequate phonatory glottal closure and ideal voice production.

Results: Six of 25 cricoid-chondrosarcoma patients underwent laryngofissure and transcervical hemi-cricoid removal. None of the patients required a post-healing tracheotomy and all reported satisfaction with their voice function.

Conclusion: Resecting cricoid chondrosarcomas that involve a cricoarytenoid joint negatively impacts vocal fold length, tension, and 3-dimensional position for optimal airway and voice function. Reconstruction is achieved by carefully realigning and affixing the ipsilateral arytenoid through the laryngofissure so that the contralateral one can compensate abductory and adductory function of the glottal valve.

RESIDENT RESEARCH AWARD
TORS With Ablative Lasers - The Next Frontier in Laryngeal Surgery?

Delaney Sheehan, MD; Harishanker Jeyarajan, MD;
Andrew Fuson, MD; Bharat Panuganti, MD

Background/Objectives: TORS exposure for laryngeal surgery is uncommon, given perceived difficulties in exposure and distal instrumentation. This study aims to provide early outcomes and characterize synergistic benefits of TORS paired with ablative lasers in treatment of laryngeal squamous cell carcinoma (LSCC).

Methods: Retrospective review of 5 patients with glottic or supraglottic cancer that underwent TORS exposure with ablative laser resection using the da Vinci single port robotic platform. Patients underwent transoral exposure using the FK-WO retractor and a curved tongue blade. A KTP or ARC blue light laser fiber was accommodated via flexible drop-in guide and manipulated with a robotic needle holder. The Endocraft Zeitels Suspension Gallows was employed to maximize anterior leverage. Outcomes reported include surgical complications, margin status, proportion of case completed via TORS, and disease-free survival.

Results: The mean patient age was 68 (SD 5.7). The mean operative time was 265.8 minutes (SD 152.1). Adequate surgical exposure for resection via TORS was feasible in all cases; however, marginal biopsies were universally obtained with standard microlaryngeal instruments given the size of extant robotic instrumentation. All marginal biopsies were negative. All patients remain disease free at latest follow-up. One patient demonstrated a Grade III/IV complication (overnight intubation due to edema from sustained exposure).

Conclusion: TORS for laryngeal surgery was found to be safe with sound short-term oncologic outcomes, while offering global visualization unconfined by a tubular scope, and dynamic surgical field visualization facilitated by semi-flexible endoscope helping overcome the need for repetitive laryngoscope re-positioning and the limitations of straight-line rigid endoscopic visualization.

Ambulatory Phonation Monitoring Using Wireless Bluetooth Earphones

Chi-Te Wang, MD, PhD

Objective: Ambulatory phonation monitoring (APM) has a long evolving history. Current devices mostly use contact microphone or accelerometer over anterior neck, which has limited its general acceptance outside of academic purposes. This study applied wireless earphones to receive voice signals via Bluetooth. We also designed a mobile APP (iOS system) with personalized deep neural networks (DNNs) to detect phonation segments.

Methods: The materials comprised 1-hour audio files from seven teachers in the classroom. The first five minutes were used for training DNN models (5 hidden layer with 500 neurons in each layer). Another 6 segments (30s each) were selected for testing the accuracy of this APM system via 2 parameters: (1) speech intensity, which was compared to the gold standard measured by CLIO 12, a professional system for voice recording; and 2) phonation segments, which was compared with manual labeling.

Results: The accuracy of personalized DNN model ranged from 91.2% to 98.5%, with a mean 95.4%. After linear calibration, the accuracy of measuring speech intensity ranged from 0.846 to 0.927 ($p < 0.001$, Pearson correlation coefficient) and the absolute mean difference was 0.04 dB, or 3.8%. The accuracy for detecting phonation segments ranged from 88.4% to 97.0% (mean: 88.6%). The kappa value of consistency ranged from 0.710 to 0.931 ($p < 0.001$ for all the 7 participants).

Conclusions: The study results demonstrated an APM system using wireless earphones with mobile APPs can accurately measure phonation segments and speech intensity. This new design holds promise for a novel real-time voice monitoring device in the future.

ROBERT H. OSSOFF, DMD, MD POST-GRADUATE MEMBER BEST PAPER AWARD
The Bridge2AI-Voice App: Initial Feasibility Study of Voice Data
Acquisition Through Mobile Health

Elijah Moothedan, BS; Micah Boyer, PhD; Stephanie Watts, PhD; Yassmeen Abdel-Aty, MD; Satrajit Ghosh, PhD;
Anaïs Rameau, MD; Bridge2AI-Voice Consortium; Yael Bensoussan, MD, MSc

Bridge2AI-Voice, a collaborative consortium, aims to generate a voice database to support AI-driven research. A smartphone application was created to collect voice-related tasks, surveys, and validated patient reported outcomes. Before broad data collection, this feasibility study assesses the practicality and utility of this application through task performance metrics and participant feedback.

Participants were recruited from a tertiary academic voice center. Demographic information was collected, including age, sex, digital literacy, education status, primary language, and smart device ownership. Participants were instructed to complete a series of tasks through the application, followed by a qualitative interview adapted from the Mobile App Rating Scale. Feasibility metrics recorded included time of completion, successful task/recording completion, and need for assistance. The iterative Plan-Do-Study-Act model for quality improvement was implemented for three phases of data collection.

Participants presenting at a tertiary academic clinic were recruited (N=47; 61% female, 92% reported primary language of English, mean age of 58.3 years). All participants owned smart devices, with 49% using mobile health apps. Overall task completion rate was 68%, with acoustic tasks successfully recorded in 41% of cases and assistance requested in 41% of tasks. Incomplete tasks were related to design and instruction understandability, rather than cognitive or physical limitations. Mean total time for completion of all tasks was 51 minutes. Interview responses reflected favorable perception of voice-screening apps and their features.

These findings suggest that the Bridge2AI-Voice application is a promising tool for voice data collection. Further development of User Interface/User Experience and broader, diverse feasibility studies are needed for a usable tool.

Quantification of Automatic Speech Recognition System
Performance on d/Deaf and Hard of Hearing Speech

Robin Zhao, BS; Anna Seo Gyrong Choi, MA;
Allison Koenecke, PhD; Anaïs Rameau, MD, MPhil

Objective: To evaluate the performance of commercial automatic speech recognition (ASR) systems on d/Deaf and hard-of-hearing (d/Dhh) speech.

Methods: A corpus containing 1948 audio files of d/Dhh speech from the University of Memphis Speech Perception Assessment Laboratory was tested against four speech-to-text application program interfaces (APIs): Google Chirp, Microsoft Azure, Amazon Web Services, and OpenAI Whisper. To compare API performance between 30 d/Dhh participants and 10 normal hearing (NH) participants, we quantify the Word Error Rate (WER). We also performed a subgroup analysis of WER by speech intelligibility classification (SIC), onset of hearing loss, and communication mode.

Results: All four APIs generated transcripts with four to five times as many errors for the d/Dhh group relative to the NH group. Overall mean WER values for d/Dhh speech were 60.1%, 57.7%, 55.9%, and 48.0% for Google Chirp, Microsoft Azure, Amazon Web Services, and Open AI Whisper, respectively. Within the d/Dhh group, we found worse API performance for “low” and “medium” SIC (87.6% and 51.4% WER, respectively) as compared to the “high” SIC group (a low 12% WER, comparable to NH groups). Altogether, the mean WER for the APIs was significantly higher for the d/Dhh group (55.4%) than the NH group (11.4%).

Conclusion: Modern speech-to-text APIs perform worse for the d/Dhh population than the NH population. While Big Tech companies advertise accessibility as a marketing strategy, their ASRs perform poorly with a large portion of the d/Dhh population, demonstrating the need for more d/Dhh training data and more advanced models to uphold their promise of accessibility.

A Deep-Learning Model for Multiclass Classification of Vocal Fold Pathologies in Stroboscopy

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Objective: To develop and validate a deep-learning classifier trained on voice data extracted from stroboscopic exams, differentiating between three different vocal fold (VF) states: healthy (HVF), unilateral paralysis (UVFP), and VF lesions, including benign and malignant pathologies.

Methods: Patients with UVFP (n=50), VF lesions (n=83), and HVF (n=45) were retrospectively identified. Voice samples were extracted from stroboscopy, including sustained /i/ phonation, pitch glide, and /i/ sniff task (Pentax Laryngeal Strobe Model 9400). Extracted audio files were converted into Mel-spectrograms. Six patients per class were randomly selected for validation. Two models, pre-trained on ResNet-50, were trained to classify 1) HVF and VF lesions, and 2) HVF, UVFP, and VF lesions. Both classifiers were further validated on an external dataset consisting of 17 UVFP, 20 VF lesions, and 19 HVF patients. Model performances were measured by accuracy and F1-score.

Results: When evaluated on a hold-out test set, the binary classifier demonstrated stronger performance compared to the multiclass classifier (accuracy 79% vs 63%; F1-score 0.7850 vs 0.6032). When evaluated on an external dataset, the binary classifier achieved an accuracy of 64% and F1-score of 0.5852, compared to 36% and 0.3312 for the multiclass classifier.

Conclusions: A deep-learning classifier differentiating HVF, UVFP, and VF lesions was developed based on voice data from stroboscopic videos. Although HVF and VF lesions were differentiated with moderate accuracy, introducing UVFP lowered model performance. The model performed poorly on an external dataset. Voice captured in stroboscopic videos may have limited diagnostic value, though further studies are needed.

How Should We Collect Voice Data? Evidence-Based Recommendations for Tablet Recordings from the Bridge2AI-Voice Acoustic Experiments

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Micah Boyer, PhD; Shaheen N. Awan, PhD

Introduction: Bridge2AI Voice - Voice as a Biomarker of Health is large NIH-funded consortium aiming to build a large-scale voice databank of 30,000 voices and create best practices in terms of voice data collection to fuel voice AI research. This study investigated the ability of iPads and Android tablets with and without low-cost headset microphones to produce recordings and subsequent acoustic analyses comparable to “research quality” instrumentation.

Methodology: Recordings of sustained vowel samples representing a wide range of typical and disordered voices were played via a head-and-torso model. As a “gold standard”, recordings were made using a GRAS microphone + audio Interface + PC. Recordings were also made using an iOS iPad and an Android Samsung Galaxy Tab directly using the built-in tablet microphone and using a low-cost headset microphone. Effects of background noise and microphone distance were also assessed. Acoustic measures included vocal frequency, perturbation, and cepstral peak prominence (CPP).

Results: Voice measurements obtained via tablets + headset microphones resulted in no significant differences and excellent correlations vs. the standard (r 's > 0.90). In contrast, relative amplitude measurements (such as shimmer, HNR, and CPP) and measures of F0 can be detrimentally affected by increased mouth-to-microphone distance and background noise when using a tablets built-in microphone from typically held 30 and 45 cm distances.

Conclusions: Tablets + low-cost headset microphones are recommended as a readily available and accessible method to result in reduced measurement variability, increased similarity in mean measurement, and very strong correlations with a high-cost, “research quality” standard.

Understandability, Actionability, Quality, and Readability of Artificial Intelligence (AI)-Generated Patient Information on Laryngology Topics

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Objectives: To evaluate and compare the readability and quality of patient information generated by Chat-Generative Pre-Trained Transformer (ChatGPT) and American Academy of Otolaryngology-Head & Neck Surgery (AAO-HNS), utilizing validated instruments including Flesch-Kincaid Grade Level, Flesch Reading Ease, DISCERN, and Patient Education and Assessment Tool (PEMAT).

Methods: The AAO-HNS website and the ChatGPT tool were queried for patient information on selected laryngology topics. The text outputs were de-identified and randomized to be scored by three blinded reviewers. ChatGPT was queried twice for a given topic to evaluate for reliability. This generated three text documents for a given topic: one from AAO-HNS and two from ChatGPT (ChatGPT1, ChatGPT2). Grade level and reading ease were compared between the three sources using a one-way ANOVA and Tuskey's post-hoc test. T-tests (significance level = 0.0083 after Bonferroni correction) compared DISCERN and PEMAT understandability and actionability scores.

Results: Material generated from ChatGPT1 and ChatGPT2 were at least 2 grade levels higher than that of material from AAO-HNS ($p < 0.001$). Regarding reading ease, ChatGPT1 and ChatGPT2 documents had significantly lower mean scores compared to AAO-HNS ($p < 0.001$). Despite this, there were no significant differences in the DISCERN or PEMAT scores between the ChatGPT1 and AAO-HNS material (all subscores $p > 0.0083$).

Conclusions: Patient information available on the AAO-HNS website on select laryngology topics were, on average, of a marginally lower grade level and of a higher reading ease compared to that of information produced by ChatGPT, but interestingly with no difference in the quality of information provided.

Prospective Outcomes after Serial Injection with Platelet-Rich Plasma (PRP) for Vocal Fold Scar, Atrophy, and Sulcus

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Introduction: Vocal fold scar, atrophy, and sulcus pose significant treatment challenges with no current optimal treatment. Platelet rich plasma (PRP), an autologous concentration of growth factors, may offer regenerative potential in the superficial lamina propria. This study assesses the prospective impacts of serial PRP injections on the mucosal wave and vocal function.

Methods: In a prospective trial across two institutions, patients with vocal fold scar underwent four PRP injections with outcome assessment. Blinded independent laryngologists and expert listeners used pre-treatment and one-month post fourth injection videostroboscopy and CAPE-V assessments, respectively, to evaluate mucosal wave and voice quality changes. Treatment efficacy was determined through comparative analysis of these data points.

Results: In the study, 15 patients received 55 PRP injections without adverse effects. Interrater reliability for severity assessment was 76.5% for videostroboscopy, with pre-treatment conditions perceived as more severe in 61.8% of cases, and post-treatment perceived as more severe in 38.2%. CAPE-V scores showed no significant change (pre = 54.4/100, post = 49.1/100; $p > 0.05$). VHI-10 scores improved from a pre-treatment average of 26.1 to 19.6 post-treatment ($p = 0.01$).

Conclusion: PRP has been validated as a safe autologous option for treatment of vocal fold scar. Results for mucosal wave and voice quality were mixed, however there was a consistent decrease in self reported VHI-10 scores.

Long-Term Outcomes of In-Office KTP Laser Ablation of Vocal Fold Polyps in Performers

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Background/Objectives: Vocal fold polyps are a type of benign vocal fold lesion associated with phonotrauma and individuals with higher vocal demands, such as musical performers, are at higher risk of the development of these lesions. The purpose of this study is to characterize feasibility and long-term success of musical performers who undergo in-office KTP laser ablation of vocal fold lesions in the outpatient setting.

Methods: A retrospective chart review of patients who are vocal performers and underwent in-office KTP laser ablation of benign vocal fold lesions at a single academic institution between 2012-2023 was conducted. Demographics including occupation were descriptively reviewed. Vocal fold vibratory amplitude and mucosal wave were analyzed on videostroboscopy videos utilizing the Voice Vibratory Assessment with Laryngeal Imaging (VALI). Pre- and post-ablation vibratory measures were compared via Wilcoxon signed rank test.

Results: 26 patients who identified as singers successfully underwent single-treatment in-office KTP laser ablation of vocal cord polyps, predominantly left-sided. 10 patients (38.5%) identified as professional performers and all patients continued their occupation after ablation. Patients performed in a wide array of categories, most commonly classical (15%) and rock (15%) music. Average follow up for patients was 382.9 days (range 4-3290 days). Vocal cord vibratory patterns improved across bilateral mucosal wave and amplitude of the left vocal fold ($p < 0.05$).

Conclusions: In-office KTP ablation is a valuable and feasible intervention for patients with benign vocal cord polyps. This study provides insight into vocal outcomes in the largest cohort of professional performers with long term follow up.

Comparison of Photoangiolytic Lasers for the Treatment of Benign Laryngeal Lesions:

A Systematic Review and Meta-Analysis

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Background: The value of photoangiolytic lasers for laryngeal surgery has been widely established, with the latest type being the 445-nm blue laser. We sought to compare the efficacy of each type of photoangiolytic laser in the treatment of benign laryngeal lesions.

Methods: Cochrane Library, PubMed, Scopus, and CINAHL databases were searched from inception through October 15, 2023 for studies reporting the use of photoangiolytic lasers for treatment of benign laryngeal lesions, including the 585-nm pulsed dye laser (PDL), 532-nm Potassium-Titanyl-Phosphate (KTP) laser, and 445-nm blue laser. Outcome measures included lesion resolution (%) and mean differences (Δ) in Voice Handicap Index (VHI-10), summed dysphonia grade, roughness, and breathiness (GRB) scale.

Results: A total of 42 studies were included for meta-analysis, consisting of 313 patients treated with PDL, 617 patients with KTP laser, and 268 patients with blue laser. Treatment with blue laser resulted in the greatest lesion resolution (96.0%; 95% CI: 92.2%-98.3%), followed by KTP laser (87.4%; 95% CI: 81.1%-92.6%), and PDL (81.1%; 95% CI: 64.0%-93.6%). VHI-10 improved significantly in patients following treatment with blue laser ($\Delta 12.6$; 95% CI: 9.6-15.4; $P < 0.0001$), KTP laser ($\Delta 10.5$; 95% CI: 7.2-13.7; $P < 0.0001$), and PDL ($\Delta 6.8$; 95% CI: 2.2-11.3; $P = 0.004$). GRB improved significantly in patients following treatment with blue laser ($\Delta 4.1$; 95% CI: 2.9-5.2; $P < 0.0001$), KTP laser ($\Delta 3.2$; 95% CI: 2.3-4.1; $P < 0.0001$), and PDL ($\Delta 2.9$; 95% CI: 0.1-5.7; $P = 0.04$).

Conclusions: Photoangiolytic lasers are effective in treating benign laryngeal lesions. Blue lasers are promising for laryngeal laser surgery.

Vocal Fold Pseudocysts: Differences between Unilateral and Bilateral Lesions

Christine Clark, MD; Ashley Kim, BA; Lucian Sulica, MD

Background: Although features and treatment outcomes for vocal fold pseudocysts have been described, and their occurrence hypothesized to result from glottic insufficiency, no evident factor explains why they may occur bilaterally as well as unilaterally. This study compares patients with unilateral to those with bilateral pseudocysts for insights into pathogenesis.

Methods: Adults with unilateral and bilateral pseudocysts evaluated between 2018-2023 were retrospectively studied. Patient demographics, laryngeal stroboscopic findings, management strategies employed, and treatment outcomes were recorded. Fisher's exact and student's t-tests were performed to assess unilateral and bilateral cohorts for differences.

Results: 198 patients (123 with bilateral and 75 with unilateral pseudocysts) were studied. The average age was 29 years (bilateral: 29 years, unilateral: 30 years; $p=0.1917$). The groups differed with respect to sex (173 females: 118 bilateral, 55 unilateral; 25 males: 5 bilateral, 20 unilateral; $p<0.0001$) and clinical diagnosis of paresis (bilateral: 14.6%, unilateral: 33.3%; $p=0.0044$). Treatment was similar between cohorts for rates of voice therapy (bilateral: 67%, unilateral 58%; $p=0.2272$) and surgery (bilateral: 15%, unilateral 13%; $p=0.8351$). There was a total of six recurrences (bilateral: 5, unilateral: 1; $p=0.3747$).

Conclusions: Relative to bilateral disease, unilateral pseudocysts are more likely to occur in men and in the presence of paresis. This suggests that they may be the product of disparate underlying pathophysiology.

Vocal Fold Medialization Procedures in Previously Radiated Patients: A Survey of Current Practice Patterns

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Background/Objectives: Head and neck radiation therapy (HNRT) has traditionally been considered a contraindication to vocal fold medialization procedures. Although safety has been demonstrated, we hypothesize that actual management varies. This study evaluates practice patterns of otolaryngologists regarding vocal fold medialization in patients after HNRT.

Methods: A 25 question survey evaluating respondents' management of patients status post HNRT with vocal fold paresis/paralysis was distributed to 357 otolaryngologists. Practice patterns regarding injection laryngoplasty (IL), medialization thyroplasty (MT), and arytenoid adduction (AA) were queried.

Results: Eight-two clinicians (23%) completed the survey. Ninety-one percent of respondents were laryngologists, 9% head and neck surgeons, 3% comprehensive otolaryngologists, and 3% other. Eleven (15%) had been in practice <5 years, 19 (25%) for 5-10 years, and 46 (61%) for > 10 years. No respondents considered HNRT a contraindication to IL, and 11 (14%) reported complications from the procedure. Hyaluronic acid (58, 75%) was most commonly injected. Twenty percent considered HNRT a contraindication to MT, and 37% considered it a contraindication to AA. Gore-Tex was used most commonly (65%). Twenty-seven percent reported major complications after MT. All complications occurred in the >10 year practice group, and this group was more likely to delay surgery after HNRT ($p = 0.022$). Respondents with complications were more likely to perform MT in HNRT patients ($p = 0.0191$).

Conclusions: Otolaryngologists generally do not consider HNRT to be a contraindication to IL, but some consider it a contraindication to MT/AA. Previous complications do not appear to deter surgeons from performing MT.

Injection Augmentation or Medialization Improves Ability to Utilize Voice Therapy Techniques in the Parkinson's Disease Population

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Objectives: Patients with Parkinson's disease (PD) often develop early onset of dysphonia, likely related to rigidity or bradykinesia of the laryngeal muscles. Previous studies also implicate glottic insufficiency, however predate current concepts in patient reported outcome measures and treatment of glottic insufficiency. We hypothesize that restoring glottic competence with augmentation or medialization allows for more effective implementation of traditional Parkinson's specific voice therapy techniques.

Methods: Charts for patients with a PD diagnosis that underwent injection augmentation and medialization laryngoplasty were reviewed. Pre-procedural stroboscopy were evaluated for glottic closure patterns. Pre- and post-treatment Voice Handicap Index-10 scores and response to SpeakOut! and LVST Loud therapy were reviewed.

Results: Sixteen patients with PD underwent trial vocal fold injection augmentation with carboxymethyl cellulose or hyaluronic acid with 8 of these electing for repeat temporary injection for a longer trial period. Elliptical closure pattern was seen in 8 patients, anterior gap in 4, open phase predominant in 2, and complete normal closure in 2. Fifty percent (6/12) of patients had improvement in VHI-10 score after initial trial injection with an additional 33% (3/9) showing improvement after second temporary augmentation. Ten of 16 underwent durable injection augmentation or medialization laryngoplasty with subjective improvement and decreased VHI-10 scores in 60%. Of the 14 patients electing to undergo additional voice therapy following injection or medialization, improved ability to sustain techniques was noted in 8.

Conclusions: PD patients with normal closure and mild glottic insufficiency appear to benefit from injection or medialization with improvement in sustaining Parkinson's specific voice therapy techniques.

Clinical Benefit following Adjuvant Therapeutic Vaccination With PRGN-2012 in Adult Patients with RRP

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Introduction: Recurrent respiratory papillomatosis (RRP) is caused by chronic infection with human papillomavirus (HPV) 6 or 11 yet is treated with repeat surgical debulking. Non-surgical treatment that addresses the underlying infection to control papilloma formation and growth is needed to prevent disease recurrence and minimize the morbidity associated with repeat surgical interventions.

Methods: We have developed PRGN-2012, a novel gorilla-adenovirus therapeutic vaccine encoding HPV 6 and 11 antigens for the treatment of RRP. Early phase clinical study of the safety and efficacy of the vaccine is complete.

