Soundings
SPRING 2022
PUBLISHED IN THE INTEREST OF OUR MEMBERS AND THEIR PATIENTS

President's Message

David Cognetti, MD, FACS
PAO-HNS President

Welcome to Spring Soundings! We are fortunate to have four distinct seasons in Pennsylvania. Spring is a time for rejuvenation and is a wonderful reminder of how beautiful change can be. This year will feel like a time of rejuvenation for the Pennsylvania Academy of Otolaryngology – Head and Neck Surgery, beginning with the return to an in person Annual Meeting at the The Hotel Hershey on June 17th and 18th. In September, Philadelphia will host the American Academy of Otolaryngology – Head and Neck Surgery's Annual Meeting, an exciting opportunity to show off our state and our state society. These will be great opportunities to reunite after multiple years of virtual meetings and I encourage all to attend both meetings.

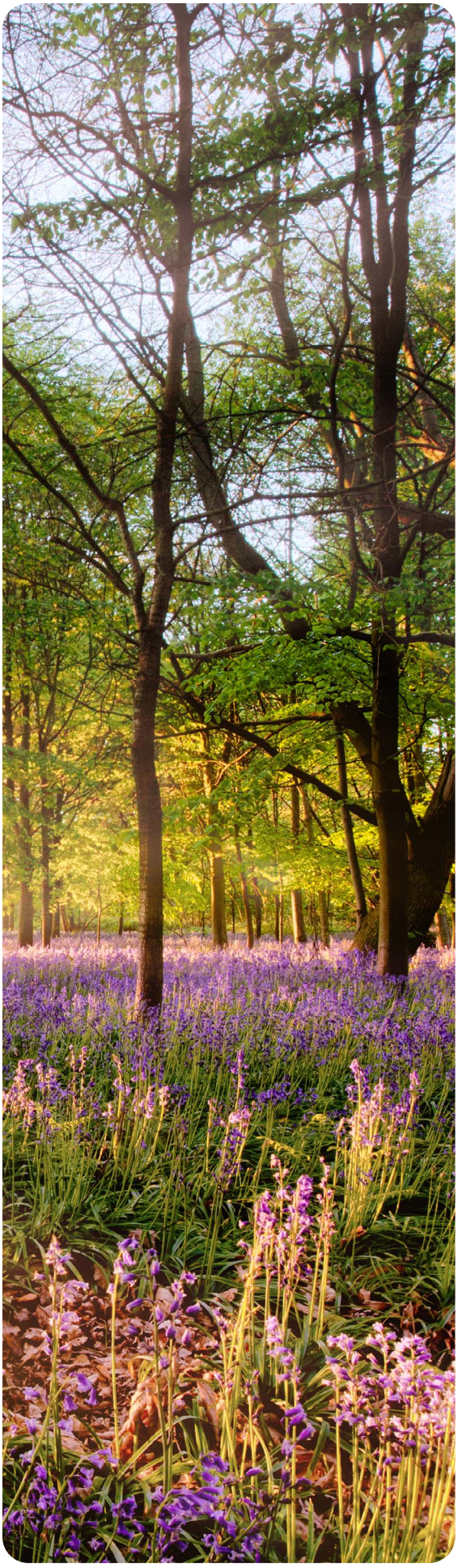
The PAO-HNS Annual Meeting in Hershey is shaping up to be outstanding thanks to the vision and work of our Program Co-Chairs, Drs. Andrew McCall and Nicholas Purdy, and the entire program committee. Our invited keynote speaker is Dr. Kelly Malloy, Clinical Associate Professor of Otolaryngology – Head and Neck Surgery and Associate Chief Clinical Officer of Surgical and Rehabilitation Services at the University of Michigan and Michigan Medicine. She completed medical school and her Otolaryngology residency at Jefferson and was previously on faculty at Penn. As such, she has attended several PAO-HNS meetings in the past. Like many of us, the PAO provided her an avenue for mentorship and advancement in her early career. Her keynote address will share her national expertise in surgical simulation in education. She will also speak at our annual Women in Otolaryngology event on the topic of sponsorship. We are excited to welcome Dr. Malloy back to the PAO-HNS Annual Meeting!

The PAO-HNS Annual Meeting is shaping up to be outstanding...

As for change, we will be holding committee meetings for our clinical committees at the PAO-HNS Annual Meeting this year. These are open meetings to encourage engagement by all members including residents and students. Committee Chairs will have term limits to maximize participation and opportunities for members who are interested in leadership in our society. Committees include Allergy & Rhinology, Facial Plastic & Reconstructive Surgery, Head & Neck Surgery, Otology, Patient Safety & Quality Improvement, Pediatrics, Sleep Medicine, and Voice & Swallowing. We look forward to your involvement!

I was excited to recently participate in the AAO-HNS/F 2022 Virtual Leadership Forum & BOG Spring Meeting representing PAO on the State Society Panel. At the meeting, ideas were discussed regarding increasing the partnership of the AAO-HNS and state societies, including specific ideas for collaboration with the society of the host state for the AAO-HNS/F Annual Meeting. This year, that is us! Please make sure to clear your calendars for September 10-14. September is a beautiful time in Philadelphia, and we look forward to welcoming our colleagues from across the country and around the world.

In closing, 2022 is going to be an exciting year for the PAO-HNS! One of the greatest strengths of our Academy is the close and collaborative relationships of our membership. We look forward to being back together in person and to the enhanced engagement of all of you!



