Acceptance type: Oral

3

Use of App-Based Technology for Remote Cochlear Implant and Bone Conduction Care

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Abstract

Introduction:

Many families of children with cochlear implants/bone conduction devices at our center face obstacles to accessing service due to geographical distance or medical challenges. We participated in a in a pre-market release of a synchronous remote care tool which benefited our Ci and BC patients. We have been able to overcome remote connection hurdles and securely provide quality hearing care to more patients by leveraging existing connectivity features of the fitting software, sound processors, and app technology.

Methods:

Interested recipients were guided through the enrollment process and we imitated a visit virtually. The audiologist had the ability to make programming adjustments, enable device settings, and provide counselling via live video. The virtual appointments typically take less time than an in-clinic visits and allowed the child and family to connect with our team from the comfort of their home.

Results:

We have successfully implemented this process using direct connection from the fitting software to the patient's smartphone app, streamlining access to virtual care. For the majority of our families this appointment is sufficient to resolving patient issues and increased patient satisfaction of care. This technology has saved many families a 2+ hour trip to the clinic to make programming changes that take less than 10 minutes.

Conclusion:

While many professions have been able to move quickly into providing telehealth, audiologic efforts have stalled at institutions around the country. Remote care tools provide a valuable/effective way to connect virtually with our patients, allowing for increased access to care.

4

Slide Tracheoplasty: Oral Feeding and Dysphagia Management from the SLP Perspective

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Abstract

Objective: To describe the slide tracheoplasty (STP) approach to surgical intervention for long segment tracheal stenosis and potential oral feeding complications and management. Emphases will be placed on pre- and post-operative dysphagia data including incidence, severity, change in dysphagia over time and trends in pharyngeal swallowing dysfunction observed in this population.

Methods: Retrospective case series performed using chart review. Clinical evaluation, parent report, Video Fluoroscopic Swallow Studies (VFSS) and Fiberoptic Evaluation of Swallowing (FEES) were used to assess swallowing outcomes. Results compared to relevant research.

Results: This study included 23 patients who received a STP and survived their post-operative course.

Preoperatively, 11 (48%) were taking a full regular diet without need for modifications and 10 (44%) were NPO. Postoperatively, 14 (61%) were ultimately cleared for a regular diet and of those patients, 5 (36%) achieved that diet within 3 weeks post-operatively.

Postoperatively, 10 patients participated in an objective assessment of swallow function (1 FEES and 9 VFSS). Aspiration was documented in 9 (90%) and delayed triggering of the pharyngeal swallow in 4 patients (40%). Three of 4 (75%) patients with delayed triggering subsequently aspirated.

Conclusion: Dysphagia can occur in patients following this procedure, but improves in most patients. The range in time to a regular diet was varied and was impacted greatly by preoperative feeding status. These results allow for more comprehensive preoperative counseling as well as preparation for families regarding post-surgery expectations.

5

Predictors of Overnight Postoperative Respiratory Complications in Obese Children Undergoing Adenotonsillectomy for Obstructive Sleep Apnea

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Abstract

Background: Current clinical guidelines recommend a preoperative polysomnogram for obese patients prior to adenotonsillectomy (T&A) and overnight admission for children with oAHI >10. Considering that many of these children have uncomplicated postoperative courses, we examined variables that could more accurately predict overnight PRCs and indicate the need for post-surgical admission after T&A.

Methods: A single-center retrospective chart review was performed on a cohort of patients who underwent T&A and had BMI >95th percentile, preoperative polysomnography (PSG), and overnight post-surgical admission. Multivariable binary logistic regression analysis was performed to assess relationship of BMI z-score, polysomnography parameters, and PACU events with overnight respiratory complications.

Results: Lower O2 saturation nadirs on polysomnography were an independent predictor of respiratory complications overnight (OR = 0.953, 95% CI = 0.91-0.99, P=0.021), as was sleep time with O2 saturation less than 90% (TST90) (OR = 1.04, 95% CI = 1.00-1.07, P=0.048). A prediction model yielded an ROC curve with AUC 0.89 (95% CI 0.82, 0.96). At a cutoff of O2 saturation nadir <80%, overnight PRCs were predicted with 70.8% sensitivity and 75.2% specificity. At a cutoff of >0.5% of sleep time with O2 <90%, overnight PRCs were predicted with 82.6% sensitivity and 62.0% specificity.

Conclusions: Our findings reaffirm the use of O2 saturation nadir on PSG <80% as a predictor of PRCs after T&A. We also suggest considering postoperative admission for patients who experience >0.5% sleep time with O2 sat <90% during PSG due to increased risk of overnight postoperative respiratory complications.

6

Characterization of Dysphagia in Infants with Laryngomalacia

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Abstract

Background: Laryngomalacia is associated with dysphagia, aspiration, and feeding difficulties among infants, but specific elements of swallow dysfunction in this population have not yet been characterized.

Methods: We performed a retrospective chart review of swallow study reports of patients <12 months with a diagnosis of laryngomalacia who underwent modified barium swallow study (MBSS) with standardized protocol at a tertiary academic medical center between 5/17/12 and 7/24/18. Validated MBSS elements were examined and aspiration sub-group analysis was performed.

Results: A total of 64 infants (57.8% male, 42.2% female, mean age 3.0 months, SD 2.4 months) underwent MBSS. 100% of infants demonstrated at least one element of pharyngeal phase dysfunction, with abnormal location of initiation of pharyngeal swallow and tongue base retraction occurring most frequently. Infants who aspirated (n=36) showed significantly higher rates of abnormal number of sucks to form bolus (43.8% vs 11.5%, p=0.009), epiglottic movement (80.6% vs 42.9%, p=0.003), and late laryngeal vestibular closure (86.1% vs 14.3%, p<0.001). Apgar 5 score was significantly lower for infants who aspirated (M=6.7, SD=2.1) than those who did not t(62)=2.4, p=0.02. Significant differences in clinical recommendations for those who aspirated included liquid consistency change (47.2% vs 10.7%, p=0.002), follow-up imaging (69.4% vs 14.3%, p<0.001), and allowance of thin-liquid diet (61.1% vs 100%, p<0.001). Univariate logistic regression revealed no significant relationship between infant characteristics and aspiration.

Conclusions: MBSS remains an important evaluation tool in laryngomalacia given the high prevalence of dysphagia and difficulty in predicting aspiration in this population.

8

Cost and Outcome Differences in External versus Internal Mandibular Distraction Osteogenesis in Infants with Robin Sequence

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Abstract

Background: Robin sequence (RS) is characterized by micrognathia, glossoptosis, and airway obstruction. Mandibular Distraction Osteogenesis (MDO) during infancy surgically improves airway obstruction and feeding. There is little data exploring differences in short-term outcomes and cost for internal versus external MDO.

Methods: Medical and billing records of infants who underwent MDO between 1/2011–1/2021 were reviewed. Data collected included charges, demographics, length of stay (LOS), complications, intubation duration, distraction type, and enteral and/or intravenous access type. One-way MANOVA testing and significance testing was conducted using R Core Team (2020) to determine differences in short-term outcomes and cost between distractor types.

Results: Of 29 MDO cases, 52% (15/29) were male with mean age of 12 ±18 days. Mean postoperative and overall LOS were 19±10 days and 31 ±13 days, respectively. 19 underwent external MDO and 10 underwent internal MDO with virtual surgical planning (VSP). External MDO was significantly less expensive compared to internal MDO ($27K vs $48K, $p<0.01$). There was no significant difference in rates of postoperative extubation after 5 days, infectious, cardiopulmonary, hematologic, or neurologic complications, or rates of gastrostomy tube or central line placement between external and internal MDO.

Conclusion: Internal MDO with VSP, while more expensive, may offer more precise distraction and avoidance of tooth buds. However, there is no significant difference in short-term outcomes and complications between internal and external MDO. Further study is needed to determine if long-term outcomes such as asymmetry or secondary procedure rates differ between the two methods.

10

A QI Project to Improve Patient Outcomes and Maternal Satisfaction after Office Frenotomy

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Abstract

Background: Ankyloglossia is a congenital condition characterized by an abnormally short, tight lingual frenulum. Ankyloglossia is cited as a cause for difficulty with breastfeeding, maternal reports of pain with breastfeeding and can manifest as difficulty latching or weight loss. It has been reported that ankyloglossia is present in 0.1-12% of newborns. The primary objective of this QI project is to evaluate the outcomes for mothers and their breastfeeding infants undergoing office frenotomy.

Methods: During the office visit, an Advanced Practice Provider (APP) completes a history and physical exam. Questions include pain with breastfeeding, difficulty latching, weight loss, and if they are first time breastfeeding mothers. If a frenotomy is completed, the family is contacted after to obtain outcomes such as indication for frenotomy resolved, weight gain and continuation of breastfeeding.

Results: 1524 patients have undergone office frenotomies with 60% less than 30 days old. 72% reported the indication for the frenotomy resolved. Average pre-procedure reported maternal pain was 5.4 which decreased to 0.9 after. 74% reported they continued breastfeeding after procedure and 57% were first time breastfeeding mothers.

Conclusions: Frenotomy is procedure that can be done safely in the office setting. It should be considered in newborns and infants with ankyloglossia who present with difficulty nursing. It is important to remember factors such as maternal experience, milk production, or breast anatomy can affect the ability to breastfeed Although we did not initiate this QI project as a cost saving measure, it has advantages of saving money and avoiding general anesthesia.

17

Pediatric Tonsillectomy and Adenoidectomy: How do we care for you at home?

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Abstract

Background: Research has shown that multimedia patient education can increase patient satisfaction and improve outcomes after surgery. At our institution an extensive library of patient/family written information on caring for children after surgery exists. However, other forms of education are limited. Use of videos for patient education can facilitate knowledge, has shown to reduce anxiety prior to surgery, it standardizes education and therefore improves patient outcomes.

Methods: A video was designed for children undergoing tonsillectomy/adenoidectomy surgery. The script replicated the information presented in the written material. Goals for this video are to increase patient and family's knowledge on postoperative tonsillectomy/adenoidectomy care, to decrease caretaker phone calls and re-admissions, and to standardize the educational content. The team collaborated with the nursing instructional design technician who applied video development skills to the story.

Results: The completed video was added to the multimedia educational library and a QR code was designed and added to the tonsillectomy written materials. After surgery patients and families are sent a survey to assess the use of the video and determine its helpfulness

Conclusion: Multimedia forms of education allow patients and families to view information before and after surgery, on their electronic devices. The video provides standardized information for all children undergoing tonsillectomy/adenoidectomy surgery. The next steps include plans to produce videos for other surgical procedures and in languages other than English.

18

Opioid Prescribing Trends After Major Pediatric Ear Surgery: A 12-year Analysis

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Abstract

Background

Postoperative opioid prescriptions tend to exceed children's analgesic needs, but awareness of the opioid epidemic may have driven changes in prescribing behaviors. This study evaluated opioid prescribing patterns after major pediatric ear surgery.

Methods

This study reviewed all cases of tympanoplasty, tympanomastoidectomy, mastoidectomy, cochlear implantation, otoplasty, and aural atresia repair at a pediatric hospital during 2010-2021. Regressions were conducted to identify opioid prescribing trends over time. Potential covariates were assessed. Returns to the system were reviewed as a balancing measure.

Results

Even without a targeted protocol, opioid prescribing declined significantly. After prescribing peaked in 2012-2013, significant negative trends yielded lower rates of opioid prescriptions, fewer doses per prescription, smaller patient-weight-standardized dose sizes, and less variability (all $P < .001$). In 2012, 96.1% of patients received opioid prescriptions; the rate fell to 13.5% by 2021. The annual average supply of doses per prescription decreased by 68% between 2013 and 2021, reducing the total days' supply to an evidence-based 3.1 ± 1.6 days. Academic surgeons were significantly less likely than private-practice surgeons to prescribe opioids, and academic prescriptions contained fewer and smaller doses ($P < .001$). Regressions did not detect changes in returns to the system. Pain-related returns were rare (0.9%) and did not vary by opioid prescriptions ($P = .37$). Prescribing trends were closely correlated with a tonsillectomy-focused protocol that our institution implemented in 2019.

Conclusion

Surgeon-driven opioid stewardship has improved with no resultant change in revisit rates. Procedure-specific quality improvement interventions may have broader off-target effects on prescribing behaviors.

19

Noise Exposure in Pediatric Otolaryngology Clinic: A sound survey of a single-institution tertiary care facility

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Abstract

Healthcare providers exposed to considerable noise can predispose them to stress-related health disorders and poor working environments. The Occupational Safety and Health Administration (OSHA) set the limit for exposure as 85 dBA (LAeq, 8h)/140 dBC (LCpeak = peak sound). However, literature has shown that exposure to less may cause untoward health effects. No research exists on noise exposure in pediatric Otolaryngology. Thus, this project's goal is to evaluate the noise exposure to which pediatric otolaryngologists encounter in the clinical setting.

We performed a sound survey of 420 pediatric otolaryngology clinic visits within a single-institution tertiary care facility from January 2022 – March 2022. At each visit, noise was measured using a calibrated NIOSH Sound Meter application, an iPad, and a Dayton Audio iMM-6 microphone. The LAeq, peak SPL, LCpeak, 8-hour time-weighted average sound level (TWA), and DOSE were recorded.

This investigation revealed that the average LAeq was 61.1dB, the median was 60.3dB and the average peak SPL was 80.5dB. Only 0.5% of visits reached a LAeq above 80dB. However, 51% were above 60dB and 99% were greater than 45dB. No provider was exposed to noise exceeding limits.

The results from a tertiary care pediatric otolaryngology clinic suggests that providers do not exceed noise limits. However, they are exposed to levels above those which have been linked to stress, poor productivity, and possibly stress-related disorders. This represents the first study examining noise exposure in pediatric Otolaryngology, and research should evaluate the risks from noise exposure in this environment.

20

Evaluating Obesity as a Risk Factor for Complications After Pediatric Adenotonsillectomy

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Abstract

Background

Conflicting evidence exists regarding the risk of post-adenotonsillectomy complications associated with childhood obesity.

Methods

This retrospective analysis assessed outpatient pediatric tonsillectomy/adenoidectomy cases performed at 2 ambulatory surgery centers in 2020. Complications in the recovery unit and within 2 weeks of surgical discharge were reviewed along with clinical and demographic variables. Obesity was defined as sex-specific body mass index-for-age, or weight-for-age if height data were unavailable, at or above the 95th percentile. The 99th percentile served as the threshold for severe obesity. Analyses used Chi-square/Fisher's exact tests and independent-samples *t*-tests with relative risk or effect sizes when significant.

Results

Of 708 cases included in the review, 180 patients were obese. Overall incidence of complications in the recovery unit was 9.0%. Patients with obesity were significantly more likely to require supplemental blow-by oxygen (P = .01); relative risk was 1.65 (95% CI: 1.16-2.35) times greater in the cohort with obesity. Obesity had a small effect on the postoperative oxygen saturation nadir, which was significantly lower among patients with obesity (*d* = -0.34; *P* < .001). No differences emerged between cohorts with and without obesity in the incidence of any other complications before or after surgical discharge. Overall incidence of post-discharge returns was 7.9%. Incidence of complications did not vary by obesity severity.

Conclusions

Outpatient adenotonsillectomy is a safe option for children with obesity; childhood obesity does not warrant routine inpatient care. Patients with obesity should receive additional monitoring for oxygen desaturation events during the first hours of recovery.

23

Mitigation Strategies for Surgical Aerosol in the COVID-19 Era

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Abstract

Background: Aerosol generating procedures commonly used in pediatric otolaryngology pose a risk for SARS-CoV-2 transmission. This study examined methods to mitigate surgical aerosols in the operating room.

Methods: Using both a particle counter and thermal imaging system(Figure 1), 4 mitigation strategies were investigated: intraoral Yankauer, extraoral smoke evacuation system(SES), suction bovie pencil, and combined Yankauer/SES. Levels of electrocautery smoke escaping each strategy were measured in an intubation simulator. Significance of results was assessed by Analysis of Covariance(ANCOVA) and Tukey method.

Results: Both measurement systems produced similar results. As shown in Table 1, intraoral suction methods were superior to any method incorporating extraoral methods(SES).

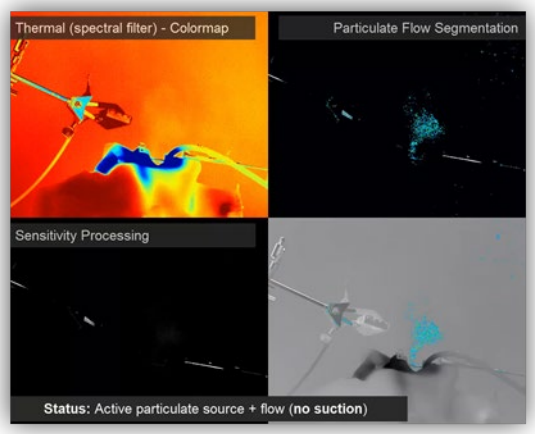

Figure 1: Thermal imaging system

Table 1. Comparison of odds of differences between log average particle counts

Comparison	Estimate*	Lower limit(ll)	Upper limit(ul)	p-value
SES Yankauer - SES	0.6044	0.5914	0.6177	<0.0001
Suction Bovie – SES	0.4944	0.4838	0.5053	<0.0001
Yankauer – SES	0.5775	0.5651	0.5902	<0.0001
Suction Bovie - SES Yaunker	0.818	0.8004	0.836	<0.0001
Yankauer – SES Yankauer	0.9554	0.9349	0.9764	0.0063
Yankauer - Suction Bovie	1.168	1.1429	1.1937	<0.0001

(Values in ll and ul in ANCOVA table are the 95% confidence limits.)

Conclusions: Intraoral suction techniques are recommended for aerosol mitigation. Extraoral SES use alone is insufficient, and may be counterproductive when used with intraoral suction techniques. Further work is needed to determine the optimal mitigation strategy for intraoperative surgical aerosols.

24

Assessment of Impact of Sociodemographic Disparities in Speech And Language Outcomes For Children With Cochlear Implantation In Diverse Pediatric Cohort

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Abstract

Background: Cochlear implantation (CI) is recommended for some children with severe to profound hearing loss (HL) to improve speech and language outcomes. Few studies have investigated how social determinants of health affect these outcomes. We examined how sociodemographic and audiologic factors affect receptive language (RL) outcomes (Preschool Language Scale and Clinical Evaluation of Language Fundamentals) in children with CI.

Methods: Retrospective cohort study of patients with congenital HL with first CI by 4 years old after January 1, 2007.

Results: Among 79 patients, 42 (53%) were females, 44 (54%) under-represented minorities, and 56 (71%) had public insurance. At least one year after their first CI, the median RL score was 69 (range 50-117).

Females (p=0.005), private insurance (p=0.00001), Cochlear Implant Profile (CHIP) score below 4 (p=0.0001), and first CI at or before 12 months old (p=0.0009) were significantly associated with improved RL outcomes. Public insurance was significantly associated with later age at CI (p=0.003). Mediator analysis of insurance type on RL showed significant total and direct effects, but no indirect effect via age of implantation (total: coef= -13.00, p=0.02; direct: coef= -12.26, p=0.03; indirect: coef= -0.75, p=0.47). Sociodemographic variables had large effect sizes, with CHIP having the largest effect size (d=1.3).

Conclusion: Sociodemographic factors have large impacts on RL outcomes. Public insurance is associated with worse RL, not mediated by later age at CI, suggesting that factors other than age of implantation primarily impact language outcomes in publicly-insured children with CI.

25

Mixed methods study of factors that impact success of natural-sleep ABR in a diverse patient cohort

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Abstract

Background: Hearing loss affects about 0.2% of newborns. Auditory brainstem response (ABR) is the gold standard diagnostic test for infants unable to participate in behavioral audiometry. ABR is preferably completed under natural sleep (NS-ABR) to avoid risks associated with general anesthesia. If the infant wakes up during testing, the NS-ABR must be stopped and may need to be repeated at a later date. These delays may delay cognitive and educational development. Studies on successful NS-ABR have focused on alternative forms of sedation. We performed a mixed-methods study to understand the barriers to obtaining a successful NS-ABR (clinically sufficient for management).

Methods: Retrospective review of a convenience sample of patients 0-12 months old who received an NS-ABR from January 2015 to March 2022. Semi-structured interviews with providers were analyzed with content analysis.

Results: For our quantitative approach, 87/167 patients were conveniently sampled, of which they had 166 NS-ABRs. This population was considerably diverse. 62 (37%) NS-ABRs were successful. The most common reasons for unsuccessful NS-ABR were poor sleep quality (n=63, 61%), needing to "expand and confirm findings" (n=26, 25%), and lack of or nonadherence to patient instructions (n=24, 23%). Five themes emerged from our interviews, which revealed that individual, provider, and systemic factors interact with one another to impact success of NS-ABR, before, during, and after each visit.

Conclusions: We formed a conceptual model of how individual, provider, and systemic factors impact NS-ABR based on our qualitative and quantitative findings to help create targeted and effective interventions for NS-ABRs.

26

Outcomes of Pediatric Patients with Invasive Fungal Rhinosinusitis

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Abstract

Background:

Acute invasive fungal rhinosinusitis (IFRS) manifests almost exclusively in severely neutropenic individuals and is challenging to manage. This study seeks to describe the impact of clinical factors on mortality among pediatric patients who have undergone biopsy for suspected IFRS relative to a comparable clinical population.

Methods:

This is a single-site three arm retrospective review of mortality among patients undergoing sinonasal biopsy for suspected IFRS, with a control group of similar patients for whom IFRS was not suspected. Data collected included biopsy result, cause of death in those biopsied, underlying diagnosis, time from most recent major oncologic event, corticosteroid use, fungal species, and duration of neutropenia.

Results:

Mortality was higher among patients undergoing biopsy to rule-out IFRS (35.1%) compared to a control cohort (9.72%) ($p<0.05$). A positive biopsy did not increase the mortality rate relative to those with a negative biopsy, and most biopsy-positive patients did not die of IFRS ($p=0.501$). Among biopsy patients, all patients with relapsed ALL expired. Other clinical factors examined did not impact survival.

Conclusions:

Patients requiring biopsy to rule out IFRS had a significantly higher mortality than the control population, while biopsy result did not impact mortality. This implies that other disease processes contributing to a need for biopsy to rule out IFRS may increase mortality in a manner similar to IFRS; expeditious biopsy remains important, even if ultimately negative, to facilitate appropriate treatment. Additionally, the dismal prognosis noted in relapsed-ALL patients requiring biopsy may be useful for clinicians counseling caregivers.

32

Positive Impact of Continuous Interval Auditory Processing Assessment and Intervention over Childhood: a Twenty Year Review

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Abstract

BACKGROUND

We reviewed our 20-year experience with an Auditory Processing Dysfunction (APD) program within a private practice setting to assess the value of scheduled interval follow up testing over childhood with respect to outcomes and documentation of progression to within normal findings over time.

METHODS

We undertook a retrospective study of 552 patients identified and/or referred for APD testing over 20 years, including analysis of personal communications with patients, parents, and referral sources. We evaluated for trends in age of new patients, referral sources, testing results, therapy resources, education system compliance, and long-term follow-up results from planned continuous interval testing over childhood. Analysis of serial testing results was performed to evaluate documented progression to within normal-for-age testing results over time, or not, with patient/parent perception of clinical progress. The utility and benefit of maintaining a long-term patient/parent – audiologist relationship was assessed.

RESULTS

There was a consistent trend for correlation of documented and perceived improvement in binaural integration-separation scores when identified as abnormal in younger children. Increased academic institutional support and ever-widening parent-parent social communication awareness has resulted in earlier identification of children with APD and secondary ease of entry into necessary home and school accommodation and therapy. There is value in maintaining a long-term patient/parent – audiologist relationship.

CONCLUSIONS

Continuous planned interval follow-up auditory processing assessment and intervention over childhood has documented and perceived patient and family long-term value when managing children with APD.

34

Auditory brainstem response characteristics in pediatric enlarged vestibular aqueduct

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Abstract

Background: Enlarged vestibular aqueduct (EVA) is a congenital malformation of the temporal bone currently identified as the most common radiographic abnormality in children diagnosed with sensorineural hearing loss. Audiometric data are widely variable across patients with EVA. Although sensorineural hearing loss occurs most frequently, conductive and mixed losses arise as well. Hearing loss can be stable, progressive, or fluctuating and age at onset of hearing loss varies greatly, although the majority of affected subjects experience hearing loss during childhood.

Methods: To further characterize the clinical presentation of hearing loss in EVA, a retrospective analysis of auditory brainstem responses (ABRs) in 41 pediatric patients was conducted.

Results: Three main ABR patterns were revealed. Six patients (14.6%) presented with auditory neuropathy spectrum disorder (present cochlear microphonic in the absence of neural waveforms) and 24 patients (58.6%) had ABRs typical of sensorineural hearing loss (presence of waveforms and thresholds correlated with the degree of behavioral hearing loss). The third category was composed of 11 patients (26.8%) with an abnormally large wave I with an amplitude up to twice that of wave V. Otoacoustic emissions were absent in these ears while the degree of hearing loss ranged from mild to profound.

Conclusions: These results add to the spectrum of clinical findings in children with EVA.

35

Long-term outcomes of Tympanoplasty in children with prior cleft palate repair

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Abstract

Background: Optimal timing and technique of pediatric tympanoplasty has been debated and data are even more limited in children with a history of cleft palate (CP). Given this population's propensity for Eustachian tube dysfunction, we aim to examine predictors of tympanoplasty success in children with prior cleft palate repair.

Methods: We performed a retrospective chart review of children less than 18 years of age with prior CP repair who underwent tympanoplasty for tympanic membrane perforation over a ten-year period. The primary outcomes were 1) anatomic success in reconstructing the tympanic membrane and 2) functional success, defined as post-surgical Pure Tone Average (PTA) of ≤20 dB. Multivariable logistic regression was performed to determine demographic predictors of tympanoplasty success.

Results: A total of 35 patients (42 ears) underwent primary tympanoplasty. Median age was 11.1 years (range 3.6-17.1), and 57.1% were female. Anatomic success was achieved in 37 ears (88.1%, range 3.6-17.1 years), and functional success was achieved in 19 ears (51.4%, range 4.3-17.1 years). Controlling for sex, syndrome status, and perforation size, increasing age at tympanoplasty did not show an increased odds of anatomic or functional success (aOR 0.9 [95%CI 0.6-1.2], p=0.349; aOR 0.9 [95%CI 0.6-1.0], p=0.091, respectively).

Conclusions: In children with a history of CP repair, age was not a factor in graft success or hearing outcomes after tympanoplasty. Larger studies are warranted to corroborate these findings and to guide clinicians in optimal management and counseling for tympanoplasty in this population.

39

Public Knowledge of Button Battery Ingestions: A social media based cross-sectional analysis.

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Abstract

Background: Efforts to reduce the prevalence of esophageal button battery (BB) impactions have included public health measures and research focused on the epidemiology, risk factors, and mechanisms of injury in BB impaction; however, the penetration of current public health measures is unknown.

Methods: An online cross-sectional crowdsourcing survey was distributed through institutional social media platforms.

Results: A total of 705 survey responses were obtained: 68% of respondents were Canadian (452/705, 64% (538/705) had a University degree, 66% had a household income of more than $75,000 CAD/year (462/705). The majority of respondents knew that button batteries could cause injury (86%) or death (71%) when ingested. The majority of participants (83%, 582/705) had children in their home. 46% (320/702) of respondents endorsed regularly checking if button batteries were fastened into devices. More respondents with children at home knew that swallowing a BB could cause death than those without (72% vs 59%, p = 0.007). The majority of respondents did not know to give a child honey after the suspected ingestion of a BB (75/702, 11%); however, more respondents without children at home correctly identified the importance of honey administration (18% vs 10%, p = 0.016).

Conclusion: The majority of the public is aware of the dangers of BB ingestion highlighting the importance of engaging policy makers to reduce BB injuries. However, this study identified gaps in the public's knowledge of the role of honey in managing BB injuries. Focused effort is required to increase public knowledge about mitigating strategies.

40

Advances in auditory neuropathy spectrum disorder diagnosis and management: A 15-year review

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Abstract

Background: Auditory neuropathy spectrum disorder (ANSD) is a common cause of hearing impairment, accounting for 10 to 15% of permanent childhood hearing loss. ANSD is characterized by intact outer hair cell function, evidenced by present otoacoustic emissions and/or a repeatable cochlear microphonic, and either abnormal or absent waveforms on auditory brainstem response testing.

Methods: The aim of the study was to review the demographic and clinical characteristics, type and timing of intervention and outcomes of all pediatric patients diagnosed with ANSD by a pediatric health care system from 2005 to 2020. We also sought to examine whether our diagnostic and management capabilities in an ANSD population have evolved as our institutional experience has grown and knowledge in the field has expanded.

Results: About 40% of affected children were premature and most were admitted to the NICU. More than a third of our patients presented with a complex medical history and/or neural involvement while about 30% were full term newborns with no risk factors. Drastic improvements were made in the identification of ANSD, with a significant decrease in the age at diagnosis and a reduction in the percentage of misdiagnosed patients. Similarly, a noteworthy decrease in the age at hearing aid fitting and age at cochlear implantation (CI) was observed over time.

Conclusions: CI constituted the major rehabilitative intervention that allowed for speech perception in patients who did not benefit from conventional amplification.

42

Fluctuating hearing loss in EVAS: To treat or not treat? – a systematic review of treatment options and their outcomes.

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Abstract

Background:

Enlarged Vestibular Aqueduct Syndrome (EVAS) is a cause of childhood hearing loss where up to 60% of patients experience episodes of fluctuating hearing function. The hearing deterioration is often significant and can be catastrophic in patients with pre-existing severe hearing loss. This can result in complete loss of hearing, which we term an EVAS crisis. There are no guidelines on the treatment of fluctuating hearing loss in EVAS. This review aims to identify the treatment options for patients in EVAS crisis and their success rates.

Methods:

The EMBASE, Medline OVID, and World of Science databases were searched and 13 of 1064 articles were included in the final analysis. Data on the number of patients, number of episodes, treatment administered, baseline hearing, and change in hearing after intervention was analyzed.

Results:

Systemic steroids were the mainstay of treatment and salvage hyperbaric oxygen therapy (HBOT) was used in partial and non-responders. Patients treated with steroids had a higher rate of recovery (56%) than those who were observed (11%). Patients undergoing salvage HBOT had an 87.5% chance of improvement.

Conclusion:

Patients in EVAS crisis may first be treated with systemic steroids as it is more effective in restoring hearing than observation. Salvage HBOT has been shown to be effective if there is poor response to systemic steroids and should be considered to give these patients the best chance at a functional hearing outcome.

43

Efficacy of Tympanostomy Tube Placement with Adjuvant Adenoidectomy in Children Less Than 4 years of Age

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Abstract

Background:

About 8.6% of children in the United States undergo tympanostomy tube (TT) placement every year. Of these, 24.1% require a second set of tubes. Adjuvant adenoidectomy in children over 4 years is thought to improve the efficacy of TT. The goal of this study is to characterize the efficacy of adjuvant adenoidectomy at the time of TT placement in children under 4 years, to further improve middle ear function.

Methods:

All patients undergoing TT placement alone or TT placement with adenoidectomy from 2014-2016 were reviewed. The primary outcome was need for subsequent tube placement.