Results: Fifteen adults with RRP (median age 51 years) that required three or more clinically indicated interventions in the 12 months prior to study enrollment (median number of interventions 6, range 3-10) were treated in a phase 1 study. Median number of lifetime interventions prior to study enrollment was 32 (range 9-300+). A course of adjuvant vaccination with PRGN-2012 after initial surgical debridement, consisting of four subcutaneous injections over a three-month period, was safe and well tolerated. Grade 1 injection site reaction, fatigue and malaise were the most frequent adverse events. All patients completed the study treatment. Complete response, defined as no need for clinically-indicated intervention in the 12 months after the clinical trial, was observed in 6 of 12 (50%) patients treated at the phase 2 dose (5×10^{11} viral particles per injection). Neutralizing antibody titers against the vaccine remained low despite multiple administrations.

Conclusions: Adjuvant therapeutic vaccination with PRGN-2012 is safe and results in clear clinical benefit in 50% of treated RRP patients. A pivotal, registration phase 2 clinical study aimed at validating the clinical efficacy of adjuvant PRGN-2012 in adults with RRP is ongoing.

Safety of Percutaneous Dilatational Tracheostomy (PDT in Obese Critically-Ill Adults: A Retrospective Cohort Study

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Introduction: This study aimed to assess the safety and efficacy of PDT in obese and non-obese critically-ill adults.

Methods: A retrospective study of all cases of PDT performed at two academic health centres between 2016 and 2023 was conducted. Primary outcomes included peri- and post-operative complications stratified by both timing and severity. Body Mass Index (BMI) data was stratified according to the World Health Organization classification.

Results: 336 patients underwent a PDT, 279 of which had available BMI data: 193 (69.2%) patients had a normal BMI, 56 (20.1%) had obesity, 15 (5.4%) severe obesity, 14 (5.0%) morbid obesity, and 1 (0.4%) super obesity. The overall complication rates for the non-obese, obese, severely obese, and morbidly obese groups were 7.3%, 8.9%, 13.3%, and 14.3%, respectively. The patient with super obesity had no reported complications. There were no conversions to an open approach and no procedure-related mortality. The only accidental decannulation event was in a morbidly obese patient. There was no difference in overall complication rates between non-obese patients and patients with obesity (BMI ≥ 30). However, patients with a BMI ≥ 35 had a greater incidence of late life-threatening complications compared to patients with a BMI < 35 (10% vs. 2% respectively, $P = 0.026$).

Conclusions: This study significantly expands the current literature and represents one of the largest studies to date supporting PDT as a safe procedure in patients with obesity. Late life-threatening complications may be increased in patients with severe obesity.

Preoperative Acetaminophen for Microlaryngoscopy Reduces Postoperative Opioid Use

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Introduction: The opioid crisis has prompted an evaluation of analgesic prescriptions. This study explored the value of preoperative acetaminophen for pain control following microlaryngoscopy (ML) and compared results to a previous study of opioid use/pain following ML (Tsang et al).

Methods: A prospective study was conducted in patients undergoing ML. All patients received pre-operative oral acetaminophen. Short-form McGill Pain Questionnaire (SF-MPQ), pain visual analogue scale (VAS) and Present Pain Intensity (PPI) scale were collected on postoperative days (POD) 1, 3, 7 and 14. Statistical analysis was performed to identify variables associated with opioid use or increased pain scores, and to compare outcomes between the present study and Tsang et al.

Results: Eighty-nine patients were enrolled (mean age 52.8 ± 17.3 years, 40 males). No adverse effects were noted from administering oral acetaminophen. On POD1, opioid usage was 10% and median [IQR] pain scores were 5 [2-11], 21 [12.3-56.8], and 3 [2-3.3] on the SF-MPQ, VAS, and PPI, respectively. Post-Anesthesia Care Unit opioid requirements significantly correlated with opioid consumption on POD 1 ($\tau_b = 0.214$, $p \leq 0.05$) and longer total anesthesia time significantly correlated with increased postoperative opioid use ($OR(95\%CI) = 1.27 (1.04, 1.55)$, $p = 0.017$). Notably, this cohort demonstrated reduced opioid usage on POD1 (10%) compared to the 23% reported by Tsang et al. No associations were found with anesthesia (e.g., ASA classification) nor surgical variables (e.g., type of surgery or laryngoscope).

Conclusions: Preoperative acetaminophen is a safe intervention, resulting in a decrease in postoperative opioid use following ML. Surgery time correlated with the need for postoperative opioid use.

**Assessing the Efficacy of Preoperative Procedural Patient Education as an Intervention
to Mitigate Stress and Anxiety Among Otorhinolaryngology Surgery Patients:
A Randomized Controlled Trial**

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Background: Patients awaiting ENT surgery experience significant physical and psychological stress. While preoperative education benefits surgical patients generally, its effectiveness in ENT surgery remains unclear.

Methods: This randomized controlled trial included 164 inpatient ENT surgery cases. Two groups received either procedural patient education or standard preparation. We assessed perioperative state anxiety using the State-Trait Operation Anxiety (STOA) inventory at multiple points (T1, T2, T3, and T4). Stress and anxiety were also measured with the Numeric Rating Scale (NRS) and vital signs (BP, RR, HR). A user evaluation questionnaire gauged education usefulness.

Results: Of 164 participants, 152 completed the trial. Preoperative education significantly reduced state anxiety on the day of surgery (mean difference +2.15, $P=0.03$) compared to no education (mean difference 3.09, $P=0.04$). Those finding education helpful (rated 6-10) experienced lower stress ($M=+2.80$) than the control group ($M=+4.04$, $P=0.05$). Vital signs showed no significant differences. Female patients in the education group had significantly lower postoperative stress ($M=-2.95$) compared to the control group ($M=-2.19$; $P=0.04$), with a similar but non-significant trend for male patients ($P=0.10$).

Conclusions: Preoperative education effectively reduces stress and anxiety in ENT surgery patients, supporting its integration into standard practice. Offering it to patients who value it is crucial, as our study demonstrates substantial benefits. These findings have significant implications for enhancing ENT surgery patients' perioperative experience.

**Role of Radiotherapy in Laryngeal Neuroendocrine Carcinoma:
A National Cancer Database (NCDB) Analysis**

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Background/Objectives: Laryngeal neuroendocrine carcinomas (LNC) encompass a heterogeneous group of laryngeal malignancies. Optimal management of LNC remains poorly understood. Here, we assess the association between adjuvant XRT and overall survival (OS).

Methods: Retrospective cohort study of patients with LNC (classification codes 8020, 8240, 8013, 8249, 8246, 8041) between 2004 and 2020 using the NCDB. Patients with missing staging or survival data were excluded. The primary outcome was OS. Multivariable Cox regressions were performed to identify variables significantly associated with OS.

Results: Of 676 patients (mean [SD] age, 63 [11.8] years; 411 [60.8%] male; 565 [83.6%] White) with LNC, 227 [33.6%] underwent resection. Patients with negative margins following surgery had a 5-year OS of 47.6% compared to 21.7% in patients with positive margins ($p<0.001$). In patients receiving XRT, median OS was 25.2 months compared to 17.0 months in patients receiving no XRT ($p=0.014$). Adjuvant XRT did not improve median OS in patients with negative ($p=0.07$) or positive margin ($p=0.43$) surgery. On Multivariable Cox regression, age > 70 (HR 1.83, 95% CI 1.24-2.70), Charlson comorbidity score ≥ 1 (HR 1.47, 95% 1.21-1.80), positive nodal status (HR 1.91, 95% CI 1.53-2.38), and high tumor grade (HR 2.24, 95% 1.58-3.17) were associated with poorer OS. Receipt of XRT (HR 0.53, 95% 0.41-0.67), female sex (HR 0.74, 95% 0.60-0.91), and Black race (HR 0.71, 95% 0.52-0.97) were associated with improved OS.

Conclusions: Adjuvant XRT following surgery may have a limited role in patients with LNC. The role of multimodal therapy in LNC management should be further explored.

Age and Menopausal Status in Idiopathic Subglottic Stenosis

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Background/Objectives: The association between age and disease recurrence in idiopathic subglottic stenosis (iSGS) has not been previously described. The purpose of this study is to evaluate the impact of age and other factors on disease recurrence in iSGS patients.

Methods: This was a retrospective review of iSGS patients treated with laser wedge excision (LWE). Patients did not have prior surgery, such as dilations. Kaplan-Meier method was used for survival analysis and recurrence outcomes were evaluated using regression models with hazard ratios.

Results: Eighty-five female patients were included. Most patients (68%) were postmenopausal, had menarche at 13 years of age, had at least one pregnancy (82%), were not undergoing hormone replacement therapy (93%), were not using hormonal birth control (88%), and were either partially or completely compliant with triple therapy regimen (80%).

There was a statistically significant reduction of risk of recurrence of 5% for every additional year of age ($p < .0001$). When compared to patients older than 65 years of age, patients less than 35 were nearly 10 times more likely to recur ($p = 0.002$) and patients 45-55 years were 5 times more likely to recur ($p = 0.009$). Additionally, females on birth control showed decreased risk of recurrence of 74% compared to counterparts ($p = 0.04$).

Conclusions: This is the first study to demonstrate an inverse relationship between age and disease recurrence in patients with iSGS following surgery. Using age as a surrogate for menopausal status, these results suggest that increased age and/or birth control provide a protective effect through decreased recurrence rates, possibly mediated by the decreased estrogen levels.

Targeting Orally Inhaled Drugs to the Laryngotracheal Stenosis Using Different Delivery Methods

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Background: Although patients with laryngotracheal stenosis (LTS) are routinely prescribed topical orally inhaled medications, such as corticosteroids, the drug administrative method for these medications varies: metered dose inhalers with/without a spacer, dry powder inhalers, or nebulization. It remains to be determined the effectiveness of these methods in targeting medications to the stenotic inflammation. To this end, this study uses computational fluid dynamics modeling techniques to quantify and compare stenotic drug particle depositions across different delivery methods in a cohort of patients with LTS.

Methods: Patient-specific laryngotracheal airway models were constructed from computed-tomography images of 11 subjects. Simulations were performed in each model to capture resting inhalation flow at 15L/min during drug administration, and three different delivery methods were simulated mimicking metered dose inhalers (MDI), metered dose inhalers with a spacer (MDI+S), and nebulization. MDI+S was simulated by assuming that inhaled drugs had 0m/s aerosol velocity, while nebulization and MDI were assumed to have been inhaled with aerosol velocities of 1m/s, and 5m/s, respectively. Simulated aerosol sizes were 1-30 microns for all delivery methods.

Results: Across all delivery methods, median stenotic depositions were 0.15% (Interquartile range, IQR=0.51%), 0.12% (IQR=0.52%), and 0.11% (IQR=0.48%) for MDI+S, nebulization and MDI, respectively. Drug particle sizes measuring 6-8 microns had the most stenotic deposition for each delivery method.

Conclusion: This study showed minimal difference in drug deposition across the three delivery methods. Each delivery method experienced large variability in deposition due to subject-specific anatomical variability of their stenosis. Regardless of delivery method, 6-8 micron particles consistently demonstrated superior stenotic deposition.

Acute Laryngeal Injury in Patients Undergoing Airway Screening Evaluation at a Long-Term Acute Care Hospital

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Background/Objectives: Acute laryngeal injury (ALGI) is a commonly identified complication of prolonged intubation. The evolution of ALGI into mature stenosis and factors affecting decannulation are unclear. This retrospective review aims to characterize the incidence and natural history of ALGI.

Methods: Retrospective study of post-intubated patients seen for screening evaluation at a single long-term acute care hospital (LTACH) from July 2019 to September 2022.

Results: Forty-seven of 118 adult patients had ALGI. Those with ALGI were more likely female (59.5% vs 35.2%, $p = 0.01$), with higher BMI (32.9 vs 28.1, $p=0.02$) and lower height (165.7cm vs 168.8cm, $p=0.007$). Decannulation rates in patients with ALGI were 70.2% compared to 84.5% without. Patients with ALGI were scoped more quickly after extubation (28.9 days vs 38, $p=0.02$), but the average time to decannulation was longer (67.7 days vs 87.3 days). Patients with ALGI treated conservatively (observation or medical management) were decannulated up to 71 days after extubation. Further decannulations occurred only after surgical intervention. Eighteen of 47 patients with ALGI (38%) ultimately underwent procedural intervention.

Conclusions: Female gender, higher BMI, and shorter height are associated with ALGI among patients undergoing a LTACH standardized screening evaluation. The time course of progression of ALGI into mature laryngotracheal stenosis is suggested to be near 71 days given lack of decannulation without further surgical intervention among ALGI cohort.

Cadaveric Study on the Safety of High Flow Nasal Oxygen (HFNO)

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Paul Bryson, MD, MBA;

Introduction: High Flow Nasal Oxygen (HFNO) is a technique that provides apneic oxygenation and a degree of ventilation during microlaryngeal surgery. HFNO common misnomer is: Transnasal humidified rapid insufflation ventilatory exchange (THRIVE). Despite a recent retrospective study out of Stanford advocating for its safety, its use in conjunction with laser has been questioned. For an airway fire to occur, a triad of ignition source, oxidizer, and fuel source must be present. By using HFNO during laser surgery and eliminating an endotracheal tube, it is hypothesized that airway fire risk is minimal. We tested this theory with human cadavers using HFNO with increasing levels of FiO₂ while performing microlaryngeal laser surgery.

Methods: Two human cadavers were used in this study. High flow nasal cannula was placed on cadavers and oxygen was administered at incrementally increasing levels (30% to 100%). Laryngeal microsurgery was then carried out with CO₂ and KTP lasers which were each fired for 30 seconds.

Results: The use of CO₂ and KTP laser produced char on cadaveric vocal cords, however, no airway fire or even a flash were observed with any of the tested oxygen concentrations.

Conclusion: HFNO may be safe to use during microlaryngeal laser surgery. By eliminating the endotracheal tube as a fuel source, risk of airway fire may be negligible. Our study safely fired CO₂ and KTP lasers for an uninterrupted 30 seconds on 100% HFNO without airway fire.

Magnitude of Oropharyngeal Pressures during Swallowing

Tadeas Lunga, MD; Kazuhiro Hon, MD; Timothy McCulloch, MD; Susan Abdelhalim, MD, MPH

Background: Swallowing is a complex process requiring precise coordination of pressure and timing across multiple structures. While bolus volume and viscosity require swallow adaptation, the specific role of oral pressure modifications remains uncertain. This study aims to investigate the role of tongue-to-palate pressures in swallow adaptation, including pressures of the anterior(AT) and lateral tongue(LT), velopharynx(VP), and tongue base(TB).

Methods: Seventeen healthy volunteers participated. Tongue and pharyngeal pressures were measured using sensors attached to the palate and high-resolution manometry(HRM), respectively. Signals from both systems were synchronized for data analysis. Participants completed three swallows of different volumes (5 cc, 10cc, and 20cc) and viscosities (thin, nectar, honey). Maximum pressure magnitudes were recorded. Descriptive statistics and a TWO-WAY-ANOVA were used for analysis.

Results: Values indicate mean pressure in mmHg +/- standard deviation.

Effect of volume (5cc, 10cc, 20cc), regardless of viscosity:

AT: 54mmHg+/-SD=34, 63mmHg+/-SD=35, 59mmHg+/-SD=37

LT: 87mmHg+/-SD=52, 91mmHg+/-SD=55, 87mmHg+/-SD=48

VP: 117mmHg+/-SD=35, 124mmHg+/-SD=34, 133mmHg+/-SD=33

TB: 121mmHg+/-SD=36, 121mmHg+/-SD=39, 125mmHg+/-SD=41

Effect of viscosity (thin, nectar, honey), regardless of volume:

AT: 52mmHg+/-SD=34, 59mmHg+/-SD=37, 65mmHg+/-SD=34.

LT: 79mmHg+/-SD=45, 90mmHg+/-SD=49, 97mmHg+/-SD=58.

VP: 124mmHg+/-SD=33, 125mmHg+/-SD=36, 125mmHg+/-SD=36

TB: 121mmHg+/-SD=38, 123mmHg+/-SD=40, 124mmHg+/-SD=39

No significant effects of viscosity or volume on pressures were observed.

Conclusion: This study was the first to synchronously measure tongue and pharyngeal pressures using a sensor sheet system/HRM. Anterior/lateral tongue pressures tend to increase with thicker liquids, requiring more pressure to initiate flow. Velopharyngeal pressures tend to increase with greater volume, ensuring a tight seal to prevent nasal regurgitation. Some trends may have reached significance with additional data; other adaptive behaviors may have superseded changes in pressure generation.

**Prospective Evaluation of 100 Abelchia/RCPD patients:
Abnormalities in High Resolution Esophageal Manometry**

Huixin Hu, MBBS; Jennifer Anderson, MD, MSc

Introduction: Self-diagnosis of retrograde cricopharyngeus dysfunction (RCPD) or abelchia, has been increasing over the past 5 years with patients seeking treatment for lifelong symptoms of inability to burp, neck gurgling, bloating and flatulence. There is a paucity of objective data on the pathophysiology and underlying mechanisms of this disorder. The purpose of this study was to prospectively evaluate patients who present with RCPD symptoms with relevant investigations to rule out other pathology and explore possible underlying mechanisms.

Methods: Patients presenting with clinical scenario consistent with RCPD were recruited into the study after informed consent. All patients underwent standardized investigations: Self reporting questionnaire EAT-10 and RSI scores as well as esophagogastrosocopy, barium swallow and high resolution esophageal manometry (HRES).

Results: RCPD patients demonstrated a minor increase in the mean EAT-10(5.2 +/-1.2) and normal RSI scores. Barium swallow revealed 51% (CI 38-64%) were abnormal with reflux (45%) and dysmotility (20%) as most common findings.

HRES revealed that 67% (CI 54-78%) were abnormal. Ineffective motility was found in 41% , a further 23% showed a complete absence of peristalsis whereas 33% were normal.

Conclusions: RCPD is a clinical condition of lifelong inability to belch and associated symptoms. The underlying pathophysiology is poorly understood. This study demonstrates that a significant number of RCPD patients have abnormal esophageal neural network with high proportion of abnormal or absent esophageal peristalsis.

YOUNG FACULTY/PRACTITIONER AWARD

Investigating the Effects of Acute Intracordal GC Administration on Vocal Fold Epithelial Barrier Function following Iatrogenic Injury in a Preclinical Model

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Introduction: Glucocorticoids (GC)s are commonly prescribed to treat various laryngeal indications due to their potent anti-inflammatory properties. However, GCs effect on VF epithelial barrier following injury has been overlooked due to the absence of robust models. Epithelial barrier function is a crucial indicator of tissue remodeling and health. The purpose of this study was to quantify the effects of GCs on epithelial barrier function in both healthy and injured VF tissue to increase our insight into fundamental biochemical processes underlying GC mechanisms. Ultimately, we aim to refine therapeutic strategies for the millions of patients with voice-related disability.

Study Design: In vivo; ex vivo

Methods: Seventy-five New Zealand white rabbits were anesthetized and subjected to iatrogenic VF injury. 7-days after injury, animals received a 20µl injection directly into each vocal fold consisting of either saline, dexamethasone, methylprednisolone, triamcinolone, or served as an injury control without injection (n=15 per condition). Additionally, a cohort of 5 rabbits per treatment condition survived 1-day, 7-days, or 60-days following treatment. An additional 5 animals served as non-injured/untreated controls. 1mm biopsies were placed in an Ussing chamber to calculate transepithelial electrical resistance (TEER). A two-way ANOVA with a post-hoc Tukey's test was employed.

Results: At 60-days post-recovery, saline, dexamethasone, and methylprednisolone elevated TEER relative to injury control. GCs elevated TEER to normal non-injured levels; however, saline increased TEER compared to non-injured controls.

Conclusion: Dexamethasone and methylprednisolone demonstrate greater efficacy in restoring barrier function than triamcinolone following injury at 60-days. Effect of saline on TEER warrants further investigation.

Metagenomic Whole Genome Shotgun Analysis of the Airway Microbiome In Laryngotracheal Stenosis

Nour Awad, MD; Cheick A. Sissoko, MSc; Laurel L. Ball, MD; Gregory R. Dion, MD, MS; Peter J. Larson, MD, PhD

Introduction: The airway microbiome has been implicated in the pathogenesis of laryngotracheal stenosis (LTS). However, these studies have been limited by the sub-genus-level resolution of amplicon-based 16S rRNA sequencing. Metagenomic whole genome shotgun sequencing (mWGS), by contrast, allows for strain-level taxonomic and functional genomic analysis, providing insight into the specific organisms and pathways involved. This study aims to explore the role and function of microbiome in LTS using mWGS.

Methods: mWGS was conducted on 12 intraoperative swab samples from 4 patients with LTS and 4 control patients. Patients also underwent chart review and completed questionnaires to document their medical history, antibiotic use, zip code, diet, and current medications. DNA was extracted and sequenced on an Illumina NextSeq 2000. Using Biobakery workflows, reads were quality controlled through KneadData and taxonomic profiles were generated through MetaPhlAn4.

Results: LTS samples exhibited decreased taxonomic diversity and were dominated by species with previously described roles in other chronic inflammatory processes such as *Streptococcus salivarius*, *Streptococcus mitis*, *Anaerococcus vaginalis*. Our results demonstrate species- and strain-level microbiome differences in patients with LTS and shed light on potential microbial players in the chronic inflammatory processes of airway stenosis. These data illustrate the additional insight mWGS can provide and enable downstream strain-level and functional analysis to characterize the pathogenesis of LTS.

Conclusion: Analyzing microbiota variations in LTS could reveal etiology-specific biomarkers, comorbidity links, and therapeutic targets.

Establishment of 3D Cell Culture Models for Recurrent Respiratory Papillomatosis

Takeyuki Kono, MD, PhD; Hiroyuki Ozawa, MD, PhD

Objective; Recurrent respiratory papilloma (RRP) is a rare benign tumor caused by low-risk human papillomavirus (LR-HPV) infection. The pathogenesis of RRP is poorly understood due to the lack of cell lines harboring LR-HPV genome and an observational system to evaluate the viral life cycle in vitro. In this study, we try to establish 3D culture models of RRP.

Methods; Patient-derived 2D RRP cells were established by the conditional reprogramming method which utilizes the combination of irradiated fibroblast feeder cells and Rho kinase inhibitor. Then, the obtained cells were embedded in an atelocollagen gel to develop 3D cells. Normal mucosal epithelial cells were also isolated as controls. HPV status was confirmed by both RT-qPCR and RNA in-situ hybridization.

Results; We established primary cells of 12 RRP patients. The success rate was 92%, and established cells can be passively cultured and repopulated after freezing and thawing. Of these, 10 cases contained HPV6 and 2 cases contained HPV11 viral genomes. The expression of Ki67 and cytokeratin5 was detected by immunofluorescence, suggesting that 3D cells reproduce the clinical characteristics of RRP.

Conclusion; We successfully established 3D culture cells from RRP with a relatively high success rate by the conditional reprogramming method. In the future, these cells will be utilized to evaluate the expression of various proteins and genetic mutations to elucidate factors involved in the amplification of the LR-HPV genome and tumor growth.

Action and Reaction: A Review of Force Metrics During Suspension Microlaryngoscopy

Phillip Song, MD; Allen Feng, MD

Objective: To understand the relationship between force measurements and extralaryngeal complications during suspension microlaryngoscopy (SML). The laryngeal force sensor measures the force applied to the oral cavity and oropharynx intraoperatively. Prior studies have shown that total suspension time correlates with postoperative pain and narcotic administration in the postanesthesia care unit (PACU), and higher maximum and average force is associated with dysphagia.