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BOG UPDATE: Spring 2022

Karen A. Rizzo, MD, FACS
Governor

Introduction

The Board of Governors of the American Academy of Otolaryngology/Head & Neck Surgery continues to strive to enhance communication between the leadership of the Academy and grassroot members by serving as a conduit for information regarding issues of importance impacting Otolaryngology practice. The BOG sponsored a Spring Leadership Forum on April 9th which included a day long virtual meeting involving excellent speakers, and updating members on legislative, socioeconomic, and advocacy issues.

Topics included: 1) Best practices in utilizing APP's in your practice, 2) What you need to know about private equity, 3) Over the counter audiology and how to prepare your practice for it, and 4) A coding and billing update. Kate Stewart who is vice president and general manager for the ENT division of Stryker spoke regarding: Raising your voice and paving the path for an equitable future- promoting pay parity and female leadership opportunity. Dr. Joan Coker from Delaware spoke on health care at the grassroots level and the impact of COVID-19 on a busy otolaryngology practice. A president-elect candidate forum was also held between Dr. Lance Manning and Dr. Doug Backous who are the two candidates for this year's president -elect position, addressing their vision of where Otolaryngology will be in the future and what they felt were the most important issues impacting the specialty today. William Prentice, CEO of the ambulatory surgical center's association, spoke on the national trends of ambulatory surgery centers and how that impacts our specialty. A state society panel discussion was also included involving leadership from California, Pennsylvania, Connecticut, and Tennessee. Our president, Dr. David Cognetti,participated in an excellent discussion and highlighted the many attributes and accomplishments of our state society and the importance of its annual educational meeting. Discussion regarding the importance of communication and engagement of state societies with the Academy leadership, regional cooperation, and each other promoted.

The Board of Governors is also sponsoring a 4 series Employment Webinar addressing the realities of hiring physicians and members of the health care team in today's challenging environment.

Webinar #1 occurred on April 26th and involved hiring in health care today -realities and successful strategies. Issues regarding the impact on call, bonus structure, ancillary revenue as well as retirement plan options and health insurance benefits that are important to candidates were addressed.

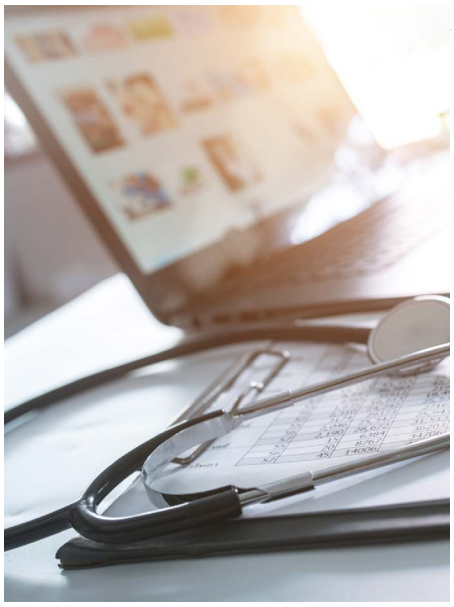
Webinar #2 is slated for May 17th and will include winning strategies for recruiting thinking short and long term. This session will focus on how large practices as well as small practices build recruiting relationships leveraging the physicians at the practice and other out of the box ideas that have worked in the past.

Webinar # 3, June 7, will include the management of your practice's website and social media, focusing on how to win over new hires as well as patients. This session will focus on how to leverage your website and social media to make a positive impression on any physician or other staff considering a job with your practice and would naturally look at your website and check out your social media channels to familiarize themselves with the practice. This would be a "put your best foot forward" type of session. Fuel medical has worked with the Academy on prior webinars and will be involved in this.

Webinar #4, June 28, would involve the hiring of young physicians and will include a panel from the young physician section and resident fellow section to understand what motivates them and what is important in their hiring decisions. All these webinars are recorded and available to watch on demand along with the Stryker forum, Candidate forum, and the Congressional update.

I also encourage our members to watch the Academy website for additional webinars being promoted by the private practice specialty group focused on leadership, advocacy, and private practice sustainability and viability. Lastly, I would like to remind members about the annual meeting for the Academy being held in Philadelphia this year from September 11th to the 14th. I would encourage all to participate in person for it's a great opportunity to network and be educated on the best care available for our patients in otolaryngology.

Karen A. Rizzo, M.D. FACS
BOG Chair elect
BOG PA Governor



AAO-HNSF Releases Clinical Practice Guideline on Tympanostomy Tubes in Children

Resident, University of Pittsburgh School of Medicine
Jeffrey P. Simons, MD, MMM, Professor of Otolaryngology, UPMC Children's Hospital of Pittsburgh, University of Pittsburgh School of Medicine

The American Academy of Otolaryngology – Head and Neck Surgery Foundation (AAO-HNSF) has released a new guideline on patient selection and surgical indications for tympanostomy tubes in children. As the most common ambulatory surgery performed on children, continuous review is essential for maintaining safety and quality measures that directly impact a large population. This review updates the prior one from 2013.