Results:

A total of 485 patients were included in the study (59.4% male, 40.6% female). Median age at initial TT placement was 20 months (range 5-153 months); extreme outliers for age were removed from further analysis. Patients were followed for 1-8 years. 264 patients received TT alone while 221 received TT with adenoidectomy. 134 required a second set of tubes. Older children were more likely to undergo adjuvant adenoidectomy with TT placement (OR=1.074, $p<0.001$).

Adjuvant adenoidectomy in patients 0-48 months was associated with decreased likelihood of requiring subsequent tube placement (OR=0.578, $p=0.018$). There was no association between experiencing post-operative otorrhea with TT alone or TT with adenoidectomy.

Conclusion:

Adjuvant adenoidectomy at the time of initial TT placement has a role in the management of chronic middle ear disease in patients younger than 4 years.

48

Feeding Position for Infants with Cleft Palate and Aspiration Risk

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Abstract

Infants who are born prematurely or with certain medical conditions are at increased risk of pharyngeal dysphagia, specifically aspiration. One strategy that is employed to reduce aspiration risk during feeding in these infants is an elevated side-lying position, as opposed to an upright position.

Infants who present with cleft palate and other medical conditions may have *both* oral *and* pharyngeal swallowing difficulty. For such infants, an upright position may compensate for impaired oral function, while simultaneously increasing risk of aspiration. No research has assessed the effect of body position on oropharyngeal swallow function in infants with both cleft palate and medical conditions such as prematurity, neurologic conditions, and/or syndromes/sequences. Therefore, the purpose of this investigation was to assess the impact of position on swallow function in this population through direct visualization of the swallow via radiologic imaging.

Infants with both cleft palate and aspiration risk underwent Modified Barium Swallow Studies (MBS). Each infant was captured swallowing with the same nipple and liquid viscosity in both upright and side-lying positions. Oropharyngeal swallow function and incidence of aspiration were compared.

Incidence and severity of aspiration improved for some, but not all infants in this sample. Incidence of nasopharyngeal regurgitation remained consistent across body positions. Results are reported in case series format.

Preliminary results indicate that for infants with both cleft palate and cooccurring medical complexities, an elevated side-lying position may reduce aspiration risk. However, instrumental assessment of the swallow is recommended to guide positioning for individual infants in this population.

54

Assessing the Impact of COVID-19 Precautions on Classroom Communication for Adolescents with Hearing Loss: A Qualitative Study

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Abstract

Background: Public health measures such as masks and social distancing during the COVID-19 pandemic have presented unique challenges for people who are hard-of-hearing. Previous studies have found that hard-of-hearing students can experience communication challenges in classrooms, however no equivalent studies have been conducted during the COVID-19 pandemic. This study seeks to understand how adolescents with varying levels of hearing loss, including those with normal hearing, would describe their experiences communicating in a classroom environment during the COVID-19 pandemic and its associated public health measures.

Methods: Adolescents ages 12-17 with and without hearing loss were interviewed in a one-on-one semi-structured format. Interviews were transcribed and analyzed using a reflexive thematic analysis to conceptualize the main themes from the data.

Results: Fourteen adolescents were interviewed, 9 with hearing loss and 5 with normal hearing. Pandemic associated challenges such as masks muffling speech, protocol fatigue, and missing pre-pandemic life were present in both the hearing loss and normal hearing groups. Classroom communication for adolescents with hearing loss was disproportionately affected by pandemic measures, leading to challenges making friends, feeling behind peers in learning, and listening fatigue. Resilience was noted among adolescents with hearing loss in their ability to adapt to pandemic measures and changing classroom dynamics. For adolescents with unilateral hearing loss, the pandemic provided an improved listening environment via a reduction in background noise.

Conclusions: Pre-existing classroom communication challenges for adolescents with hearing loss were amplified during the COVID-19 pandemic and shared in part by those with normal hearing.

56

Social Determinants of Otitis Media Treatment in a Commercially Insured Population

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Abstract

Objectives: It is well established that social disadvantage is associated with earlier, more frequent, and more severe otitis media (OM) in children. Here, we describe social inequalities in OM treatment.

Methods: This retrospective analysis of 4.8 million children with OM in the 2003-2021 Optum Clinformatics database identified the following exposures: age of first OM diagnosis, gender, allergies, reflux, adenotonsillar hypertrophy, zip code, and social deprivation index. Effects on the treatment of recurrent and suppurative OM, insertion of tympanostomy tubes, and treatment for severe complications of undertreated OM were assessed.

Results: We identified 994,921 (19.6%) treated for recurrent OM, 717,978 (14.9%) treated for suppurative OM, 335,949 (7.0%) who received tympanostomy tubes, and 10,975 (0.3%) with severe complications of OM. In multivariable regression analyses fully adjusted for patient factors and social indices, earlier age at diagnosis, male gender, allergies, reflux, and adenotonsillar hypertrophy were associated with increased treatment for OM, while social deprivation was associated with lower odds of treatment for recurrent OM (OR, 0.86; 95% CI 0.85, 0.87), suppurative OM (OR, 0.61; 95% CI 0.6, 0.62), and insertion of tympanostomy tubes (OR, 0.76; 95% CI 0.75, 0.78), but higher odds of having severe complications (OR, 1.28; 95% CI 1.19, 1.37).

Conclusions: While OM is associated with social disadvantage, socially disadvantaged children were less likely to receive treatment for OM and more likely to experience complications for undertreated OM. As OM is a modifiable risk factor for hearing loss, efforts must be made to ensure equitable access to treatment for all children.

57

Team Approach to Management of Newborn Auricular Malformation

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Abstract

Background

Ear molding is a simple, non-surgical, safe, and cost-effective intervention, that can be applied to a variety of congenital ear deformities with excellent results. The goal of this research is to evaluate the effectiveness of our team approach to ear molding therapy utilizing a screening protocol for identifying auricular malformations in the newborn population with expedited evaluation, therapy initiation, and follow-up by ENT Advanced Practice Providers (APPs) in Ear Molding Clinic.

Methods: After the hearing screen technicians (HSTs) identified children with auricular malformation during the newborn hearing screen, the auricular malformation team was immediately alerted, and consultation with Otolaryngology APPs occurred with the application of the ear molds on the same day.

Results: In 36 months, 26 patients were evaluated and ear moldings were applied. The average age of treatment initiation was 2.75 weeks with the average treatment duration of 3.13 weeks. 77% of parents reported satisfaction with outcomes, 19.2% of patients didn't follow up, and 3.8% of patients developed irritation therefore treatment was stopped. The families reported increased satisfaction with the expedited evaluation, treatment, and easy access to follow-up appointments.

Conclusion: The team approach in auricular malformation management resulted in expedited identification and treatment of newborn auricular malformation and improved patient satisfaction and results. Team approach management show improvement in patient access to quality care, alleviating individual workload and preventing provider burnout. The APPs were also utilized to their highest potential, increased productivity, and yielded financial benefits.

62

Integrating Psychology Services into Pediatric Audiology/Otolaryngology Clinics: A Model of Care for Deaf and Hard of Hearing Patients

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Abstract

Background: Research has shown that hearing differences and its intersection with social, systemic, and community factors, has concomitant effects on numerous areas of child development, including executive functioning, behavioral challenges, anxiety, depression, social functioning, academic performance, and parental interactions. However, treatment of pediatric hearing differences historically has not targeted the "whole child" beyond audition and speech. This presentation will briefly review what is known about psychopathology and neurodevelopmental concerns in deaf/hard of hearing (DHH) children, identify current clinical gaps, and present a model of care for integrating psychology into pediatric otolaryngology/audiology clinics that serve DHH patients and their families.

Methods: A literature review and clinical reflection/peer collaboration was completed to develop a model of integrated psychological services for pediatric psychologists in otolaryngology/audiology clinics.

Results: Fully integrating psychology services into otolaryngology/audiology clinics can include, but is not limited to, psychotherapeutic supports following initial diagnosis of hearing loss, neuropsychological evaluations for cochlear implant candidates, mental health screening of patients with permanent hearing differences, and consultation-liaison services for those with microtia/atresia. Integrated psychologists can also engage in multidisciplinary research and contribute to programmatic development centered on diversity, health equity, and intersectionality.

Conclusions: The reviewed data clearly show that current multidisciplinary models leave numerous unmet needs that psychologists can help address. Incorporating psychologists into pediatric hospital settings that serve DHH patients is an essential ingredient in high quality care that meets the needs of the "whole child."

63

Educational Program for Caregivers of Children with Tympanostomy Tube Otorrhea: Impact on Caregiver Self-Efficacy and Clinical Outcomes

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Abstract

There is an overuse of oral antibiotics and acute care visits conducted to treat children with acute uncomplicated tympanostomy tube otorrhea (TTO), a condition easily identified by the child's caregiver who can then independently initiate treatment with ototopical antibiotics. Yet, some caregivers seek urgent medical attention, often resulting in mismanagement of the condition including administration of oral antibiotics. This project involved the development and implementation of an educational program for caregivers of children with tympanostomy tubes (TT). Resources for caregivers included a web-based instructional video, informational pocket-card, and a post-operative text reminder to educate and improve the self-efficacy of caregivers of children with TTO to initiate treatment independently when clinically indicated. Fifty-eight caregivers were enrolled. Caregiver self-efficacy mean scores were analyzed (paired T-test) and significantly higher ($p=<0.0001$) after implementing the educational program when compared to pre-intervention scores on all 7 self-efficacy items measured. Caregivers were surveyed regarding their perception of the educational program; the majority felt the resources were helpful and valuable for future use. Twenty-one percent of the patients experienced post-operative TTO; 100% of those caregivers reported initiating TAD, 58% of whom referred to the educational resources. Those who did not refer to the educational material all had children who had previous TTs. No children received oral antibiotics following tube placement related to TTO. Recommendations pertaining to scaling, sustainability and dissemination of the project will be presented. Efficiency in care, reduced health care utilization and cost, improved outcomes and patient education are at the foundation of this project.

67

The role of lingual tonsillectomy in pediatric chronic upper airway-related symptoms refractory to treatment

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Abstract

Introduction:

Lingual tonsil hypertrophy (LTH) is known as a possible cause of persistent child obstructive sleep apnea after adenotonsillectomy, especially in patients with trisomy 21, but its role in chronic cough and exercise-induced shortness of breath in non-syndromic patients is less well-established. As such, lingual tonsillectomy is rarely performed. This study is a preliminary exploration of the role of lingual tonsils and subsequent lingual tonsillectomy in pediatric patients with chronic respiratory-related symptoms refractory to more traditional therapies.

Methods:

Ten children were referred by a pediatric pulmonologist with chronic upper airway symptoms (cough, throat-clearing, exercise-induced shortness of breath) unresponsive to traditional treatments, and for whom the only abnormal finding on flexible bronchoscopy was LTH. Endoscopic lingual tonsillectomy was subsequently performed, and the post-operative response was assessed.

Results:

Nine of ten patients saw preoperative symptom resolution after surgery. One patient experienced symptom recurrence and LTH again after 1 year but has seen symptom resolution 14 months after surgical revision. One patient was subsequently scheduled for palatine tonsillectomy due to symptom persistence 2 years later. There were no intraoperative complications and only one patient experienced mild and self-limited pharyngeal bleeding 8 days postoperatively.

Conclusion:

Lingual tonsillectomy proved to significantly resolve chronic respiratory related symptoms when no other treatment had in this case series, implicating LTH in difficult-to-treat symptoms, including chronic cough, throat-clearing and shortness of breath. Though sample size is a limitation, this study suggests that the role of the lingual tonsils should not be overlooked in patients with these types of symptoms.

70

Review of an advanced practitioner and speech pathology directed multidisciplinary neonatal feeding clinic

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Abstract

Background: Dysphagia in neonates is common resulting in nutrition concerns for the infant and significant stress for new parents. Although ankyloglossia is a common cause, other multifactorial conditions contribute to neonatal dysphagia. Our center developed a multidisciplinary advanced practitioner and speech and language pathology led neonatal dysphagia clinic to address these concerns.

Methods: A retrospective review was performed at a tertiary children's hospital. Babies referred for ankyloglossia or neonatal feeding and swallowing difficulty are scheduled with a physician assistant and speech and language pathologist with specialized interest in neonatal feeding disorders. Babies undergo swallowing evaluation followed by frenulectomy and/or feeding therapy where indicated. Continued therapy is arranged for infants without significant immediate improvement after frenulectomy.

Results: Since coalescence of the multidisciplinary clinic, 271 babies have been evaluated. Prior to neonatal feeding clinic, office frenulectomy was performed by the physician assistant in 45.5% of patients and one of seven pediatric otolaryngologists in 54.4% of patients. In 2022, 93.8% of frenulectomies are performed by the neonatal feeding specialized advanced practitioner. Prior to neonatal feeding clinic, consultation with speech and language pathology was performed infrequently on a case by case basis particularly when no ankyloglossia was noted. Since clinic inception, 185 swallowing evaluations have been performed by speech pathology.

Conclusion: A novel advanced practitioner and speech pathology led multidisciplinary approach to neonatal dysphagia improves outcomes in sensory motor function, patient and parent satisfaction, improved oral intake and financial viability in an outpatient otolaryngology clinic.

73

Can feeding outcomes be used to predict gastrostomy tube use in tracheostomy dependent infants?

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Abstract

Background: Infants requiring tracheostomies have complex care needs and often require additional medical intervention, including gastrostomy tube placement. Recurrent exposure to anesthetic may deleteriously affect the infant brain. In infants likely to require both tracheostomy and gastrostomy, coordination of these procedures may reduce this repeated risk. However, it is also important to avoid unnecessary gastrostomy in those infants unlikely to require one. This study aims to identify features of infants requiring tracheostomy that might predict future feeding difficulties necessitating gastrostomy.

Methods: A retrospective review of infants under 18 months who underwent tracheostomy at an academic tertiary care centre between January 1, 2000, and January 1, 2021, was performed. Descriptive statistics on demographic and clinical outcomes (tracheostomy, medical conditions, gastrostomy use, and feeding) were completed. Follow-up logistic and linear regression modelling will be conducted to identify factors predictive of gastrostomy tube placement and duration of use.

Interim Results: Forty-seven patients were included (29M:18F). The average age at tracheostomy was 99.6 days (IQR 57.5 – 130.0). Upper airway abnormality was the most common indication [n=32 (68.1%)]. Most patients had a congenital anomaly, or a syndromic diagnosis (n=43). 72.3% (n=34) patients required a gastrostomy tube, however only 14.7% were placed concurrently (n= 5). Decannulation was achieved in 19 patients (55.9%) after an average of 1499.7 days (IQR 627.5 – 2267.5). Eight (17.0%) infants attempted breastfeeding.

Conclusion: Through the coordination of tracheostomy and gastrostomy tube placement we may improve care quality, mitigate anesthetic risk, and reduce the hospital care burden of caring for complex infants.

74

Outcomes of Bone-Anchored Hearing Implant Surgery in Syndromic and Non-Syndromic Pediatric Patients

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Abstract

Background: The literature involving Bone-Anchored Hearing Implant (BAHI)-related challenges in syndromic patients is currently lacking. The purpose of this study is to compare peri-operative outcomes of percutaneous BAHI surgery in syndromic and non-syndromic pediatric patients.

Methods: A retrospective cohort study was performed. 41 pediatric patients (22 syndromic, 19 non-syndromic) who underwent percutaneous BAHI surgery between March 2008 and April 2021 were included. Extracted data included patient characteristics (age at surgery, gender, laterality of implant), peri-operative information (anesthesia, surgical technique, abutment length), and post-operative outcomes (implant stability quotient [ISQ], skin reactions, implant survival).

Results: The most frequent syndromes observed were Treacher Collins (27.3%), Goldenhar (13.6%), Trisomy 21 (13.6%), and Nager (9.1%). The linear incision technique was performed in 68.2% of syndromic and 42.1% of non-syndromic surgeries. 18.2% of syndromic patients experienced implant extrusion compared to 0% of non-syndromic. 40.9% of syndromic patients experienced severe Holgers Grade 4 skin reactions compared to 0% of non-syndromic. Implant stability was similar between cohorts at all post-operative time-points except for significantly greater non-syndromic ISQ High and Low scores at 16 weeks (p= .048 High; p= .027 Low) and 31+ weeks (p= .005 High; p= .016 Low).

Conclusion: Percutaneous BAHI surgery in syndromic patients is a successful rehabilitation option. However, these patients present challenges, including higher incidence of implant extrusion and skin complications, that should be considered. Syndromic patients may be great candidates for the novel transcutaneous bone conduction implants.

Key Words: syndrome, BAHI, hearing loss, implant stability, skin reactions

75

Prospective Ultrasound Protocol for Vocal Mobility Screening in Neonates After PDA Ligation

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Abstract

Background: Vocal cord immobility (VCI) is a common complication in neonates after patent ductus arteriosus (PDA) ligation from injury to the laryngeal nerve. The utilization of ultrasound (US) complementary to laryngoscopy is beginning to be implemented due to similar sensitivity to laryngoscopy. The goal was to determine if the implementation of a screening ultrasound protocol increased detection of VCI and if this resulted in shortened length of stay (LOS) and time to diagnosis.

Methods: From August 2018 to December 2020, a prospective point of care ultrasound screening protocol to evaluate vocal mobility following PDA ligation began.

Results: During this period, 40 patients had PDA ligation and 19 (47.5%) of those patients were screened with US. Among those screened, 9 patients had VCI (47.4%) and of those not screened 11 had VCI (27.5%). For patients with VCI, the time to VCI diagnosis after PDA ligation was 0.8 months for patients receiving US compared to 0.4 months for patients not receiving US (p=0.203). Further, the median length of stay for patients screened with US was 3.8 months (3.1 – 7.8) versus 3.7 months (2.7 – 4.4) for patients not receiving US (p=0.724).

Conclusion: Prospective screening in this population did not necessarily improve quality of care as the length of stay and time to diagnosis was not different between patients screened versus those who were identified based on symptoms. There is likely an underdiagnosis of neonates with vocal immobility who are not screened given distinctly different rate of identified VCI.

76

Nasal chrondromsenchymal hamartoma: A peculiar tumor

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Abstract

BACKGROUND: Nasal chrondromsenchymal hamartoma (NCMH) is a rare, benign sinonasal tract lesion, highly associated with germline DICER1 syndrome (DS). However, its natural history has not been thoroughly described. The objective of this study is to evaluate if our institutional experience would enrich the knowledge base.

METHODS: A single-institutional 23-year retrospective review of NCMH was conducted. Histologic specimens and electronic health records were analyzed.

RESULTS: Two patients were identified through the chart review.

Case 1: A 17-year-old white female with DS presented with a left nasal mass. A nasal biopsy confirmed NCMH. The tumor stalk was found at the cribriform region. Surgical margins showed no tumor in the cribriform mucosa. The tumor recurred and she underwent resection via a left middle turbinectomy approach and CO2 laser fulguration of the cribriform. An incidental right nasal mass was found which also showed NCMH.

Case 2: A 13-year-old Hispanic female presented with a left nasal mass. The mass was thought to arise from within the anterior ethmoid which revealed NCMH. A surveillance procedure showed no residual NCMH. Both germline and somatic NCMH testing were negative for DICER1 mutations.

CONCLUSIONS: This case series highlights clinical nuances not previously described. In NCMH associated with DS, the tumor stalk could arise from the cribriform plate, and it could recur even when histologic margins were clear. Moreover, NCMH could be bilateral in its presentation. NCMH may also occur in subjects without DS. The pediatric otolaryngologist needs to know these peculiar characteristics.

77

Challenges in Collaborative, Multidisciplinary Laryngeal Cleft Management in a Joint ORL and SLP Dysphagia Clinic

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Abstract

This presentation aims to highlight challenges in the multidisciplinary diagnosis and management of Type I laryngeal clefts and the joint involvement of the Otorhinolaryngology and Speech-Language Pathology Teams. Presenters will unfold the management, diagnosis, and treatment of laryngeal clefts from both surgical and dysphagia treatment perspectives through three illustrative cases ranging in age from infancy to toddlerhood, with various modalities of alimentation ranging from exclusive breastfeeding to drinking from open cup and eating solids. These patients will be discussed and details will be given regarding the following: parent/family medical literacy, underlying medical diagnoses/risk factors for dysphagia, considerations and complications of surgical management, longitudinal SLP assessment, details of SLP management and intervention as it relates to dysphagia, review of objective instrumental assessments and finally analysis of outcomes. ORL will highlight timing of surgical intervention as it relates to their signs and symptoms of airway protection deficits. Presenters will also explain joint SLP/ORL clinic structure and how this diagnostic forum leads to improved patient outcomes and patient satisfaction.

78

Pediatric Dysphagia in the Time of COVID: Lessons from a COVID-19 Epicenter

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Abstract

This presentation aims to focus on highlighting pediatric dysphagia during the surge of the novel COVID-19 pandemic, through the lens of both SLP and Otolaryngology at an acute care Children's Hospital. Presenters will discuss the management, diagnosis, and treatment of dysphagia in an acute pediatric hospital, including tracheostomy/ventilator management and candidacy/criteria for decannulation. Now that we have had two more years of data during this pandemic, we can take a retrospective look at the way patients were assessed, managed, treated and perhaps ways in which things could have been done differently. Being that at the time things were evolving by the minute, it is important to reflect upon the clinical implications of the decisions made during this tenuous period of time. Five patients will be discussed and details will be given regarding the following: underlying medical diagnoses/risk factors of dysphagia, complications of hospital course including airway factors and tracheostomy, timing of SLP assessment, details of SLP/ENT management and intervention as it relates to dysphagia, review of any objective instrumental assessments and finally analysis of outcomes. Presenters will highlight ways management could have been approached differently now having more experience with this particular population.

80

Increasing Demand for “Lip Tie” Division: Parental Sources and Perceptions.

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Abstract

Introduction: Parental concern about the maxillary frenulum in infants is increasing. Our goal was to identify why parents feel this is a problem.

Method: Charts of infants presenting to a pediatric otolaryngology clinic for evaluation of maxillary frenulum (MF) division between 18 March and 18 June 2022 were reviewed. Data collected included feeding concerns, who identified the problem, where the parent or guardian learned about MF, and level of concern.

Results: 37 parents (32 mothers, 4 fathers, 1 guardian) provided information. Feeding complaints included poor latch in 20 (54%), breast pain, frequent feedings, and clicking with swallowing. 12 (32%) respondents selected each of these options, with mean of 2 (range 0-7) feeding complaints per parent.

The “lip tie” was diagnosed by the child’s mother in 16 (43%) and by a pediatrician in 15 (41%) of children. Other diagnosticians were nurses (7), lactation consultants (8), dentists (4), and chiropractors (2). Parents claimed that they learned about MF from a pediatrician in 18 (49%) cases, a lactation consultant in 12 (32%), and from family/friends in 10 (27%) cases.

Mean level of concern about their child’s MF was 5.5 out of 10 (10 was “your current greatest concern”) with 95% CI of 4.7-6.3. Diagnosis by anyone other than mother or a physician was associated with a higher concern level (Mean=7, p=.006).

Conclusion: More work needs to be done to understand why many parents are concerned about their infants’ maxillary frenulum. Physicians are not the major drivers of these concerns.

81

Iatrogenic Injuries in Pediatric Airway - "Primum Non Nocere" - Lessons learnt

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Abstract

Background- Iatrogenic injuries in paediatric airway are common. Various articles have been published about airway injuries especially post intubation in the recent past but the injuries due to airway surgical interventions are not reported well. The smaller airway anatomy, limited access to instrumentation, lack of training for surgical powered instruments or LASER poses a greater risk in paediatric age group. The purpose of this study was to evaluate the causes & outcomes of iatrogenic airway injuries other than intubation.

Method- A retrospective study from January 2015 to January 2022, cases referred having iatrogenic injuries due to prior history of airway interventions were included and analysed by SPSS. Injuries occurred due to intubation, neck trauma, cardiac or gastrointestinal procedures or associated complications were excluded from the study.

Result- Total 12 patients with age ranging from 1 month to 14 years were included. The male & female ratio was 1:1. Majority of patient had LASER associated injuries (58.3%), 16.6 % injuries were caused by powered instruments and 25 % caused by inappropriate selection of devices. Laryngeal lesions that required tracheostomy and long-term management were- acquired trans glottic stenosis, grade 4 subglottic stenosis, supraglottic adhesion and stenosis. 41.6 % patients underwent open reconstruction surgeries. 25% children are still tracheostomized and remaining 75 % underwent total 41 procedure to restore their airway.

Conclusion- Identification of iatrogenic injuries aids prevention and allows appropriate choice of instrumentation especially when learning new techniques. Further adequate training and supervision is important to avoid such injuries and better airway outcomes in pediatric age group.

82

Surgeon and Patient Noise Exposures During Common Pediatric Otolaryngologic Procedures

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Abstract

Background: Operating room sounds may surpass normal thresholds and induce hearing loss in both patients and surgeons alike. The intensity of noises emitted by various surgical instruments during common pediatric otolaryngologic procedures were compared. Noise exposure levels of both the surgeon and patient were also compared to evaluate the need for quality improvement measures.

Methods: Noise levels were measured using the RISEPRO Decibel Meter and the SoundMeter X application 10.0.4 at the ear-level of the surgeon and patient. For each measurement, procedure type, presence of music, and tools used (Bovie, microdebrider,Coblator) were recorded.

Results: 208 total occasions of noise measurements (1, 664 individual measurements) were recorded for 57 cases. Adenoidectomy was found to be the loudest case for both surgeon (66.4 dBA; $p<0.001$) and patient (65.2 dBA; $p=0.001$). Adenotonsillectomy was the second loudest, with the average surgeon's noise exposure 65.8 dBA ($p<0.001$) and average patient's noise exposure 64.9 dBA ($p=0.001$). The suction with and without Bovie were significantly louder at the surgeon's ear-level (66.7 dBA; $p= <0.001$, 85.1 Leq Peak dBA; $p= 0.017$) compared to the patient's ear-level (65.6 dBA; $p= 0.001$, 84.2 Leq Peak dBA; $p= <0.001$), respectively.

Conclusions: Surgeons have a slightly greater noise exposure than patients during the tested procedures. Procedure type and instruments used have a significant effect on noise levels. Noise levels in these cases are generally safe, typically less than 80 dB and may warrant further safety measures. Noise levels of otologic drilling will be tested.

84

The effect of drug induced sleep endoscopy on surgical decision making in otherwise healthy children with sleep disordered breathing: a prospective cohort study

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Abstract

Background: Drug-induced sleep endoscopy (DISE) continues to be controversial in healthy children withsleep disordered breathing (SDB). We investigated the level of agreement between surgical planning based on DISE versus physical examination in surgically naïve, healthy children with SDB.

Methods: A prospective cohort study (January 2016 -October 2018) at a tertiary center was performed. Primary outcome: level of agreement between a DISE-directed surgical decision versus outpatient physical examination (Unweighted Kappa) based on 2 different scenarios. Three options of treatment were considered; AT and its variants, AT combined with non-AT surgery, and non-AT options or no surgery at all. Secondary outcomes: level of agreement on tonsil size between a DISE-directed surgical decision versus outpatient physical examination, the frequency of alternate surgical targets identified by DISE and predictors of disagreement.

Results: 198 were included, males (n=97, 49%), age (6.48±3.19 years, range 3.0-16). In scenario #1 (adenoidectomy performed if the size was greater than 50%), and scenario #2 (adenoidectomy performed irrespective of size), the overall agreement was poor (κ= 0.0845 SE=0.0261 [95% CI 0.0334 - 0.1356]) and fair (κ= 0.233 SE= 0.0839 [95% CI 0.0686 - 0.3974]), respectively. Overall, there was a fair agreement on tonsil size (κ = 0.3659 SE = 0.0564 [95% CI 0.2554– 0.4764]). An additional diagnosis was identified by DISE in 159 (80.3%) patients. Small tonsil size, history of prematurity and duration of snoring predicted disagreement.

Conclusions: DISE should be considered in surgically naïve healthy children, especially those with small tonsils, history of prematurity, and prolonged snoring.

85

Pediatric Tracheostomy Code Blue- A New Safety Initiative

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Abstract

Background- The Pediatric Code Blue (PCB) term is used to alert the resuscitation team for cardiopulmonary arrest cases. The team involves the pediatric residents, intensivist, pediatric emergency physicians, anesthetist and scribe nurses. Various institutions form their resuscitation team but so far, the role of Pediatric Otolaryngologist in tracheostomized code blue cases has not been established. The purpose of this study was to analyze the need of a Pediatric Otolaryngologist and initiation of specific Pediatric Tracheostomy Code Blue (PTCB) for resuscitation of tracheostomized children.

Method- Retrospective analysis of PCB alerts from January 2019 to December 2019 was performed. The codes announced for tracheostomized cases in children below 18 years were analyzed in detail. PTCB was then proposed with involvement of otolaryngologist in resuscitation of tracheostomized children, post airway surgeries and anticipating difficult airway cases.

Results- Total 26 PCB were announced in which 34.6% were tracheostomized children. The major cause of code initiation was tube block in 66.7 % of cases followed by accidental tube decannulation in 33.3% of cases. Separate calls were made to the otolaryngologist and the mean time for otolaryngologist to reach at the scene was 13.3 mins (range- 10 mins to 23 mins). The mortality was found to be 22.2 % and the cause of death was tube block in both the cases.

Conclusion- Identification of tracheostomy tube blocks and immediate intervention can avoid cardiopulmonary arrest in such children. The involvement of pediatric otolaryngologist during tracheostomy code blue can make a significant difference in improving resuscitation efforts and patient management.

86

Implementation and Comparison of Tracheostomy Care Curricula for Pediatric Residents

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Abstract

Background: to address deficiencies in the understanding of proper care for children with tracheostomies among non-otolaryngology providers, we sought to implement a multimodal training curriculum for pediatrics residents and assess changes in knowledge and confidence with tracheostomy care.

Methods: pediatric residents were assigned to one of three study arms: 1) online module plus in-person training (live), 2) online module plus live video training (Zoom), or 3) online module only, by an algorithm taking into account PGY and gender. All participants completed a pre-training survey, online module, and post-training survey to assess their knowledge. Surveys were analyzed using ANCOVA, chi-square, and Fisher's exact test.

Results: Of 85 participants enrolled, 29 completed both the pre- and post-training quiz. Completion rates did not differ significantly by assigned study arm. The average quiz score improved by 9.6% (64.5% to 74.1%) after completion of the online module and assigned training session ($p < 0.05$). Average post-training confidence scores were significantly increased from pre-training for all objectives ($p < 0.001$). Both the in-person and Zoom training arms had 14.4% improvement and the online module arm had 1.8% improvement.

Conclusions: Trends in knowledge and confidence gained suggest that hands-on and live video training are better modalities for teaching novices tracheostomy care than an online module alone. We hope to gain greater insight into learner preferences and knowledge retention over time in this program.

87

Disparities in access for diagnosis and treatment of pediatric sensorineural hearing loss in different countries

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Abstract

Timely diagnosis and management of pediatric sensorineural hearing loss (SNHL) is essential for best outcomes. This study evaluated the differences of access to care among cochlear implant (CI) centers of countries with different health care systems.

Retrospective study of patients from CI centers in four countries (USA, France (FR), Australia (AUS), and Brazil (BR)) from January 2017 to December 2019, with IRB approval. Age included was 0-21 years. Data analyzed included patient demographics, age at SNHL diagnosis, age at hearing aid (HA) fitting, age at CI, insurance, and etiology. JMP® was used for Statistical analysis.