Method: The laryngeal force sensor measures intraoperative force metrics during suspension microlaryngoscopy. A consecutive series of 510 surgeries had force data collected over a 5-year period. Force metrics were recorded along with PACU data, including pain and dysphagia.

Results: Force metrics were recorded from 510 consecutive suspension microlaryngeal surgeries. The mean maximum force applied was 46.5 pounds of force (lbf) with a median of 31.5 lbf and mode of 27.45 lbf. The average force was 17.8 lbf, with a mean of 15.82 lbf and mode of 11.0 lbf. Average tissue compression under suspension, as calculated by the difference between Max force and Avg force was 17.6 pounds. The average total suspension time was 30.4 minutes. The likelihood of developing extralaryngeal complications increased with Max force, from 15.1% at 20 lbf to 41.0% at 40 lbf and 72.5% at 60 lbf.

Conclusions: The likelihood of developing complications after SML increases with higher force metrics and suspension time. Strategies for reducing force metrics included changing to smaller laryngoscopes and shortening suspension time. Surgeon awareness of force and suspension time during SML may reduce complications.

High Concentration Methylprednisolone-Induced Fibrotic Response Is Associated with YAP/TAZ/TEAD Signaling in Human Vocal Fold Fibroblasts Co-Cultured with Macrophages

Ryosuke Nakamura, PhD; Renjie Bing, MD; Gary Gartling, PhD;
Michael Garabedian, PhD; Ryan C. Branski, PhD

Objective: The pro-fibrotic effects of glucocorticoids may lead to a suboptimal therapeutic response for vocal fold (VF) pathology. Interactions between resident fibroblasts and inflammatory cells likely mediate this response – targeting these interactions may prove therapeutically valuable. Macrophages alter their phenotype to mediate both inflammation and fibrosis. We previously reported high concentrations of methylprednisolone increased transcription of fibrotic genes in VF fibroblasts exposed to macrophage-derived soluble factors, including CCN2, a target of YAP/TAZ-TEAD signaling. In this study, we investigated concentration-dependent effects of methylprednisolone on fibrotic and inflammatory gene transcription in VF fibroblasts in physical contact with macrophages as a foundation to optimize therapeutic strategies for patients with voice/laryngeal diseases.

Study design: In vitro

Methods: Macrophages were differentiated from THP-1 monocytes expressing green fluorescent protein (GFP), and inflammatory (M(IFN/LPS)) and fibrotic (M(TGF)) phenotypes of macrophages were induced. Macrophages were seeded onto HVOX vocal fold fibroblasts. Cells were co-cultured +/-0.3-3000nM methylprednisolone +/- 3µM verteporfin, a YAP/TAZ inhibitor. Inflammatory (CXCL10, TNF, PTGS2) and fibrotic genes (ACTA2, CCN2, COL1A1) in fibroblasts were analyzed by real-time polymerase chain reaction after sorting cells based on GFP expression.

Results: Methylprednisolone decreased TNF and PTGS2 in fibroblasts co-cultured with M(IFN/LPS) macrophages and increased ACTA2 and CCN2 in fibroblasts co-cultured with M(IFN/LPS) and M(TGF). Lower concentrations were required to decrease TNF and PTGS2 than to increase ACTA2 and CCN2. Verteporfin attenuated the upregulation of CCN2 but not PTGS2 downregulation.

Conclusion: High concentration methylprednisolone induced fibrotic response genes mediated by YAP/TAZ activation.

ALA POSTERS

A Computer Vision Pipeline for Laryngoscopic Image Standardization Through Histogram Matching and Equalization

Amruta Parulekar, BA; Lueder A. Kahrs, PhD;
R. Jun Lin, MD, MSc; Julia Wircigroch, MASc, MSc

Background/ Objectives: Otolaryngologists use various endoscopes and light sources to observe laryngeal diseases. However, inconsistent illumination and color variation caused by endoscopic light can lead to challenges in diagnosis and treatment planning. We propose an image processing pipeline to standardize laryngoscopic images to improve treatment planning and enable comparison across examinations and visits.

Methods: Two distal chip laryngoscopes were used to capture twenty videos from 14 patients with halogen and strobe lights. Our pipeline automatically extracts stills from videos, discards blurry and sharpens low-resolution frames. Images are grouped into bins based on color similarity, and two intensity thresholds are adjusted per bin to enhance dark pixels and replace over-illuminated areas with surrounding textures. Using the average histogram from a selected target bin, histogram matching transforms the images into the target color space. The correlation between each image and the target histogram is assessed before and after histogram matching to evaluate color transformation.

Results: The image enhancement and histogram matching increased the correlation for all 450 transformed images, representing a better correspondence with the target histogram. The pipeline standardized the correlations to fall within the range of the target bin in 96% of images. The correlations of 56% of images were also within one standard deviation of the target average histogram.

Conclusion: Our pipeline enhanced image quality and standardized the color space across light sources and laryngoscopes. Standardizing laryngoscopic images has the potential to improve diagnosis and treatment planning in clinical routines or to create standardized datasets for artificial intelligence tasks.

A Computer Vision Approach for Standardized Vocal Fold Paralysis and Paresis Detection

Atharva Rajesh Madiwale, MS; Alexander Abdollahzadeh, BS; Anthony R. Law, MD, PhD;
Thad E. Stamer, PhD; Jenna Jiayi Kang, BS

Coughing is a prevalent medical symptom that is associated with a wide range of pathologies, ranging from an upper respiratory infection to LPRD to asthma. Neurogenic cough is thought to be a consequence of vagal nerve hypersensitivity, which may also present with motion abnormalities at the level of the glottis for many patients. Detection of vocal fold paresis can aid in increasing the positive predictive value for this challenging diagnosis. However, objective and non-invasive diagnosis of paresis holds its own complications. Even among seasoned medical professionals, there are reports of low inter-rater reliability in the diagnosis of vocal fold paresis, making this an unreliable marker for neurogenic cough.

Leveraging state-of-the-art computer vision models, we quantify vocal fold motion and identify thresholds for specific metrics that suggest paresis and paralysis. While the current methodology involves pre-processing steps and video feed filtration, our goal is to make it universally applicable to any video, providing surgeons with a clear and standardized parameter for understanding the severity of paralysis/paresis.

By eliminating subjectivity, this paralysis measurement scheme provides a quantifiable tool that can provide a reliable and standardized metric. It empowers medical professionals in smaller healthcare facilities, thereby reducing the dependency on highly specialized experts. This democratization marks a crucial step towards accessible and standardized diagnostics, enabling timely and effective treatment for patients worldwide.

A Mixed-Methods Analysis of Laryngology Related Content on TikTok

Jonah Schmitz, MSc; Sofia Olsson BS; Coleton Evans, BA

Background/Objectives: Social media has been an important vehicle for dissemination of medical information for a variety of audiences. The popular video sharing platform TikTok has seen ongoing increased worldwide engagement in the last 4 years, including within the medical community. This study is the first to describe TikTok content among laryngologists and related professionals.

Methods: A systematic search of laryngology-related hashtags was performed on TikTok in early February 2023, and accounts with content published in the last 6 months were included. Two researchers performed independent deductive qualitative analyses on the video content to identify key themes among content creators.

Results: Laryngology as a sub-specialty is relatively well-represented among otolaryngology TikTok content. Accounts with the largest engagement were led by laryngologists, general otolaryngologists, speech-language pathologists, and voice coaches. While some content was aimed at advertising the services of private physician practices or voice coaching services, the majority of videos were designated with a primary purpose of education or entertainment. This included topics such as vocal hygiene, proper voice use, and layman summaries of the standard of care for common voice pathologies.

Conclusions: Laryngology content on TikTok is a growing avenue for laryngologists and vocal health professionals to engage both educated and lay audiences. There appears to be room for further professional involvement on the social platform to increase the amount of reliable, high-quality information.

A Novel Option for Revision Medialization: Repeat Reinnervation

Ari D. Schuman, MD, MSCR; Julina Ongkasuwan, MD

Introduction: Nonselective laryngeal reinnervation (NSLR) shows comparable voice results to thyroplasty. In the rare case of a second ipsilateral vocal fold paralysis after NSLR, we present the first reported revision NSLR.

Methods: Case report.

Results: A 51 year old woman with a history of right NSLR in 2017 for vocal fold paralysis after an anterior cervical discectomy and fusion (ACDF) presented for re-evaluation prior to revision ACDF. An ipsilateral approach was recommended to reduce the risk of bilateral vocal fold paralysis. Post-operatively, she was noted to have a moderately breathy and moderately asthenic voice with vocal fold immobility in a lateral position. She was offered thyroplasty or revision reinnervation, she opted for revision reinnervation due to a strong preference for her reinnervated voice. One year after the revision ACDF, she underwent a revision NSLR using the contralateral ansa cervicalis and commercial nerve interposition graft. Pre-op maximum phonation time was 9 seconds, fundamental frequency (F0) was 211 Hz, jitter was 2.868%, shimmer 14.429%, noise to harmonic ratio was 0.366, cepstral peak prominence was 2.689. One year later her voice was mildly breathy and asthenic. Her MPT was 7.6 seconds, F0 was 190 Hz, jitter decreased to 2.42%, shimmer to 6.478%, and NHR to 0.165. Cepstral peak prominence increased to 4.427. VHI decreased from 35 pre-operatively to 7 post-operatively.

Conclusions: We present the first case of a revision NSLR. Notable improvement has been found in objective voice measures and patient-reported outcomes post-operatively, demonstrating feasibility in similar patients.

Airway Obstruction Due to Mixed Pyolaryngocele in the Setting of Covid-19 Infection

Ryan Durgham, MPH; Cecilia Freeman, MD; Aaron J. Jaworek, MD

Background/Objectives: Laryngoceles are a rare condition defined by abnormal dilatation of the laryngeal saccule. Findings associated with laryngoceles can range from mild (hoarseness, globus) to life threatening (acute airway obstruction, abscess, sepsis). We present a case of acute airway obstruction caused by a mixed pyolaryngocele in the setting of COVID-19 infection complicated by deep neck space abscess/necrotizing fasciitis from rupture of the external component through the thyrohyoid membrane.

Methods: With consent of the patient, a retrospective chart review was performed to document their clinical course. A brief literature review for case reports involving COVID-19, deep neck space abscesses, and laryngoceles was also performed.

Results/Conclusions: To our knowledge, this is the first report of a pyolaryngocele superinfection in the setting of COVID-19 infection. While it is well known that viral infections predispose patients to subsequent bacterial infections, some studies have found that secondary bacterial infections in patients with COVID-19 were both more prevalent and more lethal compared to influenza. Additionally, some research has suggested that laryngeal pathology following COVID-19 infection can occur even in mild cases. In this patient who was diabetic and diagnosed with COVID-19, his unique presentation of a mixed pyolaryngocele with deep neck space necrotizing fasciitis warranted aggressive multidisciplinary treatment both pharmacologically and surgically. Throughout the pandemic, steep learning curves and adapting to new challenges became the norm; sharing unique cases like this one during the COVID-19 era of medicine will hopefully improve outcomes for other similar presentations that may arise in the future.

Application of Artificial Intelligence in Laryngeal Lesions: A Systematic Review and Meta-Analysis

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Kirsten Meenan, MD; Ashli O'Rourke, MD

Background: The field of laryngology related to laryngeal cancer has seen a recent rise in artificial intelligence (AI) applications. This AI-driven technology has been used for endoscopic diagnosis/classification, voice substitution, histopathologic evaluation, and survival/prognosis of malignant laryngeal lesions. Although it is a growing field, the effectiveness and usefulness of these applications have not been well described.

Methods: The COCHRANE Library, CINAHL, PubMed, and Scopus databases were searched for English articles from inception to October 15, 2023. Search terms included: artificial intelligence, detection of laryngeal lesions, and laryngeal cancer. Studies investigating diagnosis, lesion classification, voice substitution, histopathologic evaluation, and survival and prognosis were used. Meta-analysis of proportions (%) with 95% confidence intervals (CI) were conducted for outcomes such as sensitivity, specificity, and accuracy.

Results: Of the 200 unique abstracts screened, ten studies (N = 6167) met the inclusion criteria to be meta-analyzed. The overall accuracy of AI models was 91.3% ([95%CI: 87.4% to 95.3%]). AI models' sensitivity and specificity for endoscopic differentiation of benign versus malignant lesions were 83.0% ([95%CI: 77.5% to 88.5%] and 87.2% ([95%CI: 82.0% to 92.5%], respectively. The Retina Net AI model had the highest accuracy and sensitivity, which were 95% and 98%, respectively, when used to differentiate between benign and malignant laryngeal lesions.

Conclusions: The utilization of artificial intelligence for endoscopic detection and classification of malignant laryngeal lesions showed excellent accuracy, sensitivity, and specificity, exhibiting potential for clinical implementation

Application of Artificial Intelligence-Based Ultrasonic Image Analysis in Patients Receiving Injection Laryngoplasty for Unilateral Vocal Paralysis

Wen-Hsuan Tseng, MD; Ming-Sui Lee, PhD; Ze-Siang Wang, MS; Tsung-Lin Yang, MD, PhD

Hyaluronic acid (HA) can be degraded over time. However, persistence of the effects after injection laryngoplasty (IL) for unilateral vocal fold paralysis (UVFP) has been observed. The purpose of the study was to develop a non-invasive method with clinical applicability for objective evaluation of the biomaterial effects of the injected HA using artificial intelligence-based ultrasonic assessment.

Imaging phantoms were built for designing the algorithm for machine learning. Subsequently, adult patients without formal voice training, who underwent HA IL for UVFP were recruited. The Voice Handicap Index-10 questionnaire, GRBAS scale and normalized glottal closure were evaluated before IL. Patients received ultrasonography for estimation of HA volume as well as voice outcome assessments at 2 weeks, and 2 and 6 months after IL.

Contours of HA were described well and volumes were estimated accordingly for imaging phantoms and all participants. Clinical voice outcomes were significantly improved post-operatively and remained stationary. Contrarily, estimated HA volume decreased significantly across time points (1.21 ± 0.53 at 2 weeks, 0.63 ± 0.35 at 2 months, $P < 0.001$; 0.32 ± 0.25 at 6 months, $P < 0.001$). Three patients received secondary procedures at 2 months. There were no significant differences in clinical voice outcomes at baseline and 2-week. For ultrasonic outcomes, HA volumes were similar at 2-week and 2-month. However, the remaining HA percentage at 2 months was numerically lower in 2nd-IL group (50.84% v.s. 55.15%).

In conclusion, the volume change of the injected HA over time for an individual was estimated non-invasively. The prolonged effect after treatment, longer than HA longevity, was demonstrated objectively for the first time.

Botulinum Toxin Injection Dose Changes in a Long Term Cohort of Adductor Spasmodic Dysphonia Patients

Randal C. Paniello, MD, PhD; Scott A. Norris, MD; Joel S. Perimutter, MD

Introduction: Patients with adductor spasmodic dysphonia (ADSD) are often treated with serial injections of botulinum toxin (BTX). The injection dose may be adjusted based on clinical benefit and side effects, patient preference, or other factors. This report reviews these dose adjustment factors in our cohort of long-term ADSD patients.

Methods: Charts of patients receiving BTX injections for ADSD for at least five years were reviewed. BTX doses for each injection cycle, and rationale for dose changes, were recorded. Data were plotted and analyzed for patterns.

Results: 99 patients meeting criteria were identified, F:M ratio was 77:22, and mean age at the start of treatment was 57.2 (range 22-90). The median treatment time was 9.74 years (range 5 to 29 years). A median 18 injections per patient (range 6-99) were given for a total of 2,452 injections reviewed. Treatment dose was considered "established" after a mean of 4.63 injections (range 3-20); females used a higher dose than males ($p=0.032$). The median treatment interval between injections, per patient, was 6.8 months (range 3.0-23.9). BTX doses were changed from the prior dose 423 times (17.2%). Doses were adjusted to increase benefit (51.2%; effect:duration = 7:1), to reduce side effects (37.7%; breathiness:swallowing = 15:1), or for other reasons (11.1%). Overall, patients underwent a mean of 4.1 dose changes (range 0-29). 28 patients in this cohort are still receiving BTX treatments in our clinic.

Conclusion: Laryngeal BTX injections can effectively improve symptoms of adductor spasmodic dysphonia, but dose adjustments are often needed for optimal benefit.

Building Phonomicrosurgical Skills Through Simulation: An Affordable, Easy Model for Operating Room Downtime

Julia Thomas, MD, MSPH; Brandon Baird, MD

Introduction: Phonomicrosurgery is a key component of laryngology but also can be challenging for trainees to learn. While simulations can help develop surgical skills in a safe, comfortable environment, they are often expensive and time-consuming. This study evaluates the validity of a low-cost simulation to improve microsurgical skills during downtime in the operating room (OR) using easily accessible supplies.

Methods: The simulation was designed using a 35cc syringe with the plunger removed. The syringe was filled with pieces of paper (approximately 3x5mm) and placed on a rolled surgical towel at a downward angle. Participants used right and left facing microsurgical alligator forceps to pick up a slip of paper, transfer it to their other hand and remove it from the syringe. The number of paper slips each participant removed in three minutes was collected. Participants also completed a short survey.

Results: Ten participants (laryngology attendings (n=2), residents (n=5), and non-residents (n=3)) tested the simulation. Attendings scored significantly higher at removing paper slips than residents and non-residents ($p=0.01$). Of non-attendings, 88% agreed or strongly agreed that the simulation was a useful method to practice handling phonomicrosurgical tools and 100% would use the simulation in the OR during downtime.

Conclusions: This study shows that attendings with extensive experience in phonomicrosurgery perform better in the simulation than those with limited experience, which helps establish construct validity. Using basic materials found in the OR, this simulation could be used to help trainees build dexterity with phonomicrosurgical tools and could be easily replicated at other institutions.

Cellular and Molecular Effects of Sex Hormones on the Vocal Folds: A Scoping Review

Serena Pu, BA; Benjamin Laitman, MD, PhD; Spencer Johnson, BA;
Lily Martin, MLIS; Mark S. Courey, MD

Introduction: Steroid sex hormones (SSH) target cell nuclei to affect transcription. Although vocal fold tissue is theorized to be hormonally responsive, SSH receptor presence and cellular effects on the vocal folds are not well established. A summary of this literature might inform future research.

Methods: This scoping review followed PRISMA-ScR Guidelines. Medline, Embase, Scopus, and Web of Science were searched. Two independent reviewers screened each title/abstract and full-text according to eligibility criteria. Exclusion criteria included primary outcomes based on subjective interpretation and secondary effects on the vocal folds (e.g. voice).

Results: 341 articles were screened by title/abstract, leaving 66 for full-text review, of which 30 met inclusion criteria. 13 studies were performed in humans and 14 in animals; 3 were review articles. The vocal folds were evaluated by histology, MRI, and PCR. In studies directly examining receptors (n=14), estrogen receptors (ER) were found in 8/13, progesterone receptors (PR) in 5/9, and androgen receptors (AR) in 3/7. When the effects of SSH on vocal folds were studied (n=15), estrogen had effects in 10/13, progesterone in 3/3, and androgens in 4/5. ER and PR were mostly identified in epithelium and fibroblasts of lamina propria while AR was found in muscle, lamina propria, and epithelium.

Conclusions: Existing evidence variably supports the presence of SSH receptors in vocal fold tissue; therefore, further clarification is needed. Estrogen and progesterone were most commonly identified in mucosal tissue, where they decrease fibrosis and help maintain the epithelial barrier. Androgens appear to be pro-fibrotic in epithelium and hypertrophic in muscle.

Characterizing Radiation-Related Laryngotracheal Stenosis

Natalia Queenan, BA; Jay Trivedi, BS; Sana Siddiqui, MD;
Dylan Bertoni, MD; Kathleen M. Tibbetts, MD

Background: Laryngotracheal stenosis (LTS) may result from multiple etiologies but is most commonly iatrogenic. Rarely, LTS develops from fibrosis and necrosis of the airway tissue after radiotherapy. The disease course, treatment methods, and outcomes of radiation-related LTS (RLTS) are not well-described in the current literature.

Objective: To compare risk factors, treatment methods, and outcomes of patients with RLTS to patients with iatrogenic LTS (ILTS).

Methods: This single-center retrospective cohort study analyzed patients diagnosed with LTS from 2017 to 2023. Demographic data, comorbidities, cancer history and treatment, and primary stenosis intervention and outcomes were extracted. Data was analyzed using Fisher's Exact Tests and paired t-tests.

Results: Eight patients with cancer (7 laryngeal, 1 thyroid) and subsequent RLTS were included, showing variable stenosis location (2 supraglottic, 3 glottic, 6 subglottic). Five patients received treatment, including laser excision (3), laser excision with balloon dilation (1), and cold knife excision (1). A control group of 98 patients with ILTS was included. Patients with ILTS were more likely to have obesity ($p = .03$) and trended towards higher rates of previous airway issues including asthma and chronic obstructive pulmonary disease. No significant differences were found in interventions or outcomes.

Conclusions: Patients with RLTS have different risk factors for developing LTS than patients with ILTS. No differences were seen between cohorts regarding treatments or outcomes. Although RLTS is uncommon, it may be treated similarly to other etiologies of LTS.

Clinical Characteristics of Hemorrhagic Polyps

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Background: Phonotraumatic lesions of the vocal folds are common and associated with increased vocal demands. Hemorrhagic polyps (HP) are more commonly seen in males and are thought to be vocal accidents, originating from an acute hemorrhage. We present one of the largest cohorts in the literature focusing on this benign lesion.

Methods: Retrospective cohort study, inclusive of all patients with hemorrhagic polyps managed by the senior authors from 2016 to present. We collected demographic information, risk factors for vocal accidents (including profession, hobbies, self-reported talkative scale), management, pre and post-treatment Voice Handicap Index (VHI-10) scores. We also examined the patients' videostroboscopy and categorized the size of the HP (ranging from 1-3, as described in prior literature) and identified the presence or absence of any concurrent mucosal abnormality.

Results: 111 patients with confirmed diagnosis of hemorrhagic polyp, 84 males (75.7%). 33 patients were size category 1 (29.7%), 55 were category 2 (49.5%) and 23 were category 3 (20.7%). 10 patients (9%) had bilateral HPs. 62 patients (56%) reported increased risk for vocal accidents. 24 patients (22%) had concurrent mucosal abnormalities (sulcus, atrophy or nodules). Patients were managed with micro-flap excision most commonly (52.4%), in-office potassium titanyl phosphate (KTP) laser (23.1%), voice therapy alone (8.5%) and KTP in the operating room (6%). 9 patients (8%) deferred recommended surgical treatment or had spontaneous resolution. The mean pre-treatment VHI-10 was 18.6, compared to a post-treatment VHI-10 of 6.9 ($p < 0.001$).

Conclusions: We present one of the largest cohorts of patients with HP and document their clinical characteristics.

Comparing Efficacy and Facility of Training Using a Novel User-Controllable Endotracheal Tube Stylet

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Andrew Vahabzadeh-Hagh, MD

Background: Endotracheal intubation is critical in airway management training, with vital ramifications for patient care. Due to variations in training across the US, there is a general consensus that there is room for improvement, both in the technique itself and training. The purpose of this study is to compare the usability of a preformed, rigid stylet designed for use with videolaryngoscopes (GlideRite stylet) with a novel user-controllable stylet.

Methods: Subjects performed endotracheal intubation of a fresh human cadaver using the videolaryngoscope coupled with the rigid and novel stylet in random orders. The NASA Task Load Index form was used to evaluate their experience with each stylet. Descriptive and statistical analysis was conducted to compare efficacy and user experience.