The authors target otolaryngologists, pediatricians and audiologists who are considering children 6 months to 12 years for tympanostomy tube placement or currently managing their tubes. Research has excluded ages outside of this age range. Children with the following diagnoses were also excluded due to clearly settled indications for tympanostomy tubes:

- Retraction-type ear disease
- Complications of acute otitis media (AOM)
- Barotrauma
- Sudden idiopathic sensorineural hearing loss or Meniere's disease requiring drug delivery via tubes

Using new research evidence from multiple systematic reviews and randomized controlled trials (RCTs), the guideline update group focuses on gaps in the initial article and proposes future investigative efforts. This evidence-based approach provides a graded strength of the action statements with the expectation that clinicians will maintain their own judgment when deciding whether to proceed with surgery. Considering 20% of school aged children have middle ear effusion at any given time, not all patients will benefit from tubes. Other factors including hearing status, developmental risk, associated symptoms, direct and indirect costs, and quality of life improvements often drive management.

This article focuses on changes to the key action statements compared to the 2013 statement. The following is a summary of these new guidelines:

- If otitis media with effusion (OME) persists for >3 months or the child becomes a candidate for surgery, a hearing evaluation is recommended (2013 normal hearing <20 decibels, now <15dB).

Using Grade C evidence based on observations and cross-sectional studies, the authors recommend a hearing evaluation since benefit from tympanostomy tubes largely relies on improved hearing. Children 6 months to 2.5 years may undergo visual reinforcement audiometry, 2.5 years to 4 years can undergo play audiometry and greater than 4 years old can undergo an audiogram with fail criterion of >20 dB at 1 or more frequencies in either ear. Postoperative evaluation is valued over preoperative to confirm resolution of hearing loss.

- Long-term tubes are not recommended initially unless a specific reason for prolonged middle ear ventilation is anticipated.

Long-term tubes (most commonly, Goode T-tube) generally remain in place for 2 years or longer, whereas short-term tubes (Armstrong) remain for 8-18 months. Despite their perceived longer benefit, long-term tubes bring more risks including perforation, myringosclerosis, granulation tissue, cholesteatoma and chronic otorrhea. Typically, long-term tubes are reserved for diagnoses including Trisomy 21, cleft palate or stenotic ear canals.

- For kids that have associated adenoiditis or nasal obstruction or >4 years old to reduce recurrent otitis media, clinicians may consider an adenoidectomy.

RCTs and systematic reviews have demonstrated the benefit of an adenoidectomy in this population. These include, but are not limited to, reduction in the prevalence of middle ear effusion, comparable hearing outcomes to tube insertion alone and doubling the length of benefit compared to tube insertion alone. Adenoidectomy has not been established as an adjunct for patients under the age of 4 years. It is worth noting that adenoid size is irrelevant compared to the bacterial reservoir in the nasopharynx that has easy access to the middle ear. This option stems from Grade B evidence.

- Routine ear drops are not recommended after tube placement.

Based on 15 RCTs, antibiotic ear drops after tube placement do not offer improved outcomes when compared with less costly alternatives. Multiple saline washouts or a single application antibiotic/steroid drops during surgery had similar efficacy. One clinical trial even found no difference between an oral antibiotic alone, oral antibiotic plus several days of an antibiotic ear drop, saline washout and observation. Limitations of this evidence include only studying children with chronic OME, excluding acute otitis media at the time of insertion, and excluding children at high risk for postoperative otorrhea (immune deficiency, Down syndrome, cleft palate, and craniofacial disorders). Cost, risk of fungal infections or local skin reactions have been cited as additional reasons not to routinely prescribe drops after surgery. Studies have shown that drops also do not significantly prevent obstruction of the tube after placement. Finally, another key action statement unchanged from 2013 still recommends topical antibiotic ear drops for children with uncomplicated acute tympanostomy tube otorrhea.

- Follow up recommended within 3 months for ear evaluation and education of families for routine, periodic follow up to monitor tubes until extruded.

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AAO-HNSF Releases Clinical Practice Guideline on Tympanostomy Tubes in Children

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The authors value documentation of tube outcomes for providers to improve quality. After the first appointment within 3 months, most clinicians recommend subsequent 6-month interval follow-ups. These early appointments offer the early detection of the 5-11% of children that develop obstruction. In this situation, saline or antibiotic drops help.

For a procedure that often takes only minutes to perform, this 46-page guideline offers multiple new resources for clinicians to consider prior to rolling back to the operating room. In addition to these new recommendations, the guideline offers a flowchart depiction of clinical decision making based on all key action statements. It is important to consider this guideline when faced with some of the most common complaints a pediatric otolaryngologist will see in clinic. These statements help to improve outcomes and maintain quality across all domains when assessing management.

REFERENCE:

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WELCOME!

New Members

Harish Dharmaraian, MD

Lauren Melley, DO

Tanner Lyons, DO

Helen Lesser, BS

Anas Oatanani, BS

Karthik Rajasekaran, MD, FACS

Maxwell Wright, MD

CONGRATULATIONS!

Congratulations to PAO-HNS nominees and winners!

We Recognize hard working physicians!

To Telemedicine Or Not To Telemedicine?

Allison Keane, MD, Neerav Goyal, MD, MPH, and Ellen S Deutsch, MD, MS
PAO-HNS Patient Safety Committee

Introduction

The COVID-19 pandemic has caused our healthcare system to transform and adjust to accommodate a constantly changing landscape. The effects specifically on the Otolaryngology field have been no less transformative in both inpatient and outpatient settings. One technologic application that has been pushed to the forefront in our field because of the pandemic is telemedicine. For better or worse, telemedicine seems here to stay. We present a "point-counterpoint" discussion about telemedicine with regard to patient safety and healthcare quality. We conclude with areas of agreement and discussion of the future implementation of telemedicine within Otolaryngology.