1723 patients were included (193 AUS, 153 BR, 1158 FR and 219 USA). 444 (25%) had prelingual SNHL, 108 (6%) postlingual, 1171 (68%) unknown. The mean time (months) from diagnosis to HA fitting was 5.6±11.5, AUS= 9.3±20.7, BR = 8.9±13.9, FR = 4.2±7.8 and USA = 6±10.2 ($p<0.001$). This difference was absent in age of diagnosis and time of HA fitting for prelingual patients. Bilingual patients or those who don't speak the official language receive HAs later ($p=0.005$; official = 4.9 months; bilingual = 7.3). AUS and USA patients with public insurance take longer for HA fitting (public=8.6 months±0.9; private=5.3±1.8; $p=0.03$). BR had more infectious and perinatal causes of SNHL.

There are disparities in etiology and access care for pediatric SNHL among CI centers of different countries. Understanding these disparities might help eliminate barriers and promote faster and more equitable access to care of pediatric SNHL.

88

Characteristics of Political Contributions by Self-Described Otolaryngologists in the United States

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Abstract

Background: The current political climate of the United States has shifted healthcare into a leading topic of debate and concern in each election cycle. Though a small subset of the population, physicians provide a unique perspective on healthcare legislation. As the United States Supreme Court equates campaign contributions to free speech, contributions by individual citizens suggest what ideology they support.

Methods: Publicly available data regarding contributions by individual citizens published by the Federal Election Commission (FEC) were filtered to include self-described otolaryngologists from January 1st, 2003 to December 31st, 2021. Each contribution was classified by its receiver (Political Action Committee or candidate for House, Senate, President) and party (Democratic, Republican, other). Line charts were created using Microsoft Excel, and heatmaps were created using mapchart.net.

Results: The FEC reported 61,341,000 individual contributions reported between 2003 to 2021. Of these, 319 unique otolaryngologists made 1,615 contributions totaling $568,731.37. Individual contributions by otolaryngologists ranged from $1 to $33,400. The number of yearly contributions have increased significantly since 2012.

Conclusions: The largest cumulative yearly contributions were in 2012 and 2016 (to Democrats) and 2020 (to Republicans). With increasing political polarization in the United States, understanding the involvement of medical professionals can better inform future health policy. Given these findings, future research can evaluate how contributions by physicians can effectively influence health policy.

89

Impact of a Dedicated In-Person Spanish Interpreter on No-Show Rates in a Pediatric Otolaryngology Ambulatory Clinic

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Abstract

Background:

Language barriers provide unique challenges in health care settings. In-person interpreters are preferable to phone interpreters for patients and their families. This study aims to evaluate the sustainability and impact of a dedicated Spanish interpreter who places a pre-visit reminder phone call to all Spanish speaking patients/families and is also available to the high-volume practice for in-person office visits. In this study, we hypothesized that the addition of a phone call from the Spanish interpreter prior to the scheduled office visit would decrease cancellation rates, no-show rates, and late arrival times.

Methods:

A retrospective cohort study was performed with IRB-approval comparing patients contacted by an automated system from 1/1/2019-12/31/2019 to those contacted by a live Spanish speaker approximately one week prior to their visit from 1/1/2021-12/31/2021.

Results:

There were 2944 visits with Spanish-speaking parents receiving an automated call in 2019 and 592 visits with Spanish-speaking parents receiving a live call in 2021. There was an increase in office visit completion rate from 71.5%-75.8%, p-value <0.001, and decrease in no-show rates from11.2%-9.5%, p-value <0.03 between the 2 time periods. There was a decline in cancelled patients from 17.3%-14.7%, although not significant, p-value 0.15. Late arrivals increased from 8.1%-8.6%, although not significant, p-value 0.20.

Conclusion:

A dedicated Spanish interpreter has potential to increase productivity and efficiency in the ambulatory pediatric otolaryngology setting by reducing no-show and cancellation rates. There is potential for the Spanish interpreter to have additional positive impact relative to patient-family and physician experience, which deserves further investigation.

95

Hearing loss in patients with 22q11.2 deletion syndrome: a review of 689 patients

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Abstract

Background: Hearing loss is considered common in children with 22q11.2 deletion syndrome (22q). A few small studies have reported a 32-77% prevalence. Despite the prior studies examining hearing loss in patients with 22q, there is an overall paucity of data regarding the frequency, type, severity, and progression of hearing loss.

Methods: A retrospective chart review was completed. Data was combined for two large US-based 22q Centers based in tertiary care children's hospitals. Pediatric patients with a diagnosis of 22q11.2 deletion syndrome and documented audiologic testing were included. Data collection included co-morbidities, results of all prior audiologic testing, radiologic temporal bone imaging, and otologic surgical procedures.

Results: 1,640 charts reviewed; 689 patients met inclusion criteria. Comorbidities included 87% speech delay and 25% cleft palate. In total, 2,539 audiograms were reviewed, of which 74% showed abnormal results. For this cohort, 71% of patients had an abnormal audiogram. Hearing loss was most often mild and conductive; sensorineural hearing loss was less common and a majority did not progress. Ear tube placement occurred in 42% of patients; of these, 55% required multiple sets of ear tubes. Thirty-seven patients had temporal bone imaging with 89% showing anomalies of the middle/inner ear.

Conclusion: This is the largest study to date describing hearing loss in children with 22q. This study confirms the high frequency of hearing loss. The results highlight the importance of otolaryngology and audiology involvement in managing patients with 22q, particularly as speech and language deficits may be exacerbated by hearing deficits.

97

Fostering Joy in Parents with Children who are Deaf/Hard of Hearing

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Abstract

Background

Parental outlook can have a cascading effect on child development, impacting parent involvement, social support, and expectations that influence the development of children who are deaf or hard of hearing (DHH) (Calderon & Greenberg, 2011). Parents who report high stress levels tend to have deaf children with more emotional difficulties and reduced socio-emotional development (Hintermair, 2006).

Our appointments are frequently filled with many objectives; however, attending to parents' acceptance of their child is rarely among them. Yet, the emotional availability of caregivers influences how caregivers attend, attune, and foster engagement with their DHH child (Bornstein et al., 2012). By fostering joy, we can enrich the parent-child bond and enhance a child's development during a stressful time. The more we consciously focus on joy, the better we become at "being joyful." (Johnson, 2020).

Methods

This presentation introduces Fostering Joy, a family/professional collaboration to help caregivers celebrate the joyful moments with their DHH children. Fostering Joy acknowledges the unique challenges faced children who are DHH and the professionals who support them yet strives to "highlight the highlights."

Results

Aligning with the construct of compassionate healthcare, the Fostering Joy movement shifts away from focusing on mitigation of health challenges to embracing the positive moments, helping professionals and families alike. Tip sheets and resources have been translated and are available in 10 different languages.

Conclusions

As professionals, we should be cognizant of the effect joy can have on our patients and families. Strategies for fostering joy during our day will be shared.

99

Cochlear Implantation Outcomes in Children with Cochlea Nerve Aplasia or Hypoplasia

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Abstract

Background: It is not currently understood how children with absent cochlear nerves produce a response or perform post implantation. The objective of the study was to evaluate the preoperative candidacy and postoperative performance of cochlear implant (CI) recipients with absent or hypoplastic cochlear nerves.

Methods: A retrospective case review was performed at a tertiary care center to identify children with cochlear nerve absence or deficiency who underwent CI evaluation. High-resolution three-dimensional T2-weighted magnetic resonance imaging in the oblique sagittal and axial planes were used to identify absent or hypoplastic cochlear nerves. CI candidacy was determined by test results from the auditory brainstem response and behavioral observational audiometry. Neural response telemetry and speech reception threshold were used to measure audiological performance after cochlear implantation.

Results: Five children underwent cochlear implantation with imaging evidence of an absent or hypoplastic cochlear nerve. Based on aided behavioral test results indicating speech awareness thresholds of greater than 25 dBHL, all children were deemed candidates for CIs. Evaluation of auditory rehabilitation status indicated significant and appropriate benefit from CI. One patient's performance was determined by the LittlEars Questionnaire and demonstrated limited to no sound awareness.

Conclusions: Our experience with CIs for children with absent or hypoplastic cochlear nerves demonstrates that CI can be a viable option in select patients who satisfy pre-operative criteria. Radiological identification of a hypoplastic of aplastic cochlear nerve does not always prevent auditory innervation of the cochlea. CI recipients in this subgroup must be counseled on difficulty in predicting post-implantation outcomes.

105

A Complicated Post-Operative Course May Predict Post-Tonsillectomy Hemorrhage: A Large Database Analysis

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Abstract

Background:

Post-operative hemorrhage is a frequent and concerning complication of tonsillectomy. This study aimed to utilize the largest known cohort to determine risk factors for post-tonsillectomy hemorrhage.

Methods:

This was a retrospective case-control study. The TriNetX Research Network was queried using ICD-10 and CPT codes to identify patients under 18 years old who underwent tonsillectomy or adenotonsillectomy between 2012 and 2022. Demographics, pre-existing conditions, and post-operative variables were compared between patients with and without post-tonsillectomy hemorrhages using bivariate analyses.

Results:

A total of 134,742 patients were identified with 53% male and 47% female. In the cohort, 2.5% (n = 3,426) experienced post-tonsillectomy hemorrhage. These patients were older (6.8 years vs. 5.9 years, $P < 0.001$), and were also more likely to have a history of asthma (OR, 95% CI, P) (1.20, 1.11-1.30, $P < 0.001$), coagulopathy (1.29, 1.08-1.55, $P = 0.006$), autism (1.50, 1.24-1.81, $P < 0.001$), or ADHD (1.50, 1.32-1.70, $P < 0.001$). In addition, they were more likely to experience post-operative cough (3.14, 2.77-3.56, $P < 0.001$), pain (2.90, 2.57-3.26, $P < 0.001$), nausea and vomiting (3.91, 3.52-4.34, $P < 0.001$), dehydration (3.56, 3.16-4.0, $P < 0.001$), and fever (1.70, 1.53-1.95, $P < 0.001$).

Conclusion:

Children with post-operative courses complicated by cough, pain, nausea and vomiting, dehydration, or fever could be at increased risk for post-tonsillectomy hemorrhage. These patients may warrant closer monitoring by their physicians and caretakers.

106

Validation of the Spanish and Chinese Versions of the Scale of Parental Involvement and Self-Efficacy (SPISE)

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Abstract

Background: The Scale of Parental Involvement and Self-Efficacy (SPISE) evaluates parents' knowledge, beliefs, and actions related to their deaf or hard-of-hearing (DHH) child's language development and auditory access. It is used to assess areas for intervention considering parental strengths and needs. However, it has only been formally validated in a small English-speaking population.

Methods: We aimed to evaluate the validity and reliability of the SPISE in a larger, more diverse population of English, Spanish, and Chinese speaking families receiving care in a multidisciplinary hearing clinic. 297 parents (English: 186; Spanish: 84; Chinese: 27) of DHH children ages 0-18 completed the survey. We conducted an exploratory factor analysis converging onto four factors and assessed translated survey reliability and validity.

Results: Across the three languages, findings suggest significant overlap in items that loaded onto the original proposed groupings of parental self-efficacy and involvement. Survey items inquiring about parental ability to "positively affect" aspects of their child's development explained the most variability in the parental self-efficacy factor. For each language, Cronbach's alpha for each factor group was significant (>0.64), suggesting a moderate to high internal consistency of factor items.

Demographic Characteristics	ENGLISH	SPANISH	CHI
Male (%)	47.8	54.8	
Average age (years)	5.12	6.45	

Original Item Classification	
Parental Self-Efficacy: Speech - Language Development	
How much do you feel that you can positively affect your child's speech development?	
How much do you feel that you can positively affect your child's language development?	
How much do you feel that you can positively affect your child's ability to express his or her thoughts?	
How much do you feel that you can positively affect your child's overall early development?	
	Cronbach's Alpl

Conclusions: Validation of the SPISE in Spanish and Chinese will allow for more inclusive and impactful assessment of parents' perceived self-efficacy and involvement related to their child's hearing-related health. Initial analysis reveals high concordance amongst parental self-efficacy related items. Future steps include comparing item factor loading scores to identify potentially unique strengths or concerns amongst different language groups.

107

Association of Pediatric Hearing Impairment & School Engagement Outcomes in a US Population-Based Study

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Abstract

Background: To examine whether parent-perceived deafness or hearing problems is associated with school engagement outcomes, including extracurricular activity participation (sports, clubs, organized activities/lessons, community service/volunteer work, and paid work) and educational performance (contacted by the school about problems, missed school days, cares about doing well in school, does required homework, and repeated grades), among children in the United States

Methods: Data from the National Survey of Children's Health (NSCH), an annual serial cross-sectional survey, for the combined years 2017-2020 were analyzed. Participants were 1,528 children with parent-reported hearing impairment and 122,273 children without parent-reported hearing impairment who were 0-17 years of age, representing a total population of about 73 million US children and adolescents. Univariate statistics and multivariate logistic regression analyzed the association of hearing problems with the school engagement variables. After adjusting for race, sex, age, and poverty level, odds ratios were computed.

Results:

Odds ratios for relationships between school engagement variables in children with deafness or hearing problems.

Outcome Measure	OR (95% CI)	P Value
Sports	.79 (.59 – 1.04)	0.097
Clubs	.84 (.58 – 1.20)	0.332
Organized Lessons	.76 (.56 – 1.03)	0.072
Community Service	.68* (.52 – .88)	0.004
Paid Work	.69 (.47 – 1.03)	0.071
2+ Times Contacted by School About Problem	2.60* (1.89 –3.58)	0.000
11+ Missed School Days	2.94* (2.00 –4.31)	0.000
Cares About Doing Well in School	.45* (.34 – .61)	0.000
Does Required Homework	.45* (.33 – .61)	0.000
Repeated Grades	1.73* (1.22 –2.45	0.002

* Statistically significant with Bonferroni Correction ($\alpha = 0.005$)

Conclusions: While there are no statistically significant differences in extracurricular participation (besides from community service) between parent-reported children with hearing impairment and those without, children with hearing impairment struggle with direct educational performance variables, such as missed school days and grade repetition. Examining the role of risk and resilience factors (i.e, hearing impairment severity, cochlear implantation and/or hearing device use, early intervention services participation, etc.) behind these associations may provide information for interventions to enhance the academic progress of these children.

109

In-depth analysis using Next-generation Sequencing (NGS) and bioinformatics results in pediatric ADGRV1 compound heterozygotes

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Abstract

BACKGROUND: Medical evaluation of sensorineural hearing loss (SNHL) is critical to anticipatory guidance, particularly important with syndromic and/or progressive disorders like Usher syndrome (SNHL and retinitis pigmentosa). Genetic diagnosis using next generation sequencing (NGS) proves challenging with multigenic, multiallelic variants of uncertain significance (VUS). Identification and reclassification of VUS is a fluid process, accelerated by genetic testing companies, and thus necessitates in depth-analysis and interpretation. Compound heterozygous variants may be misinterpreted as benign but in fact result in deleterious combined autosomal recessive expression, important to diagnosis.

METHODS: This study assessed VUS compound heterozygotes with SNHL at a tertiary care children's hospital. Rare variants of autosomal recessive ADGRV1, associated with Usher Syndrome Type II, were investigated using NGS and bioinformatics software. Three subjects identified via NGS testing as ADGRV1 compound heterozygotes were further evaluated for pathogenicity using PhyloP, Polyphen-2, SIFT, MutTaster, and CADD, and cross-referenced in ExAC/gnomAD population databases.

RESULTS: Six different ADGRV1 variants in three ethnically diverse families were identified. Subject 1 (Honduran) carried two known pathogenic variants (c.2864C>A(p.Ser955*), c.10550-1G>A). Subject 2 (French Acadian) carried two VUS (c.16172T>G(p.Leu5391Arg), c.2035C>T(p.Arg679Trp)), predicted as damaging/deleterious. Subject 3 (African American) carried two VUS (c.12286-10T>C (intronic), c.1283A>G(p.Asn428Ser)), predicted as benign/tolerated.

CONCLUSION: VUS should not be misinterpreted as "benign". Analysis of VUS using open-source bioinformatics software supports clinicians and researchers in VUS reclassification, enabling physicians to provide better anticipatory guidance, ultimately leading to high-quality healthcare and improved academic support for diverse special-needs populations.

111

Single- and Double-Staged Laryngotracheal Reconstruction: Ten Year Experience from a Single Institution

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Abstract

Background: Laryngotracheal reconstruction (LTR) is widely employed for the treatment of pediatric airway stenosis. However, there is a paucity of available clinical data with consistent reported outcome measures, making meaningfully comparisons of clinical outcomes between intuitions difficult. We set out to report our experience according to the recent LTR consensus statement by Balakrishnan, et. al. (2018)

Methods: A retrospective chart review was performed to examine surgical outcomes of single- and double-staged LTR patients at our Institution from January 2011 to December 2021.

Results: From January 2011 to December 2021, 48 patients underwent single- (27.1%) or double-staged (72.9%) LTR, respectively, at Children's Mercy hospital. The vast majority of our patients (93.7%) had grade III stenosis at the time of surgical reconstruction. The average length of stay is 14.1 days for single-staged, and 7.4 days for double-staged LTR. The most common complication was granulation tissue formation (70.8%). No major complications occurred including anastomotic separation, tracheoesophageal fistula, or trachea-innominate fistula. 92% of our patients with single-staged LTR achieved surgical success with decannulation, while 86% of patients who underwent double- staged LTR successfully achieved subsequent decannulation (at the time of this report).

Conclusion: Both single- and double-staged LTR are safe and effective procedures for airway stenosis. Granulation tissue formation appeared to be the most common complication following LTR in our series, though most patients with granulation tissue (82.4%) ultimately had resolution and were subsequently decannulated. We were able to achieve a similar surgical success rate compared to previous reports in the literature.

113

Disparities in educational services for children who are deaf or hard-of-hearing

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Abstract

Background

Children with hearing loss are entitled to educational support services under federal law, and many are eligible for Individualized Education Programs (IEPs). Demographic factors, including public insurance, non-English home language, and underrepresented minority (URM) status have been associated with delays in identification and intervention for hearing loss. This study aimed to identify if demographic factors impact time taken for patients to establish an IEP.

Methods

We extracted data from 93 IEPs belonging to a diverse cohort of patients with hearing loss followed through the UCSF Children's Communication Center. Associations of demographic and clinical factors with outcomes (interval between referral, consent, and eligibility, number of services, and number of accomodations) were evaluated with a two-sample t test with equal variances using STATA.

Results

The study group was 59% male, 36% non-English speaking with 27% requiring an interpreter, and 33% URM. Need for an interpreter (p=0.029) was associated with an increased number of days between initial referral for special education services and determination of eligibility. Private insurance (p=0.026) was associated with an increased number of days between the time of initial referral and time to parental consent. Race/ethnicity, URM status, gender, and non-English home language were not statistically significantly associated with delays.

Conclusions

There is a delay in obtaining an IEP for children from families who require an interpreter and those from families with private insurance. Future studies could examine potential causes for these delays, such as school district of residence or other socioeconomic variables.

114

Emergency Cricothyrotomy Simulation – Using a Porcine Model for Resident Education

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Abstract

Background:

The "cannot ventilate, cannot intubate" scenario, is an extremely stressful situation in which the physician would be called upon to attempt a surgical airway (i.e cricothyrotomy). Our goals were to provide Otolaryngology residents/associates with practice performing a rapid surgical airway in a porcine model and determine if prior resident experience with performing tracheostomies increases the speed of performing successful cricothyrotomy.

Methods and Materials:

33 participants (from 2019 and 2022) were provided with an unloaded scalpel, soft tissue instrument tray, and adult porcine larynx in order to perform a cricothyroidotomy. Each procedure was timed from the start of scalpel loading through completion of cricothyrotomy. A supervising attending confirmed each surgical airway completion. The total number of prior tracheostomies per resident was compared against their speed of successful completion.

Results:

There were 33 total participants (post-graduate years 0-5). The time for successful cricothyrotomy ranged from 56 seconds to 299 seconds, with an average time 124.7±60.23 seconds. All participants were successful. The total number of prior tracheostomies ranged from 0-98. The average number of tracheostomies was 28.73±28.82. There was a statistically significant difference in the number of tracheostomies versus the time to perform a cricothyrotomy ($P<0.0001$).

Conclusions:

We found the speed of successful porcine cricothyrotomy correlates with prior experience with performing tracheostomies and believe practicing cricothyrotomy in a non-emergency setting is a beneficial teaching tool for residents. Future research could employ this technique for other residencies and could observe if successful cricothyrotomies are correlative in participants taking this course.

116

The utility of non-occlusive balloon dilation in paediatric laryngotracheal stenosis: A 30 month retrospective review

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Abstract

Background

Endolaryngeal techniques with balloon dilation are preferred as first line treatment in laryngotracheal stenosis. Traditional occlusive balloon dilators require pre-oxygenation prior to dilation. A non-occlusive balloon that permits ventilation during dilation and safely facilitates the recommended dilation period, makes for an ideal endolaryngeal tool. The aim of this study is firstly to describe the technique of using a novel non-occlusive balloon dilator and secondly to evaluate post dilation outcomes.

Materials and methods

A retrospective review of medical records was performed. Children with presumed laryngotracheal stenosis who underwent endolaryngeal balloon dilation over 30 months, between 2019 and 2022, were collected and analysed. For intra-operative technique assessment, all non-tracheostomised children were included. In cases of confirmed laryngotracheal stenosis, outcome of dilation was also recorded.

Results

Twenty-nine children underwent 32 endolaryngeal balloon dilation procedures aged 2 weeks to 10 years old (median: 18 months). 26/32 (81%) successfully completed two, 2-minute balloon dilation intervals. Oxygen saturation remained above 92% in all cases, no change within 5% during dilation period. None required rescue intubation. Seven (22%) had simultaneous endoscopic expansion procedures. The remaining 6/32 (19%) had tracheostomies. Four (Cotton-Myer grade 3/4) had laryngotracheoplasties. Diagnosis included: 25 (86%) SGS; 3 tracheal stenosis (10%); 1 congenital BVCP (3.4%). CM grade improved by 2 in 9 (32%), by 1 in 15 (53%), no change in 4 (14%).

Conclusion

Non-occlusive balloon dilation in children with laryngotracheal stenosis may offer a safe and effective technique for endolaryngeal management. Ventilation is permitted throughout the procedure, minimising risk and improving safety.

119

Risk Factors for Respiratory Infections Following Tracheostomy in Pediatric Patients

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Abstract

Background: Respiratory infections are a leading cause of morbidity and mortality in pediatric populations. Tracheostomies increase that risk. We sought to determine risk factors for respiratory infections post-tracheostomy.

Methods: We conducted a retrospective cohort study of all pediatric patients who underwent tracheostomies at Cincinnati Children's Hospital Medical Center from January 1, 2019–December 31, 2021. We collected demographics, surgical indications, comorbidities, associated procedures, and respiratory cultures before and after tracheostomy. Outcomes were positive bacterial respiratory cultures with speciation within 1 or 6 months of tracheostomy. Cases were stratified by age and logistic regression models were fit.

Results: In total, 180 patients were identified. 67.8% of patients were under age 1, 11.7% were ages 1–5, and 20.6% were over age 5. Most patients were male (52.2%) and White (67.2%). The prevalence of respiratory infections within 1 and 6 months were 45.0% and 60.6%, respectively. Under age 1, Other and Black races increased the odds of respiratory infection within 1 (OR 10.0, 95% CI 1.2–84.9) and 6 months (3.0, 1.1–8.0), respectively, compared to White race. Over age 5, an indication of airway obstruction decreased the odds of respiratory infection within 6 months (0.1, 0.0–0.9) compared to inability to extubate.

Conclusions: More than half of children undergoing tracheostomy developed a bacterial respiratory infection within 6 months. Race and indication for surgery were significantly associated with positive postoperative respiratory cultures. There should be a low threshold for obtaining respiratory cultures in children who undergo tracheostomy.

122

Recurrent Laryngeal Nerve Reinnervation and Pediatric Dysphagia Outcomes

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Abstract

Background: Recurrent laryngeal nerve (RLN) reinnervation in children with unilateral vocal fold immobility has an uncertain impact on dysphagia outcomes. The primary objective was to determine frequency of aspiration resolution after RLN reinnervation.

Methods: A case series with chart review included all pediatric RLN reinnervations between 2013 and 2022 at a tertiary aerodigestive program. Only children completing videofluoroscopic swallow studies (VFSS) were analyzed.

Results: Twenty-six RLN reinnervations were reviewed with 9 children (35%) obtaining preoperative VFSS. Among this group, surgery occurred at a median of 4.1 years (IQR: 3.3-5.5) after a median of 1 injection laryngoplasties (range: 0-3). All children had left vocal cord immobility secondary to cardiac surgery and confirmed with abnormal laryngeal electromyography. Thin liquid aspiration was identified in 66% (N=6). After RLN reinnervation, all but one child (83%, N=5) had resolution of their aspiration including 4 of the 5 (80%) obtaining a postoperative VFSS.

Conclusions: Resolution of dysphagia and advancement of oral diet after RLN reinnervation is common among children with aspiration and unilateral vocal fold immobility. Future studies with larger samples are needed to corroborate these encouraging findings.

126

Routine screening for sleep apnea in the pediatric population

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Abstract

Routine screening for sleep apnea in the pediatric population

Background:

Pediatric obstructive sleep apnea (OSA) is a common problem, reportedly affecting 1-5% of the pediatric population. It is suspected the risk of OSA is higher with many children going undiagnosed. This study investigates the rate of positive OSA screenings in the ENT clinic compared to the currently reported rate.

Methods:

The pediatric modified STOP-BANG questionnaire for OSA was administered to 334 pediatric ENT clinic patients with a chief complaint unrelated to sleep. The PM-STOP-BANG survey evaluates snoring (S), tonsillar hypertrophy (T), obstruction (O), daytime tiredness or neuropsychological behavioral symptoms (P), BMI percentile for age (B), age at diagnostic screening (A), neuromuscular disorder (N), and genetic disorder (G). Answers of “yes” receive a score of 1, while “no” or “unknown” receive a 0. Scoring 4 or more indicates high risk for OSA. The Epworth sleepiness scale was also administered. A score of 10 or greater indicates excessive daytime tiredness.

Results:

Of 334 pediatric patients screened, 45 (13.5%) received a PM-STOPBANG score of 4 or more, which is over twice the reported rate.

n=334

PM-STOPBANG Score	Patients
5	14
4	31
3 or less	289

Epworth Sleepiness Scale	Patients
10 or greater	120
less than 10	214

Conclusion:

These results indicate that the risk for OSA is higher and likely underdiagnosed compared to the reported 5% prevalence in the general pediatric population. The PM-STOP-BANG questionnaire is a cost-effective and quick way to screen for obstructive sleep apnea in the clinical setting.

127

Is Congenital Laryngomalacia Associated with Low Serum Vitamin D Levels in Infants and their Mothers?

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Abstract

Background: Vitamin D deficiency is purported to promote laryngomalacia by creating a pro inflammatory state that allows edema of supraglottic mucosa. We aimed to measure Vitamin D levels in infants with laryngomalacia and their mothers to explore this potential association.

Methods: Prospective study at a tertiary pediatric hospital of mother-infant dyads in whom the infant participant was diagnosed with laryngomalacia via flexible fiberoptic laryngoscopy performed during a clinic evaluation from August 2021 to June 2022. Mothers completed questionnaires about perinatal history including prenatal vitamin D deficiency/supplementation and infants' breathing and feeding. Vitamin D levels were assessed in infant and mother.

Results: Fourteen participants (7 dyads) were included in analysis. Six infants were male. Mean infant and mother age at blood draw was 2.52 months and 31.9 years, respectively (0.47-8.8, 27.89-38.9). In 5 infants, levels were <30 (mean 22.3) and 1 of their mothers also had a low level. Additionally, 1 mother had low vitamin D compared to infant's normal level. Both infants with normal Vitamin D levels, had been prescribed supplementation before their visit. Age at time of laryngomalacia diagnosis was significantly younger with low Vitamin D (p=.001).

Conclusions: In this preliminary study, Vitamin D levels were low in 5 of 7 infants with laryngomalacia. Further investigation is required to determine if this is an incidental finding or causal-effect relationship, particularly as early supplementation may be beneficial in preventing laryngomalacia.

128

Clinical-epidemiological study of children referred to the otolaryngology outpatient clinic for evaluation of swallowing disorders

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Abstract

Background: Swallowing dysfunction in children can result in aspiration, chronic lung disease and poor weight gain/malnutricion, early diagnosis can reduce negative impacts. The following report aims to describe the clinical-epidemiological characteristics of children referred for swallowing evaluation at a Brazilian public university hospital to build better strategies for healthcare attention.

Methods: Prospective cohort study of 60 patients referred to the otolaryngology outpatient clinic for swallowing evaluation between June 2019 and June 2021.

Results: Mean age was 4,25 years old. Swallowing was considered normal in only 7 patients (11,6%). Of the 53 patients with dysphagia, 25 (47,1%) had severe dysphagia with evidence of aspiration on fiberoptic endoscopic evaluation of swallowing (FEES). Seventeen of these (68%) were feeding orally before and had the feeding route changed. The most frequent complaint was choking (45%), nevertheless, in the group of severe dysphagic patients drooling was present in 40%. There was a statistically significant association between children with neurologic disorders (48) and dysphagia ($p<0,01$). Ninety-six percent of children with neurologic disorders had confirmed dysphagia, of which 46% were classified as severe. Mean duration of complaints until the first swallowing evaluation was 2 years, although 46 (76%) patients had at least one hospitalization for respiratory cause in the previous year.

Conclusions: Majority of patients referred for swallowing disorders present neurologic disorders and a large percentage of these will need a change in feeding route. These patients should benefit from earlier referral. Choking was a recurrent symptom and drooling was particularly associated with more severe dysphagia.

131

A Multidisciplinary Quality Improvement Project to Improve Adherence to Chemotherapy Ototoxicity Monitoring Protocol in Pediatric Patients

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Abstract

Background:

Platinum-based chemotherapy agents are used for a wide range of malignancies in both pediatric and adult patients. Ototoxicity is a well-documented side effect of platinum-based drugs. Our institution has a Pediatric Ototoxicity Monitoring Protocol; however audiologists have noted varying adherence to the protocol. The aim of our QI project is to identify areas of breakdown in our Ototoxicity Monitoring Protocol and to improve adherence to recommended surveillance monitoring.

Methods:

A multidisciplinary team of advanced practice nurses in both ENT and oncology, an oncology pharmacist, and several audiologists from the inpatient and outpatient team was formed for this quality improvement project. Current process barriers were identified, and a chart review was completed to document current state of protocol adherence. Based on this background data, our team educated team members on this data and leveraged the newly established inpatient audiology team to ensure patients are following the Ototoxicity Monitoring Protocol.

Results:

Our team monitored protocol adherence outcomes monthly, including any missed audiograms, those patients with identified hearing loss, and if any further changes to the protocol or our process for trying to improve adherence needs to change. This was done through cycles of PDSA, with a goal of improving protocol adherence rates to 90%.

Conclusion:

While ototoxicity monitoring protocols exist, clinical practice may not always follow these recommendations. Collaboration between disciplines can help to improve rates of adherence to protocols and best practices can be shared and replicated at other pediatric institutions who want to improve their process for ototoxicity monitoring.