Results: 13 subjects were recruited for this study. The average age was 30.8 years. Subjects included undergraduates, medical students, residents, and attendings with a majority of individuals having previously intubated between 10-50 patients. The average intubation time was about 4 seconds slower in the novel vs the rigid stylet. Average number of attempts was similar. The novel stylet scored lower in physical demand, effort, temporal demand, and frustration compared to the traditional stylet on the NASA Task Load Index. The traditional stylet scored lower on mental effort. The novel stylet provided a less traumatic form of intubation and permitted easier intubation without adjustment when the laryngeal view was less optimal.

Conclusion: Appropriate technique and training is necessary for successful endotracheal intubation. A novel user-controllable stylet showed promising results in terms of ease of use and intubation technique.

Comparing Severity of Vocal Fold Bowing Between People with Parkinson's Disease, Progressive Supranuclear Palsy, and Cerebellar Ataxia

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James A. Curtis, PhD, CCC-SLP; Michelle Troche, PhD, CCC-SLP

Purpose: Vocal fold bowing, as measured endoscopically with the bowing index (BI), is associated with impairments in cough and swallowing function in patients with neurodegenerative disease. The purpose of this study was to compare the degree of vocal fold bowing between individuals with Parkinson's disease (PD), progressive supranuclear palsy (PSP), and cerebellar ataxia (CA).

Methods: Thirty individuals with PD, 23 with PSP, and 24 with CA (total n=77) were included in this study and underwent flexible laryngoscopy. BI was measured using ImageJ software to assess degree of vocal fold bowing. Total BI was calculated by summing the right and left vocal fold BIs. Student's t-test was then used to compare differences between total BI between the various groups.

Results: Average total BI was 10.05 (SD=6.64) in the PD group, 15.27 (SD=4.03) in the PSP group, and 9.66 (SD=3.70) in the CA group. Controlling for age, PSP demonstrated a 5.11% more bowing compared to PD (95% CI: 7.95% - 2.26%, $p < .001$) and 6.27% more bowing compared to ataxia (95% CI: 10.38% - 2.16%, $p = .003$). There was no significant difference between PD and ataxia (mean difference = 1.16%, $p = .601$).

Conclusions: The results of this study show that vocal fold atrophy is highly prevalent in patients with neurodegenerative disease, particularly in patients with PSP. It is important to recognize the prevalence of vocal fold atrophy, as vocal fold atrophy may significantly impact voice and airway protective measures in these patients.

Deep Learning Analysis of Laryngology Fellowship Applications: Gender Difference and Possible Implicit Bias

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Previous research on factors effecting candidate success in obtaining a surgical fellowship suggest that personal statements (PSs) and letters of reference (LORs) along with the identity of the letter writer are given preferential consideration. These personally written documents may influence the reader through the use of sentimental phrases or words demonstrating empathy. The effect of gender on the use of these statements is unknown. We used artificial intelligence programs to analyze the sentiment and linguistic differences between genders in Laryngology fellowship applications.

Applications to a Laryngology fellowship program from 2019-2021 and in 2024 were collected. Sentiment scores and word counts were generated using a Natural Language Processing package. Empath, a deep learning peer-reviewed tool, categorized text into scores and Wilcoxon rank-sum tests compared between genders.

Among 54 applicants, 52 PSs (46% female applicants) and 156 LORs (49% female applicants) were available. There were no statistically significant differences in word count or sentiment scores for PSs between genders (word count $p=0.87$, sentiment $p=0.80$), and none in word count or sentiment scores for LORs (word count $p=0.22$, sentiment $p=0.46$). Among the Empath linguistic categories, male applicants had a higher frequency of help-related, leader-related, valuable-related, and trust-related emotions expressed in their LORs ($p=0.026$, $p=0.014$, $p<0.001$, $p=0.034$). In other Empath categories, there were no statistically significant gender differences observed.

In this pilot study, gender-based differences in word count/sentiment scores were not observed for PSs or LORs. There is an increased prevalence of positive Empath categories in the LOR's in male applicants. This may suggest a potential implicit bias.

Development of a Peroral Vocal Fold Injection Simulator

Brian Reilly, MD; Adam Szymanowski, MD; Ahmed Soliman, MD

Background: Although trainees often receive adequate training in operative vocal fold (VF) injections under anesthesia, their participation in awake in-office injections is usually more limited due to increased skill required and patient tolerance. Multiple models exist to help trainees become more familiar with awake percutaneous VF injections, but there is a paucity of simulation models for the awake peroral approach. We designed and built a low-cost, easily reproduced model to allow trainees to develop some of the fundamental skills required to perform awake peroral VF injections.

Methods: After IRB approval was obtained, medical students and otolaryngology residents were recruited for participation in the study. The Michigan Standard Simulation Experience Scale (MiSSES) was used to assess participants comfortability with peroral VF injections before using the model. Participants then performed 5 injections, then completed the remaining portion of the MiSSES to assess the simulation's efficacy, fidelity, and educational value.

Results: 19 participants were enrolled. Nearly all (18/19) reported poor confidence with peroral VF injections before participation. After using the model, participants rated the model as having realistic features and reported improved confidence and ability with peroral VF injections. On average, the overall simulation experience was rated as 4.8/5.

Conclusion: This low-cost, easily reproduced model enhanced participants' confidence and ability with peroral VF injections. It can be used to teach trainees the basic skills of peroral VF injection and is a valuable addition to their educational experience.

Demographic and Academic Characteristics Affecting Industry Payments Received by Laryngology Fellowship Directors

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Purpose: Fellowship directors play an important role in guiding the careers of their trainees. The objective is to evaluate the demographic and academic characteristics that influence industry payments received by Laryngological fellowship directors.

Methods: Fellowship directors were identified from the American Laryngological Association's website. Gender, geographical region, fellowship graduation year (to approximate years in practice), and additional degrees were collected from institutional websites and Doximity. Quantity and size of non-research related industry payments were collected from the U.S. Centers for Medicare & Medicaid Services (CMS) Open Payments website, and stratified based on demographic features.

Results: Of the 29 directors included, 28 received at least one payment. No significant differences in average payment size were observed based on gender (85.7% male; \$427.45 vs \$756.20; $p=0.122$), nor by the presence of an additional graduate degree (17.9% hold an additional degree; \$562.16 vs \$455.34; $p=0.179$). Average CMS payment size was highest in the West and lowest in the Midwest, though no statistically significant differences were observed (\$560.15 vs \$167.15; $p=0.548$). 57.1% of program directors have been practicing for 20 or more years, but this did not have a significant association with the average CMS payment size (\$522.06 vs \$410.90; $p=0.296$).

Conclusion: Higher industry payments were observed on average among directors who were female, had greater years in practice, and had additional degrees, although this trend was not statistically significant. Further study of other academic laryngologists may identify specific characteristics that influence industry payment size.

Demographics, Risk Factors, and Outcomes Associated with Idiopathic Vocal Fold Paralysis: A Systematic Review

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Introduction: Idiopathic vocal fold paralysis (IVFP) is an enigmatic disease that results in various voice, breathing, and swallowing impairments. This systematic review, the first to our knowledge, provides a comprehensive discussion of risk factors, demographics, and outcomes of IVFP.

Methods: The PubMed and Embase databases were queried with the keywords “((vocal fold paralysis) OR (vocal cord paralysis)) AND (idiopathic)”. Articles were selected if published between 1990-2023 and reported data related to patients aged ≥ 18 years old with IVFP. Case studies and reviews were excluded. Participant demographics, co-morbidities, treatment modalities, and outcomes were extracted.

Results: The database query identified 418 relevant abstracts, of which 43 studies met inclusion criteria. A total of 2,341 patients with IVFP were identified with 52% female patients and a mean age of 57.1 years (range: 40.0-72.0). Patients experienced unilateral IVFP in 98.1% of cases with 64.1% affecting the left side. The most common presenting symptoms were dysphonia (58.6%), dysphagia (16.3%), cough (7.7%), and aspiration (4.3%). Five studies reported time to presentation with a mean of 114.5 days (range: 29.0-340.9). Twelve studies found a mean spontaneous recovery rate of 37.8% over a mean of 140.9 days (range: 68.0-180.0). Seventy-three patients were documented to have a viral upper respiratory infection (URI) prior to developing IVFP. No specific treatments were linked to spontaneous recovery.

Conclusions: There is a paucity of research describing the presentation and outcomes of patients with IVFP. Spontaneous recovery occurred in 37.8% of patients. Viral URI may be a potential contributing factor to IVFP development, however more research is necessary.

Dissection Protocol for Murine Larynx and Vocal Folds

Tadeas Lunga, MD; Vlasta Lungova, PhD; Kristy Wendt, BS; Susan Thibeault, PhD

Background: Murine models offer a unique opportunity for investigating genetic influences on laryngeal development and disease. Due to its structural similarities to the human larynx and vocal folds (VFs) the murine model is ideal for such investigations. We provided a detailed dissection protocol for murine larynx and VFs, specifically addressing embryonic and postnatal stages.

Methods: Using FVB mice, murine larynges were collected at E15.5, selected as a representative stage from E11.5 to postnatal day 0. Adult murine larynx and VF were harvested at 12-weeks-of-age.

Results: Embryonic dissection:

1. Initiating an incision between the lower and upper jaw, extending towards the posterior neck under a dissection scope.
2. Making an additional incision below the upper limbs through the torso.
3. Making two scissor-cuts through the piriformis recess lateral to the larynx into the esophagus.
4. Delicately separating the larynx using a needle for precise dissection.

Adult dissection:

1. An anterior neck incision to access the larynx and trachea after submandibular gland removal.
2. Using forceps to hold the tongue and making scissor-cuts along the mandible down to ribcage to fully expose the larynx and trachea.
3. Incising the trachea and transferring the tissue to a petri dish.
4. Separating the larynx from the esophagus through blunt dissection.
5. Placing the excised larynx on a polyester platform, facing down.
6. Performing posterior laryngotomy through the cricoid cartilage, exposing the VFs
8. Excising the VFs using micro-scissors.

Conclusion: We present a comprehensive method for dissecting the murine larynx and VF at key developmental stages. The murine model's similarity to humans and its genetic manipulability offers a unique opportunity to study gene roles in various biological processes.

Early Injection Laryngoplasty in Acute Unilateral Vocal Fold Paralysis After Thoracic Aortic Surgery

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Jae Hang Lee, MD, PhD; Kwang Hyun Kim, MD, PhD

Objectives: Vocal fold paralysis (VFP) after thoracic aortic surgery is a serious problem that leads to higher pulmonary complications and prolonged hospitalization. Office-based injection laryngoplasty (IL) is a safe and minimal-invasive procedure to treat unilateral VFP (UVFP). This study aims to determine whether early intervention protocol with IL reduces postoperative complications related to UVFP in thoracic aortic surgery.

Methods: Medical records were retrospectively reviewed in the patients who underwent open thoracic aortic surgery between March 2020 and February 2023. Patients were excluded if they had preoperative VFP or postoperative bilateral VFP, or if they remained hospitalized in the intensive care unit (ICU) for over 30 days postoperatively. When the UVFP patient had a glottic gap, IL was scheduled for within a week of diagnosis as possible. Postoperative complications were analyzed, including pneumonia, reintubation, hospital stay, ICU stay, and ICU re-transfer.

Results: In total 355 patients, 304 (85.6%) patients had normal vocal fold function after surgery and 51 patients had postoperative UVFP. IL were performed in 42 (82.4%) patients with a glottic gap. There were no significant differences in the incidences of complications including pneumonia and hospital stay between the no VFP group and UVFP group. There were no complications related to IL including dyspnea or hematoma.

Conclusion: Acute UVFP after thoracic aortic surgery does not increase the incidence of postoperative complications when managed with early IL. Early intervention protocols with IL might be helpful to reduce the adverse effects of UVFP after thoracic aortic surgery.

Effect of Age on Treatment Response to Injection Laryngoplasty in Patients with Unilateral Vocal Fold Immobility

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Rachel Jones, MD; Neel K. Bhatt, MD

Introduction: Unilateral vocal fold immobility (UVFI) affects voice and swallowing. Injection laryngoplasty (IL) is frequently performed to improve glottic closure. In aged individuals with UVFI, vocal folds can also show signs of atrophy, further contributing to the glottic incompetence. The purpose of this study was to determine whether age affects the treatment response to IL.

Methods: Adult patients with UVFI who underwent unilateral IL were included in this study. Patients were excluded if they <18 years, had bilateral VFI and/or underwent bilateral IL. Primary outcome measures were Consensus Auditory-Perceptual Evaluation of Voice (CAPE-V), Voice Handicap Index-10 (VHI-10), Bowing index (BI) and injection volume.

Results: 42 patients were included. Patients with UVFI experienced significant improvement in CAPE-V, VHI-10, and BI following IL with a mean difference(MD) of 11.81(95%CI:6.38,17.23,p<0.001), 3.7(95%CI:0.93,6.46, p=0.01) and 3.53(95%CI:2.78,4.2,p<0.001) respectively. Increasing age correlated with worse scores in pre and post-operative CAPE-V ($r^2=0.429$, $p=0.006$) and ($r^2=0.464$, $p=0.003$) respectively. There was no significant relationship between age and absolute treatment response in CAPE-V, BI and VHI-10. There was no significant relationship between age and injection volume.

Conclusion: Age did not affect absolute treatment response following IL in patients with UVFI. However, patient age was associated with worse pre-injection and post-injection voice measures. This study suggests age is an important factor that negatively impacts baseline dysphonia severity, but absolute treatment response following IL appears similar between aged and non-aged individuals.

Effectiveness of Autologous Fat Injection by Measuring Closed Quotient Using Stroboscopy

Dong-Hyun Kim, MD; Tack-Kyun Kwon, MD, PhD

Background/Objectives: Autologous fat injection uses the patient's own body fat, reducing the risk of complications associated with foreign body and a sufficient amount can be obtained to resolve glottic dysfunction. The authors conducted an objective evaluation by measuring closed quotient (CQ) using stroboscopy to evaluate the efficacy of autologous fat injection on each disease in patients with vocal cord paralysis, presbylaryngis, and vocal fold atrophy.

Methods: A retrospective chart review and CQ using stroboscopy of patients treated for unilateral vocal cord paralysis, presbylaryngis, vocal fold atrophy with autologous fat injection at the Seoul National University Hospital and Boramae Hospital between 2011 and 2022.

A total of 44 patients underwent surgery by one surgeon(T. K. Kwon), 20 patients were diagnosed with vocal cord paralysis, 18 patients were diagnosed with presbylaryngis, and 6 patients were diagnosed with vocal fold atrophy.

Results: We showed objective improvements in vocal cord junction, including significant improvements in CQ at 1, 3, and 6 months after injection than before injection, and this improvement continued without significant changes during follow-up.

By subgroup, vocal cord paralysis and presbylaryngis showed a significant improvement that lasted more than 6 months compared to before the injection, and vocal fold atrophy also improved, but it was not statistically significant.

Conclusions: Autologous fat injection is effective in strengthening vocal fold function, especially in cases of vocal cord paralysis and presbylaryngis, and can be maintained for a sufficient period of time. In cases of vocal fold atrophy, it may provide limited but still beneficial improvement.

Endoscopic Mucosal Rotation Flap for Posterior Glottic Insufficiency Due to Interarytenoid Atrophy: A Case Report

Jessica ML Pagel, AB; Rachel Jonas, MD; James Daniero, MD; Patrick O .McGarey Jr., MD

Objectives: To describe the novel use of an endoscopic CO2 LASER assisted mucosal rotation flap in a professional voice user with non-intubation related posterior glottic insufficiency due to interarytenoid muscle atrophy.

Method: Electronic medical record was reviewed. Normalized posterior glottic gap area was measured using ImageJ. Perceptual and Voice Handicap Index-10 scores are reported pre and post-treatment.

Results: A 78-year-old law school professor with no preceding airway instrumentation or intubation presented with progressive dysphonia, cough with thin liquids, and dyspnea with speaking. Stroboscopy revealed scant vocal fold atrophy but notable posterior glottic gap. An extensive workup was unrevealing, and glottic interventions (voice therapy, injection augmentation, therapeutic injection) did not improve voice quality or function. He then underwent interarytenoid space saline injection with immediate improved voice quality. The patient underwent endoscopic CO2 LASER assisted posterior glottic rotation flap to augment the interarytenoid space. VHI-10 improved from 25 to 9 and functionally the patient was able to resume public speaking and lecturing. Normalized posterior glottic gap area was eliminated postoperatively (184.3 to 0), with some recurrence of gap at most recent follow up (64.5). Improvement in vocal quality and function was maintained at last follow-up 6 months postoperatively.

Conclusion: Interarytenoid muscle atrophy is a poorly recognized cause of dysphonia. The previously described endoscopic posterior glottic mucosal rotation flap has applications beyond improving posterior glottic insufficiency from intubation injury.

Evaluation of Transnasal Videoendoscopic-Guided Botulinum Toxin Injection in Patients with Adductor Spasmodic Dysphonia

Ihab Atallah, MD, PhD; Paul Castellanos, MD

Objectives: Botulinum toxin injection is widely used for the treatment of adductor spasmodic dysphonia (ASD). Electromyography-guided percutaneous injection is the technique most commonly used to perform intralaryngeal botulinum toxin injection. The aim of our work is to evaluate office-based laryngeal trans-nasal injection of botulinum toxin as an alternative for electromyography-guided percutaneous injection in patients with ASD.

Methods: Patients with ASD who underwent transnasal laryngeal injection of botulinum toxin were included in this report. A flexible video-endoscope with an operating channel was used. After local anesthesia of the larynx by dripping of lidocaine, a flexible needle was inserted into the operating channel in order to inject the desired dose of botulinum toxin into the vocal and/or vestibular folds. Phonation was assessed before and after injection during follow up visits.

Results: Twenty-seven patients with ASD were included. There was significant improvement of the VHI-10 (Voice Handicap Index-10) and VRQOL (Voice Related Quality Of Life) scores after transnasal injection of botulinum toxin injection in patients with ASD. GRBAS scale tended to improve post-injection.

Conclusion: Office-based laryngeal trans-nasal injection of botulinum toxin is an easy and reliable technique for the treatment of adductor spasmodic dysphonia disorders. It can be performed by any laryngologist without the need for electromyography.

Evolution Of Epiglottis and Pre-epiglottic Space of the Primate Larynx as the Vocal Tract Is Acquired

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Objectives: Comparative histoanatomy regarding the evolution of the epiglottis and pre-epiglottic space (PES) of the primate larynx as the vocal tract (VT) is acquired was investigated.

Methods: Two lemur, two macaque, two gorilla and two chimpanzee normal larynges were investigated and compared with human larynges using the whole organ serial section technique.

Results: Non-human primates without the pharyngeal space of VT (lemurs and macaques, phyletic distant relative of humans) did not have PES. Their epiglottis was composed of fibrocartilage indicating they are not flexible. Non-human primates with the pharyngeal space of VT (gorillas and chimpanzees, hominids, phyletic close relative of humans) had PES. Furthermore, the PES of chimpanzees (phyletic closest relative of humans) existed astride the epiglottis considerably similar to the human PES. The gorillas and chimpanzee epiglottises were composed of elastic cartilage indicating they are flexible and play the role of retroflexion. These histoanatomical structures of epiglottis and PES reflect the fact that those of the primate larynx evolved as the pharyngeal space of VT was acquired.

Conclusions: The results of this study are consistent with the hypothesis that, in the process of evolution, the histoanatomical structures of epiglottis and PES change and allow the larynx to descend and lengthen the pharyngeal space of VT which facilitates speech production in humans. Moreover, the distribution of the human PES likely allows the epiglottis to more effectively play the role of retroflexion during swallowing in order to prevent aspiration. Human speech faculty occurs with a primate origin of swallowing physiology.

Exploring Epistemic Fairness in Voice Datasets for Artificial Intelligence through Case Studies

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B2AI-Voice; Anaïs Rameau, MD, MPhil

Background/Objectives: Epistemic fairness in clinical research requires equitable access to the knowledge produced, which may be compromised when the knowledge gained benefits privileged groups disproportionately. We explore three case studies to evaluate epistemic fairness in the practices of researchers and entrepreneurs creating voice datasets for artificial intelligence (AI) training.

Methods: Qualitative comparative analysis of voice data collection by Virufy (closed-source, nonprofit), International Dialects of English Archive (IDEA) (open-source, for-profit), and Coswara (open-source, not-for-profit), assessing research aims, consent process, demographics of researchers and participants.

Results: All three entities state benevolent research objectives: to create low-cost tools for early detection of disease and/or benefit humanity. While both Coswara and IDEA rely on remote electronic consent, Virufy had variable consent practice, including verbal assent. Only IDEA specifies that captured voices may be commercialized. While 93.6% of IDEA's team members are located in high-income countries (HICs), the majority of participants' voices (61.9%) from low- and middle-income countries (LMICs) are collected by those in HICs. In contrast, 91.7% of Coswara team members are from LMICs where 93.4% of voices are collected. Virufy mostly collected data in LMICs, including Pakistan and Colombia. The IDEA database included 7 participants in LMICs under 18. IDEA and Virufy primarily collected data in LMICs, with intentions of HIC market sales. In contrast, COSWARA created an open-access dataset available to all.

Conclusion: Epistemic fairness may be compromised in the practices of voice AI startups based in HICs. Voice scientists ought to advocate for fair practices in voice AI innovation.

Factors Influencing Treatment Outcomes in Retrograde Cricopharyngeal Dysfunction: A Retrospective Analysis

Hunter Johnson, BS; Forrest Weir, MD; Kirk Withrow, MD; Delaney Sheehan, MD

Background/Introduction: Retrograde cricopharyngeal dysfunction (R-CPD) has a potential association with multiple clinical parameters that have limited exploration. The relationship of patients experiencing R-CPD, with associated gastroesophageal reflux disease (GERD) and their associated treatment demands a deeper understanding.

Objectives: This study aimed to investigate potential associations between patients experiencing retrograde cricopharyngeal dysfunction and their associated symptoms, patient characteristics and propensity for treatment involved.

Methods: A retrospective analysis consisting of 18 patients diagnosed with R-CPD was conducted. In the study we employed a multivariate logistical regression analysis using the powerful coding software R to assess the association between specific variables. Specifically, the estimated time to seek medical treatment, age of onset, GERD, duration of symptoms and the association of receiving multiple treatments of Botox.

Results: Among the 18 patients studied, only 3 required a second Botox injection, with all patients achieving symptom resolution. Eight patients reported GERD concomitantly. Logistical regression was performed, and the age of onset of R-CPD nor estimated time interval to seek treatment had impact on if the patient required a second treatment of Botox. Similarly, symptom severity and presence of concomitant GERD were not determinants for a second Botox treatments.

Conclusions: In our cohort, factors traditionally believed to impact R-CPD treatment outcomes, such as symptom duration, onset age, and GERD, did not influence the recurrence of Botox treatments. Single injection for R-CPD with Botox seems to be effective with a 83% success rate and a 100% success rate with two injections in our patient cohort. Further research is required to help guide treatment.

Factors Impacting Provider Decision-Making in the Treatment of Early Glottic Cancer

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Matthew Naunheim, MD; Lee Akst, MD

Introduction: Transoral laser microsurgery (TLMS) and radiotherapy (XRT) are mainstays of treatment for early glottic carcinoma (EGC). Here, we investigated case-dependent provider treatment preferences and identify factors which impact decision-making in EGC.