To Telemedicine

The convenience of telemedicine for patients is undeniable. The time taken to turn on a device and log into an application, from the comfort of a home, or without ever leaving the workplace is minimal compared to the time previously spent traveling to and from offices and waiting in waiting rooms. Decreased time away from work and decreased travel also correlates to a decreased cost for patients. Carbrera et al. conducted a systematic review of the cost of telemedicine for otolaryngology patients and found an average savings per patient in the US ranging from $68 to $900.[1] Analysis of cost savings by subspecialty revealed the highest savings for patients with otologic and head and neck conditions.[1]

The convenience of telemedicine has benefits beyond cost savings for patients, including increased access. Telemedicine enables any patient with an electronic connection have a medical visit with an otolaryngologist. Patients previously limited by travel time or cost are able to seek specialty care. This increases access to care for underserved communities, disabled, and elderly patients.

The cost and access benefits of telemedicine in otolaryngology were achieved while maintaining patient satisfaction. In a systematic review on telemedicine in otolaryngology, Ning et al. reported patient satisfaction scores of 95% and above for patient-otolaryngologist virtual visits.[2] In one of the studies, 88% of patients stated they would use telemedicine again.[2] Telemedicine has not adversely affected patient satisfaction with their physician visits.

The perspective of the physician is also important. Otolaryngologists have similarly reported high satisfaction rates regarding telemedicine patient encounters. In the same review, Ning et al. discussed five

Not to Telemedicine

The convenience of telemedicine is undeniable—within limits and when it works. While telemedicine may save on travel, there are stipulations associated with a telehealth encounter. Effective telemedicine requires the presence of synchronous communication with both an audio and video component. The patient needs a computer with a web camera or a smartphone and confidence in using the telehealth platform. While 85% of Americans in 2021 own a smartphone, in rural environments only 70% have access to the broadband necessary for telemedicine encounters.[3]

For many physicians, the inequities surrounding telemedicine are clear. A study from Johns Hopkins demonstrated that marginalized racial groups, seniors and patients on Medicaid were more likely to have a telephone visit when doing telemedicine.[4] Additionally, the personal comfort of using a "smart" device for telemedicine was an identified barrier. It was not uncommon for patients to require a call by a staff member to help them start the telemedicine encounter.[4] Unfortunately, the same patients for whom telehealth may provide increased access are those patients who have the most significant barriers to using these services. Anecdotally, with the rapid implementation of telemedicine during COVID, there was a simultaneous and persistent build out of on site or third-party services to support the telehealth platform.

Beyond the access limitations, in its current most pervasive form, telemedicine is limited in the type of healthcare that it can deliver. For patients using their home devices, an otoscopic exam is impossible. Even a clear evaluation of the oral cavity or

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To Telemedicine Or Not To Telemedicine?

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studies evaluating provider satisfaction ranging from an average of 64%- 100% satisfied.[2] While there may be implicit positive bias among providers utilizing telemedicine, studies thus far have shown both patient and provider satisfaction with the use of telemedicine in otolaryngology for patient-provider encounters.

The cost benefit of telemedicine is not isolated to the patient. Regulations regarding reimbursements for telemedicine visits have drastically changed the cost-benefit ratio for telemedicine providers. In addition, telemedicine enables health systems to decrease patient wait times and increase patient volume. Preparation and ongoing costs of telemedicine vary significantly by institution and system, but implementation has been shown to be cost effective. Carbrera et al. report the "number needed to see" to cover telemedicine costs ranged from 35 to 537 patients.[1]

Telemedicine technology also offers the potential to provide services not available during in-person visits. For example, closed captioning may improve the understanding of explanations that physicians provide, which is especially important for patients with hearing impairment or limited English proficiency.

Telemedicine in otolaryngology improves access to physicians, is cost effective from a patient and healthcare system standpoint and does not sacrifice patient and provider satisfaction in the process.

oropharynx is limited by the resolution of the video and the lighting provided by the smartphone or webcam (or handheld flashlight). Unless a patient has a grossly visible neck mass, lymphadenopathy will not be appreciated. Imaging obtained before a telemedicine visit may minimize some concerns but would require a separate in-person visit and potentially increase costs to the system and the patient.

Having seen the doctor from the comfort of their own home, the patient may report high satisfaction. However, with a limited visit and a limited physical exam, there remains the specter of a missed diagnosis or a misdiagnosis. In a review by Ning et al, the same physician changed their diagnosis between a remote and an in-person visit 12-23% of the time.[2] For certain diagnoses, such as an early-stage oropharyngeal cancer, that miss through a remote platform could be catastrophic.

Many studies that argue cost savings are patient focused without considering the expenses borne by a practice or health system. A study by the Penn Orthopedics Department outlined the increased costs associated with the additional staff support required as well as the reduced revenue and potential patient inconvenience if a duplicative in-office visit was still needed.[5] They noted a net negative impact to the practice, even at higher volumes, secondary to a reliance on hospital-based outpatient practices.