132

Outcomes after Total Thyroidectomy in the Pediatric Population at a High-Volume Pediatric Thyroid Center of Excellence.

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Abstract

Background: Hypoparathyroidism is a common complication after thyroidectomy in the pediatric population. Recent studies have shown a 35.5% risk of transient hypocalcemia and a 4.2% risk of permanent hypocalcemia. This study aims to evaluate patient outcomes after total thyroidectomy and risk of transient and permanent hypocalcemia at a high-volume pediatric thyroid center.

Methods: A retrospective chart review was performed for pediatric patients (<18 years) who underwent total thyroidectomy at a single high-volume pediatric thyroid center over an 11-year period. Information regarding neck dissections and complications were reviewed.

Results: A total of 107 patients underwent total thyroidectomy or completion thyroidectomy by pediatric otolaryngologists at our institution between December 2011 and June 2022. Final pathology included papillary thyroid carcinoma (PTC; 35.5%), Graves' (34.6%), multinodular goiter (8.4%), and C-cell hyperplasia (6.5%). Thirty-five patients also underwent central neck dissection (30.5%). Complications after surgery included hypoparathyroidism (11.2%), chyle leak that resolved with medical management (1.9%), and recurrent laryngeal nerve injury (RLN; 2.8%). Duration of hypocalcemia was transient (25%) or permanent (75%). Risk of hypocalcemia was 2.8% (transient) and 8.4% (permanent). Two permanent RLN injuries were due to tumor compromise. Fifty-eight percent of patients with hypoparathyroidism had a central neck dissection. Of those with hypoparathyroidism, 50% had PTC and 25% had Graves' disease.

Conclusions: Thyroidectomy is associated with an increased complication rate in children. Pediatric thyroid centers of excellence can contribute to risk reduction. Here, we present the outcomes of a single high-volume pediatric thyroid center over the past 11 years.

136

Factors Influencing Quality of Life in Children with Tracheostomy with Emphasis on Home Care Visits: A Multicenter Investigation

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Abstract

Background:

Complications and mortality rates associated with tracheostomies are high, especially in children. There are only a few studies that assessed QOL in children with tracheostomy (CWT). We aim to evaluate QOL in CWT and their parents, and the factors influencing it.

Methods:

This cross-sectional multi-center study was conducted on pediatric patients living in the community with a tracheostomy by using the Pediatric Quality of Life Inventory (PedsQL). Children with psychiatric conditions or paralysis, and children who were completely bedridden due to mechanical ventilation were excluded. Patients' clinical and demographic information, as well as parents' socioeconomic factors, were obtained. PedsQL Generic Scales scores were compared with normative data.

Results:

A total of 53 patients met our inclusion criteria and their parents agreed to participate (response rate 86.9%). The patients' mean age was 6.85 years. The most frequent comorbidity was airway diseases. 21 patients were ventilator dependent. The total pediatric health-related QOL score was 59.28 and the family impact score was 68.49. Generic scores were lower for CWT than they were for healthy children. In patients who were not ventilator-dependent, multivariate analyses indicated that social functioning and total pediatric HRQOL were negatively affected by the duration of tracheostomy. Ventilator-dependent patients were influenced by home care visits and the presence of pulmonary comorbidities.

Conclusion:

CWT have a lower QOL than healthy children do. Routine care visits by a respiratory therapist and nurses yielded significantly improved QOL in ventilator-dependent children. Earlier decannulation could result in better social functioning and overall QOL.

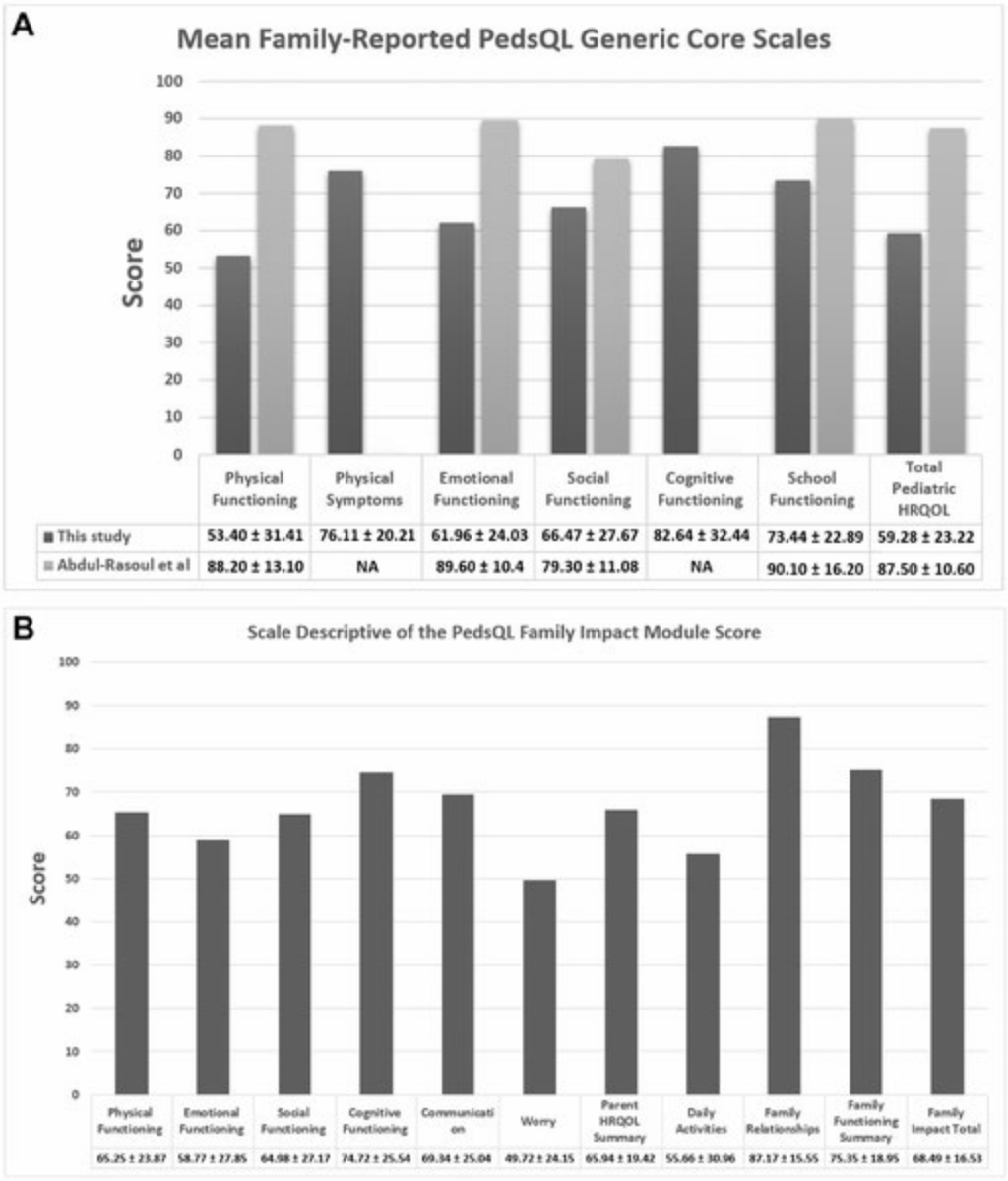

Figure 1. (A) Mean of Family-Reported PedsQL Generic Core Scales and PedsQL Infant Scales of Studied Patients (n = 53) and their normal counterparts from Abdul-Rasoul et al. **(B)** Scale Descriptive of the PedsQL Family Impact Module Scores of Studied Patients (n = 53). Higher values equal better health-related quality of life. Data are expressed as mean ± standard deviation. PedsQL = Pediatric Quality of Life Inventory; HRQOL = health-related quality of life.

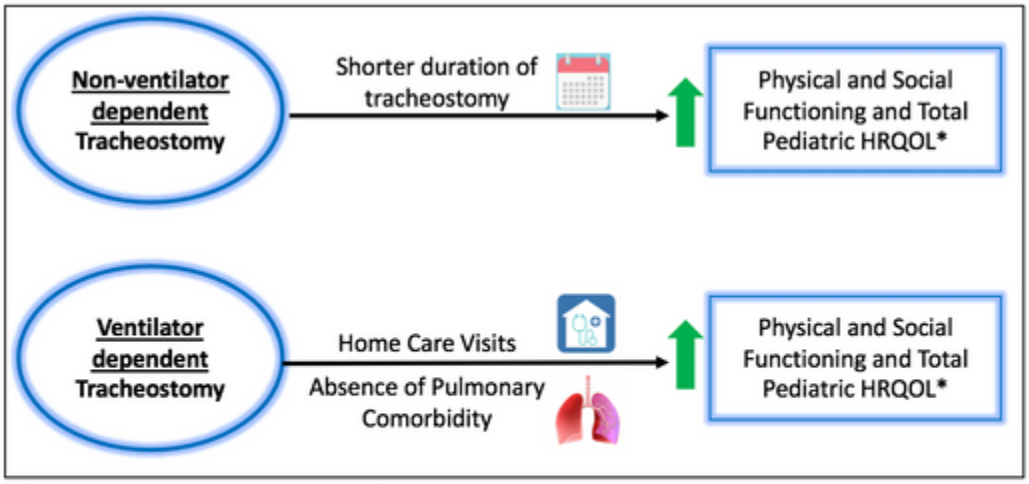

Figure 2. Summary of the Important Findings from the Study.

* HRQOL: Health-Related Quality of Life. These findings are based on multivariate regression analyses. Predictors in the models: duration of tracheostomy, co-morbidities (pulmonary, neurologic, cardiovascular, endocrine, airway and genetic), residence area and home care visits. Other socioeconomic factors, like parents' income and educational level, were not included as they were not found to influence QOL in univariate analysis.

137

Outcomes of cochlear implantation in patients with Auditory Neuropathy Spectrum Disorder

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Abstract

Background:

Auditory Neuropathy Spectrum Disorder (ANSD) accounts for 10 to 15% of pediatric hearing loss. Diagnosis and management are often delayed due to poor detection on newborn hearing screening with otoacoustic emissions, need for serial auditory brainstem response testing to determine auditory thresholds, and controversy regarding best management. It can be difficult to predict the outcomes of cochlear implantation in this heterogeneous population.

Methods:

This was a retrospective chart review of all patients at a tertiary pediatric center with a diagnosis of ANSD between 1/10/2010 and 9/27/2021. Data collected included demographic variables, audiometric information, neonatal and medical history, comorbidities, and speech and language outcomes.

Results:

281 patients were diagnosed with ANSD. Of those, 266 were included in our final review. 29 and 9 underwent bilateral and unilateral cochlear implantation, respectively. All patients underwent a thorough evaluation by a multidisciplinary cochlear implant team. All cochlear implant patients had improvements in pure tone thresholds in the implanted ear(s), with a mean of 2.7 degrees of improvement (i.e. moderate to mild is 1 degree of improvement). All cochlear implant patients tested identified 6/6 Ling sounds at least 1 year after surgery, 46% at a distance of 6 feet or greater including 3 patients with hypoplastic or aplastic cochlear nerves identified on the implanted side on MRI.

Conclusions:

Despite challenges in early diagnosis and amplification, pediatric patients with ANSD appropriately evaluated by a cochlear implant team can receive benefit from cochlear implantation. This includes selected cases of hypoplastic or aplastic cochlear nerves.

141

Usher syndrome IIIA: a review of the disorder and preclinical research advances in therapeutic approaches

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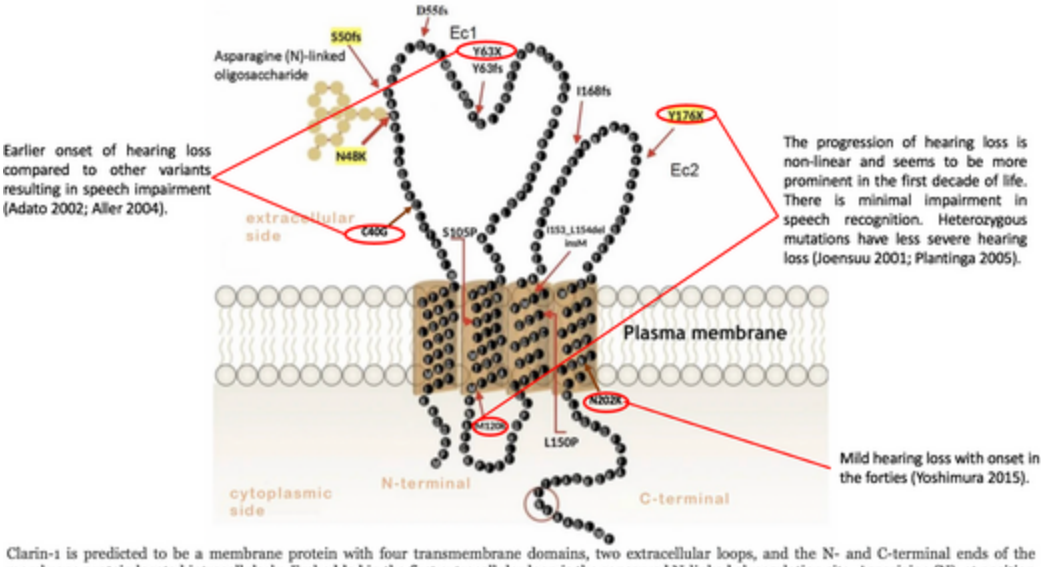
Abstract

Usher syndrome (USH) is an autosomal recessive disorder characterized by sensorineural hearing loss, progressive pigmentary retinopathy, and vestibular dysfunction. The degree and onset of hearing loss vary among subtypes I, II, and III, while blindness often occurs in the second to fourth decades of life. Usher type III (USH3), characterized by postlingual progressive sensorineural hearing loss, varying levels of vestibular dysfunction, and varying degrees of visual impairment, typically manifests in the first to second decades of life. While USH3 is rare, it is highly prevalent in certain populations. RP61, USH3, and USH3A symbolize the same disorder, with the latter symbol used more frequently in recent literature. Previous work from our group showed that in addition to gene therapy in mice, artemisinin (an antimalarial drug that enhances the trafficking of CLRN1N48K to the cell membrane) in zebrafish and BF844 (a protein stabilizer) in mice have shown very promising results. This review focuses on and summarizes the clinical features, epidemiology, molecular genetics, treatment, and research advances for sensory deficits in USH3A.

General clinical features of USH3A*	Postlingual, progressive and symmetrical hearing loss. Usually, speech normally develops. Vestibular dysfunction reported in 51% of tested patients.
	Retinitis pigmentosa develops after puberty (~ 17 years), but electroretinography abnormalities start earlier. First manifestation is nyctalopia due to rod degeneration.



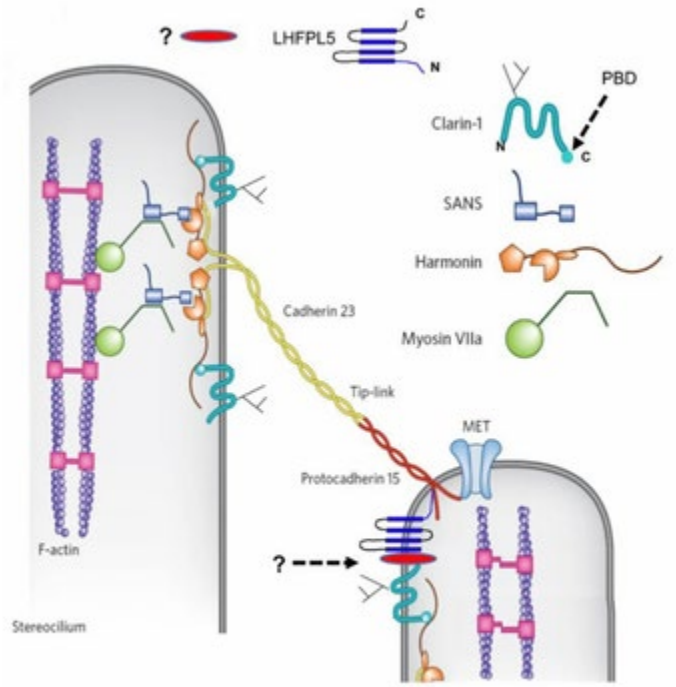
Earlier onset of hearing loss compared to other variants resulting in speech impairment (Adato 2002; Aller 2004).

The progression of hearing loss is non-linear and seems to be more prominent in the first decade of life. There is minimal impairment in speech recognition. Heterozygous mutations have less severe hearing loss (Joensuu 2001; Plantinga 2005).

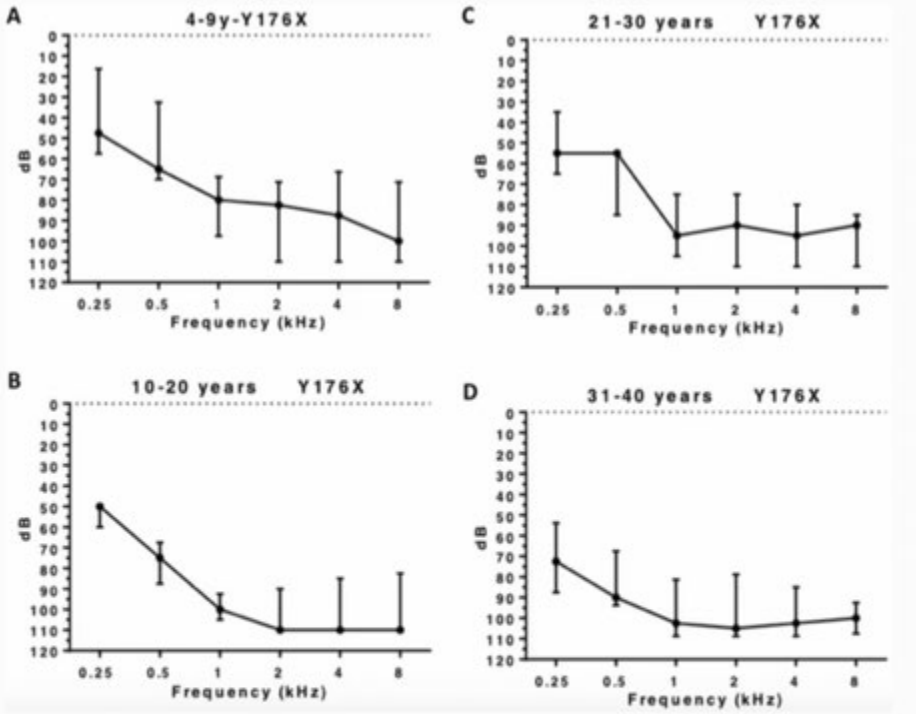
Mild hearing loss with onset in the forties (Yoshimura 2015).

Clarin-1 is predicted to be a membrane protein with four transmembrane domains, two extracellular loops, and the N- and C-terminal ends of the membrane protein located intracellularly. Embedded in the first extracellular loop is the conserved N-linked glycosylation site, Asparigine (N), at position 48. The C-terminus is predicted to contain a PDZ-binding motif (red circle). Some of the pathogenic variants associated with human Clarin-1 protein are indicated (common variants are highlighted). The clinical features of some variants that deviate from the general picture of USH3 are indicated.

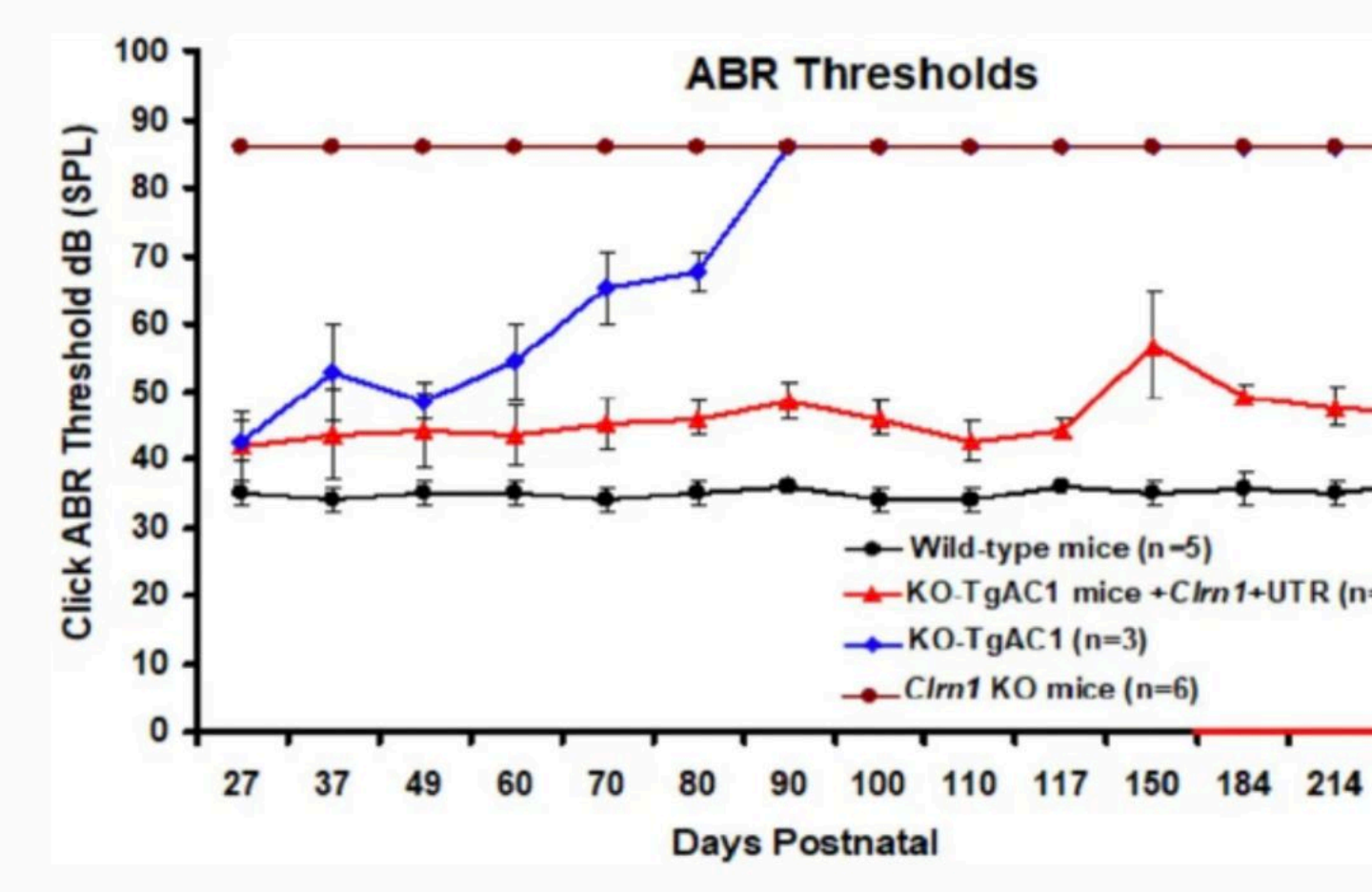
* Ness et al 2003, Sadeghi et al 2005, Pennings et al 2003, Pakarinen et al 1995, Plantinga et al 2005, Ratnam et al. 2013, El-Amraoui and Petit 2014.



A hypothetical model of how clarin-1 mediates its function in the hair bundle (based on published work). For clarity and simplicity, only a few of the reported or hypothesized interactions between clarin-1 and other proteins are depicted.. LHFPL5 = Lipoma HMGIC Fusion Partner-Like 5. **Modified from Lukacs et al. (2016) with permission**



Hearing loss profile in USH3A-Y176X patients. A simplified representation of the pure tone audiometry from USH3-Y176X patients to show a hearing loss trend in this group (data analyzed from Sadeghi et al. 2005). Panels A-D show median pure tone audiometry thresholds in different age groups. **A** Six patients ($N = 6$) ages 4–9 years. **B** Six patients ($N = 6$) ages 10–20 years. Some patients have more than 1 reading included. **C** 21–30 years, ($N = 3$). **D** 31–40 years, ($N = 4$). This figure was generated from reported data (Sadeghi et al. 2005) to show the hearing loss trend in USH3-Y176X patients



AAV-mediated gene therapy in the KO-TgAC1 USH3A mouse model. Data from P27 to P150 including s
were reported (Geng et al (2017)). The red arrow (*x*-axis) represents longitudinal observations from P15
three KO-TgAC1 mice injected with the AAV8-*Clrn1*-UTR vector; hearing was preserved in two of three
P284 (not shown here), with a threshold of 71 and 66 db SPL at P543 (*Omar Akil, UCSF, personal com*

Acceptance type: Poster

1

Delayed Sublingual Edema Following Neonatal Mandibular Distraction Osteogenesis

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Abstract

Background

Mandibular Distraction Osteogenesis (MDO) is a well-established treatment option for neonatal airway obstruction secondary to micrognathia associated with Robin sequence (RS). We aim to report a rare, previously undescribed sequela following neonatal MDO involving delayed onset sublingual swelling.

Methods

In this retrospective case series, three patients diagnosed with RS presented with delayed onset sublingual swelling following uncomplicated neonatal MDO by three different surgeons. The patients presented between August 2019 and September 2021. Retrospective chart review was used to identify patient demographics, chronicity and description of symptoms, and imaging results.

Results

The three patients presented at 2, 4, and 12 months following MDO for micrognathia secondary to RS with intermittent sublingual swelling associated with sialorrhea and feeding difficulties. There was no associated recent illness, fevers, or purulent drainage. All three children underwent MRI imaging which demonstrated asymmetric sublingual gland edema. The edema was located on the left sublingual gland in two children and was bilateral in the third. The symptoms continue to recur 25.5 ± 3.3 months (range, 22.3 – 28.9) postoperatively and all are being managed conservatively.

Conclusion

The present case series describes an unusual and possibly underreported sequela following MDO in RS infants. Chronic delayed onset intermittent sublingual edema is a possible long-term complication following neonatal MDO and further studies should explore the incidence and etiology of this finding.

2

Infected thyroglossal duct cyst in a neonate: A rare case report

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Abstract

Background

Thyroglossal duct cysts are the most common congenital cervical anomalies often presenting as midline neck cysts. The mean age of presentation of pediatric thyroglossal duct cysts varies between five and nine years old with rare cases younger than one year old.

Methods

This case report details a rare infected thyroglossal duct cyst presenting during the neonatal period as upper airway obstruction.

Results

A 3-week-old neonate born full-term with no complications during pregnancy or labor presented with a five-day history of worsening nasal congestion and upper airway obstruction after upper respiratory infection. Physical examination revealed a large midline neck mass measuring 3.1 x 4.2 x 3.2 cm abutting the hyoid with internal echogenicity consistent with a thyroglossal duct cyst causing posterior tongue compression of the airway and airway distress. The patient was emergently taken to the operating room for incision and drainage where she underwent difficult intubation due to superior-posterior tongue displacement and global supraglottic edema. She was discharged on postoperative day five on a course of Augmentin after cultures grew methicillin-sensitive Staphylococcus aureus. The patient had no further complications with successful excision using a Sistrunk procedure six months later.

Conclusions

Pediatric thyroglossal duct cysts most often present as an asymptomatic midline neck mass with rare sequelae of infection and upper airway obstruction. This case report highlights the pathophysiology and presenting symptomology of thyroglossal duct cysts, explores the rarity of infected thyroglossal duct cysts in neonates, and reviews current literature on management strategies for these patients.

7

Pediatric Cholesteatoma Associated with Congenital Aural Atresia and Stenosis

Dr. Olivia Kalmanson MD, MS[1,2], Dr. Christian Francom MD[2,1], Dr. Owen Darr MD[2,1], Dr. Steven Hamilton MD[2,1]

[1]Dept of Otolaryngology, University of Colorado, Aurora, CO, USA. [2]Dept of Otolaryngology, Children's Hospital of Colorado, Aurora, CO, USA

Abstract

Background

There is a paucity of literature on pediatric cholesteatoma associated with congenital aural atresia (CAA) or stenosis (CAS). The objective of this study was to identify presenting features, associated surgical treatment, and report outcomes in this patient population.

Methods

Colorado Multiple Institution Review Board approval was obtained. A retrospective chart review was performed at a single tertiary care children's hospital of all pediatric patients with congenital aural atresia or stenosis with associated cholesteatoma from January 1, 2003, to October 15, 2018.

Results

Of the 278 patients identified with CAA or CAS, twelve (4.3%) were found to have a canal cholesteatoma. There was a male predominance (8:4). Nine patients (75%) had conductive loss and three (25%) had mixed loss. Four patients (33.3%) exhibited canal cholesteatomas extending into the middle ear or mastoid cavity. All patients underwent surgery, and 25% of patients required revision canalplasty and 58% required revision surgery for cholesteatoma recidivism. The average age at the time of surgery was 11.3±3.7 years.

Conclusion

Fewer than 5% of pediatric patients with congenital aural atresia or stenosis were diagnosed with an acquired canal cholesteatoma. The need for revision surgery was common, occurring in >50% of cases. While associated cholesteatomas were rare, the morbidity was considerable. The authors advocate for imaging to screen pediatric patients with CAA or CAS preventing reliable otoscopy.

9

Surgical vs interventional radiology drainage of neck abscesses in pediatric patients

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Abstract

Background

To compare outcomes using an open surgical incision and drainage (S-ID) versus an aspiration under interventional radiology drainage (A-ID) of pediatric neck abscesses. The primary outcome measure was successful drainage requiring one intervention, and the secondary outcome measures were readmission rates and overall cost to the healthcare system.

Methods

Retrospective data collection of all pediatric patients treated at the Primary Children's Hospital for neck abscess from 2008-2020. Patients who did not require drainage were not included. Comparison between S-ID and A-ID was performed according to the primary and secondary outcomes.

Results

Two hundred fifty nine patients were included in the study. Twenty-six patients had A-IR and 234 patients had S-ID. Patient demographics were not significantly different between both groups. Overall length of stay was greater in the A-ID group (5 vs 3.3 days) ($p<0.05$). A second procedure was more frequent in the A-ID group with 11/26 (42.3%) versus 12/234(5.1%) in the S-ID group (P=0.001) even after controlling for multiple possible confounding factors. The rate of readmission was also higher in the A-ID group with 3/26 (11.5%) versus 7/234 (3.0%) in the S-ID group (P=0.006). Both groups showed similar overall cost (P=0.621).

Conclusions

A-ID and S-ID are both methods to treat head and neck abscess requiring drainage. However, overall results indicate a higher rate of failure requiring a second intervention and a higher rate of readmission. In our study cost was noted to be similar between both methods.

11

Rare Case of Nasal Vault Oncocytic Cystadenoma

Aarti Agarwal MD[1], Katie McClain DO[2], Karen Banker PA-C[2], Kudakwashe Chikwava MD[2], Udayan Shah MD[2]

[1]Thomas Jefferson University, Philadelphia, PA, USA. [2]Nemours Children's Hospital - Delaware, Wilmington, DE, USA

Abstract

Background: Oncocytic Cystadenomas are a rare benign pathology often found to arise from the salivary glands, reported more commonly in minor salivary glands, but even more rarely in major salivary glands and the larynx. This is the first known report of a nasal vault oncocytic cystadenoma in a pediatric patient.

Methods: Case Report and Literature Review

Case Presentation: A 10-year-old female presented with a mass involving the left nasal vestibule that caused nasal obstruction and a visible external abnormality. MRI imaging revealed a cystic lesion in the anterior nasal cavity that was rim enhancing with a bright T2 signal that appeared to arise from the nasal mucosa. She was taken to the operating room for endoscopic-assisted removal of the lesion. Pathology showed an oncocytic cystadenoma. On follow-up clinic visit, she is doing well with no signs or symptoms of recurrence.