Methods: This cross-sectional survey sent to laryngologists, head-and-neck surgeons, and radiation oncologists presented five diagrammatic cases of progressively advanced EGC (T1/2, N0). Respondents indicated preference for TLMS or XRT and ranked factors which influenced their recommendation for each case. Analysis utilized descriptive statistics, Fischer's exact tests, and Kruskal-Wallis tests for non-parametric data.

Results: 141 complete responses (69.5% laryngologists) were received. Most respondents practiced in academic settings (93.5%) and within multidisciplinary teams (94.0%). Anterior commissure involvement was the most important a-priori tumor factor for case-independent treatment recommendation (Likert Scale: 4.22/5), followed by Laterality (Likert Scale: 4.02/5). Across all specialties, TLMS was recommended for unilateral T1a lesions. Laryngologists continued recommending TLMS in T2 lesions (41.0%) more than head-and-neck surgeons (5.0%) and radiation oncologists (0.0%). Across all cases, survival and voice outcomes were the most important clinical factors impacting treatment decisions. Radiation oncologists weighed voice more heavily than laryngologists in more complex presentations of EGC (rank: 1.6 vs. 2.7, Kruskal-Wallis: $p < 0.05$).

Conclusion: In more complex clinical presentations of EGC, preference for TLMS compared to XRT differed across specialists, despite similar rankings of factors driving these treatment recommendations. This may be driven by differing viewpoints on case-dependent voice outcomes following TLMS vs. XRT, suggesting a need for increased understanding of how tumor location and depth impact voice outcomes.

Feasibility of Chatbots for Patient Education on Surgical and Emergent Airways

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Introduction: Chatbots, such as ChatGPT and Google Bard, are increasingly popular artificial intelligence (AI) tools with educational utility for patients. This study aims to evaluate the accuracy and readability of chatbot-generated responses to surgical and emergent airway patient education questions.

Method: ChatGPT and Google Bard were asked 23 identical questions using four prompts: none, patient-friendly, 6th-grade level, and references. Response accuracy was assessed by 4 Otolaryngology attendings and upper-year residents using Global Quality Score (GQS, range: 1-5), a scale for patient education materials. Chatbot-provided references were analyzed for veracity and response readability was assessed using Flesch-Kincaid score, a widely-used formula to assess reading grade level.

Results: Across all graded responses, 89% of ChatGPT responses were good quality (GQS>4) compared to 17% of Google Bard ($p<0.0001$). ChatGPT generated more accurate responses ($p<0.0001$). Google Bard responses were a significantly lower grade level than ChatGPT across all prompts ($p<0.001$). Despite prompting, mean response grade level for both chatbots was high: ChatGPT (10.5 ± 1.8), Google Bard (9.6 ± 1.3). References were only provided upon prompting. 75/144 (52%) references were illegitimate citations (74% ChatGPT, 35% GoogleBard, $p<0.0001^*$). 48/69 (70%) accurately reflected information from the prompt.

Conclusion: Overall, Chatbots provided accurate answers, with ChatGPT producing more accurate responses. Though more accurate, ChatGPT responses were at a higher education level and referenced more factitious citations. Despite targeted prompting, ChatGPT and GoogleBard responses remain above recommended grade levels for patients. Significant rates of factitious references may preclude physicians from recommending AI as a standalone tool for patients at this time.

Follow-Up Trends in Patients Undergoing Wendler Glottoplasty

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Objectives: Following Wendler glottoplasty, close follow-up with the laryngologist and speech-language pathologist (SLP) are essential to achieve best outcomes. Post-operative care guides the patient through the healing process and optimizes voice recovery and results. Trends in post-operative treatment completion have not been described to date.

Methods: We performed a retrospective review of patients who underwent Wendler glottoplasty between March 2018 and July 2023. Demographic data, pre-operative care, and post-operative courses were reviewed. Lost to follow-up (LTFU) was defined as a failure to return to the office for post-operative care or schedule a new appointment as recommended for ≥ 2 months.

Results: Eight (50%) of 16 patients identified met criteria for being lost to follow-up; 3 patients (19%) completed care and 5 (31%) were still undergoing care. The average length of follow-up care in the LTFU group was 4.8 months. They were most likely to be lost after their third post-op visit with the laryngologist. Factors associated with a higher likelihood of being LTFU included age at presentation, minority status, having fewer chronic diseases, a higher number of pre-operative voice therapy visits, and having higher scores on the Vocal Handicap Index-10 and Trans Woman Voice Questionnaire. Total number of gender-affirming surgeries, distance from hospital, socioeconomic status of residential zip code, and other psychological history did not affect LTFU rate.

Conclusion: Fifty percent of patients were lost to follow-up after Wendler glottoplasty. Better understanding of factors affecting likelihood of LTFU can assist clinicians in addressing these issues and improving patient outcomes.

Haemorrhagic Pseudocyst (Polyst) and True Haemorrhagic Cyst of the Vocal Fold

Nupur Kapoor Nerurkar, MBBS, MS (ENT); Sakshi Goyal, MD (ENT)

Objective: Though haemorrhagic vocal fold polyps are a common entity, haemorrhagic vocal fold cysts have not been previously described. In our study we have evaluated patients who were diagnosed on stroboscopy as “haemorrhagic” cysts.

Methods: This 18 month retrospective study has received institutional ethics clearance. Using the database of our voice clinic, 14 patients diagnosed as haemorrhagic cyst by stroboscopy were reviewed. Age, sex, chief complaints, symptom duration, videostroboscopy findings, surgical details and the histopathology was noted.

Results: Out of a total 14 patients, 12 were males with a mean age of presentation as 41 years. Duration of hoarseness ranged from 2 - 24 months. Videostroboscopy revealed a markedly decreased amplitude of the mucosal waves over a well-delineated ovoid haemorrhagic lesion, which seemed tethered down by the overlying vocal fold epithelium. All patients had operative findings of a well encapsulated haemorrhagic lesion in the superficial lamina propria with anterior and posterior fibrotic bands. Histopathology of 13 patients was similar and revealed a haemorrhagic polypoidal lesion. A pseudo-capsule could be identified occasionally. These lesions seemed to be haemorrhagic pseudocysts, named “polyst” by us. In one male patient the histopathology revealed a true vocal fold cyst(type C Koren) with haemorrhage.

Conclusion: A haemorrhagic pseudocyst (polyst) of the vocal fold has stroboscopic and surgical findings resembling a true vocal fold cyst with haemorrhage, however histologically it resembles a haemorrhagic polyp. A true haemorrhagic cyst however is typically a type C Koren cyst with haemorrhage. Both these entities have not been previously described

Heterogeneous Presentation and Serology in Myasthenia Gravis Patients Presenting with Dysphagia

Clare Moffatt, BS; Pranati Pillutia, MD; Payan Soltanzadeh, MD; Dinesh K. Chhetri, MD

Introduction: Myasthenia gravis (MG) patients may present de novo with primary head and neck complaints, including swallowing dysfunction. This study describes a range of unique presentations and rare diagnostic serologies, which have not previously been fully described.

Methods: A retrospective review was performed of all patients presenting with primary symptom of dysphagia and subsequently diagnosed with MG. Data reviewed included demographics, clinical presentation, swallow studies, serology, imaging, treatment, and response.

Results: Five patients presented with no prior MG diagnosis. Four patients endorsed dysphagia as primary complaint. One endorsed dysphonia and dysphagia. Additional symptoms included fatigue, tongue weakness, diplopia, ptosis, dry mouth, and dry eyes. One patient with additional symptoms of dyspnea was admitted and found to be in myasthenic crisis. All patients underwent fiberoptic swallowing evaluations that showed vallecular or piriform sinus residue. Three patients completed modified barium swallow studies that showed pharyngeal weakness and epiglottic dysfunction in all, and upper esophageal sphincter dysfunction in two.

Upon serologic evaluation, three patients were positive for acetylcholine receptor (AChR) antibodies only, one for muscle-specific-kinase (MuSK) antibodies only, and one for low density lipoprotein receptor-related protein 4 (LRP4) antibodies only.

All patients were referred to neurology and treated with steroids, pyridostigmine, plasma exchange or rituximab. In three patients with over one year follow-up, symptoms are significantly improved or resolved.

Conclusions: MG is an important differential diagnosis in patients with unexplained pharyngeal dysphagia. While workup can include AChR antibody screening, in seronegative patients with persistent symptoms, additional testing for MuSK and LRP4 may lead to diagnosis and effective treatment.

Incidence and Evaluation of Vocal Cord Pathology following Lung Transplantation

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Background/Objectives: Vocal fold paralysis or paresis (VCP) is a possible complication of lung transplant surgery. The otolaryngology service is often consulted to evaluate these patients via flexible endoscopic evaluation of swallowing (FEES). There is a paucity of data in otolaryngology literature that identifies and quantifies specific laryngoscopy findings post-lung transplantation, including VCP. This study aims to quantify the incidence of vocal fold pathologies via direct visualization.

Methods: A retrospective chart review was conducted at a single tertiary medical center over a 3.5-year period, from December 2019 to May 2023. Patients were included if they underwent successful unilateral or bilateral lung transplantation with subsequent inpatient FEES performed. The presence of abnormal laryngoscopic findings in these patients was reviewed with specific descriptions of vocal fold findings reviewed and described in further detail.

Results: A total of 78 patients met the inclusion criteria out of 127 lung transplants performed. Of these, 46 patients (59.0%) were found to have abnormal laryngoscopy findings on inpatient examination. Average time from the date of transplant to FEES examination was 9.93 days. Thirty-two patients (42.0%) were found to have pathologies at the site of the true vocal folds. Nine patients exhibited new VCP (11.5%), 13 with granuloma (16.7%), 6 with hemorrhage (7.69%), and 4 with polyp (5.13%). Only 11 patients (14.1%) followed up with laryngology once discharged.

Conclusions: Vocal cord pathologies, including VCP, frequently occur in patients post-lung transplantation. It is vital for the transplant team and laryngologists to monitor and help institute appropriate care and follow-up for these patients.

Improved Laryngeal Dystonia after Unilateral Basal Ganglia Stroke: A Case Review

Jessica ML Pagel, AB; Rachel H. Jonas, MD; James Daniero, MD

Objectives: To discuss the improvement of vocal tremor and laryngeal dystonia after unilateral basal ganglia stroke.

Methods: Review of electronic medical records.

Results: We present a 66-year-old woman with mixed spasmodic dysphonia and vocal tremor, treated with serial onabotulinum toxin A thyroarytenoid injections, who reported improvement in her vocal tremor following a unilateral basal ganglia stroke. She had an acute parenchymal hemorrhage within the left basal ganglia two weeks after a botulinum toxin injection. She presented four months after her stroke with no residual neurological deficits, and reported that her vocal concerns fully disappeared following her stroke. Her main vocal concern was related to the tremor, which had recently returned, but at much lower intensity compared to before her stroke. Therefore, we decreased her botulinum toxin dosage with excellent results and have continued this reduced dosage.

Conclusion: It is believed that the glottis receives bilateral innervation, with fibers traveling through the cortico-basal ganglia-thalamic circuit to the bilateral nucleus ambiguus (corticobulbar tract). Therefore, bilateral corticobulbar tracts lesions would be needed to impact the voice. In this patient, unilateral disruption within the cortico-basal ganglia-thalamic circuit resulted in improvement of chronic vocal tremor. This suggests that there may be a dominant side of the subcortical circuit providing innervation to the bilateral nucleus ambiguus and glottis. Recently, our team also demonstrated that focused ultrasound for unilateral thalamic ablation can reduce vocal and limb tremor in patients with essential tremor. This presents an opportunity for novel neurosurgical intervention for vocal tremor and laryngeal dystonia treatment.

Infraglottal Medialization Implants: Restoring Vocal Fold Stiffness Gradient for Improved Vocal Efficiency

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Objective: During vocal fold vibration, the vertical mucosal wave is governed by the interaction between the glottal airflow and the membranous fold. The vertical stiffness gradient (VSG) between the superior and inferior edges is directly related to the convergent-divergent glottal shape, an important characteristic of the fold's vibration that affects vocal efficiency. We hypothesize that placing an infraglottal medialization implant produces a stiffness gradient similar to a healthy normal control.

Methods: Elasticity measurements were done using the indentation technique in a canine hemilarynx model. In each larynx, the silastic implant was shifted between two vertical positions (superior/glottal versus inferior/infraglottal). VSG measurements were taken at 4 points vertically spaced 1 mm apart from the superior edge and 3 placements along the medial edge (anterior, mid, and posterior planes) for each of the two vertical positions and the non-medialized fold.

Results: The stiffness gradient at low strain values was not measurable in all cases but exponentially increased at higher strain values (corresponding to higher vocal effort). The medialized fold exhibits a more substantial stiffness gradient than its non-medialized state. Infraglottal medialization demonstrated a more pronounced gradient than superior edge medialization.

Conclusion: Our research confirms that using infraglottal medialization implants leads to a more pronounced stiffness gradient, which can have a positive impact on vocal efficiency. This relationship between VSG and the convergent-divergent angle, known to influence closing speed and vocal efficiency, could have significant implications. This data provides valuable guidance to clinicians in implant selection and medialization techniques, offering the prospect of enhanced vocal outcomes.

Insights into Laryngeal Castleman Disease: A Comprehensive Scoping Review with a Case Study Focus

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Margaret Bridges, BS; Amy Rutt, DO

Introduction: Castleman Disease (CD) refers to a heterogeneous group of lymphoproliferative disorders. One exceptionally rare manifestation of CD is with dysphonia or dysphagia due to lymphoid hyperplasia involving the larynx. Our goal in this study is to elucidate the clinical presentation, diagnostic techniques, and treatment methods of laryngeal CD through a scoping literature review and the addition of a new case.

Methods: Due to limited existing literature, we employed a mixed methodology for review. First, we entered relevant search terms into Google Scholar. Then, we screened abstracts from databases including PubMed, Science Direct, ProQuest, and EMBASE using the Covidence platform. Finally, we added our own clinic-presented case example.

Results: We present the case of a 71-year-old male with a known history of CD diagnosed in January 2021. In March 2023, the patient presented to his laryngologist for evaluation of new neck swelling, dysphagia, and dysphonia. Flexible laryngoscopy revealed lymphoid hyperplasia as well as edema of the larynx and supraglottis. A CT neck was ordered for further characterization, which showed diffuse edema and robustly-enhancing bilateral non-necrotic cervical lymph nodes. The laryngeal symptoms improved without any intervention aside from his established CD treatment with siltuximab.

Conclusion: Given the rarity of laryngeal CD, its identification and management can be a challenge. Practitioners should be aware of characteristic points in a CD patient's history, physical exam, imaging, and biopsies. Local excision of obstructive lymphoid tissue and radiation are the best-supported therapies. This study aims to build toward improvements in accurate diagnosis and appropriate treatment for laryngeal CD.

Intraoperative Instrumentation Considerations for Chondrolaryngoplasty

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Background: Chondrolaryngoplasty alleviates gender dysphoria by reshaping the thyroid cartilage to conform to a patient's gender identity. Reduction of thyroid cartilage prominence ("Adam's apple") can typically be performed with a scalpel, but in cases of cartilage calcification; rongeurs or drills can be utilized. The objective of this study was to characterize the success rate with scalpel-only excision, and relate this to patient age and operative time.

Methods: Departmental billing records were screened for patients undergoing chondrolaryngoplasty from 2020 through 2023 by a single surgeon. Patient demographics, operative notes, and operation duration were recorded. Type of instrumentation was categorized as scalpel only, rongeur, or drill. All cases began with attempted scalpel excision of cartilage and were transitioned to rongeur or drill if there was calcification that prevented sharp excision. Descriptive statistics were used to describe patient and surgical factors.

Results: 52 transgender and non-binary individuals underwent chondrolaryngoplasty. 30 cases (57.7%) had soft cartilage requiring use of only a blade, 22 (42.3%) required use of either drill or rongeur. The average age of these groups was 25.7 (SE 1.8) and 41.3 years (SE 2.2), respectively; this difference was statistically significant ($p < 0.0001$). Cases requiring a drill or rongeur lasted on average 78.5 minutes (SE 2.3), whereas those using only a blade were shorter at 66.8 minutes (SE 2.7); this difference was significant ($p = 0.0017$).

Conclusion: Cartilage calcification should be expected in a significant number of chondrolaryngoplasties, and surgeons should be prepared for this scenario. This data demonstrates that this happens more in older individuals and may extend procedural time.

Intraoperative Pirfenidone Injection for Prevention of Postoperative Scarring in a Canine Model

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Background/Objectives: Postoperative vocal fold (VF) scarring remains a challenging issue in laser cordectomy. Pirfenidone (PFD) is an FDA-approved antifibrotic agent. This study aimed to evaluate the preventive effect of PFD injection for postoperative VF scarring in a canine model.

Methods: To assess toxicity, various concentrations (0.5, 1.0, 2.5, 5.0, and 10mg/ml) of PFD, along with saline were injected into each VFs of three dogs. Larynges were removed for histologic evaluation at 2 weeks. In the efficacy test, six dogs were divided into three groups: saline, 1.0mg/ml-PFD, and 2.5mg/ml-PFD. Saline, 1.0 and 2.5mg/ml PFD were injected on unilateral VFs, followed by laser cordectomy type III. Contralateral VFs were left untreated. Wound status was examined under direct laryngoscopy at 4 and 8 weeks. At 8 weeks, larynges were excised for vibratory evaluation with high-speed camera and histologic examinations including H&E staining and immunohistochemistry for collagen type I (COL1) and alpha-smooth muscle actin (α -SMA).

Results: In the toxicity test, VFs injected with 2.5mg/ml PFD or less, exhibited complete epithelial healing, while those injected with 5mg/ml PFD or more had epithelium detachment from lamina propria. In the efficacy test, laryngoscopy at 8th week revealed that VF mucosa was all the groups. High-speed evaluation demonstrated higher mucosal wave amplitudes in PFD groups. In H&E staining, less fibrotic change was shown in PFD groups. Expression levels of COL1 and α -SMA were lower in the PFD groups than in control group.

Conclusions: Intraoperative PFD injection has potential to prevent postoperative scarring after laser cordectomy.

Investigating the Laryngeal Microbiome in Pathological and Non-Pathological States

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Background/Introduction: The laryngeal microbiome has been observed to alter composition in cases of disease. However, most studies have focused on laryngeal squamous cell carcinoma (SCC) alone and utilized biopsied tissue samples for analysis. Further data is needed to fully characterize the laryngeal microbiome. This study investigates the laryngeal microbiome in a wide variety of diseases. Swabs of the vocal folds were utilized, as they are both less invasive and a widely accepted method in surveying the human microbiome.

Methods: Subjects above 18 years of age were recruited from the UConn Health Department of Otolaryngology. Those who utilized antibiotics or topical antiseptics within 7 days of sampling were excluded. Non-pathological samples included vocal cord paralysis, presbylarynx, and congenital vallecular cysts. Pathological samples included subjects with laryngeal SCC, vocal cord polyps, Reinke's edema, and recurrent respiratory papillomatosis (RRP). While under general anesthesia, a sterile swab was applied to the vocal folds. 16S rRNA PCR sequencing was performed to characterize the microbiome.

Results: 9 subjects were enrolled in the non-pathological group and 12 subjects in the pathological group. Preliminary results showed that among all samples, Streptococcus and Prevotella were present in the highest abundance. No difference in microbial composition was found between healthy and diseased laryngeal samples. However, 6 samples still require further analysis and incorporation into results.

Conclusions: Preliminary results did not find a difference between microbiomes of healthy and diseased laryngeal samples. High abundance of Streptococcus present could be related to its hypothesized disease-protective role. As additional subjects still require analysis, further data may strengthen results.

Laryngeal Schwannomatosis: A Diagnostic Challenge

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Objective: To describe a unique case of laryngeal schwannomatosis, as well as the clinical and diagnostic challenges associated with the disease.

Case Description/Methods: A 68-year-old female was referred to the otolaryngology clinic for pharyngeal cobble stoning that was noted on intubation for a recent elective surgery. Videostroboscopy was significant for supraglottic and glottic lesions concerning for a wide differential including infectious, autoimmune, and neoplastic etiologies. Workup included preoperative labwork, direct microlaryngoscopy, audio testing, imaging, and genetic analysis.

Diagnosis/Results: Preoperative lab panels were inconsistent with infectious or autoimmune etiology. Direct microlaryngoscopy revealed 2-4 mm submucosal papular eruptions throughout the larynx. Several lesions were excised and sent for permanent pathology and the mucosa was swabbed for cultures. Pathology was consistent with palisading neuromas concerning for neurofibromatosis (NF). Subsequent brain imaging revealed a frontal meningioma without evidence of vestibular schwannoma. Genetics testing was negative for NF1 and NF2. Findings were consistent with schwannomatosis.

Conclusion: While isolated laryngeal schwannomas have been reported, to our knowledge this is the first case of laryngeal schwannomatosis. Schwannomatosis is a unique entity, considered a third form of neurofibromatosis, without involvement of the vestibular nerves. We highlight the importance of a thorough workup, including brain imaging and genetic testing for differentiation. Complete surgical resection is optimal, however the extent of her neurofibromas prevents total clearance. Long term follow up examination is essential for tracking disease progression and recurrence.

Laryngology Involvement and Impact on Comprehensive Gender Affirming Care

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Introduction: Laryngology involvement with gender affirming (GA) surgery is outlined by the standards of care created by The World Professional Association for Transgender Health (WPATH). We aimed to determine laryngology involvement in Multidisciplinary Gender Affirming Care Centers (MGACC), frequency of GA surgery, and how affiliation with an MGACC and/or local/state politics impacts their practice.

Methods: A RedCap survey was sent to Laryngologists within the US. Data was collected and analyzed regarding involvement in GA care, affiliation with a MGACCs, procedures performed, impact on practice from local governance, and demographic data.

Results/Outcomes: 49 laryngologists responded to the online questionnaire (response rate: 25.1%) representing 25 States. 27 (55.1%) performed vocal feminization surgery. On average, they performed 10.83 $\pm$ 7.5 (CI: >95%) procedures per year. Of the 27 laryngologists, 17 (34.7%) were affiliated with an MGACC. Surgeons affiliated with a MGACC performed 15.4 $\pm$ 11.4 procedures vs. 3.1 $\pm$ 0.9 ($p=0.12$, CI: 95%) with no affiliation. Seven (25.9%) respondents reported that local/state laws have affected their practice. Two laryngologists (28.6%) in Illinois and Oregon responded that local and/or state laws have positively affected their practice, while five (71.4%) reported being negatively impacted.

Conclusion: Laryngology participation in gender affirming care centers is still evolving with a wide variation of frequencies in gender affirming laryngeal surgery between practices. With the political climate and divisiveness regarding transgender health in the US, patients face a varied and changing landscape in the pursuit of specialized gender affirming voice care.

Manometric Pattern Predicts the Outcome of Transoral Swallowing Surgery for Pharyngeal Dysphagia

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Objective: Transoral swallowing surgery (TOSS) based on endoscopic cricopharyngeal myotomy (ECPM) in combination with fat injection laryngoplasty (FIL) and/or pharyngeal flap surgery (PFS) is a useful tool for pharyngeal dysphagia. However, there has been no quantitative evaluation to predict the surgical outcome. This study aimed to clarify the swallowing pressure conditions involved in the surgical outcome for pharyngeal dysphagia.

Methods: Twenty-two patients with pharyngeal dysphagia who underwent high-resolution manometry (HRM) before and after TOSS were included. Eight underwent ECPM alone, 5 underwent ECPM with FIL, and 9 underwent ECPM, FIL, and PFS. Good surgical outcome (GS) was defined as achieving a functional oral intake scale (FOIS) level of 4 or higher on a 7-point scale, or plus 2 or higher improvement for preoperative level of 4 to 5. HRM data in the nasopharyngeal, oropharyngeal, hypopharyngeal, oro-hypopharyngeal, and upper esophageal sphincter (UES) zones of swallowing were compared between the GS and non-GS groups.