Telemedicine when delivered via synchronous audiovisual communication is currently limited. Not all patients are able to access these platforms and there are not necessarily cost savings to the patient, practice, or health system. Additionally, misdiagnoses can occur.

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Areas of agreement and the future of Telemedicine

With the perspective we've gained during the COVID pandemic, we should consider the complementary and unique attributes of telemedicine and in-person patient care and find the best option for each circumstance in the care of each patient. This journey began at least 20 years ago 6-8 but applications and acceptance have been accelerated by the pandemic and facilitated by improvements in technology. As usual, technology solves some challenges and creates others. For telemedicine we will need to address privacy, cyber-security and storage capacity (e.g., for "store and forward" applications).[9] We will need to find ways to optimize telemedicine access and equity, based on geographic, racial, ethnic, cultural, age-related, socioeconomic, and individual factors.[10-14]

Although it's important to address the costs and resources required to allow patients, providers, and systems to use telemedicine, accurate calculations are complex and controversial, probably impacted by the size of the practice, and likely to change over time.

Finally, many components of our examinations are accomplished by visual and auditory processes that are amenable to electronic transmission, but some aspects of a thorough examination require palpation and manipulation, and there are essential aspects of acknowledgement and empathy that are best accomplished with human-to-human touch.

The future will require judicious use of both in-person and telemedicine-based patient care, with likely hybrid combinations customized and individualized based on patient conditions and treatment stages as well as patient and physician resources and preferences.

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Case Report: Neuroblastoma Presenting as a Mandibular Mass in a Young Child

Cecilia G Freeman, MD
Aarti Agarwal, MD
Conor H Blanco, DO
William Parkes, MD

Introduction

A broad differential exists for pediatric mandibular masses, including benign & malignant masses of both odontogenic and non-odontogenic origin. Approximately 30% of malignant mandibular masses originate from an unknown primary[1]. Mandibular masses in children are often asymptomatic, though locally aggressive lesions can cause pain, swelling, and trismus. The differential for non-odontogenic mandibular malignancies includes osteosarcoma, rhabdomyosarcoma, Ewing sarcoma, Burkitt lymphoma, and neuroblastoma.[2] Neuroblastoma is the most common solid tumor in pediatric patients, however, metastases to the head and neck are rare, representing less than 1% of all cancers in pediatric patients that affect this site.[3]

Case Description

A 2-year-old, otherwise healthy male, presented to the ED due to insidious onset of right facial swelling associated with trismus. Physical exam demonstrated a firm lesion overlying the entire length of the right mandibular ramus, which was non-tender to palpation. The mass could also be palpated along the retromolar trigone intraorally. Laboratory workup was notable for anemia, thrombocytopenia, elevated ESR, elevated LDH, and elevated uric acid. The patient was subsequently admitted for complications of tumor lysis syndrome, which was managed with fluids and allopurinol. While inpatient, CT and MRI were obtained prior to proceeding to the OR for a transoral biopsy via modified Ward incision in the vestibule. The final pathology was consistent with metastatic neuroblastoma. Further metastatic work-up included CT chest and MRI abdomen/pelvis which demonstrated a left renal heterogeneous mass, a lytic right scapular lesion, multiple hepatic lesions, and a right lung pleural nodule. He was determined to have stage IV disease and subsequently enrolled in a clinical trial, COG ANBL 1531. He underwent 5 cycles of induction chemotherapy, Metaiodobenzylguanidine (MIBG) treatment, and later adrenalectomy for resection of the primary tumor with tandem autologous stem cell transplant. Given the development of transplant associated thrombocytic microangiopathy, he was taken out of the study, but continues to receive dinutuximab treatment as part of his post-consolidation therapy.

Discussion

Neuroblastoma is the most common solid tumor in pediatric patients. 80% of cases are diagnosed in patients less than 4 years of age, with a median diagnostic age of 22 months.[1] The tumor itself is comprised of ectodermal neural crest cells, and the most common primary sites are adrenal glands (48%), retroperitoneum (24%), chest (8%), neck (3%), and pelvis (3%).[1,4] Neuroblastoma most often presents with abnormalities on abdominal exam or complaints related to mass effect within the abdomen. Laboratory workup frequently reveals elevated urinary catecholamines, and diagnosis of neuroblastoma is made by histopathological confirmation or bone marrow biopsy.[1]

Metastatic neuroblastoma is very common, with 60-70% of cases presenting with metastatic disease. Mandibular metastasis, however, is rare with only approximately 20 cases reported to date.[1,3] Though rare, it is important to consider metastatic neuroblastoma when a mandibular lesion is discovered in a pediatric patient. Imaging can reveal a soft tissue mass with calcification and bony destruction, but biopsy is ultimately required for definitive diagnosis. Mandibular metastasis is a poor prognostic indicator, with any bony involvement upstaging a tumor to Stage IV based on the International Neuroblastoma Staging System.[4] Given the high stage associated with mandibular metastasis, recognition of neuroblastoma as an etiology for mandibular mass in pediatric patients is essential. Early identification and investigation will allow for prompt diagnosis and facilitate timely initiation of treatment in these patients.