Conclusion: The authors present the first reported case of a pediatric patient with nasal vault oncocytic cystadenoma. In other head and neck locations, these cysts are generally benign and only cause symptoms related to their location and proximity to other vital structures. Surgical endoscopic management was effective for resection.

12

Successful Diagnosis and Management of Riga-Fede Disease in Pediatric Patients: A Case Series

Catherine Nguyen M.S.[1], Dr. Emily Wikner M.D.[2], Dr. David Darrow M.D.,D.D.S.[2], Dr. Thomas Gallagher D.O.[2]

[1]Eastern Virginia Medical School, Norfolk, VA, USA. [2]EVMS Department of Otolaryngology, Norfolk, VA, USA

Abstract

Background: Mucosal lesions of the oral cavity are common in children. However, the sudden appearance of ulcerated or hyperplastic mucosa in the floor of mouth of a nursing or developmentally-delayed child should alert the otolaryngologist to the diagnosis of Riga-Fede disease (RFD). This disorder is characterized by mucosal trauma resulting from the repetitive protrusion of the tongue against the mandibular incisors. Although the lesion begins as a benign ulceration, it may progress into a mass of hyperplastic, painful, and/or bleeding tissue that mimics malignancy.

Methods: Case series with a review of relevant literature and objective to familiarize the otolaryngologist with RFD to discuss its proper management.

Results: Five patients presenting with ulcerations or masses of the proximal ventral tongue or floor of the mouth were diagnosed with RFD over a nine-year period. In two of the children, a change in feeding mechanics over 2 and 5 months, respectively, preceded appearance of the mass. Three of the children were developmentally delayed and manifested oral habits resulting in repeated trauma to the sublingual mucosa. All cases were managed by surgical excision of the lesion and/or dental intervention.

Conclusion: Successful management of RFD depends on recognition of the pathology and its cause, as well as reduction of dental trauma by alteration of feeding mechanics, occlusal adjustment, use of protective appliances, or dental extraction. Surgical excision may be necessary to restore normal mucosal appearance and function. Interdisciplinary care between the otolaryngologist and pediatric dentist is paramount for optimal functional and anatomic outcomes.

13

Pediatric Single-Sided Deafness (SSD) and Cochlear Implantation at the Nemours Children's Health, Delaware

Dr. Julie Verhoff AuD,PhD, Melissa Stone Mengistu MSEd, Dr William Parkes MD

Nemours Children's Health, Delaware, Wilmington, DE, USA

Abstract

Cochlear implant surgery provides a way for pediatric patients with severe-to-profound single-sided deafness (SSD) to access binaural hearing. The purpose of this investigation was to review outcomes for children with SSD implanted at Nemours Children's Health in Delaware in 2020 and 2021. Our program consists of Audiology, Otolaryngology, Psychology, Therapy Services, and Social Work. We collaborate with patients' school districts and other various service providers to help achieve improved auditory benefit and outcomes.

A retrospective case review from a tertiary pediatric (<18 years) hospital for children with SSD was completed to assess outcomes with pre- and post-cochlear implant (CI) surgery. Eight pediatric patients were implanted with either a Cochlear Americas or MED EL device. Assessment questionnaires (i.e., LittleEars, PEACH, or APAHB), audiometric thresholds, word recognition, and sentence-in-noise testing were attempted pre- and post-CI surgery.

Cochlear implant surgery is a viable treatment option for pediatric SSD. Open set speech and improvement in background noise can be achieved. Thorough counseling prior to surgery and throughout follow up post-surgery appointments about expectations is vital to achieving successful outcomes to avoid loss to follow up or patient dissatisfaction.

14

Improving Audiology and Otolaryngology Post-Tube Follow-Up Appointments in the Delaware Valley

Dr. Julie Verhoff AuD, PhD, Dr Patrick Barth MD, Karen Banker PA, Melissa Stone Mengistu MSEd, Shannon Francese BS, Michelle Morrow MS, Stephanie Oliet BS, Brian Burke BS

Nemours Children's Health, Delaware, Wilmington, DE, USA

Abstract

Background: Standard of care for bilateral myringotomy tube placement is a follow up audiogram with Audiology (AUD) within six weeks and follow up with ORL at 6 months following tube placement. Patients lost to follow up may experience adverse events including hearing loss and unneeded oral antibiotics. Post-tube completion rate is low and may result in poor patient outcomes.

Aim: Increase completed AUD six-week post-tube appointments from 72% to 92% within 6 months. Increase scheduled ORL six-month post-tube appointments from 63% to 80% within six months.

Design: A fishbone diagram was used to identify barriers for success in the current postoperative scheduling process. A driver diagram was created to identify steps within the pre- and post-surgical process that would help increase the percentage of postoperative appointments scheduled and completed. Post operative instructions were modified to reflect appropriate follow-up audiogram scheduled within 6 weeks and ORL office follow-up within 6 months. Manually entered post-op orders directing follow-up appointments to be scheduled by the Access Center were developed for the surgeons.

Challenges: Obtaining accurate baseline data due to halt in elective procedures and office appointments following COVID-19. Shifting scheduling responsibility to Access Center caused significantly increased workload for outbound scheduling team. Data collection challenging due to delay between scheduling appointments, surgery and completion of follow-up visits.

Next Steps: Expand postoperative orders and scheduling process to other surgeries requiring follow-up. Continue conversations with scheduling groups to address any unintended consequences. Periodic data review to ensure that best practices are being achieved.

15

Coblation as an Effective Tool for Treating Subglottic Cysts and Hemangiomas in Pediatric Patients

Ana Khatiashvili BA, Lara Reichert MD, MPH

Albany Medical College, Albany, NY, USA

Abstract

Background: Subglottic cysts and hemangiomas are rare but life-threatening conditions in pediatric patients. Subglottic cysts are generally associated with premature infants with a history of prolonged endotracheal intubation, while subglottic hemangiomas are congenital vascular lesions that grow rapidly and are common head and neck tumors in pediatric patients. Both conditions can present with generalized respiratory symptoms such as stridor. Early diagnoses and treatment are crucial in avoiding airway compromise. Coblation should be considered as an effective treatment for the aforementioned subglottic conditions as it accurately reduces tissue volume and operates at considerably lower temperatures than cautery and CO_2 lasers, therefore minimizing damage to the surrounding tissue, reducing the potential for scar formation, and almost completely eliminating the risk of airway fire.

Methods: Medical records of 3 pediatric patients from June 2021 to June 2022 were reviewed. All cases involved the use of coblation as treatment for subglottic cysts or hemangiomas. Patients' presentation, surgical intervention(s), and post-operative course were analyzed.

Results: All 3 cases responded well to coblation and have demonstrated no signs of stridor or subcostal retractions since surgery. Subsequent endoscopies have shown excellent healing with no additional cyst or hemangioma formation with minimal stenosis.

Conclusion: The results of the study suggest that coblation may be a safer and more effective alternative to cautery and CO_2 lasers for the treatment of pediatric subglottic cysts and hemangiomas.

16

Staged surgical correction of a nose with a septal perforation and saddle deformity

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Division of Facial Plastic Surgery, Mayo Clinic, Phoenix, AZ, USA

Abstract

Background: Perforation of the nasal septum with subsequent aesthetic deformity are well-documented complications following insertion of a button battery. We present a case of an adolescent with a large septal perforation and saddle deformity due to a childhood button battery injury. The patient's reconstructive course was interrupted by psychiatric illness.

Methods: Retrospective case report

Results: A 16-year-old male presented with septal perforation and progressive saddle nose deformity due to placement of multiple button batteries intranasally at age 4. Nasal dorsum depression, columellar retraction, valve dysfunction, and a 1.8 cm perforation were noted. A staged reconstructive approach was planned. The perforation was successfully closed through an endonasal approach utilizing bilateral mucosal flaps supported with a temporalis fascia interposition graft. Reconstructive surgery scheduled 11 months following perforation repair to address the aesthetic and valve deformities was postponed due to emergence of patient's depression and suicidal ideation. The patient's ultimate commitment and adherence to mental health care allowed for a second stage reconstruction 28 months following perforation closure. Open reconstructive septorhinoplasty with autogenous costal cartilage grafting was employed to address the dorsum, valve, and caudal septum. The postoperative course was uneventful with a successful result noted at 7 months.

Conclusions: An adolescent psychiatric patient with septal perforation and nasal aesthetic deformities poses multiple management challenges. This report highlights our staged approach to perforations with a substantial saddle deformity to optimize the surgical outcome. Secondary reconstruction was delayed to address and safeguard the patient's mental health against acute surgical stress.

21

The Role of 3D Modeling in Cochlear Implantation

Alyssa Leong BS[1], Monika Edejer BS[1], Ellen Smith Au.D[2], Dr. Daniela Carvalho MD MMM[2,3]

[1]University of California, San Diego, La Jolla, CA, USA. [2]Rady Children's Hospital of San Diego, San Diego, CA, USA. [3]Department of Otolaryngology, University of California, San Diego, La Jolla, CA, USA

Abstract

Background:

Cochlear implantation has been used for years to help patients with bilateral hearing loss. This is an effective treatment as it improves their hearing, speech comprehension and production. Born with cochleovestibular abnormalities, 3D cochlear implants were employed to help a patient to hear.

Methods:

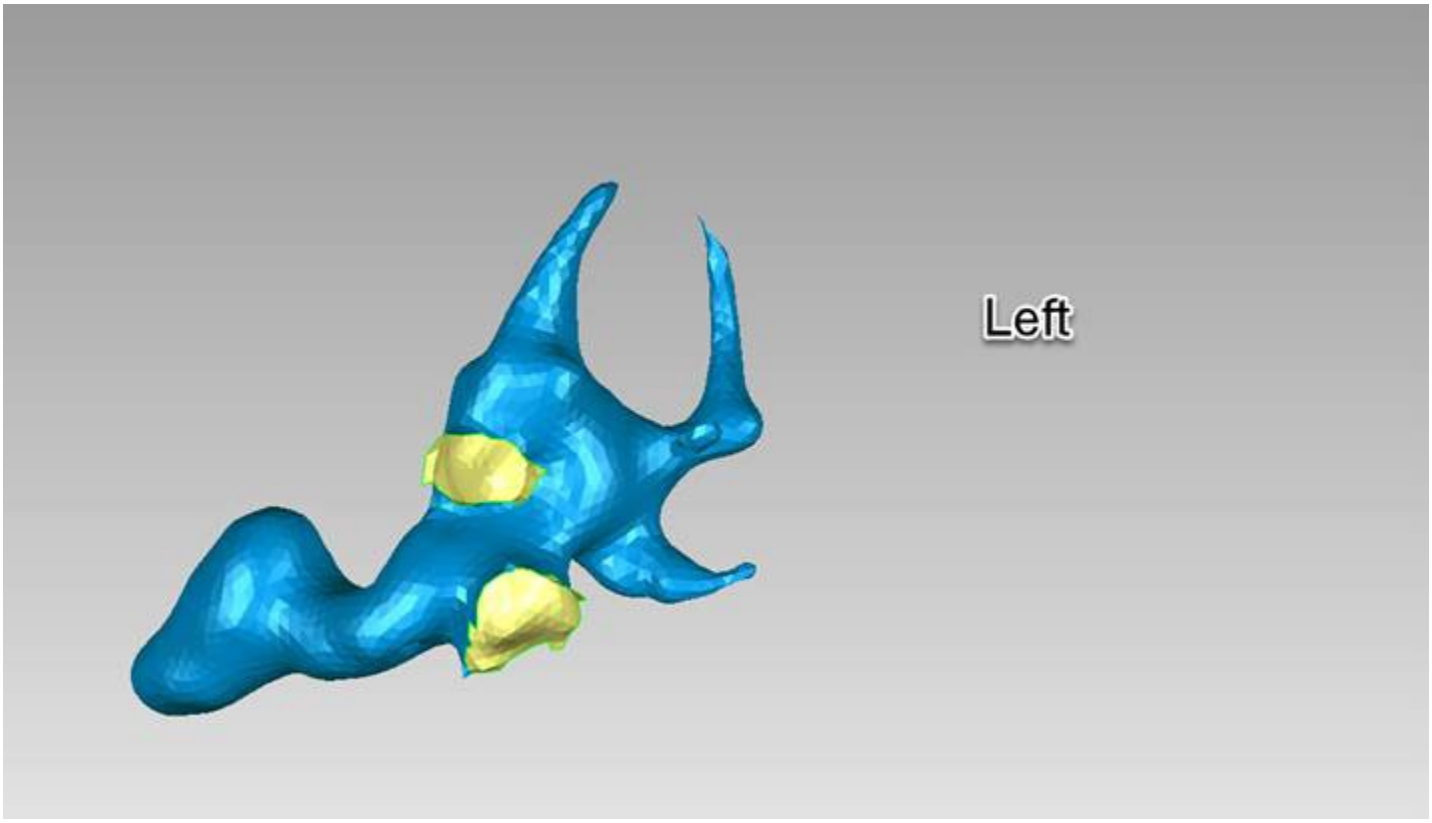
This is a case report of a cochleovestibular abnormality resolved with 3D cochlear implants. The medical history used was anonymized and permission had been granted by the family.

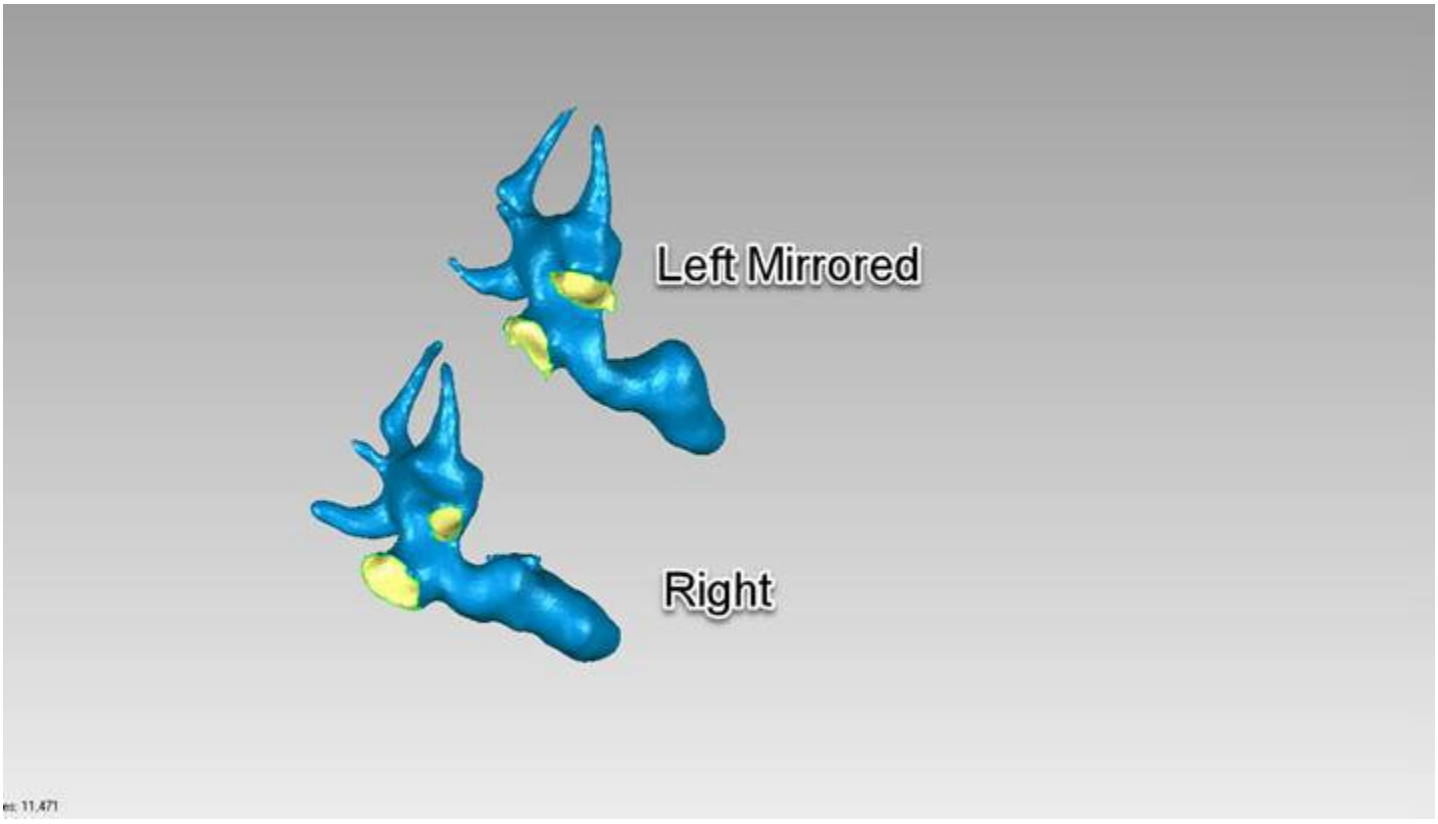
Results:

The patient was born prematurely and failed newborn hearing screening bilaterally. The family did not report a history of hearing loss or issues. The patient was diagnosed with Nicotinamide Adenine Dinucleotide which was attributed to their bilateral congenital sensorineural hearing loss. Imaging of the patient's temporal bone revealed significant cochleovestibular abnormalities. The patient was approved for bilateral cochlear implantation. A 3D model of both cochleas was made to assess the best electrode array to use. Physicians decided on CI612 with Contour Advance Electrode. 16 and 15 of the 22 electrodes were implanted into the patient's left and right cochlea, respectively. 13 and 15 nerve responses were observed on the left and right side of their brain, respectively. After surgery, the family reported significant improvement in the patient's hearing.

Conclusion:

3D modeling is an effective solution for cochlear abnormalities if it is an available resource. All possible resources should be utilized for optimal treatment outcomes. The success of this case is a testament to this as it improved the patient's quality of life.





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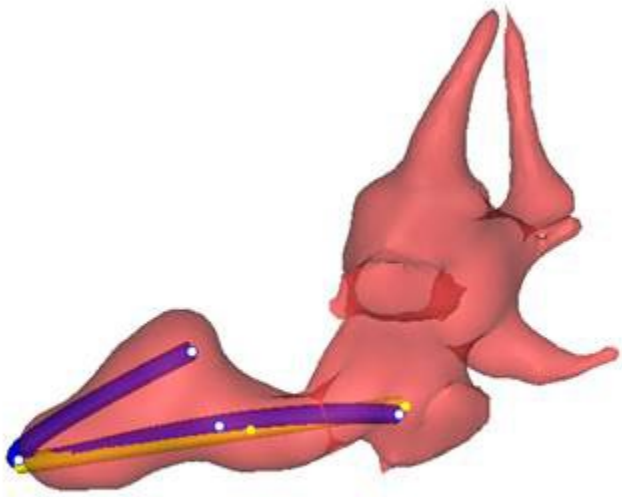

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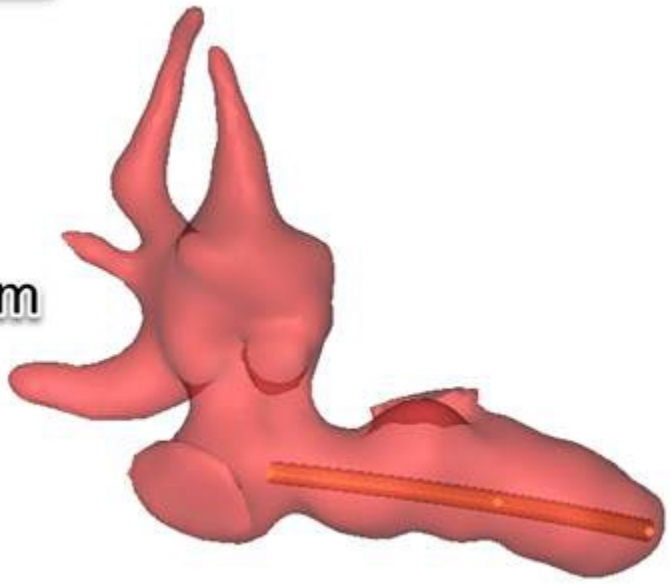

22

Does REM AHI predict persistent OSA after pediatric adenotonsillectomy?

Caroline M Fields BS[1], Nicolas S Poupore BS[1], Hussein Smaily MD[1], Jenna H Barengo MD[1], Shaun A Nguyen MD, MA[1], Jacqueline Angles DO[2], Clarice S Clemmens MD[1], Phayvanh P Pecha MD[1], William W Carroll MD[1]

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Abstract

The utility of REM AHI in managing pediatric obstructive sleep apnea (OSA) is not fully understood. This study aimed to evaluate the relationship of preoperative REM AHI to postoperative persistence of OSA in children who underwent adenotonsillectomy.

This case series identified children under the age of 18 that received an adenotonsillectomy for OSA and a preoperative and postoperative polysomnogram. Children with craniofacial or neuromuscular disorders or a tracheostomy were excluded. The primary outcome was the postoperative persistence of OSA, defined as a postoperative obstructive apnea-hypopnea index (oAHI)≥1.5 events/h. REM-predominant OSA was defined as a ratio of REM/NREM AHI≥2. REM AHI minus NREM AHI and REM AHI minus oAHI helped to identify patients with a larger distribution of REM AHI.

A total of 353 patients were included. Postoperative persistent OSA was seen in 232 (65.7%) children. The preoperative REM AHI, REM AHI minus NREM AHI, and REM AHI minus oAHI of children with persistent OSA did not differ significantly from children with resolution of OSA. Rates of persistence were not different between those with REM-predominant OSA and REM-independent OSA (63.8% vs. 70.7%, p=0.218). No statistical differences were seen in rates of persistent OSA when stratifying patients with a threshold REM AHI at 20, 30, 40, 50, and 60 events/h.

This study suggests that preoperative REM AHI may be a poor predictor of OSA persistence after adenotonsillectomy. Further study is needed to help characterize how pre-operative REM AHI should impact clinicians' decision making, family counseling and recommendations.

27

Evaluation of the Effectiveness of Childhood Dysphagia Management Scale Implementation

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Abstract

Background: The Childhood Dysphagia Management Scale (CDMS) is a validated scale completed by SLPs and/or OTs after completion of an instrumental swallow study (VFSS or FEES). The CDMS contextualizes findings of VFSS and FEES studies by assigning a weighted score based on the impact of the recommendations and restrictions made during the swallow study and the persistence of dysphagia across repeated swallow studies. The total score corresponds to a recommendation for the most appropriate medical home for management of dysphagia. The CDMS has been implemented across inpatient/outpatient settings at all network of care sites at one pediatric hospital since 2019. This study evaluates the effectiveness of CDMS implementation to provide potential adopters with the data needed to evaluate whether this innovation could be used to support their pediatric patients with dysphagia.

Methods: All VFSS/FEES competed at our institution from May 2019 – November 2022 will be reviewed for determination of CDMS completion. Contact coverage (# CDMS scored/# possible to complete) will be calculated across all potential sites and settings (inpatient/outpatient). CDMS completion will be analyzed by patient age and across the timeline from implementation to present to determine if education and infrastructure impacted compliance with scale completion. Encounters with scales that are not completed will be examined for reason for non-completion.

Results: Data collection and analysis is still underway for this study.

Conclusions: To be determined after data analysis. We hypothesize that our data will show the CDMS to be a feasible innovation to support pediatric dysphagia management.

28

Drug-induced sleep endoscopy impacts intraoperative decision making in young children with obstructive sleep apnea

Emma Landes BA, Rebecca Lin BA, Judith Lieu MD, MSPH, Katherine Dunsky MD

Washington University School of Medicine in St. Louis, St. Louis, MO, USA

Abstract

Background

Studies of drug-induced sleep endoscopy (DISE)-directed surgery have not compared differences in surgical management between patients with and without DISE. This is of particular interest in young children who are at increased risk for complications after adenotonsillectomy. Our study investigated whether the use of DISE in our youngest patients led to more individualized surgical planning beyond adenotonsillectomy.

Methods

We reviewed a consecutive cohort of patients with obstructive sleep apnea (OSA) under 3 years old between July 2018 and August 2021. Charts were reviewed for demographics, medical history, polysomnography (PSG) findings, DISE Chan-Parikh Score, surgeries, and outcomes. Chi-squared and independent-sample t tests were performed with IBM SPSS 28.0.

Results

We identified 107 children with sleep apnea under age 3, half of which had DISE as part of their operative procedure. The mean pre-intervention O2 nadir of patients with DISE was lower than those without DISE (74.0 vs 78.6; p=0.016). Children who had DISE were more likely to have a surgery to address sleep apnea (96.1% vs. 82.1%; p=0.023). An increased number of patients underwent supraglottoplasty after DISE (35.3% vs. 13.7%; p=0.011). There were no significant differences in outcomes or changes in pre- to post-intervention PSGs between the two groups.

Conclusions

Patients with DISE were more likely to undergo supraglottoplasty compared to patients without DISE. Laryngomalacia may be missed in children who do not have overt stridor when awake. Surgeons should consider utilizing DISE for young children with OSA as they may have sites of obstruction other than adenotonsillar hypertrophy.

29

The changing landscape of pediatric salivary gland stones: a half-century systematic review

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Abstract

Background: Pediatric sialolithiasis is a rare, but important pathology. Diagnosis and management have evolved over the years but there lacks a consolidation of the literature on this topic. Our goal was to assess the evidence for pediatric sialolithiasis, including its demographic characteristics, diagnosis, and demonstrate the shift in its treatment paradigm.

Methods: A systematic review of sources from the Medline and Embase databases was conducted from inception to Dec 4, 2020. Studies that evaluated pediatric subjects with sialolithiasis were included. Study design, cohort size, age, sex, symptoms, stone characteristics and intervention were collected data points.

Results. Forty-one studies with 243 patients were included in the review, of which 40 were case reports or series. The majority of stones were found in the submandibular gland (n=210, 85.4%) and were single stones (n=101, 71.1%). Average stone size was 7.7 mm. The most common diagnostic imaging modality was ultrasound (n=73, 47.4%), shifting from plain radiograph which was favoured in earlier years. Similarly, open gland excision was historically preferred, but since 2000, sialoendoscopy comprised 40.5% of all treatment modalities and continues to increase in prevalence, up to 52.1% by 2020. Extracorporeal shock wave lithotripsy was associated to the highest complication rate of 54.2%.

Conclusions. Evolving technology has pushed the progress of diagnosis and therapy, especially sialoendoscopy. There is an increasing research interest in this field and further high-quality studies are warranted to follow future innovations.

30

Superabsorbent Polymer (SAP) Obstruction Presenting As Periorbital Cellulitis and Nasal Abscess

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Abstract

BACKGROUND:

Superabsorbent polymers (SAP) are hydrogels comprised of copolymers, giving them a high-water absorption capacity. Due to their radiolucent properties, presentations of SAP obstructions can be misdiagnosed as congenital abnormalities, infections, neoplasms, systemic diseases, or trauma. This abstract presents a unique case of a young child whose physical and imaging presentation of SAP-related nasal obstruction manifested as periorbital cellulitis and nasal abscess.

DISCUSSION:

A two-year female presented to our emergency department with progressive periorbital edema and conjunctival erythema. Upon inspection of her right nares a large "green jelly-filled ball" was noted, suspicious for foreign body. Subsequent CT imaging demonstrated a right anterior nasal cavity rim enhancing hypodense collection, presumably a forming abscess. Intraoperatively, a transparent polymer was found occluding the entirety of her right naris, which was removed without issue. There was no purulent drainage, however the surrounding nasal mucosa was noted to be significantly edematous and boggy. During follow-up, the patient continued to suffer from epistaxis, congestion, and periorbital edema. Intranasally, there was significant narrowing, granulation tissue, and crusting at the site of the original obstruction, concerning for vestibular stenosis. Unfortunately, she has required multiple subsequent operative debridements and scar division procedures, with further procedures scheduled for the near future.

CONCLUSION:

Our case highlights the difficulty in diagnosing SAP obstruction, as it's physical and imaging presentations can mimic other, more common, diseases. Parents and health professionals should be aware of SAP dangers and keep foreign body obstruction in the differential diagnosis in suitable clinical scenarios.

31

Pediatric Mandibular Malignancies: A Comprehensive SEER Analysis

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Abstract

Background:

Mandibular malignancies are rare entities in pediatric otolaryngology. Prior studies have characterized histological tumor subsets, but we offer a contemporary analysis of the myriad of malignant pediatric mandible tumor subtypes using the Surveillance, Epidemiology, and End Results (SEER) registry.

Methods:

SEER 18 registry data was collected using the 0-18 years age range and C41.1 (mandible) ICD-O-3 site code. Univariate Cox proportional hazard ratios (HR) were calculated for overall survival (OS) and disease-specific survival (DSS) among patient demographics, tumor characteristics, and treatment groups. Kaplan-Meier survival curves were generated for OS and DSS for significant groups.

Results:

Of 541 patients identified, 64 patients met inclusion criteria. The median age of diagnosis was 13.0, and the median survival was 8.7 years. Osteosarcoma was the most common diagnosis (n = 22). Race, sex, odontogenic origin, or treatment modality did not affect OS or DSS. However, p-values for age <13 years and sarcomatous histology approached significance in OS. 'Distant' staging was associated with significantly elevated HR of 6.28 and 5.29 for OS and DSS, respectively ($p < 0.05$). Kaplan-Meier curve demonstrated lower OS and DSS for 'distant' stage versus 'localized' and 'regional'. Sarcomas exhibited lower DSS ($p <0.05$) than non-sarcomas on the curve.

Conclusion:

To the best of our knowledge, we report the largest analysis of pediatric mandibular malignancies in the literature. 'Distant' stage and sarcoma subtype tumors were associated with decreased survival, while age of diagnosis had a notable survival trend. Clinical suspicion and early diagnosis are paramount for improved survival.

33

Excision of a Thyroglossal Duct Cyst with Unique Findings Concerning for Malignancy

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Abstract

Background: Thyroglossal duct carcinoma is an uncommon diagnosis encompassing about 1% of all thyroglossal duct cysts (TGDC). The purpose of the study is to discuss a unique case of TGDC. It is essential to differentiate between TGDC and carcinoma as management of the latter often requires more aggressive treatment.

Methods: Case Report

Results: This is a 4-year-old male with several weeks of a midline neck mass and elevated thyroglobulin levels. Ultrasound was suspicious for TGDC but there appeared to be further extension of the lesion into the deeper soft tissues with internal vascularity. A CT neck was recommended, showing an enhancing solid midline mass below the hyoid and nonspecific bilateral cervical lymphadenopathy. Findings were concerning for a TGDC with ectopic thyroid versus TGDC carcinoma. Given overall clinical picture, removal with Sistrunk procedure was recommended. Intraoperative findings were consistent with a 2x2 cm mass in the midline of the neck with obvious inflammation, abnormal purple discoloration and altered anatomy. After pathological analysis, the specimen was consistent with an inflamed benign TGDC without thyroid tissue or malignancy.

Conclusions: This report presents a unique case of a pediatric TGDC with high concern for malignancy from radiology and primary care provider, thus an urgent surgical procedure was arranged. It is important to differentiate between these as there are differences in management, especially when assessing higher risk TGDC carcinoma cases. While TGDC can be treated with the Sistrunk procedure, management of malignancy may include additional thyroidectomy, followed by radioactive iodine therapy and thyroid-stimulating hormone suppression.