Results: There were 14 patients in the GS group and 8 in the non-GS group, with mean pre- to postoperative FOIS levels of 2.6 to 5.7 and 3.3 to 3.8, respectively. Preoperative HRM showed significant differences between the GS and non-GS group in distal contractile integrals of the oropharynx (87 $\pm$ 91 mmHg-cm-s and 54 $\pm$ 107 mmHg-cm-s) and the oro-hypopharynx (141 $\pm$ 115 mmHg-cm-s and 96 $\pm$ 165 mmHg-cm-s). Changes in pressure data between preoperative and postoperative periods were not significantly different only in the oropharynx.

Conclusion: HRM analysis revealed that preoperative oropharyngeal pressure was a factor influencing the TOSS outcome, regardless of UES pressure.

Mouse Model of Iatrogenic Vocal Fold Injury

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Background: Iatrogenic injury to the vocal fold mucosa may occur due to phonosurgery. To investigate wound healing, a mouse model has advantages in terms of cost and ease in handling. However, creating consistent mucosal injury is difficult due to the small size of the larynx. Few reports describe mouse models of vocal fold mucosal injury.

Objective: To establish a novel method for creating iatrogenic injury to the mouse vocal fold mucosa.

Methods: Mice were anesthetized using isoflurane and placed in a near vertical position. A laryngoscope and microscope were used to visualize the vocal folds. Unilateral mucosal injury was created using a stainless-steel spiral brush. Mice were euthanized 1, 3, 5, 7 and 12 days following the procedure. Morphological, epithelial, and extracellular matrix changes following injury were evaluated using histopathology and immunostaining. The uninjured vocal fold served as an internal control.

Results: The depth of mucosal injury reached the thyroarytenoid muscle. Significant epithelial hypertrophy and increased numbers of p63+ basal and Ki67+ proliferative cells were observed on day 3. At the same time point, expression of collagen III was also increased. The injured area was re-epithelialized and mildly thickened lamina propria were observed on day 5. The injury was morphologically similar to the uninjured control.

Conclusion: We have successfully established a reproducible method for creating unilateral vocal fold mucosal injury in mice. Our method is unique, low-cost, and accessible in most laboratory settings. It will be applicable for future research regarding vocal fold wound healing.

Mucosal Leishmaniasis Misdiagnosed as Treatment-Refractory Granulomatosis with Polyangiitis: A Case Report

Hannah L. Schwarzback, MD; Kara R. Silberthau, MD; Tiffany N. Chao, MD, MEd

Introduction: Mucosal leishmaniasis is a rare infectious disease that typically begins in the nose and descends along the upper respiratory tract. Misdiagnosing this clinical entity as an autoimmune process and treating it with immunosuppression can lead to disease progression.

Case Report: A 61-year-old Brazilian man with a 10-year history of presumed seronegative granulomatosis with polyangiitis (GPA) presented with dysphonia, cough, dysphagia, and weight loss. Exam showed nasal crusting and a large septal perforation which had been documented for years plus the new findings of oropharyngeal and supraglottic exudative, necrotic lesions. An oropharyngeal biopsy was inconclusive, noting neutrophilic inflammation but no vasculitis or microorganisms. Despite this result, his maintenance prednisone was increased and he was started on rituximab for a suspected GPA flare. He re-presented 3 months later with progressive symptoms plus new shortness of breath and persistent fevers. Oropharyngeal biopsy was consistent with mucosal leishmaniasis and he was started on amphotericin B. After a week of treatment, repeat nasopharyngolaryngoscopy showed resolution of supraglottic exudates and improving edema and ulceration. He was discharged to home with plans for close outpatient infectious disease follow-up and weekly amphotericin B infusions.

Conclusion: Mucosal leishmaniasis can be misdiagnosed as GPA, even after multiple biopsies and sub-specialist consultations. This seems especially likely in places like the United States where the incidence of leishmaniasis is very low. Mistreating this disease as an autoimmune process can lead to rapid disease progression.

Narrow Band Imaging Features in Laryngeal Tuberculosis

Rakesh Srivastava, MS

The study analyses the vascular pattern on narrow-band imaging (NBI) in laryngeal tuberculosis (TB) and its differentiation from premalignant and malignant lesions.

A prospective study was done on patients with hoarseness, breathing, or difficulty swallowing at a tertiary care centre. An endoscopic examination of the larynx was done, and a biopsy was taken on suspicion of a neoplastic lesion. A diagnosis of TB was made in fifteen patients. These patients were included in the study. NBI examination of the larynx was done to analyse the vascular patterns, especially the margin and the centre of the lesion, which were analysed in detail.

Five patients had primary laryngeal lesions, and ten had laryngeal and lung involvement. History and clinical examination, supportive investigations, and NBI helped in the diagnosis. The intrapapillary capillary loop pattern seen in early premalignant or malignant lesions was not observed in any of the cases on NBI. The lesions were marked by their uniqueness in that they are multicentric and distributed widely over true and false vocal folds and aryepiglottic folds. Most of the ulcers appear as brown dots with very thin capillary arrangement at the periphery. The granulomatous lesions appear as a few dark brown dots over the irregular surface seen over the epiglottis and the free edge of the true vocal folds.

NBI is not confined to the diagnosis of premalignant or malignant lesions. It is also a diagnostic tool for laryngeal TB.

Natural History of Recovery from Unilateral Vocal Fold Paralysis after Thyroid Surgery and the Impact of Intraoperative Nerve Monitoring

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Introduction: Unilateral vocal fold paralysis (UVFP) is a complication of thyroid surgery that can lead to impairment of voice, swallowing, and breathing function. Use of intraoperative nerve monitoring (IONM) can help prevent injury to the recurrent laryngeal nerve. Initial treatment for post-thyroidectomy UVFP is predicated on potential spontaneous recovery with variable timing. We sought to investigate the natural history of recovery from post-thyroidectomy UVFP.

Methods: We performed a systematic review of the literature using PRISMA guidelines. Studies that used laryngoscopy for UVFP diagnosis after thyroid surgery and with follow-up interval of at least 12 months were included. Meta-analysis was performed to analyze the time to UVFP recovery.

Results: Of 195 articles retrieved, 21 studies were included. From a total of 33,450 patients with 57,462 nerves at risk, there were 2377 cases (4.14%) of post-operative UVFP. During follow-up, 2121 cases (89.2%) recovered vocal fold mobility and 256 (0.45%) cases had permanent paralysis. 1788 of 1946 (91.9%) cases of UVFP from surgery utilizing IONM recovered, while 324 of 431 (75.2%) cases recovered when IONM was not utilized. The pooled mean time to vocal fold recovery after thyroid surgery was 5.66 months. The mean time to recovery after surgery utilizing IONM was 3.78 months vs 7.36 months after surgery without IONM.

Conclusion: The vast majority of patients with post-thyroidectomy unilateral vocal fold paralysis will attain spontaneous recovery of mobility. The time to recovery is concentrated under 6 months, and the use of intraoperative nerve monitoring is associated with a shorter recovery time.

Neck Surface Accelerometry Enables Intraoperative Voice Tremor Quantification during Magnetic Resonance Guided Ultrasound (MRgFUS) Thalamotomy

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Objectives: Essential tremor (ET) is the most common movement disorder. Vocal tremor occurs in 30% of cases, confers psychosocial disability, and is difficult to treat. While deep brain stimulation (DBS) is the gold standard operation, an incisionless technique, transcranial magnetic resonance-guided focused ultrasound surgery (MRgFUS), ablates the Vim nucleus within the thalamus with comparable limb benefits. Its role in vocal tremor is poorly understood. Neck surface accelerometry measures vocal load with less sensitivity to environmental noise than traditional acoustic methods, and is MRI-compatible, but has not been applied to vocal tremor or as an intraoperative assessment tool. We designed a novel accelerometry platform to quantify MRgFUS' possible therapeutic impact on vocal tremor.

Methods: An MRI-compatible tri-axial accelerometer was externally fixed over the larynx for data acquisition during sustained phonation prior to, during, and after MRgFUS. Platform validation was achieved by analyzing simultaneously acquired acoustic and accelerometer data in a healthy control performing normal voice and simulated vocal tremor. Frequency and amplitude data was analyzed. Study enrollment is ongoing, with a planned validation of accelerometer compared to acoustic data in tremor patients.

Results: In repeated trials with simulated tremor, no statistically significant differences were observed for frequency (0.7% difference on average) and intensity (5.5% difference on average) metrics between acoustic and accelerometry methods. Preliminary patient data demonstrates reduction in tremor across pre-, intra-, and postoperative voice accelerometer recordings.

Conclusion: Neck surface accelerometry may play a crucial role in the development and evolution of noninvasive surgical techniques for vocal tremor.

Non-Surgical Resolution of Vocal Fold Cysts: A Case Series

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Background: The typical treatment for dysphonic patients diagnosed with a vocal fold cyst is surgical excision. Prior studies have noted success using voice therapy as a treatment option for some benign vocal fold lesions such as vocal nodules. We present three cases of resolution of vocal fold cysts with non-surgical management such as voice therapy and reflux treatment.

Methods: Three patients, aged 54, 62, and 70, presented with hoarseness and were diagnosed with vocal fold subepithelial cysts. Initiation of voice therapy and reflux treatment was followed by resolution of the cyst, as confirmed by follow-up videostroboscopy.

Results: All patients displayed small yellow mid-membranous cysts. One case saw complete resolution with voice therapy and reflux treatment. Another experienced recurrence on the same vocal fold and was again managed non-surgically. The third had recurrence of the cyst and dysphonia, necessitating surgical excision. Pathology confirmed "ductal type" cyst.

Conclusions: We present three cases of small yellow vocal fold subepithelial cysts that resolved with voice therapy and reflux treatment. These cysts shared similar characteristics and at least one of the cysts was confirmed to be a ductal cyst. This subtype may lend itself to having the ability to expand and contract as was observed in two of the patients. The timing of surgical excision remains case-dependent, however, the three patients presented support for the benefits of non-surgical steps initially. Voice therapy and reflux treatment not only optimize voice outcomes after surgery but these interventions may be of benefit in identifying which cysts will resolve before surgical intervention.

Novel Simulator for Percutaneous Intralaryngeal Injection (PIL)

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Introduction: Percutaneous (trans-cricothyroid membrane) injection is a common approach for the delivery of intralaryngeal botulinum toxin into the thyroarytenoid/lateral cricoarytenoid (TA/LCA) muscle complex. Currently this “blind” technique requires that the injector reproducibly use external laryngeal landmarks to predict internal anatomy. This study aims to define a reliable methodology for assessing the precision and repeatability of this percutaneous technique, while laying groundwork for a novel training/feedback modality for this complex skill.

Methods: A cervical neck/larynx model was constructed using 3D printing, as well as artificial skin and soft tissue analogs to simulate anatomically correct neck anatomy. Using palpation for localization, two experienced, fellowship-trained Laryngologists performed 10 serial, alternating sided, percutaneous needle placements within the larynx model. A Brainlab Curve Navigation system was used to create idealized 3-dimensional targets for the TA/LCA complex, to measure the distance from the needle tip to the target region with each placement.

Results: Statistically significant differences were detected between the location (relative to the TA/LCA target) between the two surgeons (8.0 mm (SD = 2.4) vs 5.5 mm (SD = 1.3), $p = .01$). No differences were detected between Right and Left sided needle placements.

Conclusion: These data demonstrate the ability to reproducibly measure needle tip placements during PIL, and establishes a platform with which to provide accurate real-time visual feedback in the learning of this complex skill.

Patient Factors Associated with Force Metrics during Suspension Microlaryngoscopy

Phillip Song, MD; Allen Feng, MD;
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Objective: the objective of this study is to identify patient factors associated with force metrics during suspension microlaryngoscopy (SML). Prior studies have shown a significant relationship between the force applied to the tongue and throat during SML and postoperative pain and dysphagia. Finding patient factors associated with higher force metrics may help identify patients at a higher risk for complications.

Method: The laryngeal force sensor was used to measure force metrics (maximum force, average force, and tissue compression) during suspension microlaryngoscopy on 510 consecutive laryngeal surgeries over a five-year period. We recorded force metrics, along with demographic factors. Post-anesthesia care unit (PACU) data (including pain and dysphagia), and various patient factors. Individual factors include age, weight, BMI, height, inter-incisor distance, Mallampati scores, and perioperative factors such as mouth opening, cervical spine stiffness, thyromental distance, and laryngeal grade view during intubation.

Results: There was a significant difference in force metrics between the sexes, with men experiencing higher maximum force, tissue compression, and average force. Higher Mallampati score displayed a trend towards higher force metrics, but did not reach statistical significance. Force metrics did not show a significant correlation with BMI, weight, height, and age.

Conclusions Risk factors for increased force metrics include sex (men higher pressures than women) and there was a trend towards higher Mallampati scores. However, other individual patient factors such as thyromental distance, cervical stiffness, and inter-incisor distance did not reach statistical significance. Further investigation using multivariable analysis may identify combinations of factors that correlate with force metrics.

Patient Factors Associated with Voice Improvement following In-Office Vocal Fold Steroid Injections for Vocal Scar

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Paul Kwak, MD; Aaron Johnson, PhD; Milan Amin, MD

Background: In-office vocal fold steroid injection (VFSI) has risen in use to modulate vocal scar formation. This study aims to profile patients undergoing in-office VFSI and evaluate their clinical outcomes to uncover the factors contributing to voice improvement.

Methods: All patients with a diagnosis of vocal fold scar who received in-office VFSI from 2013-2023 were evaluated. Patients with less than four weeks of follow-up were excluded. Pre- and post-steroid Voice Handicap Index (VHI-10) scores and stroboscopic examinations utilizing the Voice Vibratory Assessment with Laryngeal Imaging (VALI) were compared using Wilcoxon signed-rank tests.

Results: 38 patients met inclusion criteria and a total of 50 steroid injections were administered. Following a single injection, change in VHI-10 scores ranged from -23 to +14 (N=34, Mean=-1.1, SD=7.53). A total of 21 patients underwent vocal cord surgery. Patients who underwent surgery after receiving a steroid injection reported a lower VHI-10 score after VFSI compared to non-surgical patients (N=34, $p<0.05$). Bilateral amplitude and left mucosal wave measurements improved at <1 month follow-up, but did not reach significance ($p>0.05$).

Conclusions: This single-center study is one of the largest exploring patient outcomes following in-office VFSI. Variable subjective voice improvements are present despite improvements in vibratory parameters on stroboscopic exams. Further investigation of predictive factors of who will improve from VFSI is necessary.

Pembrolizumab-Associated Laryngeal Bullous Pemphigoid

Vasiliki Triantafyllou, MD; Kevin Leahy, MD, PhD

Background: Pembrolizumab is a monoclonal antibody against programmed cell death receptors (PD-1) with increasing use in many malignancies. Anti-PD-1 immunotherapy ultimately leads to T cell activation against tumor cells, but can also induce autoimmune responses. We describe a case of pembrolizumab-associated laryngeal bullous pemphigoid (BP).

Methods: A retrospective case report of a single patient presenting to an academic tertiary referral center is described. Review of the literature is also performed.

Results: A 69-year-old male with metastatic clear cell renal cell carcinoma on pembrolizumab for 24 months presented with two months of hoarseness, odynophagia, and dysphagia to solids. His oropharyngeal exam was notable for a single desquamating lesion of the soft palate. Flexible stroboscopy noted ulceration of the epiglottis and aryepiglottic fold. The true vocal folds were bilaterally mobile with mild atrophy. Oropharyngeal symptoms were preceded by a blistering, pruritic rash over his lower extremities, back, and chest not responsive to triamcinolone. Presence of laryngeal manifestations prompted biopsy of the cutaneous lesions by dermatology. Pathology was consistent with BP. Immunotherapy was discontinued, and he was started on high-dose prednisone and dupilumab. On 6 week follow up, his oral and laryngeal mucosal lesions cleared. There is one case report of pembrolizumab-associated laryngeal BP.

Conclusions: Laryngeal manifestations of autoimmune bullous disorders are rare, occurring in 8-20% of cases. While cutaneous and mucous membrane BP has been reported as an immune-related adverse effect, there are only two cases of laryngeal involvement. Awareness of the association is necessary for timely diagnosis and treatment.

Post-Tubercular Upper Airway Stenosis-A Series of Seven Cases

Rakesh Srivastava, MS

Tuberculosis (TB) is a major health problem in India. Laryngeal TB is less than 1% of all TB cases. Healing of tubercular lesions in the upper airway leads to stenosis. The changes initially begin with infiltration of the bacilli into the mucosa and submucosa, which later leads to ulcers, granulation tissue, fibrosis and, in the end, organized stenosis.

Material and Methods: A prospective study was done on seven patients at a tertiary care hospital in north India from August 2017 to August 2023. All the patients have a recent history of antitubercular treatment. Other causes of acquired airway stenosis were excluded. The sites are Supraglottic (2), Glottic (3), Subglottic (1) and Trachea (1). There are four female and three male patients. The patient's age ranged from 18 to 65 years. Supraglottic, glottic and subglottic stenosis undergone Co2 laser-assisted procedure with ballon tracheoplasty. The silicon laryngeal keel was placed in two glottic cases for one month.

Results: All the patients at the first instance underwent endoscopic release of stenosis. One patient with tracheal stenosis underwent an open procedure after two failed endoscopic procedures. One patient's stenosis recurred after six years and again underwent an endoscopic procedure. The average follow-up of all cases was two years.

Conclusion: A past history of anti-tubercular treatment (ATT) should be obtained in any patient with idiopathic supraglottic/glottic/subglottic stenosis. In such cases, a history of patients taking ATT and an old X-ray chest to rule out airway illness like Wegener granulomatosis, sarcoidosis, amyloidosis and relapsing polychondritis.

Preclinical Vocal Fold and Airway Injury Models: A Scoping Review

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Introduction: Preclinical models are necessary to study novel therapeutics for laryngotracheal diseases. Currently, no consensus on species, injury mechanics, and study duration exists. This study reviews and organizes approaches to vocal fold (VF) and laryngotracheal injuries in preclinical models.

Methods: A scoping review of PubMed and Web of Science was performed covering the last 13 years involving rats, porcine, canines, and leporine undergoing VF, trachea, and laryngotracheal injury and/or wound healing studies. Three reviewers assessed abstracts. Selected articles were approved by a majority vote.

Results: Of 1,187 studies identified, 180 were included in the final review. The 180 studies were categorized by species, study duration, and mechanism of injury (MOI): VF stripping, intubation, lasers, microtools, scraping, and other MOIs. Within each MOI, studies were grouped by animal model, with subsections discussing tissue target, purpose, analysis method, and study duration.

Discussion: Leporine and rats were the most commonly employed animal models for both vocal fold wound healing and laryngotracheal models. Leporine studies had the broadest diversity in MOIs, with lasers, microtools, scraping, and other methods used. Comparatively, rat studies primarily utilized vocal fold stripping as a MOI, perhaps second to anatomic limitations. Larger species, specifically porcine models, were most prevalent in intubation injury studies. Study duration varied from one day to three months in VF injury models and 30 minutes to 12 months in laryngotracheal injuries.

Conclusion: This review provides a foundational framework to collate and interpret available data on preclinical VF and laryngotracheal injury models and guide future study design.

Prospective Determination of the Minimal Clinically Important Difference (MCID) of the Singing Voice Handicap Index-10 (SVHI-10)

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Background/Objectives: The Singing Voice Handicap Index-10 (SVHI-10) is a validated patient-reported outcome measure which assesses patients' perception of singing voice handicap. Although a normative value has been previously established, the minimal clinically important difference (MCID) has not yet been defined. This study prospectively determines MCID of the SVHI-10.

Methods: Ninety-eight adult singers with and without voice complaints completed SVHI-10 twice, 30 days apart. MCID was determined using receiver operating characteristic (ROC) curve analysis in an anchor-based method.

Results: Twenty men (1 transgender), 73 women (1 transgender, 1 demifemme), 4 non-binary, and 1 other unspecified individuals participated. The most frequently reported genres were classical (45), musical theatre (18), and pop (9). Mean initial SVHI-10 score was 13.1 ± 7.4 and mean follow-up SVHI-10 was 13.1 ± 8.0 . There was a strong, positive, highly significant correlation between initial and follow-up SVHI-10 scores ($r=0.879$, $p<0.001$). Voice changes were reported in 25% of participants. SVHI-10 scores were significantly higher among participants who reported voice changes in the past year ($p<0.001$) or sought voice treatment ($p=0.001$) compared with participants who did not. SVHI-10 scores varied significantly based on singing type. The area under the ROC curve for SVHI-10 was 0.700 ($p=0.003$). The SVHI-10 MCID was determined to be 9.5.

Conclusions: An SVHI-10 score change ≥ 10 should be considered clinically meaningful. This information has been missing from the literature to date and will improve clinicians' understanding of patients' responses to treatment.

Protocol Development for Data Acquisition for the Bridge2AI-Voice Project: A Multidisciplinary Team Science Exercise Involving Expert Clinicians, Ethicists, Computer Scientists, Interoperability Specialists and DEI Advocates

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Background: The Bridge2AI-voice project, funded by NIH common fund, aims to build a large-scale, ethically sourced, and diverse database of 30 000 human voices linked to health information to help fuel voice Voice AI research. The Bridge2AI-Voice consortium aimed to develop protocols for data acquisition across 5 different cohorts of disease (voice, respiratory, neurodegenerative, mood and anxiety, and pediatric disorders). Herein, we describe the methodology used to develop these protocols and detail the Bridge2AI-Voice data acquisition protocols for broader adoption by the research community and feedback.

Methods: The Bridge2AI-Voice Consortium followed principles of team science, bringing together laryngology clinician scientists, speech language pathologists, bioethicists, AI engineers, data scientists, bio acousticians, and diversity experts. Protocols for data acquisition were iteratively and systematically developed over 8 months. In-depth literature reviews were conducted, and virtual discussions were held to guide protocol development across all 5 cohorts, each led by experts in disease/demographic category.

Result: Data collection protocols included demographic surveys, confounders assessments, acoustic tasks, validated PROs, and clinician-validated diagnosis. After group review of individual protocols, common data elements and acoustic tasks across cohorts were aligned to create a common protocol across all disease/demographic cohorts (Part A). Additional acoustic tasks and PROs specific to certain diseases were added to disease-specific protocols. (Part B). Once completed, the multi-disciplinary team assessed the protocol for: 1. Inter-operability, 2. Ethical Practice 3. Diversity, Equity, and Inclusion, 4. Clinical validity and soundness, and 5. Clinical importance.

Conclusion: Bridge2AI-Voice successfully applied best practices in team science, developing complex and complete protocols for AI-Ready voice data collection.

Quantification of the Porcine Translational Model for Effective Study of Unilateral Vocal Fold Paralysis

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Introduction/Objectives: Given the complex pathology underlying unilateral vocal fold paralysis (UVFP), there has been limited systematic exploration of curative treatments in humans. Central to the investigation of experimental therapies includes establishing a reliable, analogous large animal model. The purpose of this study is to create a standardized porcine model of UVFP by establishing characteristic pathophysiology and functional outcomes.