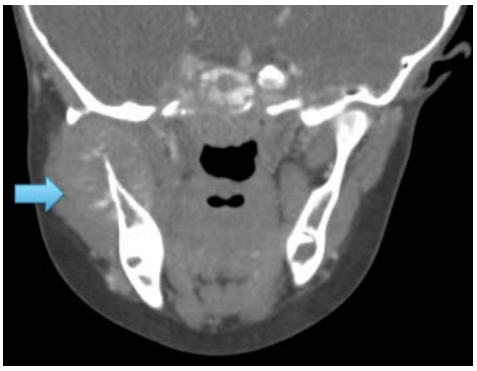

Figure A- Coronal CT with contrast demonstrating the 3cm lytic lesion (blue arrow) involving the R mandibular ramus, body, and condyle

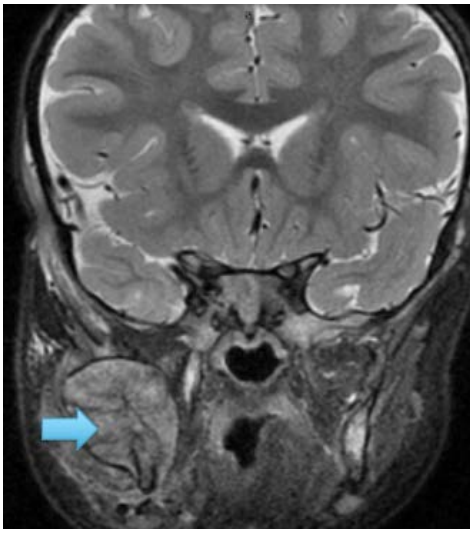

Figure B- T2 Post-contrast coronal image re-demonstrating the lesion involving the right mandibular ramus (blue arrow)

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Case Report: Neuroblastoma Presenting as a Mandibular Mass in a Young Child

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2022 PAO-HNS Annual Meeting

Nick Purdy, D.O. and Andy McCall, M.D.

We are excited to announce the upcoming 2022 PAO-HNS Annual Meeting. The meeting marks the return to a live in-person event, with content covering a broad range of topics applicable to all practicing Otolaryngologists. The event will be held at the Hershey Hotel, June 17-18. It will feature scientific sessions led by experts from across the state and opportunities to connect with colleagues from our PA Otolaryngology community.

Kelly Malloy, M.D. (University of Michigan) will be our keynote speaker for the event and will discuss the future of simulation education in Otolaryngology. She is also the featured speaker for the Friday evening Women in Otolaryngology event (an event which welcomes all meeting participants) where she will share her insights on sponsorship and networking for career development.

Scientific sessions will be held Friday and Saturday. Friday's sessions will include "Updates in Laryngology" led by John (JP) Gnaidy, M.D. and Adam Szymanowski, M.D. and "Head and Neck for the General Otolaryngologist" led by Elizabeth Cottrill, M.D. and Robert Brody, M.D. These scientific sessions will each begin with lectures by field experts, followed by an interactive panel discussion. Saturday's scientific sessions will shift the focus to quality improvement and the business aspects of Otolaryngology. Karen Rizzo, M.D. and Sandra Stinnett, M.D. will lead the business practice session in which industry and clinical experts will deliver insights into the impact of over-the-counter hearing devices. This will be followed by an interactive session on patient safety led by Ellen Deutsch, M.D. and Neerav Goyal, M.D. Saturday will also include trainee research presentations and the crowd favorite 'Resident Bowl' led by Mark Kubik, M.D. and Kevin Kovatch, M.D. The program will wrap up with the award presentations for the top podium and poster presentations as well as the PAO-HNS Service Awards by PAO president David Cognetti, M.D.

This year we are inviting your whole crew to get involved! We've added a family focused event on Friday afternoon in which Ellen Deutsch, M.D. and Kevin Kovatch, M.D. will lead a hands-on simulation and activity session during the afternoon break. The session is designed to illustrate the world of ENT for kids, spouses, and whoever else you've brought along. Think anatomy based coloring activities, and a chance for your family to view a laryngoscopy, among other experiences. Everyone will go home with a better idea of what the Otolaryngologist in the household does for a living every day at work.

We hope you are all highly anticipating this year's diverse program. We're looking forward to reconnecting with you in Hershey on June 17 and 18.

Save the Date!

ANNUAL SCIENTIFIC *Meeting 2022*

PAO-HNS
OTOLARYNGOLOGY
The Pennsylvania Academy of
HEAD AND NECK SURGERY

JUNE 17-18, 2022

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Intraoperative Monitoring In Cochlear Implant Surgery

Abhinav R. Ettyreddy M.D., Philip Perez M.D., Andrew A. McCall M.D., Barry E. Hirsch M.D.

Cochlear implants (CI) represent the sole treatment option for patients with moderate to profound sensorineural hearing loss when hearing aids no longer provide benefit. There has been ongoing interest in intraoperative monitoring during cochlear implant surgery as a tool to assess equipment integrity and to examine the progress of array introduction to ensure optimal placement. Standard cochlear implant insertion utilizes a round-window or cochleostomy approach to insert the implant array into the scala tympani. Issues that can be encountered during implant insertion include failure to insert the electrode into the cochlea, intracochlear translocation from scala tympani to scala vestibuli, tip fold over, and loss of residual hearing. The role of intraoperative monitoring is to help the surgeon ensure appropriate implant placement as well as to potentially preserve residual hearing.