36

Evaluation and Management of Juvenile Nasopharyngeal Angiofibromas

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Abstract

Background: Juvenile nasopharyngeal angiofibromas (JNA) are rare, vascular tumors occurring almost exclusively in adolescent males. JNAs can rapidly grow and invade adjacent structures. This study's purpose is to explore the management and outcomes of JNAs over time.

Methods: Single institution, retrospective chart review included pediatric patients with JNA diagnoses who presented from 2000/01/01 to 2022/02/01.

Results: Thirty-five JNAs were seen at our hospital. Symptoms were present for a median (IQR) of 5.8 (3-12) weeks before referral. The median (IQR) age at surgery was 14 (12.6-15.2) years. Seventy percent (24/34) were Radkowski stage 2A or 2B. Nineteen (54%) were treated with open surgery (OS) and 16 (46%) were managed endoscopically (ES). Preoperative embolization was used in 91% (31/35) of cases. The median intraoperative blood loss during OS was 675 (150-3500) ml compared to 500 (75-2000) ml during ES (p=0.38). The median length of stay was shorter for ES (2.0 (1.0-2.0) days) compared to OS (4.0 (3.8-5.5) days, p=0.0003). The median (IQR) follow up was 3.2 (1.7-4.3) years. One patient with a Radkowski stage 3B tumor treated with OS had residual disease requiring post-operative radiation. One patient (2.9%) with a Radkowski stage 2C treated endoscopically had a recurrence.

Conclusions: Management of JNAs has shifted towards endoscopic management. While this has resulted in a statistically significant decrease in length of stay, we did not find a difference in intraoperative blood loss. Despite the excellent visualization afford by endoscopic surgery, recurrence is still possible and vigilant postoperative monitoring is required.

37

Pediatric Vallecular Cysts

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Abstract

Background: Congenital vallecular cysts are a rare cause of feeding and respiratory issues. There is limited current literature on this anomaly. The objective of this study is to review a 17-year experience with pediatric vallecular cysts treated at our institution.

Methods: A retrospective chart review of children with vallecular cysts from 2005-2022 was performed at a tertiary care children's hospital, including data on presenting symptoms and surgical intervention.

Results: 19 patients were identified with vallecular cysts (53% male). The mean age at diagnosis was 3.3 years (range 0-17 years). Symptoms prior to diagnosis lasted 4.5 months on average (range 0-3 years). An equal number of marsupializations (8) and excisions (8) were performed, with three patients not requiring intervention. The most common preoperative symptoms were inspiratory stridor (52%), feeding difficulties (52%), apnea (42%), and reflux (42%). The most common postoperative symptoms included snoring, choking, and reflux (16% each). Two (11%) patients experienced recurrence of the vallecular cyst.

Conclusions: This large single-institutional review of pediatric vallecular cysts agree with previous studies reporting feeding difficulties and inspiratory stridor as the most common presenting symptoms. Our findings suggest marsupialization and excision are equally effective in treating symptoms and preventing recurrence.

Table 1: Patient Characteristics

Symptoms	Pre-Op (%)	Post-Op (%)
Inspiratory Stridor	53	5
Feeding Difficulties	53	5
Failure to Thrive	21	0
Snoring	37	16
Choking	26	16
Apnea	42	11
Chronic Cough	16	5
Hoarseness	21	5
Cyanosis	16	5
Croup	16	5
Laryngomalacia	32	5

GERD	42	16
Dysphagia	42	5

38

The Effect of Energy Delivery by the Gold Laser on Incidence of Postoperative Adenotonsillectomy Complications

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Abstract

Background:

The objective of this study was to determine if the energy delivered by the Gold laser impacted post-operative complication rates after adenoidectomy, tonsillectomy, or adenotonsillectomy.

Methods:

A retrospective chart review identified 420 patients within the last five years who met the criteria. Indications for the surgeries included recurrent tonsillitis, obstructive sleep apnea, sleep disordered breathing, adenoiditis, peritonsillar abscess, and others. The relationship between the energy delivered (kJ) and various complications such as bleeding, pain, dehydration, readmission, emergency center visits, and clinic calls were evaluated.

Results:

There was a significant correlation between higher kJ delivered and incidence of major bleeding requiring cauterization in the operating room ($p=0.0311$). In addition, emergency center visits ($p=0.0131$) and readmission ($p=0.0210$) showed significant correlation with the amount of energy (kJ) delivered. Furthermore, higher energy correlated to higher maximum post operative pain scores ($p=0.0302$). Attendings displayed a different pattern of energy delivery compared to residents ($p<0.0001$), which also differed by PGY ($p<0.0001$).

Conclusion:

There are significant correlations between higher energy delivered in kJ using the Gold laser and less desirable post-operative results. In addition, residents tend to utilize higher levels of energy, but this trend tapers off in the 4th and 5th years. Clinicians utilizing the Gold laser during adenotonsillectomies should be mindful about the amount of kJ they use and aim to use less energy if possible.

41

Acquired Subglottic Stenosis After Surgery in the Pediatric Population: A Unique Case of Juvenile Nasopharyngeal Angiofibroma

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Abstract

Background:

Subglottic stenosis (SGS), narrowing of the upper trachea, can be an acquired condition in pediatric patients. Presenting with varying degrees of dyspnea and stridor, acquired SGS is most commonly due to intubation. Airway stenosis is not often considered a surgical complication. No literature on acquired SGS after endoscopic sinus surgery exists. We present a unique case of SGS in a 13-year-old patient with juvenile nasopharyngeal angiofibroma.

Methods:

A 13-year-old male presented for evaluation of progressive dyspnea 6 weeks after resection of his juvenile nasopharyngeal angiofibroma (JNA) with endoscopic skull base surgery. The presentation and operative course, along with images and pathologic findings, are discussed.

Results:

The patient originally presented with a 1-week history of nasal congestion, mild epistaxis, and decreased visual acuity. The patient was urgently intubated due to signs of obstruction prior to undergoing CT/MRI imaging and ophthalmology consultation. The patient had a combined endoscopic and open skull base approach and tumor resection. Six weeks following surgery, he presented with dyspnea and loud biphasic stridor at rest. Flexible laryngoscopy revealed SGS. Endoscopic dilation and triamcinolone injection were used to treat the stenosis. At the 1-month, 3-month, and 6-month follow-up, patient was doing well.

Conclusions:

Acquired SGS can present as a life-threatening airway obstruction in pediatric patients. With the rise of endoscopic skull base surgery and prevalence of JNA, this case study sheds light on the detection and management of SGS post-operatively.

44

Surgical Technique for Columellar Reconstruction in Midline Cleft Repair

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Abstract

Background: Midline facial clefts (MFCs) are rare congenital anomalies requiring complex surgical correction. Unlike unilateral or bilateral cleft lip or palate repair, reconstruction of the columella must be a consideration for midline cleft repairs. There is a paucity of reports detailing how to approach repair of the midline cleft, particularly as it pertains to columellar reconstruction. We present a case of a 22-month-old female with large MFC necessitating creation of a neo-columella.

Methods: Surgical approach for columellar reconstruction utilized a combination of bilateral "l" flaps, forming the nasal floor, and a hinge flap, creating a tubed neo-columella.

Results: In this patient with prior respiratory distress and tracheostomy, no airway complications were encountered. Satisfactory functional and aesthetic outcomes were achieved.

Conclusions: The technique described establishes a tissue connection between the nasal tip and upper lip, facilitating additional future reconstruction. This case highlights the clinical features associated with MFC, and presents one option for construction and closure of the neo-columella in MFCs where agenesis of the columella has occurred or only remnant structures exist.

45

A Case Report of Bilateral Sensorineural Hearing Loss in Pediatric Tubulointerstitial Nephritis and Uveitis (TINU)-Atypical Cogan Syndrome.

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Abstract

Background: Tubulointerstitial nephritis and uveitis (TINU) syndrome is a rare, multisystem autoimmune disorder that causes inflammation of the uvea and renal tubules. Cogan's syndrome is an autoimmune condition that classically presents with interstitial keratitis as well as auditory and vestibular dysfunction. Overlap of the two syndromes have been previously described. Herein, we describe a pediatric case of TINU and atypical Cogan's with hearing loss.

Methods: Case report and literature review

Results: The patient was a 14-year-old Palestinian male who initially presented with abdominal pain, elevated CRP, and acute renal failure. A kidney biopsy revealed interstitial nephritis and he was started on prednisone. Prednisone was tapered off when nephritis improved, but several months later the patient reported decreased visual acuity and was diagnosed with uveitis. Subsequently, the patient noted hearing loss and was diagnosed with profound, bilateral sensorineural hearing loss refractory to medical therapy. While the patient denied vestibular symptoms, videonystagmography confirmed vestibular weakness in the right ear. The patient was diagnosed at a tertiary care center and treated with pulse dose methylprednisolone, infliximab, and methotrexate. The patient subsequently underwent cochlear implantation on the right to address his hearing loss.

Conclusions: This is the second documented case of hearing loss seen in TINU and atypical Cogan's. This case highlights the challenges of multisystem disease process and importance of providing multidisciplinary care. This case also showcases the importance of considering autoimmune causes of hearing loss in pediatric patients which require additional investigations and immunosuppressive therapy.

46

Paediatric Sjögren's syndrome with bilateral parotid cysts: A case report

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Abstract

Background: Sjögren's syndrome is an autoimmune disease characterized by the destruction of exocrine glands. Clinically, this results in loss of tear and saliva production. Although xerophthalmia and xerostomia, also known as sicca, is a common presentation among adults, pediatric patients more often present with recurrent parotitis and glandular enlargement. Overall symptoms can vary, making initial diagnosis challenging. Approximately 80% of patients with Sjögren's syndrome experience parotid gland enlargement, however, salivary cysts are rare.

Methods: case report and literature review

Results: 12-year-old female presenting with a 2-month history of bilateral parotid masses. No history of xerostomia, xerophthalmia, or constitutional symptoms. Ultrasound and MRI revealed bilateral complex cystic intraparotid masses. A right parotid gland biopsy was performed showing parotid gland parenchyma with dense lymphoplasmacytic infiltrate. Work-up was negative for infectious etiology such as HIV, mumps, CMV, and EBV. Serology was positive for rheumatoid factors, as well as anti-Ro/SSA and anti-La/SSB antibodies. consistent with a diagnosis of Sjogren’s syndrome. The patient was subsequently treated with hydroxychloroquine.

Conclusion: We present a unique case of Sjogren's syndrome with bilateral intraparotid cysts. This case illustrates the importance of a thorough workup to aid in diagnostic certainty. Parotid cysts associated with Sjogren's are rare but should be considered within the differential diagnosis for pediatric patients with parotid swelling/mass.

47

Topical Antibiotic Ear Drop Use at the Time of Tympanostomy Tube Placement: A Retrospective Analysis of the Pediatric Health Information System (PHIS) Database

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Abstract

Background: The clinical practice guideline on tympanostomy tube placements in children encourages the use of saline washout as an alternative to antibiotic ear drops intraoperatively. Our objective was to describe the current practice pattern regarding the use of topical antibiotic drops during surgery and to assess change over time.

Methods: A retrospective analysis of the Pediatric Health Information System (PHIS) was performed, examining patients ≤18 years of age with tympanostomy tube placement from January 1, 2010 to December 31, 2020. The main exposure was the use of antibiotic drops intraoperatively and the outcome was the rate of tube re-insertion within 90 days. To assess association between patient characteristics and antibiotic ear drop use, two-tailed chi-square tests were used for categorical variables and Wilcoxon rank sum tests for continuous variables. Cochran-Armitage Trend Test was used to assess trends.

Results: 445,808 ambulatory surgery discharges were included, 63.0% received antibiotic drops. The use of antibiotic drops steadily increased from 60.9% to 70.7% during the study period (p trend<0.001). The overall tube re-insertion rate within 90 days was low at 0.4% (N=1702). Patients treated with antibiotic drops were less likely to require re-insertion, with an adjusted odds ratio of 0.6 [0.4, 0.9] (p=0.02).

Conclusions: There is a large gap between current practices and new guideline recommendations regarding the use of perioperative antibiotic drops. There was a statistically significant difference in 90-day tube re-insertion rates in favor of antibiotic drops; however, the small difference is unlikely to be clinically significant.

49

Prenatal Diagnosis of Micrognathia: A Systematic Review and Meta-Analysis

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Abstract

Background: Studies evaluating the ability to diagnose and accurately predict the severity of micrognathia prenatally have yielded inconsistent results. This review aimed to evaluate reliability of diagnosing prenatal micrognathia and postnatal diagnostic congruence.

Methods: Per PRISMA guidelines, a systematic review using PubMed, Scopus, and CINAHL databases was performed. Studies using a subjective (radiologist's discretion) or objective (mandibular measurements) prenatal diagnosis of micrognathia via ultrasound with a confirmatory postnatal examination were included. Severe prenatal severity was defined using objective and subjective measures. Severe postnatal severity was defined as respiratory obstruction at birth requiring intubation or surgical intervention. Meta-analyses of proportions and relative risk were performed.

Results: A total of 16 studies with 2,753 neonates were included. The false-negative rate of prenatal micrognathia diagnosis predicting postnatal micrognathia diagnosis was 11.62% (95%CI 2.58-25.94); the false-positive rate was 2.19% (95%CI 0.24-6.01). Utilizing objective parameters, false-negative rates were statistically lower (0.20% [95%CI 0.00-0.70]), but not false-positives (1.37% [95%CI 0.71-2.22]). Patients with concern for severe micrognathia prenatally had a similar relative risk for mild or severe micrognathia postnatally (3.13 [0.59-16.55], p=0.180).

Conclusion: The false-negative rate of micrognathia diagnosis via prenatal subjective determination was over 1 in 10, with objective measures improving accuracy. Jaw index and inferior facial angle were mainly used; however, each study used different cutoffs that were retroactively applied. This study highlights the need for a uniform objective criterion, potentially combining two measurements, to improve prenatal diagnosis and planning for postnatal care.

50

Factors Associated with Eosinophilic Esophagitis in an, Urban Tertiary Care Pediatric Aerodigestive Population

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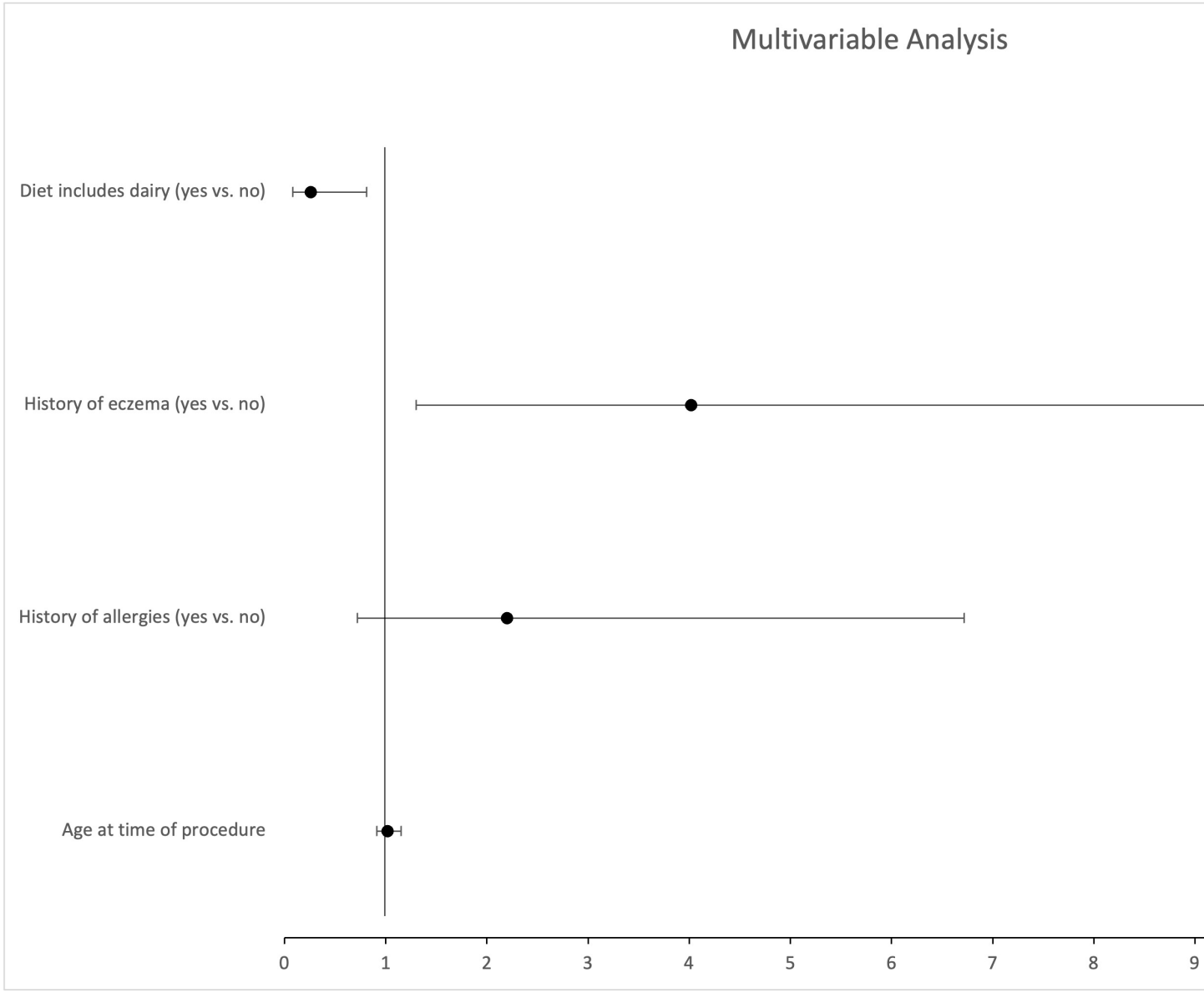
Abstract

Background: Triple endoscopy (flexible bronchoscopy, rigid direct laryngoscopy and bronchoscopy, and esophagogastroduodenoscopy with biopsy) is a key component in the diagnosis and management of pediatric aerodigestive complaints. Eosinophilic esophagitis (EoE) may present with cough, dysphagia for solids, or asymptomatic in patients screened prior to airway reconstruction. The factors associated with histopathologic diagnosis of EoE have not been elucidated.

Methods: A retrospective chart review was performed of all pediatric patients, aged 0-21 years, who underwent triple endoscopy at an urban, tertiary care children's hospital from January 1, 2015 to December 31, 2019. Bivariate statistical analysis and multivariable regression were used to compare the demographics and clinical characteristics of patients with and without EoE.

Results: 119 cases were included in the analysis. 15.97% (19) received a diagnosis of EoE following triple endoscopy. The most common indication for triple endoscopy was upper airway obstruction (47% found to have EoE and 24% without EoE). Patients with EoE were more likely to have a personal history of eczema (OR= 4.02 (1.3-12.49); p = 0.016) and dairy-free diet (OR = 0.26 (0.08-0.81); p = 0.02). Age, gender, recency of PO intake, and tracheostomy tube prior to or at the time of endoscopy were not found to be associated with increased odds of EoE.



Conclusions: A history of eczema and dairy-free diet were associated with increased odds of EoE in patients who underwent triple endoscopy in our population. Larger, multi-institutional studies are needed to identify early predictors of EoE in pediatric aerodigestive populations.

51

Psychosocial measures and outcomes among caregivers of children with tracheostomies: A systematic review

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Abstract

Background: Children with tracheostomies have complex medical issues that requiring long-term technology dependence and continuous medical care at home. The parents of tracheostomy dependent children often assume the majority of their child's homecare which can lead to a shift in family dynamics and a decrease in caregiver quality of life. This systematic review sought to identify instruments used to measure caregiver psychosocial outcomes after their child's tracheostomy.

Methods: A systematic review was performed using Medline, CINAHL, and EMBASE. Studies that evaluated psychosocial outcomes in caregivers of pediatric patients with tracheostomy were included.

Results: We screened a total of 1286 non-duplicate records to include a total of 12 studies assessing psychosocial outcomes of parents of tracheostomy dependent children. Seven cross-sectional designs, two pre-/post-intervention assessments, two prospective longitudinal studies, and one mixed methods study were analyzed. Psychosocial constructs evaluated included: quality of life, stress, coping, family functioning, health status, decision conflict, and regret. Though several indices were identified to help deduce caregiver psychosocial outcomes, only one tool was validated for this population.

Conclusion: Findings from this review suggests significant impact on caregiver quality of life and family function which can ultimately lead to worsening health outcomes of the tracheostomy dependent child; however, there are few quantitative studies that investigate this dynamic. This review has demonstrated the need for longitudinal studies using validated tools to assess the long-term impacts and outcomes of parents caring for a tracheostomy dependent child.

52

Deep Neck Space Infections Mimicking Kawasaki Disease: A Systematic Review

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Abstract

Background: Kawasaki Disease (KD), also known as Mucocutaneous Lymph Node Syndrome (MLNS), is an acute, self-limiting pediatric vasculitis primarily affecting the coronary arteries. Early diagnosis is important for prevention of coronary artery aneurysm. Despite diagnostic criteria from the American Heart Association, KD is a diagnosis of exclusion. Otolaryngologic presentations of KD may mimic deep neck space infections (DNI) delaying diagnosis. Few retrospective chart reviews have been performed in attempt to classify clinical, laboratory and imaging differences to help distinguish the two conditions. The goal of this systematic review is to quantitatively and qualitatively describe the atypical otolaryngologic manifestations of KD that may mimic DNI.

Methods: A systematic PubMed search between 4/28/2020 and 5/4/2020 using multiple criteria including KD or MLNS related to DNI and otorhinolaryngology was performed. The search yielded 343 articles of which only 45 met inclusion criteria for qualitative analysis and 34 for quantitative analysis. Data was analyzed using Fisher's exact tests and stratified by location of DNI.

Results: Overall, 39 cases were reviewed from 34 publications. The mean age at diagnosis was 5 years and approximately 79% of patients were male. Overall, 92% of patients underwent imaging all initially diagnosed with a DNI stratified at 50% between abscess and phlegmon. Only 13% had a confirmed abscess in the operating room. 52% of patients diagnosed with DNI underwent medical management.

Conclusion: KD can often mimic DNI on radiology that is often non-congruent with intraoperative findings. Such findings in a pediatric patient should raise suspicion for alternative diagnosis.

53

Acute Labyrinthitis associated with COVID-19 Infection

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Abstract

Background: To describe a case of unilateral sudden sensorineural hearing loss (SSNHL) and labyrinthitis in a pediatric patient with COVID-19 infection.

Methods: Case report with review of literature

Results: Patient is a previously healthy 12-year-old boy who presented to the emergency room with sudden right-sided hearing loss, tinnitus, severe vertigo, abdominal pain, nausea and vomiting. On admission, his SARS-CoV-2 PCR was positive, and all other viral respiratory pathogens PCRs were negative. He had no other symptoms such as fever, congestion, cough, or hyposmia. He was treated with supportive care, high dose prednisone, lorazepam and ondansetron during his 4-day hospitalization. Computed tomography of the temporal bone was normal as well as magnetic resonance imaging with contrast of the brain and internal auditory canal. First audiogram following discharge showed a moderate/moderately-severe sensorineural hearing loss from 250-8000 Hz with poor word recognition score (WRS) at 36% in the right ear and normal hearing in the left ear. At his two-month follow-up visit, his vestibular symptoms had resolved. However, he had persistent right-sided loud tinnitus. Repeat audiogram five months later showed no change in hearing sensitivity. WRS continued to be poor at multiple presentation levels, suggesting unlikely benefit from traditional amplification.

Conclusions: COVID-19 may present with viral labyrinthitis with severe vestibular symptoms and SSNHL. During the current pandemic, there has been very few reported otologic manifestations of this viral infection. The etiology of the labyrinthitis is unclear. Short-term treatment involves supportive care and high dose steroid. Close audiologic follow-up is essential.

55

Video demonstration vs puzzle for rigid bronchoscope assembly training

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Abstract

Background:

Rigid bronchoscope assembly is critical for management of airway emergencies and considered essential to otolaryngology resident education, but clinical exposure and case volume varies. We sought to investigate whether the "see one, do one, teach one" model could be improved by technology-enhanced or low-fidelity simulation.

Methods:

Medical student novices were randomized to one of two arms - watching a videotaped demonstration (n=10) or using a printed photograph puzzle of bronchoscope parts (n=13) - and then videotaped attempting to assemble a 5.0 rigid bronchoscope. Videos were reviewed by two blinded raters. Individual steps were scored for accuracy (0- not attempted, 1-incorrect, 2-correct) and time-to-completion, and overall proficiency was rated on a 5-point Likert scale. Scores and time required for assembly were compared by the two-tailed t-test, and inter-rater reliability was assessed with Cohen's kappa.

Results:

There were no differences in years of medical training between the video demonstration and puzzle groups. The video demonstration group required less time for assembly than the puzzle group (median 69 sec vs. 133 sec, $p=0.01$) and had a higher overall proficiency score (median 3 vs 2, $p=0.02$). There was fair inter-rater agreement (kappa=0.387; $p<0.001$).

Conclusions:

The group watching the video demonstration had shorter assembly times and higher overall proficiency scores than the group assembling the puzzle. Further study is needed to identify potential benefits of simulation related to the concept of productive failure, where students struggle through a process to gain a deeper understanding.

58

Actionable Fingertip Data to Enhance the Safety of Children with a Tracheostomy

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Abstract

Background

Despite a growing number of children with long term tracheostomy tubes, inconsistent event reporting obscures the true incidence of airway safety events. We brought together a multidisciplinary group to improve patient safety and quality of care for this vulnerable population through enhanced staff education on tracheostomy management and improved organization of descriptive data.

Methods

The multidisciplinary team defined and clarified care standards, created order sets for data capture, and engaged clinical faculty and staff to use the order sets. A safety checklist was created and deployed, and nursing documentation parameters were augmented to capture safety data as well as to track nursing tracheostomy experience. A PowerBI dashboard was built and validated, bringing actionable data to the forefront and streamlining the workflow of the inpatient tracheostomy care team.

Results

100% capture of inpatients with tracheostomy tubes was achieved with the successful implementation of the order sets and automated emails to the inpatient tracheostomy team. The PowerBI dashboard was validated and is now functional in streamlining the daily workflow of the inpatient tracheostomy team. Safety event reports involving hospitalized patients with tracheostomy tubes are monitored and examined by the multidisciplinary team, informing the direction of work to be done.

Conclusions

Bringing actionable data to the fingertips of the inpatient tracheostomy team enhances the ability of clinical bedside staff to efficiently maintain the safest and highest quality care for a vulnerable patient population.

59

Cholesteatoma After Cochlear Implantation – A Rare, Devastating Complication

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Abstract

Background:

Pediatric Cochlear implantation common complications include vestibular concerns, facial palsy, infection, and device failure. The purpose of this report is to discuss a rare pathology of iatrogenic cholesteatoma formation after cochlear implantation.

Case Presentation:

A 9-year-old Female with bilateral cochlear implantation 5 years prior developed left-sided mastoiditis presumably after mild trauma. She was promptly evaluated and imaged which showed suspicion of diffuse cholesteatoma in the left mastoid cavity and middle ear. She was promptly treated with IV antibiotics, cortical mastoidectomy, and tympanostomy tube placement. Cholesteatoma was found in the mastoid cavity and facial recess, surrounding the electrode. Removal of the implant to the level of the electrode in the facial recess was then performed. After prolonged IV antibiotics, a second procedure was performed, removing the remaining cholesteatoma and replacing the electrode with a spacing electrode placement in the cochlea. At the time of surgery, a posterior ear canal defect was encountered at the level of the annulus. This was likely from a violation of the annulus during the original procedure. The defect was about 1cm and was repaired with tragal cartilage.

Conclusions:

Pediatric cochlear implantation may result in delayed iatrogenic cholesteatoma. As there was no indication of cholesteatoma at the time of the initial surgery; this case likely represents an iatrogenic cholesteatoma. The true prevalence of this seemingly rare occurrence is unknown. Care should be exercised regarding the posterior canal drilling during cochlear implantation and in subsequent monitoring.

60

Cost-effectiveness of Pharmacologic and Non-pharmacologic Tympanostomy Tube Prophylaxis

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Abstract

Background:

Otorrhea is a common complication of tympanostomy tubes. Guidelines for prophylaxis are not firmly established. Given the comparable efficacy of topical agents and their highly variable costs, this study seeks to determine the most cost-effective intraoperative management strategy for preventing postoperative otorrhea.

Methods:

An observational analysis of purchasing records at a children's hospital was performed. Methods were adapted from Yeakel et al. Using a conservative initial infection rate of 10% and observing local prices, a break-even analysis was performed. Absolute risk reduction (ARR) and final infection rates to make intraoperative prophylaxis cost-effective were calculated using pharmacologic and non-pharmacologic treatments. These included ofloxacin, ciprofloxacin-dexamethasone ophthalmic version, ciprofloxacin-dexamethasone otic version, saline, and oxymetazoline (Afrin).

Results:

This table shows a cost analysis for combinations of in-hospital prophylactic agents and outpatient treatment agents. Negative values indicate a low likelihood that the prophylactic agents can be cost-effective.

Outpatient Treatment (cost)	In-Hospital Prophylaxis (cost)	Break-even Infection Rate	Break-even ARR
Ofloxacin ($15.54)	Ofloxacin ($17.27)	-1.01	1.11
	Cip-Dex Otic ($59.26)	-3.71	3.81
	Saline ($0.028)	0.0982	0.0018
	Afrin ($1.29)	0.017	0.083

Ophthalmic Ofl-Dex ($39.76)	Ofloxacin	-0.33	0.43
	Cip-Dex Otic	-1.39	1.49
	Saline	0.0993	0.0007
	Afrin	0.0676	0.0324
Otic Cip-Dex ($79.30)	Ofloxacin	-0.12	0.22
	Cip-Dex Otic	-0.64	0.74
	Saline	0.0996	0.0004
	Afrin	0.0839	0.0161

Conclusion:

Routine intraoperative antibiotic prophylaxis after placing tympanostomy tubes is unlikely to be cost-effective in most scenarios. Saline flushes and oxymetazoline should be considered for prophylaxis due to their low cost and their ability to prevent mucous plugging.

61

Otolaryngologic manifestations of Helsmoortel-Van Der Aa syndrome and the role of the aerodigestive team.

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Abstract

Abstract

Otolaryngologic manifestations of Helsmoortel-Van Der Aa syndrome and the role of the aerodigestive team.

Background: Helsmoortel-Van Der Aa syndrome (ADNP-related disorder) is a genetic condition caused by pathogenic variants in the ADNP gene. ADNP mutations typically cause features including but not limited to neurodevelopmental delays, intellectual disability, and autism spectrum disorder. To our knowledge, the medical literature has not included otolaryngologic manifestations of this disease when describing its symptomology. Our objective is to elaborate those manifestations in detail and discuss the role of an aerodigestive team (including an otolaryngologist) as an integral member of the multidisciplinary team caring for these patients.

Methods: We performed a case series with chart review of pediatric patients with ADNP syndrome who have undergone previous diagnosis based on known manifestations of the disease. The electronic medical record system was queried for the ICD-10 code for Helsmoortel-Van der Aa Syndrome (Q87.89). Patient charts were reviewed, compared, and presented in order to elaborate otolaryngologic symptoms reflected in patients with this syndrome.