Methods: Four female Yucatan minipigs underwent transection of the right recurrent laryngeal nerve (R-RLN). Measurements of acoustic vocalization data, bilateral laryngeal electromyography (LEMG) with nerve conduction studies (NCS), and laryngeal adductor pressure (LAP) were obtained prior to transection (baseline) and 7 weeks after transection. Histological analysis of the bilateral thyroarytenoid muscles was conducted at the conclusion of the study.

Results: Stimulation of the R-RLN 7 weeks after transection demonstrated reduction of motor unit action potentials (MUAPs). In addition, there was a statistically significant reduction in LAP compared to pre-injury controls when stimulating the R-RLN. Voice analysis revealed decreased intensity ranges, frequency ranges, and maximum phonation times at 7 weeks post-injury, as well as statistically lower average intensity and average frequency of glottic phonations. Morphological changes, including smaller myofibril diameters and decreased nerve to muscle contact, consistent with denervation were observed in right thyroarytenoid muscle and associated neuromuscular junctions.

Conclusion: Given that our porcine model yielded histopathological and functional changes consistent with human UVFP, it has potential to serve as a viable model for systematic and controlled study of potential new treatments for UVFP.

Rehydration with Electrolytes Versus Water Alone on Vocal Fold Osmotic and Oxidative Stress

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Background: The beneficial effects of rehydration following vocal fold dehydration are complex. Osmotic and oxidative stresses are associated with vocal fold dehydration, but our understanding of their presentation and mitigation following rehydration is not understood. The purpose of this experiment was to evaluate the rehydration impact of water versus electrolytes on osmotic and oxidative stress-related gene expression following acute dehydration.

Methods: Four-month-old male Sprague-Dawley rats (N = 32) underwent a 5-day water restriction. Rehydration was achieved with ad libitum access to water or electrolytes for 24 hours. Rats were divided into four groups: euhydration control, dehydration control, dehydration followed by water rehydration, and dehydration followed by electrolyte rehydration (N = 8/group). Gene expression was assessed via RT2 Gene Expression Profiler arrays for osmotic and oxidative stresses.

Results: The osmotic stress gene (Nfkb1a) was significantly upregulated with electrolyte rehydration compared to water rehydration. The osmotic stress gene (Pck2) was significantly downregulated in both rehydration groups. The osmotic stress gene (Egfr) was upregulated in only the electrolyte rehydration group. Seven oxidative stress genes were upregulated with water rehydration (Ccl5, Fmo2, Krt1, Txnip, Ucp3) and electrolyte rehydration (Ift172, Prdx6, Scd, Ucp3) compared to dehydration control.

Conclusions: The results support a role for oxidative stress in systemic vocal fold dehydration. Rehydration effects of water or electrolytes on oxidative and osmotic stress-related gene expression are similar, suggesting that both rehydration options offer clinical utility to subjects experiencing vocal fold dehydration.

Resolution of Laryngeal Fetal Rhabdomyoma in a Bone Marrow Transplant Patient Receiving Sirolimus

Christina NG, MBBS; Edward Damrose, MD

Background: Rhabdomyoma is a rare benign tumor from striated muscle tissue, specifically skeletal or cardiac muscle. Cardiac rhabdomyoma is more common than extracardiac rhabdomyoma. Extracardiac rhabdomyoma is subdivided into three types: adult, fetal, and genital types. The adult and fetal types have predilection for the head and neck region of the elderly and pediatric age groups, respectively. Fetal type rhabdomyoma in adult is exceedingly rare with less than 30 cases reported.

Method: We present a case report of a patient with follicular lymphoma with allogenic stem cell transplant complicated by graft versus host disease presenting with hoarseness of voice.

Results: A male in his 60s with history of follicular lymphoma with multiple relapses treated with allogenic stem cell transplant complicated by graft versus host disease presented with hoarse and weak voice. Flexible laryngoscopy showed symmetrical nodular projections with edema along the whole length of bilateral true vocal folds. He was started on sirolimus for graft versus host disease during this time. He underwent microdirect laryngoscopy and biopsy of vocal fold lesion 6 weeks after the flexible laryngoscopy and was found to have improvement in bilateral vocal folds. Histopathological evaluation showed fetal type rhabdomyoma. Post operatively, a repeat flexible laryngoscopy showed complete resolution of the nodular projections on the true vocal folds.

Conclusion: Sirolimus has been reported to be effective in treating cardiac rhabdomyomas. Our patient was started on sirolimus before the biopsy and this raises the question of whether sirolimus plays a beneficial role in the treatment of rhabdomyoma, regardless of subtype.

Results of Secondary Glottic Insufficiency Management with Transcutaneous Injection Laryngoplasty in a Chilean Public Hospital

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Valeria Carreño Silva, SLP; Matias Alvarez Baeza, MD

Introduction: Injection laryngoplasty (IL) is an endoscopic or transcutaneous procedure that uses injectable materials (synthetic or organic), designed for restoring or improving glottic competence. Transcutaneous IL (TIL); has demonstrated to improve vocal quality, optimization of vocal therapy results and voice quality of life related questionnaires.

The objective of this study is to describe and analyze the experience of in-office TIL in a Chilean public hospital.

Methods: This manuscript corresponds to a non-concurrent prospective study. All patients evaluated in the ENT Voice Unit (VU) from Hospital La Florida (HLF) from March 2021-August 2023 were included. Inclusion criteria: Adults (>18 años), secondary glottic insufficiency (GI) due to vocal fold motion impairment. Patients that after their first appointment were not contactable were excluded.

Results: 42 patients were referred for VU evaluation with a GI diagnosis, with a mean age of 57.3 years. Malignancy was present in 30.2% of our patients. 19 patients underwent TIL; and 4 of those patients needed reinjection. The main causes of GI were OTI and post-surgical. Hyalsense Sub-Q hyaluronic acid was used in all patients. The mean volume was 0.68 ml and 0.8ml for the first and second procedure. Thyrohyoid was the main injection approach (94.7%). Regarding VHI-10 and VRQOL questionnaires, there were statistical differences in the pre and post IL groups. Concerning complications, only one patient suffered a superficial hematoma, and in one patient TIL was not possible.

Conclusions: TIL has been demonstrated as an effective, viable and secure procedure for patients with GI diagnosis in a public hospital.

Return to Vocal Performance Following Vocal Fold Hemorrhage

Ashley Kim, BA; Christine Clark, MD; Lucian Sulica, MD

Background: Although vocal fold hemorrhage (VFH) is a common injury among vocal performers, no evidence exists to guide safe return to vocal performance (RTP) after VFH. This study assesses VFH recurrence following RTP to inform recommendations for these patients.

Methods: Adult vocal performers with clearly documented dates of VFH and of RTP were retrospectively studied. Patient demographics, comorbidities, interventions, and recurrence of VFH after RTP were noted; cohorts with and without recurrence were compared.

Results: Forty patients with 42 unique occurrences of VFH were included. Mean age was 36±11 years (23 (54.8%) female, 19 (45.2%) in musical theater). Most hemorrhages (38; 90.5%) were unilateral. Twenty-eight cases (66.7%) had associated mucosal lesions (8 varices, 7 pseudocysts, 4 polyps, 9 other). Four patients (9.5%) had a recurrence within 30 days of RTP.

Mean time from initial VFH to RTP was 22 days (range: 4-116 days). Median time to RTP was 12 days for those with recurrence and 18 days for those without recurrence ($p=0.4112$). There was no difference in age (38 ± 10 years vs 36 ± 12 years; $p=0.5973$), sex (1 (25.0%) vs 22 (57.9%) female; $p=0.3129$), or presence of associated lesions (75% vs 65.8%; $p>0.9999$). Of 4 patients who recurred, one underwent surgery to address the source of bleeding without further recurrence.

Conclusions: Rate of VFH recurrence following RTP 9.5% without difference in age, sex or associated lesions. Although the interval between VFH and RTP was shorter in patients who had recurrence, this interval was not statistically significant.

Safety Profile of Simultaneous Bilateral Superior Laryngeal Nerve Injections for Unexplained Chronic Cough

Andrew Bowen, MD; Ariel Roitman, MD; Benjamin Damazo, MD; Seth Dailey, MD

Background/Objectives: Superior laryngeal nerve (SLN) injections for unexplained chronic cough (UCC) are traditionally applied in unilateral fashion given concern for aspiration with simultaneous application of medicine to both superior laryngeal nerves. The following retrospective review aimed to examine the safety of simultaneous bilateral SLN injections in patients with UCC. Response to treatment was also examined.

Methods: A retrospective analysis was performed of patients diagnosed with UCC who underwent at least one simultaneous bilateral SLN injection. Any complications associated with the injection, including aspiration were recorded. Additionally, response to injection was followed by assessing subjective percentage improvement along with reported duration of benefit.

Results: A total of 12 patients (11 females) underwent 40 simultaneous bilateral transcervical SLN injections with 1.5 cc's 50:50 mixture of Kenalog/lidocaine. There were no reported complications including aspirations events following any of the injections. 8 out of 12 of patients reported improvement in cough symptoms with a mean percentage improvement of 75% (range 20-100%) that lasted 4 months (range 1-17 months). The median number of injections per patient was 2 (range 1-8).

Conclusions: A reported 30-45% of UCC patients who initially undergo a unilateral SLN injection require a subsequent contralateral SLN injection. Our retrospective cohort that underwent bilateral simultaneous SLN injections with Kenalog did not suffer a single aspiration event or complication. These injections demonstrate similar efficacy to previously published data on unilateral injections. Bilateral simultaneous SLN injections present an opportunity to decrease the frequency of office visits involved in treating UCC without compromising patient safety.

Scedosporium Infection after Intralesional Steroid Injections for Idiopathic Subglottic Stenosis: A Case Report

Melissa Papuc, BS; Manikandan Sugumaran, MD

Introduction: Intralesional steroid injections for idiopathic subglottic stenosis can improve patient quality of life, with minimal systemic absorption assumed. However, the impact on infection risk has not been quantified. *Scedosporium apiospermum* is a soil fungus known to cause respiratory infections. Although bronchial stenosis in association with *Scedosporium apiospermum* has been reported, it has not been described in tracheal or subglottic stenosis. We present the first case of an immunocompetent woman with idiopathic subglottic stenosis who developed *Scedosporium apiospermum* infection of the subglottis while receiving in-office steroid injections.

Methods: We reviewed the patient's medical records from an ENT office to write this report.

Case/Results: An immunocompetent 67 year-old female with idiopathic subglottic stenosis was treated with intraluminal steroid injections every three-to-four months over two years with successful airway maintenance. However, she recently developed difficulty breathing and was found to have significant reduction of airway patency. Intraoperatively, signs of acute infection were discovered that grew *Scedosporium apiospermum*.

Discussion: Protocols for in-office steroid injections vary with respect to dosing and timing. Long-term side effects such as localized or systemic immunosuppression are poorly studied. It is unclear whether this patient developed subglottic infection due to disease progression or if the patient's frequent steroid injections induced a level of localized immunosuppression. This raises whether such outcomes should be considered when making decisions on the frequency of and indications for steroid injections for idiopathic subglottic stenosis.

Conclusion: Future research should be performed studying the effect of intralesional steroid injections on immunocompetency locally and systemically in order to guide treatment protocols.

Social Determinants of Health and the Impact on Time to Diagnosis and Intervention on Vocal Cord Paralysis

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Background: Timely diagnosis and intervention are essential when treating vocal fold immobility (VFI). However, socio-demographic factors may impact treatment. This study evaluates potential impact of social determinants of health (SDoH) on patient presentation and treatment for VFI.

Methods: A retrospective cohort study of patients with VFI (n=217) from 1/1/2012 to 6/30/2022 evaluated demographic information, time to diagnosis (TTD), and time to intervention (TTI) for patients with VFI at Boston Medical Center. Medical records review investigated relationships between demographic information, VFI etiology, TTD, (n=163) and TTI (n=89).

Results: VFI etiology did not impact TTD or TTI. Black patients had shorter mean TTD compared to non-black patients (91.4[124.8] vs 147.8[188.1] days, p=0.023). Mean TTD for English-language patients was significantly more than non-English language patients (142.6 [184.1] vs 92.2[123.3] days, p=0.046). The mean TTD for patients living <25 miles from the hospital was less compared to those living >25 miles from hospital (104.1[144.3] vs 175.1[206.0] days, p=0.025). No significant relationships were found between TTD or TTI when comparing variables of gender, primary language, or insurance status.

Conclusion: Evaluation of potential SDoH impact on VFI presentation and treatment found that increased distance from hospital significantly and negatively impacted TTD. Black patients and non-English speaking patients had shorter TTD than non-black patients and English-speaking patients, respectively. These findings may reflect this institution's mission to minimize barriers to care for patients from socially vulnerable backgrounds.

Systematic Review and Meta-Analysis of the Outcomes for Type I Thyroplasty Between Silastic and Gore-Tex

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Emily Cao, BA; Madisyn Cox, BA; Sameer Siddiqui, BA; Andrew Tritter, MD

Background: Type 1 Thyroplasty is a well established procedure used for medializing an immobile vocal fold. Silastic and Gore-Tex are the two most common materials used to accomplish this, but comparative data on the relative efficacy between them is scarce.

Methods: We performed a systematic review and meta analysis by searching Pubmed, Medline, and Web of Science. We collected available data on demographics, maximum phonation time (MPT), voice handicap index (VHI) score, perceptual voice evaluation scores (CAPE-V/GRBAS), and any other relevant metrics encountered.

Results: Search yielded 960 records with 100 manuscripts ultimately included. Sixty nine had extractable data, with 863 total Gore-Tex patients and 660 Silastic patients for analysis. The most common measurement was MPT (52%), followed by VHI (19%, VHI-10/VHI), and CAPE-V/GRBAS 12%. Heterogeneity was high (>80%, I²). Gore-Tex patients had an average MPT improvement of 5.7s while silastic patients had an improvement of 6.3s ($p < 0.05$ for both). The average improvement in VHI scores for Gore-Tex patients was 38.2 while silastic patients had an improvement of 44.2 ($p < 0.05$ for both). There was no difference in VHI or MPT when comparing between Silastic and Gore-Tex. Significant publication bias was present.

Conclusions: This systematic review and meta-analysis suggests that Silicone and Gore-Tex implants provide adequate results in Type I Thyroplasty, with similar outcomes between the two. These results are limited by follow-up, diversity in outcomes, and publication bias. Future research should be dedicated to comparing implants in a well-randomized environment to analyze outcomes.

The 445nm TruBlue Laser Use in Laryngology: Emerging Practice Patterns and Treatment Paradigms in North America

Lauren E. Schlegel, MD; Pavan Mallur, MD; Stephanie Teng, MD; Alexa Kacin, MD

Background: The 445nm TruBlue laser was introduced to provide photoangiolytic, ablative, and cutting capabilities for laryngological applications, though little data exists regarding usage in the United States since FDA approval in 2021. Here we characterize the early practice patterns of TruBlue laser use by laryngologists in North America.

Methods: A fifteen-item survey queried respondents for pathologies treated with the TruBlue and pathology-specific laser settings, fiber-to-tissue modality, and intended effect. Respondents were posed with various clinical effects and asked to identify these as perceived strengths or weaknesses of the laser.

Results: There were 14 initial respondents of 45 utilizing the TruBlue laser. The majority practiced in an academic setting ($n=10$). Eight and 11 respondents had the laser available in the office and operating room, respectively. Laser settings for wattage, pulse width, and pulse pause varied widely. The laser was most frequently used for papilloma ($n=11$), leukoplakia ($n=10$), and Reinke's edema ($n=7$). Papilloma was most-often treated with both contact / non-contact mode ($n=10$) for tissue ablation ($n=8$), leukoplakia with non-contact ($n=6$) for tissue ablation ($n=7$), and Reinke's edema with non-contact ($n=6$) for epithelial blanching ($n=5$). The majority found the photoangiolytic properties to be a strength ($n=10$), with respondents also finding tissue ablation ($n=6$) and non-ablative treatment of lesions ($n=6$) to be strengths. Half the respondents ($n=7$) found cutting to be a weakness of the laser.

Conclusions: The 445 TruBlue laser use in laryngology is emerging with variable treatment paradigms. The strengths of angiolysis and tissue ablation correspond to usage most commonly for papilloma, leukoplakia, and Reinke's edema.

The Role of Continuous Positive Airway Pressure in Acute Vocal Cord Dysfunction Post-Thyroidectomy

Yaerin Song, BA; Taylor Lackey, MD; Milan Amin, MD

Background/Objectives: Acute post-thyroidectomy vocal cord dysfunction is often managed with observation, botox injection or tracheostomy. However, only a few cases discuss obstructive sleep apnea (OSA) in the context of vocal cord paralysis with limited exploration of home sleep tests (HST) and continuous positive airway pressure (CPAP) as post-operative assessment tools. This study suggests CPAP as a less invasive approach while awaiting vocal cord recovery.

Methods: A retrospective chart review was conducted on two female patients who presented with dyspnea and sleep-disordered breathing post-thyroidectomy. Both patients underwent laryngeal exams with stroboscopy and HSTs, followed by CPAP prescription. Descriptive analysis was conducted.

Results: Case 1 (Body-Mass Index (BMI): 32.6) and Case 2 (BMI: 20.1), aged 66 and 77 respectively, presented with post-surgery dysphagia, dyspnea, dysphonia, and severe sleep disturbances. Stroboscopy revealed left vocal fold paresis and right vocal fold paralysis in both cases. Although tracheostomy could provide definitive treatment, both cases deferred for non-invasive options, which led to HST, confirming moderate OSA (apnea-hypopnea index (AHI): 18 and 27.1) leading to CPAP recommendation. In Case 2, follow-up at 5 weeks of CPAP use has resulted in dramatic improvements in laryngeal symptoms and sleep quality.

Conclusions: These cases underscore the value of considering sleep studies and CPAP as adjunctive tools in acute post-thyroidectomy vocal cord dysfunction management while awaiting vocal motion recovery. It also further supports that vocal fold paresis or paralysis sufficiently narrows the glottic airway, predisposing patients to OSA.

The Role of Pre-Operative Injection Laryngoplasty in High Risk Radical Thoracic Procedures

Courtney Hunter, MD; Ozlem Tulunay Ugur, MD; Lauren Johnson, MD; Jason Muesse, MD

Background: Injection laryngoplasty has been established as a procedure to aid in glottic closure in unilateral vocal fold paralysis (UVFP). Mediastinal lymphadenectomy and other invasive thoracic procedures pose an increased risk in left sided recurrent laryngeal nerve injury and UVFP. More importantly, these patients are predisposed to poor pulmonary clearance in the early post-operative period secondary to pain, atelectasis, and deconditioning. Glottic insufficiency, leading to weak cough and aspiration, increases the risk of early post-operative complications, including pneumonia.

Methods: Risk stratification for RLN injury was established by fellowship trained thoracic surgeon. Patients deemed high risk for nerve injury were referred to laryngology clinic where flexible laryngoscopy confirmed functioning bilateral TVFs pre-operatively. Risks and benefits of injection laryngoplasty were reviewed with patient. Injection laryngoplasty with Renu Gel was performed 1 week prior to surgery as to provide peri-operative bulking. Patients were seen 1 day after thoracic procedure to confirm appropriate glottic closure, prior to obtaining swallow studies. Repeat injection laryngoplasty was performed one month after thoracic procedure.

Results & Conclusions: Injection laryngoplasty has been used in thoracic surgery patients post-operatively when vocal fold paralysis is confirmed. We present pre-operative injection laryngoplasty in high-risk patients to aid in pulmonary clearance and airway protection in the immediate post-operative period. A collaborative relationship between the voice and thoracic surgery teams can identify patients who would most likely benefit from this approach.

Transitioning to Adulthood Among Pediatric Tracheostomy Patients: A Retrospective Cohort Study

Rebecca Lee, MD; Cheyenne Roohani, MD; Yann-Fuu Kou, MD;
Cynthia S. Wang, MD; Stephen Chorney, MD, MPH; Romaine F. Johnson, MD, MPH

Objective: This study aims to estimate the incidence of pediatric tracheostomy patients who transition into adulthood with a tracheostomy.

Methods: We retrospectively analyzed pediatric tracheostomy patients treated at a single tertiary care pediatric hospital between 2009 and 2022. We compared demographics, comorbidities, tracheostomy outcomes, including decannulation and mortality rates, and the status of being alive with a tracheostomy.

Results: Of 663 children who underwent a tracheostomy, 103 (15.5%) would have surpassed 18 by September 1, 2023. The breakdown of this group is as follows: 26 (25%) were alive with a tracheostomy, 35 (34%) had been decannulated, 25 (24%) had passed away, and 17 (16.5%) were lost to follow-up. A significant portion of individuals with a tracheostomy who were alive at 18 had undergone their tracheostomy procedure at an older age (14.3 vs. 1.7 years, $P<.001$), were Hispanic (43.7% vs. 30.5%, $P=.003$), were not ventilated at the initial discharge (41% vs. 24%, $P<.001$), and exhibited severe neurocognitive disabilities (72% vs. 53%, $P<.001$). Logistic regression analysis revealed that an increase in age at the time of tracheostomy ($OR=1.35$, 95% CI [1.24 - 1.48]) and severe neurocognitive disability ($OR=6.20$, 95% CI [2.13 - 18.09]) were significant predictors of transitioning to adult care with a tracheostomy.

Conclusions: Children who transition to adult care with a tracheostomy are older at the time of tracheostomy placement and are more likely to have severe neurocognitive disabilities. These findings are important in informing the development of tailored transition programs for adults who underwent pediatric tracheostomies.

Treating Dysphonia in Patients with Parkinson's Disease

Priya Arya, BS; Adina Singer, BS; Tiffany P. Hwa, MD;
Julina Ongkasuwan, MD; Adam Szymanowski, MD

Introduction: Dysphonia in patients with Parkinson's Disease (PD) negatively impacts quality of life. Treatment options are evolving and include both invasive and non-invasive interventions.

Methods: Three databases (PubMed, Ovid, and Embase) were searched for articles related to treatment of PD-related dysphonia from 2013 to 2023 in accordance with PRISMA guidelines. Included studies were reviewed to extract demographic information, treatment technique, and intervention metrics.

Results: Of 277 studies reviewed, a total of 12 publications met inclusion criteria, with a total of 412 patients. Study interventions were categorized as either PD-related (medical, deep brain stimulation [DBS], or diet) or voice-related (voice therapy [VT], voice therapy + electrical stimulation [VT + ES], vocal fold augmentation). Measures reported to assess outcomes were heterogeneous across studies, but overall results showed clinical improvement in outcomes with vocal fold augmentation, VT, and ketogenic diet. The utilization of ES in conjunction with VT was not shown to improve outcomes. Measures reported in studies utilizing medical therapy showed inconsistent improvement. The use of DBS was mostly associated with deterioration of voice.

Conclusion: Comparing treatments for PD-related dysphonia, vocal fold augmentation, VT, and ketogenic diet were shown to have the most improvement in voice metrics. DBS negatively impacted voice quality. Further studies should expand upon head-to-head comparisons of outcome measures across PD- and voice-related treatment modalities.

Transtacheal Jet Ventilation for Laser Vocal Feminization Surgery (Wendler Glottoplasty): A Case Report

Daniel Jacobs, MD, MHS; Nadeera Dawlagala, MD; Jaime Hyman, MD
Daniel Li, MD; Nwanmegha Young, MD

Background/Objectives: Laser phonosurgery presents unique challenges for anesthesiologists and surgeons. While the anesthesiologist's priority is to maintain a safe airway for oxygenation and ventilation, the surgeon attempts to ensure adequate exposure to optimize patient outcomes. To address this conflict in phonosurgery, various anesthetic techniques are commonly employed. These include the use of a smaller endotracheal tube (ETT), intermittent apnea, and supraglottic jet ventilation (SJV). Each of these techniques presents different obstacles for the surgeon: the presence of an ETT can limit operative exposure; the intermittent apneic technique prolongs operative time and risks traumatic injury to the operative field; and SJV vibrates the laryngeal structures making the operation more challenging. In this case report we describe a novel technique using transtacheal jet ventilation during Wendler Glottoplasty (WG). This technique allows a completely unobstructive view of the larynx, lack of movement of the laryngeal structures and continuous operative flow.