Electrically evoked compound action potentials (ECAP) are the most common intraoperative electrophysiologic measurements obtained and are available under different monikers from the three cochlear implant manufacturers in the United States. ECAP captures the action potential of the distal cochlear nerve using the CI itself to both stimulate and record responses. ECAP testing is often conducted post implantation to check if the implant array is in proximity to the distal cochlear nerve and to evaluate the integrity of the peripheral auditory system. However, intraoperative ECAP has not been shown to correlate with postoperative hearing outcomes.[1] Impedance is another common electrophysiologic measurement obtained intraoperatively and is related to the electrical resistance at individual electrodes. Impedance varies with changes in perilymph fluid and surrounding tissues. High values can be indicative of electrodes located outside of the cochlea or increased intracochlear fibrosis and scar tissue.[2] Although ECAP and impedance are valuable measurements, they do not provide reliable information regarding scalar translocations, tip fold over, or preservation of residual hearing.[3]

As cochlear implant candidacy has broadened, surgeons are now able to offer CIs for patients with residual hearing. Several studies have demonstrated that preservation of residual hearing leads to improved outcomes on complex listening tasks and music appreciation.[4] Real time electrocochleography (RT-ECochG) is a novel tool that provides surgeons with electrophysiologic data during implant insertion with the hopes of preserving residual hearing. During insertion, ECochG can be recorded directly from intracochlear electrodes and provide surgeons with real time information about the interaction between the electrode array and the cochlea. Several studies have demonstrated that drops or changes in ECochG amplitude during implant insertion are associated with tip fold over or loss of residual hearing postoperatively.[5]

Smart Nav is a promising new product released by the Cochlear Corporation that aims to consolidate several intraoperative measurements into a single platform. The software provides surgeons with real time data on insertion speed, angular insertion depth, electrode placement, and NRT/impedance measurements. High insertion speeds have been associated with increased intracochlear forces that may lead to traumatic insertions with subsequent effect on postoperative outcomes. Angular insertion depth is a cylindrical coordinate system that provides a standardized measurement of implant insertion depth. The ideal angular insertion depth varies based on implant design and is related to implant size/scalar location. Although increasing angular insertion depth is needed for maximal cochlear coverage, there is a point at which deeper insertions can traumatize the distal cochlea.[7] Further research is ongoing to determine the exact role of angular insertion depth on postoperative outcomes. Finally, the Smart Nav system can provide surgeons with information on final electrode placement. Tip fold over occurs when the distal tip of the implant folds over on itself and is not able to stimulate the desired area of the cochlear nerve. Currently, tip fold over is identified with intraoperative x-ray or postoperatively due to poor speech outcomes leading to temporal bone imaging. One key advantage of the Smart Nav system is that it has the potential to allow surgeons to identify tip fold over without intraoperative imaging.

Although the basic principles for cochlear implant surgery have remained unchanged for decades, intraoperative electrophysiologic monitoring has provided surgeons with new tools to assist with appropriate and atraumatic electrode insertion. This article provides a brief overview of the various intraoperative measurements that can be obtained during cochlear implant surgery to this end. Further research is still needed to understand the relationship

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XEROSTOMIA: Current Treatments and Potential Novel Therapies

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Frequent sips from a bottle of water is an easy give away for many head and neck cancer survivors. Xerostomia is an almost inescapable toxicity of radiation therapy with a majority of patient developing some degree of dry mouth during treatment. A significant proportion of those patients will never fully recover and be left with varying degrees of dryness throughout their survivorship. Furthermore, head and neck cancer survivors only make up a fraction of those patients with salivary dysfunction, which can be caused by other disease such as Sjogren's and from medication side effects. Chronic xerostomia can adversely affect patients' quality of life in several ways including increased risk of dental decay, uncomfortable thick saliva, and difficulties speaking. Loss of saliva also prevents adequate lubrication of food leading to difficulties with deglutition, which can be debilitating in patients who already have significant dysphagia. Many patients have to take frequent sips of water in order to restore the sense of moisture that normal saliva production maintains.

Treatment does depend on the overall cause of xerostomia and baseline salivary function. While patients are encouraged to stay well hydrated, frequent sipping of water can reduce the natural mucus film or lead to disruptive nocturia if water is sipped throughout the night. Preventative measures should be recommended, such as avoidance of caffeine and alcohol which can be dehydrating. Maintaining good oral hygiene is also imperative for preventing dental decal. Other than near constant hydration, there are several treatment strategies for patients and providers to choose from when treating xerostomia. This includes saliva replacements, which can come in a variety of formulations, brands, and applications. Most products contain cellulose derivatives such as hyetellose and carboxymethylcellulose which act as lubricating agents or other chemical such as the artificial sweetener xylitol. They come in different formulations as well including sprays, rinses, lozenges and adherent discs. Patients are encouraged to try multiple products and applications as the perceived relief is often subjective and situation dependent. What works well before a meal might not work at night time. Stimulation of natural saliva can also be encouraged with sugarless gums and sour hard candies which work as gustatory and tactile stimuli. For patients who over the counter products do not work, prescription muscarinic agents, such as pilocarpine (Salagen) and cevimeline, work through parasympathetic activation directly. However, these products rely on residual functional glandular tissue and need to be taken 3-4 times per day.

While there are many saliva replacement options available, any otolaryngologist who has treated patients with radiation induced xerostomia knows that these options are often inadequate in achieving a sense of normalcy. Many patients report that saliva replacement products can feel "artificial" and that they fail to replicate the mouth feel of natural saliva. Furthermore, they often require frequent application which can be burdensome. Even the muscarinic agents require at least three times a day dosing and functional salivary tissue in order to work well. Thus, novel treatment strategies which provide a more realistic feel with lower maintenance are needed.