Results: Three patients were identified with all three having confirmed ADNP mutations consistent with Helsmoortel-Van Der Aa syndrome. Of these, two out of three had otolaryngologic problems such as aspiration, sensorineural hearing loss, otitis media and obstructive sleep apnea.

Conclusions: Currently there is a lack of otolaryngologic description in the literature on Helsmoortel-Van Der Aa Syndrome. We present this case series to support the idea that an otolaryngologist, as part of an aerodigestive team, should be involved in the multidisciplinary care required for these patients.

64

Acute mastoiditis in infants under six months of age: a case series

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Abstract

Acute mastoiditis (AM) is a rare but serious complication of acute otitis media (AOM), but there is limited literature on the condition in infants under six months of age. Our aim was to define the epidemiology, clinical signs/symptoms, and outcomes of AM in this group. We reviewed all cases of AM in infants under six months at a tertiary care children's hospital from 1990-2021. There were 15 cases over the 31-year period. The average age of infected infants was 4.4 months. The majority had no chronic medical conditions (80%), had received age-appropriate pneumococcal vaccination (93%), and had no prior episodes of AOM (73%). Patients presented with an average of five days of nonspecific symptoms such as fever and fussiness, and an average of three days of posterior auricular symptoms. All infants received IV antibiotics, most commonly ceftriaxone or ampicillin-sulbactam. Total antibiotic duration averaged 21 days with two-thirds transitioned to oral antibiotics at discharge, most commonly amoxicillin-clavulanate. Most infants (93%) had CT imaging and 73% were found to have a subperiosteal abscess. A majority underwent bilateral ear tube placement (80%) and all with abscesses underwent drainage. One patient required unilateral mastoidectomy. The causative agent was *Streptococcus pneumoniae* in over half of cases (53%). Coagulase-negative *Staphylococcus* was the only other organism isolated more than once. After diagnosis, hospitalization lasted on average five days with no further intracranial complications or deaths. While mastoiditis is a severe illness, it can be managed successfully with prompt antibiotic therapy and surgical intervention.

65

Nasopharyngeal Stenosis Following Adenotonsillectomy in a Pediatric Obstructive Sleep Apnea Patient: A Case Report

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Abstract

Background: Nasopharyngeal stenosis (NPS) is characterized by restricted or complete obstruction of communication between the nasopharynx and oropharynx. Acquired NPS has been reported in multiple case series secondary to tonsillectomy, adenoidectomy, uvulopalatopharyngoplasty, and radiotherapy caused by concentric scar contraction. Surgical procedures to correct NPS include excision of scar tissue with mucosal advancement flap, balloon dilation, local injection of corticosteroid, and stent placement.

Case presentation: A 3-year-old male with a history of autism spectrum disorder, recurrent otitis media with effusion status post tympanostomy tube placement, and severe obstructive sleep apnea (OSA), presented with purulent nasal drainage and congestion. The patient has a history of adenoidectomy and tonsillectomy, performed separately at an outside institution, with only mild improvement in his OSA. He had persistent snoring with apneas and gasping episodes. The nasopharyngeal cultures grew Moraxella and his symptoms improved briefly after the standard amoxicillin-clavulanate therapy. Drug-induced sleep endoscopy showed a partial obstruction in the nasal airway and near-complete circumferential collapse at the nasopharynx. Similarly, CT neck with contrast revealed circumferential moderate to severe stenosis of the nasopharynx without adenoid enlargement. The patient underwent resection of nasopharyngeal scar tissue along with a local injection of triamcinolone and balloon dilation with an immediate objective and subjective improvement in the upper airway.

Conclusions: NPS is an infrequent complication following adenotonsillectomy. It should be considered in patients with persistent or recurrent OSA and can be diagnosed using sleep endoscopy and imaging. There are multiple surgical options for correction of NPS including endoscopic resection and balloon dilation.

66

Complications after Pediatric Temporal Bone Fractures by Classification System: A Systematic Review and Meta-Analysis

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Abstract

Background: This study was performed to analyze the rates of complications after pediatric temporal bone fractures (TBF) and the utility of traditional and new classification systems in predicting these complications.

Methods: Per PRISMA guidelines, PubMed, Scopus, and CINAHL were searched. Studies of children with TBFs were included. Meta-analyses of proportions were used to analyze complications and compare rates between the traditional and new classification systems.

Results: A total of 22 studies with 1,376 TBFs were included. Children with TBF had higher rates of CHL than SNHL (31.3% [95%CI 23.2-40.1] vs. 12.9% [8.9-17.5]). No statistical differences in both conductive hearing loss (CHL) and sensorineural hearing loss (SNHL) were seen between longitudinal and transverse TBFs; however, OCV TBFs had higher rates of SNHL than OCS TBFs (59.3% [95%CI 27.8-87.0] vs. 4.9% [95%CI 1.5-10.1]). Of all patients, 9.9% (95%CI 7.2-13.1) experienced facial nerve (FN) paresis/paralysis. Transverse TBFs had higher rates of FN paresis/paralysis than longitudinal (27.7% [95%CI 17.4-40.0] vs. 8.6% [5.2-12.8]), but rates were similar between OCS and OCV TBFs.

Conclusion: CHL was the most common complication seen after pediatric TBF; however, neither classification system was superior in identifying CHL preferentially. The traditional classification system was more effective at identifying FN injuries, and the new classification system was more robust at identifying SNHL. While these results suggest that both classification systems might have utility in evaluating pediatric TBFs, these analyses were limited by sample size. Future research on long-term outcomes of pediatric TBFs stratified by type of fracture is needed.

68

Audiometric outcomes following active transcutaneous osseointegrated implants in children

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Abstract

Background: Active transcutaneous bone conduction implant systems have been shown to decrease feedback and limit high frequency gain roll off in adults. Limited data is available for active bone implants in children, particularly with regards to speech discrimination performance.

Methods: A retrospective review was performed for patients less than 21 years of age undergoing Cochlear Osia implantation at a tertiary children's hospital. Pre- and post-operative audiometry including pure tone average(PTA) and speech receptions thresholds(SRT) were compared. Aided discrimination testing using the Northwestern University Auditory Test No. 6(NU-6) was performed three to six months following implantation.

Results: Sixteen patients underwent 19 implants from August 2020 to April 2022 with a mean age of 13.9 ± 4.2 years. Hearing loss was conductive or mixed in 12 patients and single sided sensorineural in four patients. One child did require device explantation due to infection. Pre- and post-operative PTA were 76.7 ± 16.6 dB and 24.9 ± 7.2 dB respectively ($p<0.0001$) for a mean functional gain of 51.8 dB. SRT improved from 72.9 ±1 6.6 dB to 21.3 ± 4.9 dB after implantation ($p<0.0001$). Postoperative discrimination using NU-6 at 50dB and 50dB + 5 signal to noise ratio (SNR) was 94.7 ± 4.9% and 89.8 ± 6.0%.

Conclusions: Active transcutaneous osseointegrated hearing implantation in children is successful with a mean functional gain of 51.8dB. Monosyllabic discrimination following implantation is excellent at 50dB and good and 50dB + 5 SNR. Future pediatric prospective studies regarding quality-of-life improvement and long term followup are required.

69

Utility of Diagnostic Sinus CT for Diagnosis of Invasive Fungal Sinusitis in Immunocompromised Children

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Abstract

Purpose/Objective: To investigate the utility of Sinus CT imaging in the diagnosis or suspicion of invasive fungal sinusitis in immunocompromised children

Study Design: Retrospective chart review.

Setting: Tertiary-care pediatric hospital.

Subjects and Results: Between 2012-2020, the Otolaryngology service at Children's Wisconsin was consulted 102 separate times for persistent fevers of unknown origin in immune compromised patients with concern for IFS. This included 83 distinct patients. There was a CT scan associated with consultation in 82 (80%). Of these, 49% had been obtained prior to Otolaryngology consultation. 8/83 patients were confirmed by biopsy to have IFS. 6/8 of the patients with IFS had concerning findings on bedside endoscopy. The remaining two patients had congestion but no other findings on bedside nasal endoscopy however were taken to OR for facial swelling (1/8) or for high clinical suspension prompting a CT demonstrating septal abscess.

Conclusions: CT imaging is a highly used modality for the evaluation of invasive fungal sinusitis. Our data demonstrates no significant difference between the CTs ordered on patients with invasive fungal disease and those without. Bedside nasal endoscopy remained the primary driver for operative biopsy, however, one case was prompted by CT imaging. We advocate for bedside nasal endoscopy as a primary screen in these patients but there may be a role for CT imaging in cases with a high index of suspicion despite negative bedside nasal exam.

71

Is YouTube a Reliable Source for Laryngomalacia Information?

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Abstract

Background : When parents are uncertain about their child's health, the internet can be a source of unlimited information. Previous research has found that parents of children with otolaryngology complaints use the internet to learn about their child's condition. The goal of our study was to assess laryngomalacia information on YouTube.

Methods: Youtube (www.youtube.com) was searched for "laryngomalacia" in February 2022 and the first 100 videos based on "relevance" were included. Videos were excluded if they did not discuss laryngomalacia or if the audio was not English. Each video was evaluated for author, category, goal, video quality, audio quality, basic youtube metrics, and laryngomalacia information. A modified DISCERN criteria score was included to evaluate the quality of information.

Results: 95 videos were included. Authors of the videos were most often a patient's family or friend (N=33, 34.7%). The goal of 31.6% (N=30) of the videos was to demonstrate symptoms of laryngomalacia. Videos made for educational purposes by hospitals and providers were statistically more likely to be of better quality in terms of video clarity, text, and graphics (p=.001) when compared to videos classified as testimonial/patient caregiver experiences. The majority of the videos met only one of the five DISCERN criteria (N=56, 58.9%).

Conclusion: When parents and caregivers search for information about laryngomalacia on YouTube, they are mainly being exposed to home videos focused on testimonials and personal caregiver experiences. Referring parents to specific good quality social media resources may reduce misconceptions.

72

Preoperative Imaging to Assess for Internal Carotid Artery Medialization Before Pharyngeal Surgery in Children with 22q11.2 Syndrome: A Systematic Review and Meta-Analysis

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Abstract

Background: To evaluate trends of preoperative imaging before pharyngeal surgery in patients with 22q11 Deletion Syndrome (22qDS) in identifying internal carotid artery (ICA) medialization.

Methods:

Data Sources: PubMed, Scopus, and CINAHL.

Following PRISMA guidelines, a systematic review was performed. Studies of patients with 22qDS who underwent preoperative imaging (MRA, CTA, or videofluoroscopy) to identify ICA anomalies were included. High-risk medialized ICAs were defined as either submucosal, retropharyngeal, Pfeiffer Grade III-IV, or <3mm from the pharyngeal mucosa. Meta-analyses of proportions were performed.

Results: Twelve studies met inclusion criteria, comprising 419 patients with 22qDS with a weighted mean age of 7.6 years. In patients with 22qDS, the rate of ICA medialization on imaging was 44.0% (95%CI 27.3-61.4), of which 46.3% (95%CI 27.4-65.8) were considered high-risk. Of the 254 cases that reported whether imaging affected operative plans, 19.4% (95%CI 5.7-38.8) of surgeries were modified due to medialized ICA. In six studies that used nasopharyngoscopy pulsations to confirm medialization, the true-positive rate was 53.9% (95%CI 27.5-79.2) and the false-positive rate was 16.2% (95%CI 7.9-26.8). Ten of the twelve studies (83.3%) recommended universal preoperative imaging of the ICAs in patients with 22qDS undergoing pharyngeal surgery. No cases identified perioperative bleeding secondary to ICA injury.

Conclusion: Most studies endorse routine preoperative imaging to assess for ICA medialization in patients with 22qDS undergoing pharyngeal surgery, which can lead to surgical modifications. Outcomes in children who do not undergo routine pre-operative imaging are unknown. Additional studies are needed to compare outcomes in children with or without preoperative imaging.

79

Christian Guilleminault (CG) Triad - In Memory of Dr. Christian Guilleminault, MD

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Abstract

BACKGROUND: Obstructive sleep apnea (OSA), first described in pediatrics by Dr. Christian Guilleminault, MD(CG) in 1976, is the most prevalent sleep-related breathing disorder. Current otolaryngology literature does not support the idea that isolated lingual frenulum is a potential marker for OSA. The first line of treatment for OSA is tonsillectomy and adenoidectomy; furthermore, a high arched palate limits the surface area of the nasal floor and may contribute to deviation of the septum thereby encouraging mouth-breathing. Evidently mouth-breathing has been linked to abnormal orofacial growth, leading to a significant increase of upper airway resistance. Interdisciplinary medical and dental intervention can better delineate signs and symptoms of OSA. Isolated lingual frenulum should be considered an indicator of future OSA development. CG characterized a short lingual frenulum as a frequent phenotype for pediatric OSA. Untreated ankyloglossia impairs orofacial development, namely in the underdevelopment of the palate. As CG proposed, a high arch palate, ankyloglossia and propensity for mouth-breathing, increases the risk of developing OSA.

METHODS: Comprehensive, high-quality search using PubMed and Cochrane review used to gather peer-reviewed articles from CG publications from 1976 to present.

CONCLUSIONS: We propose the introduction of a new triad for identification of prodromal OSA through the markers noted by CG in over 100 articles. 'CG Triad' will be the coined term in honor of his contributions to sleep medicine. Early identification of individuals at risk for OSA allows for appropriate prevention and intervention amongst healthcare professionals working with pediatric sleep disorders and possible progression into adulthood.

83

Importance of Early Objective Auditory Testing in the Presentation of Sudden Sensorineural Hearing Loss in Children

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Abstract

Background: Pseudohypoacusis can be due to an auditory manifestation of conversion disorder. This is often underdiagnosed and improperly treated in children. Workup for sudden sensorineural hearing loss (SSHNL) routinely includes only subjective behavioural audiologic assessment which may be consistent with hearing loss. Lack of a suspicion for conversion disorder and failure to include objective measures of auditory function may lead to a misdiagnosis and initiation of an unnecessary treatment algorithm.

Methods: This is a case series of 3 pediatric patients who were referred for further management (i.e. cochlear implant evaluation) to a tertiary care Otolaryngology clinic with a diagnosis of idiopathic SSNHL who ultimately were found to have conversion disorder.

Results. Average age was 12.7 years at presentation (range 10-14 years). Delay in diagnosis relative to initial onset of SNHL ranged between 2 months and 3.5 years. All three patients underwent medical interventions, such as oral steroids or hyperbaric oxygen therapy, prior to their initial clinic visit. All patients demonstrated profound SNHL on behavioural audiogram, but normal otoacoustic emissions (OAE) and auditory brainstem response testing. With counselling, both patients demonstrated significant hearing improvement.

Conclusions. The mainstay of diagnosis of pseudohypoacusis is a lack of consistency in audiological testing which can be subtle. Conversion disorder is an important differential diagnosis to consider in a workup of idiopathic SSNHL. Early use of OAE's in the workup of SSNHL can avoid unnecessary and potentially harmful therapies, and expedite access to counselling services which may help lead to symptom resolution.

90

Safety and Outcomes of Early Cochlear Implant Activation in Pediatric Recipients

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Abstract

Safety and Outcomes of Early Cochlear Implant Activation in Pediatric Recipients

Background: Cochlear implants (CI) are the standard of care for pediatric patients with severe-profound hearing loss due to substantial clinical benefits. Limited evidence exists for the ideal time to activate the processor for optimal outcomes. Current studies demonstrate safety in activations earlier than traditional timeframes, without increased wound complications or long-term changes in impedance measurements. We evaluated the complication rates and hearing outcomes between early activation (EA; ≤3 weeks) and standard activation (SA; >3 weeks) of CIs in pediatric patients.

Methods: A retrospective chart review of pediatric patients with cochlear implantation between 2015-2022 was performed. Data collected included demographics, clinical variables, rate of complications, time from implantation to Ling 6 sounds, and time from implantation to target MAP. Mann-Whitney-U test, Chi-squared, and Fisher's exact test were used as appropriate to determine presence of statistically significant differences between patients undergoing early versus standard activation.

Results: 98 patients were included in analysis, 33% in the EA cohort. No significant difference was identified in complication rates between cohorts (15.2% vs. 25.0%, p=0.238). Similarly, no significant differences in median time (days) to Ling 6 at 100% or target MAP were identified (98.0 vs. 87.5, p=0.552; 58.5 vs. 64.0, p=0.411).

Conclusions: Our comparison of EA and SA cohorts finds no significant increased risk of complications or difference in audiologic outcomes. This highlights the possibility for shorter periods between implantation and activation, allowing earlier device usage and potential reduction in language development delay.

91

Association between no-show rates and interpreter use at the first visit in a pediatric otolaryngology clinic

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Abstract

Background: Prior studies have identified demographic and appointment characteristics associated with no-shows in pediatric otolaryngology, but none have studied the association with interpreter use. We aim to understand how primary language and interpreter use affect no-show rates in pediatric otolaryngology.

Methods: This is a retrospective review using medical records of new patients in a pediatric otolaryngology clinic from 2014-2019. Data was collected on patient demographics including age, primary language, insurance type, maternal education level, maternal primary language, interpreter use at the first visit, total number of appointments scheduled, number of missed appointments, and number of completed appointments.

Results: Descriptive statistics using parametric and non-parametric methods were used. Primary language was associated with significant differences in no-show rates ($p = 0.0474$), with the lowest no-show rate being equal for primarily Spanish and English speakers at 33%. Overall, interpreter use at the first visit was not significantly associated with appointment attendance ($p = 0.3674$). For patients who needed an interpreter, patients with a documented Spanish interpreter at the first visit had a significantly lower average no-show rate (31% ± 19%) compared to Haitian Creole (42% ± 18%) and all other languages (32% ± 19%) ($p = 0.0265$). Hispanic ethnicity and maternal factors had no statistically significant association with attendance.

Conclusion: This study found that overall, interpreter use at the first visit does not affect no-show rates, but among patients with an interpreter at the first visit, patients receiving interpreter services in Spanish had the best clinic attendance compared to other languages.

92

Assessing the safety of topical epinephrine in pediatric functional endoscopic sinus surgery

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Abstract

Background

The purpose of this study is to assess the safety of topical epinephrine during pediatric functional endoscopic sinus surgery (FESS). Topical epinephrine has demonstrated vasoconstrictive efficacy and a favorable safety profile in adult patients. It is plausible that this clinical efficacy extends to the pediatric population; however, given the potential for cardiovascular side effects, it is important to evaluate its safety profile.

Methods

After obtaining IRB approval, electronic medical records of patients aged 0-18 undergoing FESS in 2021 were retrospectively reviewed and divided into two cohorts based on the vasoconstrictive agent utilized during the case: oxymetazoline or epinephrine. Outcome variables consisted of pre-operative and maximum intra-operative heart rate, systolic blood pressure, and diastolic blood pressure, as well as indication of whether intraoperative antihypertensives were administered. Furthermore, clinical characteristics such as the indication for surgery, comorbidities, and surgeon were recorded. Patients who received both or neither vasoconstrictive agents were excluded.

Results

Among a total cohort of 96 FESS patients, 75 met inclusion criteria and were primarily male (59%), with median age of 13 (IQR 8,16). Oxymetazoline was administered to 60% (n = 45) of the cohort, while 30% (n = 30) received epinephrine. The mean differences between pre-operative and intra-operative hemodynamic parameters were not significantly different between cohorts. No intraoperative antihypertensives were administered to patients in either cohort.

Conclusions

Topical epinephrine and oxymetazoline have similar risk profiles. We intend to develop a prospective study to further investigate the safety and hemostatic efficacy of topical epinephrine in pediatric FESS.

93

Chronic Post-Tympanostomy Tube Otorrhea: Stepwise Management and Review of The Literature

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Abstract

Chronic Post-Tympanostomy Tube Otorrhea: Stepwise Management and Review of The Literature

Background: Chronic post-tympanostomy tube otorrhea (PTTO) is a difficult to manage problem with limited evidence-based guidance. Here, we present an updated summary of the current literature along with an evidence-based algorithm for management in pediatric populations.

Methods: Review of English-language literature

Results: Current literature on evidence-based management of PTTO supports initial treatment with aural toilet and topical antibiotic-corticosteroid drops over systemic antibiotics. Adjuvant therapy for refractory PTTO can be divided into culture-directed treatments and antiseptics. Mupirocin ointment is effective for MRSA-positive TPPO while topical clotrimazole is effective for fungal TPPO. Antiseptics have limited literature support but include topical acetic acid, hydrogen peroxide, alcohol, and aluminum acetate. Surgical options can be considered for patients with continued drainage. Recent literature suggests that biofilms play an important role in the development of PTTO; therefore, removal of affected tubes is an evidence-based option for refractory PTTO. Additionally, evaluation and treatment of unrecognized causes of eustachian tube dysfunction (including adenoiditis, immunodeficiency, allergies, reflux, or submucous cleft palate) is recommended. Though eustachian tube dilation is a newer consideration for pediatric populations, there is little evidence supporting their use in children and adolescents.

Conclusions: We propose a stepwise approach for treatment of chronic PTTO, beginning with topical antibiotic-steroid drops, then antiseptic drops, then culture-directed treatment, systemic antibiotics for signs of spreading bacterial infection, and finally surgical treatment as indicated. Areas for future research include developing better solvents for biofilms and new treatments for resistant bacterial strains.

94

A Silent Burden of the COVID-19 Pandemic: The Undocumented Surge in Dog Facial Bites

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Abstract

Background

The pandemic lockdown in March 2020 resulted in children spending more time at home with their dogs. Unfortunately, pets also found themselves in a stressful situation and quickly hospitals noticed an increase in dog bites. To date, the evidence has been limited to all dog bites versus specifically examining facial dog bites which has implications for our youger children. The aim of this study was to document the number of cases for facial dog bites that occurred before and during the lockdown.

Methods

A retrospective chart review was conducted on cases seen at an academic, tertiary children's hospital. The number of facial dog bites and type of injury was extracted from six months before lockdown (Sept2019-Feb2020) and compared to six months during the lockdown (March2020-August 2020). The percentage change between the two time points was calculated.

Results

The number of cases of facial dog bites doubled from before the lockdown to during the lockdown, 8 versus 17, respectively, an increase percent change of 112%. Open bite injuries increased by 500% while lacerations remained stable.

Conclusions

As expected, we found a clinically significant increase in documented cases of dog bites at our institution. The severity of the dog bites was notable. Although the lockdowns have gone away at this time, lessons can be learned from this unprecedented time. Specifically, our pets experience stress as well when life is changed. Public health messaging on this topic is key to keep our kids safe and our pets happy.

96

A rare case of retained foreign body in maxillary sinus after penetrating globe injury.

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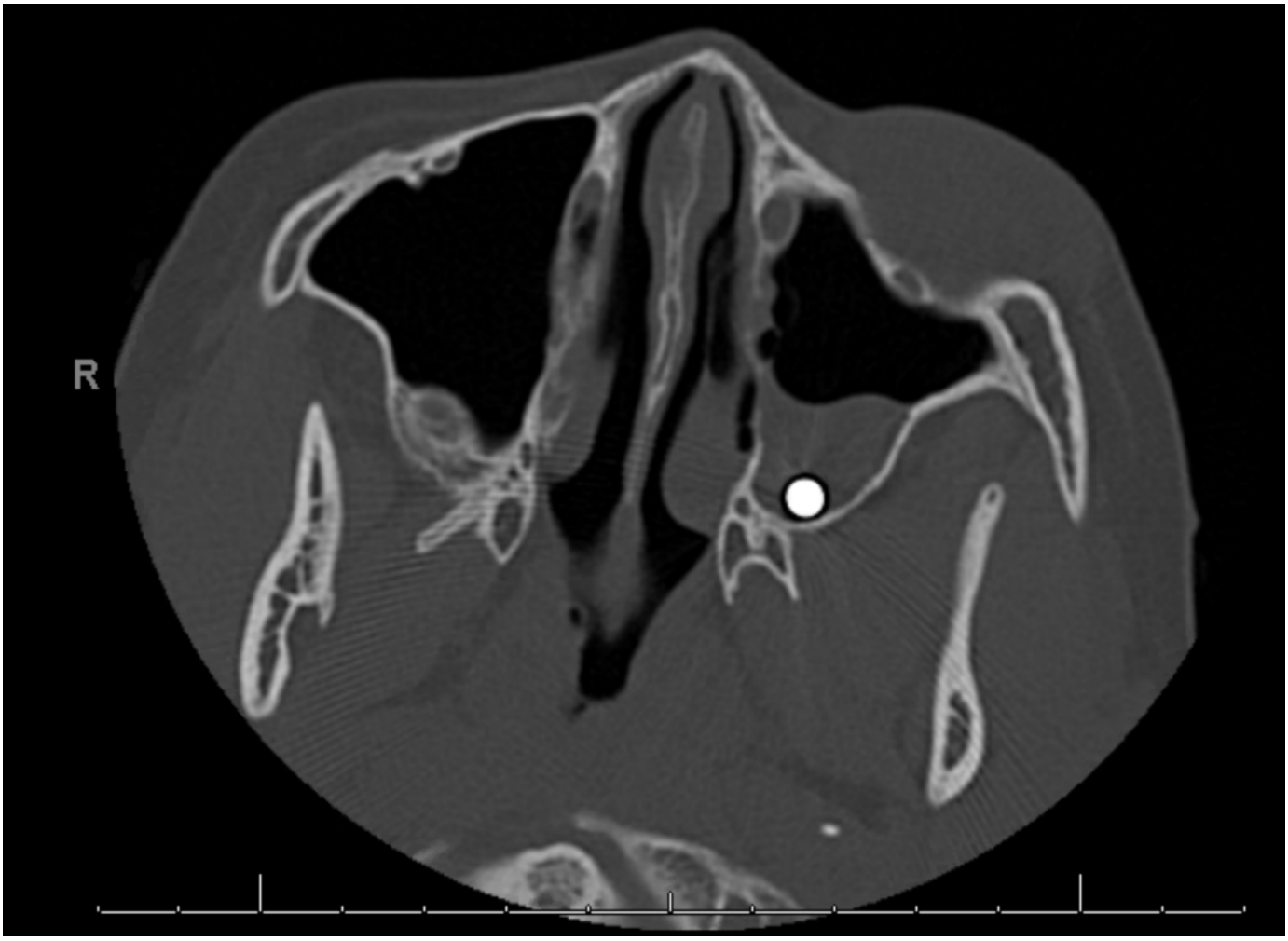
Abstract

A 13-year-old male presented to the emergency department with a left globe rupture after being accidentally shot by a BB gun. CT scans revealed a fracture of the left orbital floor posteriorly and the BB retained on the floor of the left maxillary sinus. The patient underwent emergent globe repair, and the BB was not removed. At a follow-up one week after the operation, the patient reported no facial pain or sinus pressure, but continued to spit up bloody mucus. Elective maxillary antrostomy was recommended. Although several cases of retained BBs within maxillary sinuses have been reported, this is the first report of a retained BB in the maxillary sinus that entered through the orbital floor.



98

Implication of American Society of Anesthesiologists Physical Status (ASA-PS) on Tonsillectomy with or without adenoidectomy Outcomes

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Abstract

Background: Before undergoing any surgery requiring anesthesia, patients are pre-operatively assigned an American Society of Anesthesiologists Physical Status classification (ASA-PS) based on their health. Prior studies have demonstrated an independent correlation between ASA-PS classification and perioperative morbidity and mortality. The objective of our study is to identify the association of pre-operative ASA-PS with 30-day complication rates and adverse events following tonsillectomy with or without adenoidectomy (T±A).

Methods: A retrospective analysis was performed using data from the American College of Surgeons' National Surgical Quality Improvement Program database (ACS-NSQIP) of patients who underwent T±A between 2005 and 2016. Patients were stratified into ASA-PS Classes I/II and III/IV. Postoperative outcomes in the 30-day period following surgery were compared amongst the two subsets of ASA-PS groups.

Results: On multivariate analysis, patients with ASA class III and IV were more likely to experience an unplanned readmission (OR 1.39, 95% CI 1.09-1.76; p=0.007), overall complications (OR 1.49, 95% CI 1.28-1.72; p<0.001), major complications (OR 1.52, 95% CI 1.31- 1.77, p= <0.001), reoperation (OR 1.33, 95% CI 1.04-1.69; p=0.022), and extended length of stay >1 day (OR 1.78, 95% CI 1.41-2.25; p<0.001).

Conclusion: Higher ASA-PS classification is an independent predictor of complications following T±A. Surgeons should aim to optimize the systemic medical conditions of ASA-PS classes III and IV patients prior to T±A and implement post-operative management protocols specific to these patients, to decrease morbidity, complications, and overall health care cost.

100

PHYSICIAN EXPERIENCE TO MALPRACTICE LITIGATION: PANEL VIDEO

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Abstract

PURPOSE: Present insights into the isolation and anxiety associated with medical malpractice litigation

METHODS: A 14-minute video captures the thoughts and fears of 4 senior physicians (2 pediatricians & 2 surgeons) as they reflect on this stressful impact on their careers.

RESULTS: The practice of medicine is challenging and outcomes for complex clinical care does not always meet the expectations of the patient nor their family. Parents may seek litigation and challenge the quality of the care that was rendered. Allegations of malpractice place an enormous burden on physicians and all providers Litigation is isolating since unfortunately details can often not be discussed publicly pending depositions and subsequent trial date. Four senior physicians were interviewed and their discuss personal reflections after being sued.

CONCLUSIONS: All care givers in the medical fields are potentially exposed to allegations of medical malpractice. The effects of litigation are rarely discussed publicly. This open discussion should provide insight and comfort knowing that all hopes and fears can survive this stressful process.

101

SARS-CoV-2: a new cause of pediatric hearing loss due to labyrinthitis ossificans

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Abstract

Background:

Otolaryngologic presentations of SARS-CoV-2 (COVID-19) primarily involved upper respiratory tract with few reports of otologic manifestations. There are a few reports of sudden onset sensorineural hearing loss (SNHL) in and around the time of acute COVID-19. Most were treated with corticosteroids, some were treated with hyperbaric oxygen and a few patients required and were treated with cochlear implantation (CI). Outcomes were variable.

Methods:

Report of a pediatric patient treated with CI following COVID-19 related bilateral SNHL complicated by labyrinthitis ossificans with a review of hearing outcomes following reported cases of COVID-19 related sudden SNHL.

Results:

4-year-old was referred with new sudden onset sudden bilateral cochleo-vestibular loss following COVID-19 infection. He had regression of milestones and disequilibrium which could represent vestibular compromise. Audiogram showed bilateral profound SNHL that was confirmed by ABR. MRI findings suggested labyrinthitis bilaterally and assessment of his cerebrospinal fluid demonstrated abnormal white blood cell count without bacteria and normal protein as well as glucose levels.

Given the MRI findings consistent with inflammation that is known to lead to labyrinthitis ossificans, the child underwent urgent bilateral CI within a week. Intraoperative findings suggested intracochlear inflammation with fibrosis of the lumen. Despite this full insertion bilaterally of the electrode array was achieved via cochleostomy.

Conclusion:

Sudden SNHL may be a sequelae of a recent infection with SARS-CoV-2.In patients with profound SNHL, urgent imaging is warranted to detect signs of inner ear inflammation and define the time-course of hearing loss evaluation and treatment given the risk of labyrinthitis ossificans.