Methods: Case study. Operative description: A 14-gauge catheter was placed through the cricothyroid membrane and jet ventilation was performed for the duration of the case. WG was performed in the usual fashion. Acoustic data was obtained using Visi-Pitch IV computer program.

Results: 2-3 weeks postoperatively, flexible laryngoscopy demonstrated an anterior web. Acoustic measures showed the patient's fundamental frequency was in the feminine range.

Conclusion: Transtacheal jet ventilation for WG appears to be a safe technique that allows for simultaneous ventilation and a "tube-less" field.

Understanding the Vocal Health Awareness in Undergraduate Vocal Performers: A Pilot Survey

Nizar Tejani, MD; Sarah Quitana, MD; Noah Spillers, BS; Karuna Dewan, MD

Introduction: Vocal performance students undergo a rigorous training to hone and perfect their instrument. Increasing the fund of knowledge about vocal health and care for the professional voice should be a vital educational component to augment vocal health and career longevity.

Methods: The aim of this study is to identify a baseline of knowledge of undergraduate vocal performers including the mechanisms of vocal misuse, role of speech language pathology (SLP), anatomy and physiology of the vocal tract, and the treatment of common vocal disorders using the Vocal Awareness Questionnaire for Singers.

Results: 15 participants were identified with an average age of 20.4 and 6.4 years of individual singing training. Half had performed in a professional capacity. Three participants had received previously seen an SLP. 93% indicated they had limited or basic knowledge of anatomy and physiology of the vocal tract and 79% reported a similar understanding of care of the professional voice. All participants had a limited or basic understanding of vocal disorders and the role of the SLP. 85% of respondents reported at least moderate interest in expanding their knowledge of the anatomy and physiology and the role of the SLP. All indicated at least moderate interest in care of the professional voice and optimal use of the speaking voice.

Discussion: This survey of undergraduate vocal performers demonstrates a paucity of knowledge surrounding vocal health as well as an interest in learning about care of the professional voice and vocal pathology, paving the way for a portable curriculum to address these gaps.

Upper Airway Stenosis in Post Radiation Head & Neck Cancer-A Study of Seven Cases

Rakesh Srivastava, MBBS, MS

Introduction: Radiotherapy (RT) remains the mainstay treatment of Head-Neck Malignancies. There are many deleterious effects of RT in the short and long term. Long-term effects depend on the site, disease stage and the radiation dose volume. Fibrosis may occur inside the laryngopharynx, which compromises the airway, voice and swallowing.

Material and Methods: We present seven cases, all males with an average age of 65.29 years (55-77 years). All cases presented with varied symptoms of difficulty in breathing, swallowing and change in voice. Recurrence of disease ruled out by flexible laryngoscopy utilizing white light and narrow imaging and CECT of Neck. The average duration of presentation from radiation to symptoms is 6.42 years. Two patients were tracheostomised before the procedure. The laryngeal findings in various cases are Bilateral fixed cords (3), Anterior glottic stenosis (1), Posterior glottic stenosis (PGS) (1), Pharyngeal stenosis (1) and supraglottic stenosis (1).

Results: The surgical procedures performed are Posterior Cordotomy with Partial Arytenoidectomy (4), Release of PGS(Laser) with ballon tracheoplasty (1), Partial Epiglottectomy (1) and Release of Stenosis with Keel Placement (1). The average follow-up was 3.2 years. One patient was re-tracheotomised, and one died due to a second primary in the nasopharynx after four years. In all cases, post-operative swallowing rehabilitation is crucial; in two cases, it took three months for completely normal swallowing.

Conclusion: Post-radiation airway management poses a real challenge. Proper assessment, Preoperative symptoms, and General condition of the patient, including Pulmonary reserve and Swallowing status, are important. Guarded prognosis remains the main critical component in such cases.

Utilization of Relative Citation Ratio and H-Index to Evaluate the Research Activity of Laryngology Fellowship Program Directors

Andrew Sang Lee, BA; Rita Vought, BA; Victoria Vought, BA;
Ava Herzog; Aalin Izhar, MHS; Jean Anderson Eloy, MD

Purpose: In this study, we characterized research activity of 2023 Laryngology fellowship program directors by using h-index and weighted relative citation ration (w-RCR) to measure output and mean-RCR (m-RCR) to quantify impact.

Methods: Demographic data on directors was collected using institutional websites including the American Laryngological Association website. Directors were searched on Scopus for h-index, and Scopus data was exported to the National Institutes of Health iCite website to calculate -RCR and w-RCR. Mann-Whitney and Kruskal-Wallis tests were utilized to determine statistical significance with an alpha value of 0.05.

Results: Twenty-nine US laryngology fellowship directors were identified (17% female). H index was compared based on program location ($p=0.1644$), fellowship graduation year ($p<0.001$), additional degrees ($p=0.060$), and gender ($p=0.056$). Those in practice for more than 20 years (16) had a greater average h-index (31.6) compared to peers (16.2). M-RCR comparisons were based on same criterion ($p=0.891$, 0.392, 0.507, and 0.386, respectively) along with w-RCR ($p=0.507$, 0.0003, 0.030, and 0.126, respectively). Program directors with greater years in practice had a greater w-RCR score (165) than peers (66). Similarly, a higher average w-RCR score was observed among directors with additional degrees (211.8 vs 101.5).

Conclusion: Greater years in practice, along with the presence of additional professional degrees, was associated with greater research output but not impact. Relative Citation Ratio serves as an important tool to separate these aspects of research activity.

Validation of a Low-Cost Method for Recording and Supervising Otolaryngology Trainee and Physician Extender Endoscopic Exams

Mark Lee, MD; Michelle Yu, MD; Ellie Morse, MD; Anaïs Rameau, MD, MPhil, MS

Objectives/Hypotheses: To develop low-cost smart device adaptors for recording otolaryngology trainee and physician extender rigid and flexible endoscopies in the inpatient and emergency room (ER) settings and validate their usability, clinical utility, and image quality.

Study Design: Prospective survey study

Methods: 3D-printed adaptors were deployed at the New York Presbyterian Hospital since July 2020. Three versions were provided: phone adaptors with and without telescope magnification and tablet/laptop adaptors using an external USB camera. Surveys including the System Usability Scale (SUS) and custom questions on subjective image quality, device handling, and impact on patient care (Likert scale: 1=poor/strongly disagree, 5=excellent/strongly agree) were administered to all staff in October 2023. Representative images from the adaptors were compared to existing recording methods using the BRISQUE image quality metric.

Results: Users of the adaptors (residents/PAs) and reviewers of footage (fellows/attendings) gave significantly high scores on the SUS (users: average=5.0, sd=0.4, $p<0.001$; reviewers: average=4.8, sd=0.3, $p<0.001$) and for ability to provide consistent patient care (users: average=5.0, sd=0.0, $p<0.001$; reviewers: average=4.6, sd=0.5, $p=0.003$). Images from the adaptors were comparable in BRISQUE scores (average=40.8, sd=5.1) to standard office fiberoptic systems (average=42.6, sd=5.1, $p=0.68$). For control, rigid laryngoscopy had better image quality than both systems (average=25.9, sd=2.6, $p=0.009$).

Conclusions: There are limited options for recording and supervising otolaryngology trainee endoscopic exams in the inpatient and ER settings. Existing systems may be large and difficult to transport, and prior smart-device adaptors are no longer available. Three-dimensional printing can make low-cost endoscopic smart-device adaptors that maintain image quality.

IN MEMORIAM

John N. G. Evans, MD c. 1935 – March 27, 2022

John Noel Gleave Evans, MD, one of our Corresponding Emeritus Fellows died peacefully at home on March 27, 2022 at the age of 87. In 1984, Dr. Evans was inducted as a Corresponding Fellow and elevated to emeritus status in 2019.

In 1953, Dr. Evans enrolled at St Thomas' Hospital Medical School as a 1st MB student, qualifying in 1959; however, in 1960, he began a Short Service Commission in the Royal Army Medical Corps for 3 years. Following his military service, Dr. Evans returned to St Thomas as an Anatomy Demonstrator and after passing the Primary FRCS, was appointed ENT Registrar there. His career continued to flourish with appointments as Consultant ENT Surgeon at St Thomas; to Great Ormond Street Hospital; and in 1988, the post of Honorary Consultant ENT Surgeon at King Edward VII's Hospital for Officers.

Dr. Evans was internationally renowned as a pediatric otolaryngologist after developing the innovative laryngotracheoplasty operation for pediatric subglottic stenosis that is still currently in use. At that time, he developed a close and enduring friendship with Dr. Robin Cotton. In 1993, he was presented the

ALA's prestigious Gabriel Tucker MD Award. He became President of the Section of Laryngology of the Royal Society of Medicine in



1993, and Master of the 10th British Academic Conference in Otolaryngology in 1999 that was followed by his retirement from clinical practice.

In 1960 John married Elizabeth Glascodine and became the parents to four children. Outside of patient care, they were known for their hospitality often entertaining friends and colleagues including his trainees. He was an avid windsurfer and enjoying his large garden. A towering figure in pediatric otolaryngology he was unassuming, approachable and always kind and supportive to colleagues starting out in this young subspecialty.

Eiji Yanagisawa, MD

May 12, 1930 – February 1, 2024

Dr. Eiji Yanagisawa, who was inducted as an Active Fellow in 1981, passed away on February 1, 2024 at the age of 93. He was elevated to Emeritus in 2013.

Born in Yokohama, Japan, he immigrated to the United States in 1956, where he embarked on a remarkable journey led by inspiration and determination. His extraordinary career in otolaryngology had its beginning at the Nihon University School of Medicine in Japan that was followed by a residency under Dr. John A. Kirchner. On a Fulbright Scholarship, he completed a Yale University Otolaryngology residency and graduated in 1959. He began practicing medicine in the Greater New Haven area after a residency in 1960, with the Southern New England Ear Nose Throat & Facial Plastic Surgery Group. Retiring at the age of 83 years, with more than 53 years of practicing, he provided positive influencing to a myriad number of patients, physicians, and friends around the globe. Dr. Yanagisawa was an influencer in training and developing more than 100 Yale residents during his fifty-year practice. He was recognized nationally and internationally for his clinical work and clinical research.

When he wasn't taking care of his patients or training residents, Dr. Yanagisawa cheered as an avid lifelong fan of the New York Mets and UConn basketball teams. He also found time in the tranquility and serenity of the Japanese Garden that he designed and built in his backyard in 1973. He was noted for always having his 35mm camera used to capture beautiful nature photographs and fantastic moments and memories, especially those of his water lilies.

Dr. Yanagisawa was active in the professional organizations where he served and was presented numerous honors including the ABEA's Chevalier Jackson Award; Presidential Citations from the AOS; ALA (twice) Trio Society,



and AAO-HNS. He was selected as the ABEA President, Vice President of the Eastern Section of the Triological Society, President of the New England Otolaryngological Society. Additional honors included a Lifetime Achievement Awards from AAO-HNS and the Politzer Society. A pioneer of numerous medical techniques and his documentation of disease states and videographic techniques in otolaryngology, he lectured frequently on these subjects, and won numerous awards for teaching videotapes. He authored or coauthored 356 original articles, 80 book chapters, and 4 books, presented 19 scientific exhibits nationally and abroad, and created 77 teaching videotapes.

Dr. Yanagisawa was kind, gentle, and compassionate to every person he interacted with, and served as a masterful mentor and brilliant instructor, teaching the intricacies and nuances of effective medical and surgical care of patients. Due to his excellence in nearly all facets of Otolaryngology, many referred to him as a "Renaissance Man" which is an absolute fitting name.

PAST PRESIDENTS

1879	Louis Elsberg	1920	Harris P. Mosher
1880	J. Solis-Cohen	1921	Harmon Smith
1881	F. I. Knight	1922	Emil Mayer
1882	G.M. Lefferts	1923	J. Payson Clark
1883	F.H. Bosworth	1924	Lee Wallace Dean
1884	E. L. Shurly	1925	Greenfield Sluder
1885	Harrison Allen	1926	Chevalier Jackson
1886	E. Fletcher Ingals	1927	D. Bryson Delevan
1887	R. P. Lincoln	1928	Charles W. Richardson
1888	E. C. Morgan	1929	Lewis A. Coffin
1889	J. N. Mackenzie	1930	Francis R. Packard
1890	W. C. Glasgow	1931	George R. Shambaugh
1891	S.W. Langmaid	1932	George Fetteroff
1892	M. J. Asch	1933	George M. Coates
1893	D. Bryson Delavan	1934	Dunbar Roy
1894	J. O. Rose	1935	Burt R. Shurly
1895	W. H. Day	1936	William B. Chamberlain
1896	C. H. Knight	1937	John F. Barnhill
1897	T.R. French	1938	George B. Wood
1898	W. E. Casselberry	1939	James A. Babbitt
1899	Samuel Johnston	1940	Gordon Berry
1900	H. L. Swain	1941	Thomas E. Carmody
1901	J.W. Farlow	1942	Charles J. Imperatori
1902	J. H. Bryan	1943	Charles J. Imperatori
1903	J. H. Hartman	1944	Harold I. Lillie
1904	C.C. Rise	1945	Harold I. Lillie
1905	J.W. Gleitsman	1946	Frank R. Spencer
1906	A.W. deRoaldes	1947	Arthur W. Proetz
1907	H.S. Birkett	1948	Frederick T. Hill
1908	A. W. Coolidge Jr	1949	Ralph A. Fenton
1909	J. E. Logan	1950	George B. New
1910	D. Braden Kyle	1951	H. Marshall Taylor
1911	James E. Newcomb	1952	Louis H. Clerf
1912	George A. Leland	1953	Gordon F. Harkness
1913	Thomas Hubbard	1954	Henry B. Orton
1914	Alexander W. MacCoy	1956	LeRoy A. Schall
1915	C. Hudson Makuen	1957	Harry P. Schenck
1916	Joseph L. Goodale	1958	Fred W. Dixon
1917	Thomas H. Halstead	1959	William J. McNally
1918	Cornelius G. Coakley	1960	Edwin N. Broyles
1919	Norval H. Pierce	1961	Dean M. Lierle

PAST PRESIDENTS (Continued)

1962	Frances E. LeJeune	1992	William B. Hudson
1963	Anderson C. Hilding	1993	Byron J. Bailey
1964	Albert C. Furstenberg	1994	H. Bryan Neel III
1965	Paul H. Holinger	1995	Paul H. Ward
1966	Joel J. Pressman	1996	Robert W. Cantrell
1967	Lawrence R. Bois	1997	John A. Tucker
1968	Francis W. Davison	1998	Lauren D. Holinger
1969	Alden H. Miller	1999	Gerald B. Healey
1970	DeGraff Woodman	2000	Harold C. Pillsbury III
1971	F. Johnson Putney	2001	Stanley M. Shapshay
1972	Frank D. Lathrop	2002	Gerald S. Berke
1973	G. Slaughter Fitz-Hugh	2003	W. Frederick McGuirt Sr.
1974	Daniel C. Baker Jr.	2004	Robert H. Ossoff
1974	Joseph H. Ogura	2005	Robert T. Sataloff
1975	Stanton A. Friedberg	2006	Gayle E. Woodson
1976	Charles M. Norris	2007	Marshall Strome
1977	Charles F. Ferguson	2008	Roger L. Crumley
1978	John F. Daly	2009	Marvin P. Fried
1979	John A. Kirchner	2010	Andrew Blitzer
1980	Daniel Miller	2011	Michael S. Benninger
1981	Harold G. Tabb	2012	Clarence T. Sasaki
1982	M. Stuart Strong	2013	C. Gaelyn Garrett
1983	John S. Lewis	2014	Mark S. Courey
1984	Gabriel F. Tucker Jr.	2015	Peak Woo
1985	Douglas P. Bryce	2016	Kenneth Altman
1986	Loring W. Pratt	2017	Gady Har-El
1987	Blair Fearon	2018	C. Blake Simpson
1988	Seymour R. Cohen	2019	Paul W. Flint
1989	Eugene N. Myers	2020	Paul W. Flint
1990	James B. Snow Jr	2021	Clark A. Rosen
1991	John M. Frederickson	2022	Lucian Sulica
1992	William B. Hudson	2023	Dinesh Chhetri

Vice Presidents (First and Second)

1879	F.H. Davis	1929	William B. Chamberlin, Ralph A. Fenton
1880	W. C. Glasgow, J. O. Roe	1930	Harris P. Mosher, James A. Babbitt
1881	E. L. Shurly, W. Porter	1931	Joseph B. Greene, E. Ross Faulkner
1882	C. Seiler, E. F. Ingals	1932	Gordon Berry, Frank R. Spencer
1883	S. W. Langmaid, S. Johnston	1933	E. Ross Faulkner, Thomas S. Carmody
1884	J. H. Hartman, W. H. Daly	1934	Fordon B. New, Samuel McCullagh
1885	H.A. Johnson, G. W. Major	1935	Edward C. Sewall, H. Marshall Taylor
1886	E. C. Morgan, J. N. Mackenzie	1936	William P. Wherry, Harold I. Lillie
1887	J. N. Mackenzie, S. W. Langmaid	1937	Frank R. Spencer, Bernard J. McMahon
1888	W. C. Glasgow, C. E. DeM. Sajous	1938	Ralph A. Fenton, Frederick T. Hill
1889	F. Holden, C.E. Bean	1939	John H. Foster, Thomas R. Gittins
1890	J. O. Roe, J. H. Hartman	1940	Charles H. Porter, Gordon F. Harkness
1891	M. J. Asch, S. Johnston	1941	Arthur W. Proetz, Henry B. Orton
1892	S. Johnston, J. C. Mulhall	1942-3	Harold I. Lillie, Dean M. Lierle
1893	J. C. Mulhall, W. E. Casselberry	1944-5	John J. Shea, Thomas C. Galloway
1894	C.C.Rice, S. H. Chapman	1946	H. Marshall Taylor, C. Stewart Nash
1895	J. Wright, A. W. de Roaldes	1947	John J. Shea, Frederick A. Figi
1896	T. M. Murray, D. N. Rankin	1948	Henry B. Orton, Anderson C. Hilding
1897	A. W. MacCoy, H. S. Birkett	1949	LeRoy A. Schall, Fletcher D. Woodward
1898	J. W. Farlow, F.W. Hinkel	1950	W. Likely Simpson, Lyman, G. Richards
1899	T. A. DeBlois, M. R. Brown	1951	William J. McNally, Thomas C. Galloway
1900	H. L. Wahner, A. A. Bliss	1952	J. MacKenzie Brown, Edwin N. Broyles
1901	J. W. Gleitsmann, D. Braden Kyle	1953	Claude C. Cody, Daniel S. cunning
1902	G.A. Leland, T. Melville Hardie	1954	James H. Maxwell, Clyde A. Heatly
1903	J. H. Lowman, W. Peyre Porcher	1955	Robert L. Goodale, Paul H. Holinger
1904	Thomaso Hubbard, W. J. Freeman	1956	Henry M. Goodyear, Robert E. Priest
1905	J. L. Goodale, C. W. Richardson	1957	Frances H. LeJeune, Pierre P. Viole
1906	G. H. Makuen, A. R. Thrasher	1958	Charles Blassingame, Chevalier L. Jackson
1907	J. P. Clark, J. E. Rhodes	1959	James H. Maxwell, Oliver Van Alyea
1908	E. Mayer, F. R. Packard	1960	Walter Theobald, Anderson C. Hilding
1909	C. G. Coakley, H. O. Moser	1961	Julius W. McCall, P. E. Irlend
1910	Robert C. Myles, J. M. Ingersoll	1962	Paul M. Moore, Jerome A. Hilger
1911	F. C. Cobb, B. R. Shuly	1963	Paul M. Holinger, Lester A. Brown
1912	A. W. Watson, W. Scott Renner	1964	B. Slaughter Fitz-Hugh, Daniel C. Baker
1913	F. E. Hopkins, George E. Shambaugh	1965	C. E. Munoz-McCormick, Arthur J. Crasovaner
1914	Clement T. Theien, Lewis A. Coffin	1966	Lawrence R. Boies, G. Edward Tremble
1915	J. Gordon Wilson, Christian R. Holmes	1967	John F. Daly, Stanton A. Friedberg
1916	Thomas H. Halsted, Greenfield Sluder	1968	DeGraaf Woodman, John Murtagh
1917	John Edwin Rhodes, D. Crosby Greene	1969	Joseph P. Atkins, Stanton A. Friedberg
1918	George E. Shambaugh, John R. Winslow	1970	Robert B. Lewy, Oliver W. Suehs
1919	Francis R. Packard, Harmon Smith	1970	James A. Harrill, James D. Baxter
1920	Harmon Smith, W. B. Chamberlin	1972	Francis L. Weille, Sam H. Sanders
1921	Dunbar Roy, m Robert C. Lynch	1973	William H. Saunders, Blair Fearon
1922	George Fetterolf, Lorenzo B. Lockard	1974	Joseph H. Ogura, Douglas P. Bryce, John A. Kirchner
1923	Hubert Arrowsmith, Joseph B. Greene	1975	S. Lewis, Edwin W. Cocke, Jr.

Vice Presidents (First and Second)

1924	Ross H. Skillern, Gordon Berry	1976	Emanuel M. Skolnik, John T. Dickinson
1925	John E. Mackenty, Robert Levy	1977	J. Ryan Chandler, Herbert H. Dedo
1926	Lewis A. Coffin, William V. Mullin	1978	John E. Bordley, Lester A. Brown
1927	Charles W. Richardson, Hill Hastings	1979	Albert H. Andrews, Seymour R. Cohen
1928	Robert Cole Lynch, Francis P. Emerson	1980	John Frazer, George A. Sisson

Vice-Presidents (Presidents-Elect)

1981	M. Stuart Strong	1994	Paul H. Ward	2007	Roger L. Crumley
1982	John S. Lewis	1995	Robert W. Cantrell	2008	Marvin Fried
1983	Gabriel F. Tucker, Jr	1996	John A. Tucker	2009	Andrew Blitzer
1984	Douglas P. Bryce	1997	Lauren D. Holinger	2010	Michael Benninger
1985	Loring W. Pratt	1998	Gerald B. Healy	2011	Clarence T Sasaki
1986	Blair Fearon	1999	Harold C. Pillsbury, III	2012	C. Gaelyn Garrett
1987	Seymour R. Cohen	2000	Stanley M. Shapshay	2013	Mark S. Courey
1988	Eugene N. Myers	2001	Gerald S. Berke	2014	PeakWoo
1989	John B. Snow, Jr.	2002	W. Frederick McGuirt, Sr.	2015	Kenneth Altman
1990	John M. Frederickson	2003	Robert H Ossoff	2016	Gady Har-El
1991	William R. Hudson	2004	Robert T. Sataloff	2017	C. Blake Simpson
1992	Byron Bailey	2005	Gayle Woodson	2018	Paul W. Flint
1993	H. Bryan Neel III	2006	Marshall Strome	2019-20	Clark A. Rosen
				2021	Lucian Sulica

Secretaries

1879	G.M. Lefferts	1952	Harry P. Schenck
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