One strategy receiving lots of attention with regard to toxicity reduction is de-escalation. While it is not directly focused on xerostomia, any significant reduction in radiation dose will reduce the potential for post treatment dryness. Many of the major trials in head and neck cancer are focused on treatment de-escalation and prevention of toxicities. With a focus on HPV driven cancers, dose reduction is occurring in trials throughout the country such as NRG HN002 as well as many single institution trials. Some of which assess the effectiveness of less than 50 Gray as compared to prior standard of 66-70 Gray. Trials such as ECOG 3311 and the Orator trial also look toward de-escalation by promoting surgical management in place of radiation or in conjunction with a lower dose. For those patients who still require higher dose radiation, other strategies exist. Conformal therapy with IMRT can be planned to spare the superior parotid beds, which have limited oncologic benefit but great benefits with regard to salivary function. Amifostine, a free radical scavenger, has also been shown to help prevent the development of xerostomia when given during treatment. Proton beam based radiation also has some promise with regard to toxicity reduction due to the better targeting and sharper dose fall off. However, these preventative strategies are still limited to those patients receiving radiation treatment and ignore those whom xerostomia has another cause.

For those patients who already suffer with xerostomia or who will still develop xerostomia despite treatment reduction, there are several novel approaches which have yet to make it to bedside but have much promise. These strategies focus on restoring normal salivary function through a variety of means. Based on work done by Baum et al, new trials assessing upregulation of Aquaporin 1 (AQP1) expression through adenovirus transfection are being opened. [1] The virus and associated AQP1 gene are infused into the gland through cannulation of the parotid duct, allowing for transfection of ductal cells. This leads to an overexpression of AQP1 and a flow of watery saliva into the duct. All that is required is an intact ductal architecture, which is usually preserved in radiated glands. While application will likely be an in-office procedure rather than a home based treatment, this method offers a more natural and longer lasting option for patients. Similar non-adenovirus based delivery methods are also being trialed. Another approach being taken is to replace/repair the damaged gland. Triggering differentiation of already

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XEROSTOMIA: Current Treatments and Potential Novel Therapies

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present salivary gland progenitors through mimicking of paracrine signaling as well as transplantation of progenitor cells into the damaged glands are two strategies still making their way off of the bench. [2] Another promising method is the development of engineered tissue organoids, or small collections of differentiated cells grown onto a matrix, which can then be implanted into a gland to assist in restoring normal function. While these methods will likely have a higher barrier to entry for patients, the promise of salivary function repair and restoration of normal function is likely to draw significant interest from patients and providers alike.

Overall, xerostomia is still a significant barrier for many patients to achieve a sense of normalcy after treatment. Patients are encouraged to discuss symptoms with their provider and they can be referred to a number of helpful sites including the American Head and Neck Society patient information section for more information. [3] While there are options available to patients now, the upcoming and novel treatment strategies promise to be more personalized, less burdensome, and longer lasting.

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Hearing Loss Poem

Hearing Loss

by Christian Wiman in The Long Home

Only the most obvious questions
were asked her, how she felt
or if she'd slept, and even these words,
before they reached her, wavered free
of meanings as if a wind were in them.
. . . Friends and family
came close and called to her
as they would call down a well, peering
into some darkness their own altered
voicesmight rise out of. In time,
even the echoes faded, until
any moment's simple music —
a bird singing, her grandchildren
laughing –faltered before her, trembling
somewhere in the very air she breathed.
She felt sounds she was hardly conscious
of before: the deep-freezer's door
hummedwhen touched, and the
dry heartbeat of an old clock ticked
lightly into her fingers.
Her son, old himself, would lean over
hertrying to make her understand an
hourwas all he could stay, it was
Sundayor Monday, or a particular
silence was the silence of rain,
and on the long drive out here
the wet road whispered him home.
. . . Walking alone,
dawns so quiet she hears
leaves breathing light, or drifting
alone through days unchanging as
smooth water, she can almost believe
the life she remembersis life.
Lovers on the television screen
know only the words she gives them,
birds in the trees sing her memories
of their song.
. . .She answers the softest knocks
at her door, surprised each time
that no one is there, she listens intently
to mirrors, stands at a window
bringing the wind inside.
. . . Until, in the muted light of the late
afternoon she lies resting, resisting
sleep like a small child
who has stayed up too long, who half
dreams the arms that hold her, the room
full of voices and laughter, but cannot
bring herself wholly into the world
where they are.

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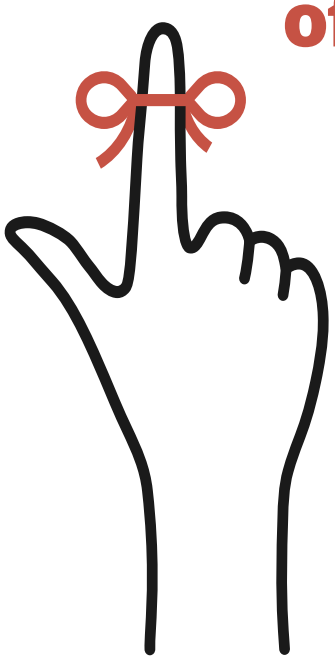

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