102

Human Papilloma Virus (HPV) Vaccination in Boys: Why So Low? Why improving?

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Abstract

BACKGROUND: Oropharyngeal cancer is more common in males than females and more common than cervical cancer, occurring as long as 20-40 years after initial infection with HPV. Vaccination against HPV, the most common cause of oropharyngeal cancer, is recommended to begin routinely at age 11-12 years of age. Although initially only recommended for females (2006), recommendation to include males began later (2011). According to Healthy People 2020, the following are immunization rates for adolescents who received 2 or 3 doses of HPV vaccine for females vs males: Females increased from 45.1% (2016) to 48.8 (2018) while males increased 36.4% (2016) to 47.1 (2018)

OBJECTIVE: To determine what factors were operative in aiding in increased acceptance by boys.

METHOD: Literature review of Pub-Med articles relating to HPV Vaccine use in boys during the period of data collection for Healthy People 2000. Problem areas were identified, and subsequent actions noted.

RESULTS: Major problem areas: (1) Knowledge about the vaccine among parents and patients was deficient (2) General vaccine hesitance in the general population. (3) Misconceptions about the vaccine relevant to labeling as a female vaccine (4) Delayed FDA designation of prevention of oropharyngeal cancer as an indication for vaccination. Inadequate explanation of prevention of respiratory papillomatosis. (4) Promotion of promiscuity. (5) Side effects.

CONCLUSIONS: Actions recommended were: Improved communication about vaccination facts with parents and patients through schools, media, and health care providers; Involved countering male stereotypes about healthcare and focusing on the specific effects in males.; Highlighted the herd effect.

103

Creation of Epic flowsheets to Accept Discrete Data from AudBase via Transfer from Audiometric Clinical Equipment

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Abstract

Background: Attempting to assess discrete audiometric data and making connections between diagnosis and other disciplines' data was often inefficient and labor intensive. Therefore, AudBase was used to transfer discrete data into Epic directly from clinical equipment which is not functionality commonly built into EMR systems.

Methods: The Nemours Clinical Applications team worked directly with Audsoft and in tandem with the Audiology Leadership Team to develop a data dictionary. After the data dictionary was defined, Epic flowsheets were created for each discrete field that could be mapped from AudBase and transferred directly into the Epic flowsheets.

Results: Over 1,100 discrete fields were defined, and Epic flowsheets were created to capture important data. Time-consuming manual chart review and searching for specific data points in the chart is no longer needed making data retrieval fast and direct.

Conclusions: Gathering discrete audiometric data from clinical diagnostic equipment to assess outcomes overtime in a pediatric hospital using Audbase and Epic is doable. Additionally, a roadmap built during this process can be used to implement a similar system into other pediatric clinics by reviewing lessons learned, minimum requirements needed, what questions to ask, and knowing what is and what isn't possible when transferring discrete diagnostic data from clinical equipment into AudBase and then to the Epic; in hopes that clinical teams wouldn't need to expend as much time, resources, or effort to implement.

104

Complications of Pediatric Cochlear Implant Surgery

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Abstract

Background:

Cochlear implantation (CI) surgery is considered a relatively safe operation. However, any invasive procedure involving the skull has risks. There are few recent studies in the United States that have analyzed complication rates among children who have received CI. Furthermore, existing studies fail to discuss specific risk factors that led to post-operative complications. This study aims to 1) determine the incidence of complications in pediatric CI patients and 2) identify evidence-based risk factors so pediatric otolaryngologists can better identify high-risk patients.

Methods:

This is a single-institution retrospective study analyzing the pre-, intra-, and post-operative data from 72 pediatric patients who underwent CI surgery between 2016 and 2021. SPSS statistical software was used for statistical analysis.

Results:

Patients were aged 8.9 months old to 25.8 years old with a mean age of 7.1 years old. Of the 72 patients, there were a total of 101 ears operated on. There were 24 total complications among the 101 ears, yielding an overall complication rate of 23.8%. The most common complication was an infection (12.9% of ears), followed by dysgeusia (3.96%). Of the 72 patients, 72.2% had >1 preoperative comorbidity and 56.9% had an inner ear abnormality on imaging. The most common comorbidities were obesity (26.4%) and eustachian tube dysfunction (22.2%).

Conclusion:

The overall complication rate was 23.8% with the most common complications being infection and dysgeusia. Further statistical analysis is required before conclusions can be made regarding any correlation between preoperative risk factors and complication rates.

108

Assessing trends in intervention for epistaxis during the COVID-19 pandemic

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Abstract

Background:

The current treatment algorithm for recurrent epistaxis in children is well understood. However, it is unclear how the COVID-19 pandemic has influenced trends in management. This study aims to determine if the COVID-19 pandemic affected intervention for children with recurrent epistaxis.

Methods:

After obtaining IRB approval, electronic medical records were retrospectively reviewed for patients aged 0 to 18 seen in the ENT clinic for epistaxis (R04.0) from 2018-2021. Clinical characteristics such as laterality of epistaxis, history of nasal trauma, digital trauma and bleeding disorders were recorded. Intervention included conservative, silver nitrate (SN), electrocautery, or both SN and electrocautery. Patients with epistaxis secondary to surgery or those who underwent previous cautery were excluded. Pre-pandemic was defined as 2018-2019 while the pandemic was defined as 2020-2021. Data collection for 2021 is ongoing.

Results:

Among a cohort of 1921 patients, 63% (n = 1217) were evaluated for epistaxis pre-pandemic compared to 37% (n = 704) during the pandemic. Conservative management increased during the pandemic (Pre: 49% vs. During: 55%, P = 0.0039) while electrocautery decreased (Pre: 21% vs. During: 17%, P = 0.0312). Treatment with SN and both remained similar (Pre: 27% vs. During: 26%, P = 0.3917, Pre: 3% vs. During: 2%, P = 0.2032). Mean age (years) for each treatment type was significantly different (8.31 conservative, 10.10 SN, 8.14 electrocautery, 8.71 both, P < .0001).

Conclusions

The pandemic affected intervention for epistaxis. Future studies should evaluate recurrence rates among each treatment group to determine the clinical implications of these changes.

110

Sclerosing extramedullary hematopoietic tumor in the masticator space of a child

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Abstract

Background: Sclerosing extramedullary hematopoietic tumor (SEMHT) is a rare tumor-like condition usually presenting in adult patients with history of chronic myeloproliferative disorders (CMPD). It is known to involve a variety of different organs including lung, skin, gastrointestinal tract, breast, kidney, lymph node, and thyroid gland.

Methods: Novel case report

Case Description: 16-year-old male with history of myelofibrosis found to have a facial mass in the right masticator/retro-maxillozygomatic space. It measured 2.0 x 2.5cm and was T1 isointense and slightly T2 hyperintense on contrasted MRI. He had been asymptomatic and unaware of the mass. Physical exam was notable for a non-tender, right-sided mass palpable just anterior to the retromolar trigone. Removal via a trans-oral approach and final pathology returned SEMHT. Molecular genetic testing was significant for a type I variant p.Leu367ThrfsTer46 in CALR and a variant p.Gln1381ThrfsTer77 in SAMD9L.

Discussion: SEMHT is a rare tumor, described almost exclusively in adults, and occurs in patients with CMPD (most commonly myelofibrosis). Characteristic features include prominent atypical megakaryocytes and dense collagen fibrosis, helping to distinguish it from extramedullary hematopoiesis. Morphologically, SEMHT has a sclerotic to myxoid background with thick collagen strands and trapped fat. Although mutations in JAK2 and CALR type 2 are more common, there is increased survival with the CALR type I mutation. Both the CALR and SAMD9L mutations predispose to myeloid neoplasms. The prognosis of SEMHT is unknown.

Conclusions: We present a unique case of SEMHT not only found in an unreported location, but also in a pediatric patient.

112

Extranodal NK/T-cell lymphoma nasal type in an adolescent male

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Abstract

Background: Lymphoma is the 3rd most common sinonasal malignancy, but extranodal NK/T-cell lymphoma nasal type (ENKTL-NT) is a rare aggressive variant related to Epstein-Barr virus (EBV) showing a geographic predominance in Asian and Latin American countries. Most cases are reported in adult males, only rarely reported children and adolescents. EBV seems to play a key role as it is the common factor across all affected groups.

Methods: Case report and literature review

Results: A 17 year-old Mexican male presented to the emergency room with severe right-sided nasal congestion for 1 month unresponsive to medical treatment. Flexible nasal endoscopy revealed an extensive ulcerative and exophytic mass of the right nasal cavity. On CT sinus there was an abnormal density and asymmetric soft tissue thickening of the right nasal ala extending to the nasal apex and the soft tissues of the face overlying the right maxillary sinus. Surgical biopsy demonstrated fragments of mucosa and deep tissue with extensive involvement by an atypical lymphoid cell proliferation positive for EBV-encoding RNA.

Conclusions: High clinical suspicion is key for diagnosis of ENKTL-NT in children. Otolaryngologists should be particularly wary in cases of prolonged, complicated nasal congestion and sinusitis unresponsive to typical medical management. Prompt diagnosis and subsequent initiation of treatment is key to ensuring the best chance of survival.

115

Comparing loss to follow-up among rural and non-rural children with tracheostomy

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Abstract

Background: Children with complex medical conditions, such as tracheostomy, may have more difficulty attending follow-up appointments at tertiary care centers if they live in rural locations. This study compares follow-up rates among rural and non-rural children after tracheostomy. As a secondary aim, this study compares follow-up rates for children with public versus private insurance status.

Methods: This study used the Pediatric Health Information System (PHIS) database to identify children who underwent tracheostomy from 2013-2017. The PHIS hospitals are 51 of the largest children's hospitals in the United States. Multivariable logistic regression model compared whether a child was able to follow-up at PHIS hospital based upon rurality and insurance status. Mean follow-up duration was also compared.

Results: 6716 children underwent a tracheostomy procedure during the study period. Of those, 781 (11.6%) did not have a follow-up encounter available in the PHIS database after discharge from initial tracheostomy hospitalization. Rural children were significantly more likely to lack follow-up encounter at a PHIS-reporting hospital than non-rural children (OR 1.5, 95% CI 1.2, 1.8, $p<0.001$). Among children able to follow-up at PHIS hospital, mean duration of follow-up was similar among rural children (2.76 years, SD=1.79) and non-rural children (2.84 years, SD=1.79), $p=0.6$. Children with public health insurance were not more likely to lack follow-up at PHIS hospital than children with private insurance (OR 0.9, 95% CI 0.7, 1, $p=0.1$).

Conclusion: Rural children were significantly more likely to lack follow-up at PHIS-reporting hospital than non-rural children after discharging with tracheostomy, which may impact clinical outcomes.

117

Parental Postoperative Decisional Regret: Correlation with OSA-18 Scores in Children Post-Tonsillectomy

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Abstract

Background:

Decisional regret (DR) in parents who elect to have their children undergo tonsillectomy is related to preoperative decisional conflict (DC), but has not been shown to correlate with how successful the surgery is in resolving preoperative complaints.

Our goal is to examine the relationship between parental postoperative DR and persisting symptoms in children undergoing tonsillectomy for sleep-disordered breathing (SDB).

Method:

Parents with children aged 2-14 years undergoing tonsillectomy +/- adenoidectomy for SDB were recruited. OSA-18 (quality-of-life scale for children with SDB) scores were collected preoperative and one month postoperative. Preoperative DC and postoperative DR scores were collected.

Results:

Parents of 31 children, 18 (58%) females and 13 (42%) males, with a mean age of 5.4 years were included. Mean preoperative OSA-18 score was 72.6 (95% CI:65.6-79.5) and mean preoperative DC score was 4.3 (95% CI:1.4-7.3), consistent with low DC. Mean postoperative OSA-18 improvement was 42.6 (95% CI:34.7-50.4, $p<.001$). Mean postoperative DR score was 6.0 (95% CI:2.8-9.3), indicating low DR. 19 parents had DR scores of 0, indicating no postoperative regret.

There was no significant contribution to DR scores from preoperative or postoperative OSA-18 scores, change in scores, or preoperative DC when analyzed with linear regression and correlation.

Conclusion:

In this group, we were not able to demonstrate a correlation between parental postoperative DR and persisting SDB symptoms in children. This may reflect the low overall postoperative regret in these parents.

118

Cell-Signaling Pathways Involved in BMP2-Treatment Response Heterogeneity in Pediatric Osteoblast-Like Cells

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Abstract

Craniofacial bone loss occurs due to aberrant embryogenic development, engendering high morbidity in children. These defects are complex, requiring multimodal treatment regimens from short-term surgical repair to newer regenerative therapies, such as local administration of bone morphogenetic protein (BMP2). BMP2 treatment is not FDA-approved for use in pediatric patients due to inflammatory and oncogenic sequelae. To investigate heterogenous patient responses following treatment with BMP2, we utilize human bone-derived osteoblast-like (HBO) cell lines isolated from pediatric bones (n=6) in this study. BMP2-treated HBO cell lines were first cultured and probed for mineralization, resulting in three cell lines observed as “responders” to treatment, while three were characterized as “non-responders.” This variability in responsiveness is hypothesized to be a result of divergence from canonical BMP2 cell-signaling pathways, which were shown to have no significant activation differences between designated responder and non-responder cell lines. We then investigated non-canonical signaling targets downstream of BMP2 (TGF-β and AKT), and the AKT pathway demonstrated significant differences in phosphorylation. These findings were validated by mineralization assays of HBO cell lines following treatments that modulate cell-signaling pathways. Responder cells treated with BMP2 and AKT inhibitor demonstrated no mineralization potential, while BMP2 and TGF-β inhibitor showed significant mineralization capability, confirming AKT as a downstream target of BMP2. Future avenues include elucidating additional cell-signaling pathways that may be involved by utilizing RNA sequencing and Luminex-based assays. These initial findings indicate non-canonical signaling pathways as potential targets of interest for bone regenerative therapies, which could be leveraged in children with craniofacial defects.

120

Single-Staged Laryngotracheal Reconstruction for a Type IV Laryngeal Web in a Premature Neonate: A Case Report and Literature Review

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Abstract

Single-Staged Laryngotracheal Reconstruction for a Type IV Laryngeal Web in a Premature Neonate

Background: Congenital laryngeal webs are rare anomalies. Type III and IV laryngeal webs are not commonly repaired in a single-staged procedure at birth.

Methods: Case report and literature review.

Results: A two day-old 36.5-week preterm infant with 22q11.2 deletion syndrome presented with respiratory distress accompanied by biphasic stridor, aphonia and CO2 of 69 mmHg despite CPAP. Nasopharyngolaryngoscopy confirmed a type IV laryngotracheal web. He was stabilized by adding heliox to his CPAP and operated the next day at 2700g. The patient was intubated with a 2.0 endotracheal tube over a telescope. The subglottis was over 70% stenosed. A single-staged laryngotracheal reconstruction with thyroid alar graft and posterior cricoid split was performed. The patient was extubated one week post- operatively. He was on room air within two days and full PO by nine days post-extubation. Apart from prolonged sedation withdrawal syndrome, there were no major post-surgical complications and he was discharged 59 days after laryngotracheoplasty. Review of the literature found 11 papers with sufficiently detailed reports of type III and/or IV congenital laryngeal webs. Only 6/50 reported cases were managed with a single-staged laryngotracheal reconstruction at ages 3 months to 4 years at the time of surgery.

Conclusion: This is the youngest case in the literature of a type IV laryngeal web successfully treated with a single-staged laryngotracheal reconstruction. In select patients a single-staged repair may avoid burdens associated of tracheostomy.

121

Children with Previous COVID-19 Infection Are More Likely to Present with Recurrent AOM or Tube Otorrhea

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Abstract

Background:

Since December 2021, the number of children with COVID-19 infections has increased. Sequelae in children have not been well-described. Our goal was to determine if children with a history of COVID-19 infection (C19 group) were more likely to present with recurrent acute otitis media (rAOM) or post-ventilation tube otorrhea (VTO) than children who had no history of COVID-19 infection (NoC19 group).

Methods:

Charts of consecutive children presenting at a pediatric otolaryngology clinic from March-May 2022 were reviewed. Demographics, COVID test history, co-morbidities, ultimate diagnosis, physical exam findings, and management plan were included. No children had a known COVID-19 infection at the time of visit.

Results:

524 children were included, 228 (43.5%) girls and 296 (56.5%) boys. Mean age was 5 years (95% CI: 4.6-5.4). 115 (22%) had a history of COVID-19 infection.

104 (20%) had a diagnosis of rAOM or VTO, 30 (26%) in C19 and 74 (18%) in NoC19 (Fisher's Exact p=.04, OR=1.6). For children without ventilation tubes in place, 27 (23.5%) in C19 had rAOM versus 62 (15%) in NoC19 (p=.03, OR=1.7). 21 (18%) of C19 group had nasal congestion compared to 27 (7%) of the NoC19 group (p<.001, OR=3.2). There was no difference in incidence of otitis media with effusion, tonsil/adenoid hypertrophy, sleep-disordered breathing, or epistaxis between the groups.

Conclusion:

Infection with recent strains of COVID-19 may be associated with an increased risk of rAOM and VTO in children. This may affect healthcare utilization by increasing the need for pediatric and otolaryngologic care.

123

New onset or worsening dysphagia in children with infantile spasms after treatment

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Abstract

New onset or worsening dysphagia in children with infantile spasms after treatment

Background:

Infantile spasms (IS) are a rare neurologic condition causing systemic issues related to function. While these issues are presented to families, dysphagia is not routinely acknowledged. ACTH and vigabatrin are IS pharmacotherapies associated with MRI changes in the swallowing centers of the brain. Speech therapy (ST) evaluation is often delayed due to dysphagia not being addressed as a process of disease or medication side effect. This study seeks to determine the presence of dysphagia in this population and advocate for early ST intervention.

Methods:

This is a retrospective chart review of 56 patients seen by the neurology department for treatment of IS. Data points extracted include diagnoses, modified barium swallow results, ST follow-up, medications and timing of diagnosis and worsened dysphagia.

Results:

Of 56 patients, 18 (32.1%) experienced new or worsening dysphagia.

New or Worsening Dysphagia After Diagnosis (18 patients):

Requiring Thickener	8
Requiring Nasogastric Tube	2
Requiring Gastrostomy Tube	8

ST Intervention (n=56):

ST prior to diagnosis of IS	22 patients (39.3%)
No ST Intervention	3 patients (5.3%)
ST after diagnosis of IS	31 patients (55.4%)

Time to ST intervention from diagnosis of IS (days):

Average	25
Median	1
Standard Deviation	60.71918425
Range	0-300

<u>Conclusion</u>:

Dysphagia commonly occurs in patients with IS and those receiving therapy. While pharmacotherapy is necessary, clinicians should counsel on dysphagia and offer appropriate ST at time of diagnosis with treatment or treatment adjustments to prevent complications.

124

Outcomes of pediatric canal wall-down mastoidectomy with ossicular chain reconstruction

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Abstract

Introduction

Canal wall-down (CWD) mastoidectomies are rare surgical options to address recalcitrant cholesteatoma in children. However, the outcomes of ossicular chain reconstruction (OCR) in pediatric CWD patients are not well described. We report our experience with CWD mastoidectomies and ossicular chain reconstruction (OCR).

Methods:

Retrospective chart review of patients at a pediatric tertiary referral hospital from January 2015 to Dec 2021 was performed. Operative reports were reviewed for inclusion if CWD mastoidectomy was performed. Measures recorded included past surgical history, indications for mastoidectomy, and if OCR was performed.

Results:

26 patients received CWD mastoidectomy with a mean age of 12 years old. The mean number of prior mastoidectomies before CWD mastoidectomy was 1.8. All cases were completed for cholesteatoma and all but 1 ear had partial or complete erosion of the ossicular chain. Of the 25 eligible CWD patients, 6 received OCR. Out of these 6 OCR recipients, 3 patients had implant complications experiencing prosthesis displacement and extrusion and 1 patient had no audiologic improvement at 6 and 18 month follow-up[GN1] . These 4 OCR failure patients were subsequently referred for bone-anchored hearing aids. 1 OCR recipient is awaiting post operative audiogram and 1 recipient declined audiogram due to financial concerns.

Conclusion:

Patients with CWD with OCR had variable outcomes, with 67% (4/6) of patients ultimately requiring bone anchored hearing aids for hearing rehabilitation. Ossicular chain reconstruction should be carefully considered in a pediatric patient with a CWD mastoidectomy due to potential poor hearing outcomes and prosthesis displacement.

125

Intraoperative Ergonomic Risk Assessment Among Otolaryngologists Performing Tympanostomy Tube Insertions

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Abstract

Intraoperative Ergonomic Risk Assessment Among Otolaryngologists Performing Tympanostomy Tube Insertions

Background

Otolaryngologists commonly report musculoskeletal symptoms and workplace symptom exacerbations that decrease productivity and worsen quality of life. Tympanostomy tube insertion (TTI) is a commonly performed, short-duration otolaryngology procedure with poorly understood ergonomic risk. The primary objective of this study was to assess ergonomic risk among pediatric otolaryngologists performing TTI.

Methods

After IRB approval, pediatric otolaryngology attendings were recorded while performing TTIs at a tertiary-level pediatric hospital as part of a prospective cohort study. Ergonomic risk was assessed through the craniovertebral angle (CA) and Rapid Upper Limb Assessment (RULA). CA was quantified using the mean value of lateral images of operating surgeons collected at each minute of the procedure; RULA was scored at time of tube insertion. Thresholds for ergonomic risk included CA < 50° and RULA scores > 2. Scores were summarized using means and standard deviations, and ranges were then utilized to stratify intraoperative ergonomic risk.

Results

Overall, 144 TTIs from 10 otolaryngologists were assessed for RULA score while a total of 275 lateral images were assessed for CA. In the majority of procedures, elevated ergonomic risk was observed as indicated by RULA (n=123, 85%) and mean procedure CA (n=128, 89%). Only 10% (n=27) of lateral images demonstrated favorable CA (≥ 50°).

Conclusions

High prevalence of intraoperative ergonomic risk exists among pediatric otolaryngologists performing TTI. Therefore, further investigation and implementation of interventions is warranted. Future directions include examining injury risk reduction through using a novel, wearable biofeedback device.

129

Interesting Case and Video Presentation: Staged Endoscopic Posterior Cricoid Reduction in a 3 year old.

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Abstract

- **Background:** Patients who undergo airway reconstruction procedures are at risk for developing post-operative dysphonia. This can manifest from poor contact of the vocal folds following a complete laryngofissure, temporary or permanent vocal fold immobility and as a result of poor contact of the vocal folds as the result of a diastasis of the posterior glottis following the placement of a posterior graft. The safety and efficacy of posterior cricoid reduction in the pediatric population has been documented. Here we present the youngest reported patient to undergo endoscopic cricoid reduction.
- **Methods:** Review of a patient who previously underwent a single stage laryngotracheoplasty with anterior and posterior costal cartilage grafts who had resulted post-operative dysphonia. She was found to have posterior glottis diastasis. At age 3 she underwent endoscopic posterior cricoid reduction and a staged second posterior cricoid reduction at age 5. We review the surgical procedures including a video presentation and evaluate pre and post-operative voice.
- **Results:** We demonstrate the safety of performing a posterior cricoid reduction in the younger pediatric population and outline a staged approach.
- **Conclusions:** Endoscopic posterior cricoid reduction in patients who previously underwent laryngotracheoplasty with anterior and posterior costal cartilage grafts with resultant posterior glottic diastasis is safe in the younger pediatric population. The reduction can be approached in staged fashion to reduce the possibility of over reduction of the posterior cricoid.

130

Novel application of Onyx intralesional embolization in the treatment of pediatric lingual venous malformations

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Abstract

Background: The treatment of head and neck venous malformations with preoperative embolization minimizes recurrence, cosmetic and functional morbidity. N-butyl cyanoacrylate (NBCA) has been the embolic agent of choice, however, Onyx is a new agent with a potential of being more effective based on the success on intracranial application.

Methods: We describe a patient with a lingual venous malformation treated with preoperative intralesional embolization using Onyx. We also present a review of the literature on current management with embolization agents and explore the mechanism of action of Onyx.

Results: Onyx has been used successfully in intracranial malformations. In our experience, Onyx delineates the borders of the lesion effectively, minimizes removal of uninvolved tissue, and reduces blood loss. We theorize that it is likely related to its mechanism of action versus other embolic agents. NBCA is an adhesive polymer that causes immediate solidification, therefore, there is less control over injection time, penetration, and extent of solidification. Onyx allows the user to determine the rate of solidification by controlling the amount of dimethylsulfoxide (DMSO) in the solution. This allows for better penetration, and an accurate solidification of the vascular malformation. Thus, increasing the chances of complete surgical resection.

Conclusions: The Onyx embolization system is a new alternative to traditional agents used in preoperative embolization of lingual venous malformations. Its unique mechanism of action favors more effective and accurate embolization and solidification, as we outlined in our case presentation. More research is necessary to effectively compare the onyx system with more traditional embolization agents.

133

Post-operative Admission Lengths After Adenotonsillectomy for Children with Trisomy 21

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Abstract

Background: Obstructive sleep apnea (OSA) is very common in children with Trisomy 21. Adenotonsillectomy (AT) is a common procedure in this patient population as it is the first line therapy for OSA. Some studies have suggested these children may have a higher risk of prolonged hospital stay, large scale studies have not examined this. The objective of this study is to assess the length of stays and factors associated with prolonged hospitalization among children with Trisomy 21 following AT.

Methods: A retrospective review was completed using the Pediatric Health Information System (PHIS) database. The patients included Trisomy 21 children <18 years-old who underwent an AT. The variables examined included age, gender, hospital length of stay (LOS), and presence of various comorbidities including cardiovascular, neurologic, respiratory or prematurity.

Results: A total of 1,822 children with Trisomy 21 aged 0-17 years (mean age of 6) were evaluated from 2017 to 2021. The LOS ranged from 0-17 days with 92.5% being admitted, and 83.2%, 6.8%, and 1.4% requiring a 1, 2, and 3 day admission, respectively. A Pearson correlation found a negative relationship ($r=-.08$), between age and LOS ($p< 0.001$). An independent samples t-test did not find a significant association between having a comorbidity (cardiac, neurologic, respiratory, prematurity) and LOS.

Conclusions: Children with Trisomy 21 have a high rate of admission following AT. A longer length of stay was associated with younger age, but not with having additional comorbidities.

134

Skull Base Osteomyelitis and Retropharyngeal Abscess Following Injection Pharyngoplasty with Calcium Hydroxyapatite for Velopharyngeal Insufficiency

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Abstract

Background: Velopharyngeal insufficiency (VPI) is a disorder that manifests in patients as hypernasal resonance due to incomplete velopharyngeal closure during phonation. Due to significant effects of VPI on speech and social development, it must be promptly diagnosed and treated. Instrumental testing guides surgical approach, which is tailored based on velopharyngeal gap size, location, and pattern of closure. Depending on the patient's individual VPI characteristics, a variety of palatal and pharyngeal surgeries can be performed. Alternatively, surgeons may elect for injection pharyngoplasty to augment the posterior pharyngeal wall. We herein report a rare presentation of a 9-year-old boy who suffered from osteomyelitis following calcium hydroxyapatite injection for VPI.

Methods: Case report.

Results: A 9-year-old boy with cleft lip and palate underwent pharyngoplasty with calcium hydroxyapatite injection for VPI. Over the next two weeks, the patient developed significant neck pain and torticollis. CT neck showed a 20x24x44mm retropharyngeal abscess. Subsequent MRI of the neck following incision and drainage demonstrated skull base osteomyelitis involving the clivus, occipital condyles, and basisphenoid region. Despite the common utilization of injection pharyngoplasty for the management of VPI, existing literature has not described this postoperative complication.

Conclusion: In certain clinical circumstances, injection augmentation pharyngoplasty is an effective intervention for VPI. However, risk of contamination and subsequent infection has not been explored in the current literature. This case highlights the serious infectious risk that accompanies this procedure. Preventive methods, such as a 0.5% povidone iodine irrigation, should be considered to mitigate this life-threatening, morbid complication.

135

Surveying Dysgeusia/Anosmia in the Pediatric Population Infected with COVID-19

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Abstract

Background: COVID-19 infection carries significant morbidity and mortality risks, including anosmia and dysgeusia. Sometimes, these can be the only symptoms seen in patients. A significant correlation between anosmia and dysgeusia has been shown in adults, but this relationship has not yet been cemented in the pediatric population. As of now, it is known that children infected with COVID tend to be mostly asymptomatic. This study aims to clarify the relationship between anosmia and dysgeusia in diagnosed COVID-19 pediatric patients.

Methods: Children that tested positive for COVID-19 at a tertiary hospital's caretakers were contacted via a text messaging surveying system through Questionpro. The survey asked for the patient's age, their anosmia/dysgeusia when testing positive for COVID, and if they had symptoms after COVID-19 resolution.

Results: 44 participated in the survey, with 23 finishing it, and a total of 262 viewing it (8.78% response rate) with the majority of patients being adolescents. 60.87% & 52.17% had a change in their ability to taste or smell, respectively. Finally, 91.3% had no long-term changes in anosmia/dysgeusia after COVID-19 resolution. Conversely, 8.7% of participants had some long-term changes.

Conclusions: This study demonstrates that the majority of the pediatric population affected with COVID-19 did not have ongoing anosmia/dysgeusia. However, 2 patients did have long-term sequelae from infection. Further research should seek to delineate the degree of loss in those patients with sequelae. Additionally, attempts to elucidate the exact mechanism of recovery/dysgeusia in kids should be assessed for therapeutic interventions.

138

Creation of EPIC Patient Questionnaires and inflow to EPIC flowsheets for improved Outcome Tracking

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Abstract

Background: Completing patient questionnaires during an appointment and entering responses into Epic for documentation is often time consuming and unbillable. Therefore, the Audiology Leadership team worked with the Nemours Epic team to develop electronic questionnaires that were generated depending on sent to families prior to the appointment and which could then be completed and captured via flowsheets for comparison and later data analysis.

Methods: Specific audiology questionnaires were identified depending on age and visit type. The in-house Epic team then converted them into electronic questionnaires which were sent to the caregiver through the NemoursApp patient portal. Additionally, flowsheets were created to capture discrete data via the QlikSense database.

Results: To date, four custom audiology questionnaires and three peer reviewed questionnaires have been created and are generated prior to the patients' visit for caregivers to complete. Providers can easily access the responses prior to the visit via Epic, pull the data into clinical notes, and assess data overtime.

Conclusions: Implementation of Epic electronic questionnaires generated prior to the patient's appointment, and which filed directly into Epic flowsheets, significantly decreased the time needed to enter data manually into Epic. Additionally, it helped decrease the number of completed questionnaires that were mailed or sent by email to families and asked to be returned to the department for review and manual data entry into Epic.

139

Quality of life improvement of inferior turbinate reduction in a single institution pediatric population

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Abstract

Background: Inferior turbinate reduction surgery has increased in popularity in the pediatric population. There is a paucity of research on the practice of inferior turbinate reduction in the pediatric population and long-term symptomatic outcomes. The Nasal Obstruction Symptom Evaluation (NOSE) scale is a validated sinonasal quality of life tool for children. The purpose of this study is to evaluate the quality of life efficacy of inferior turbinate reduction surgery in children in a single surgeon practice via collection of postoperative NOSE scores and surgical revision rates.

Methods: Retrospective review of children in a single surgeon otolaryngology practice who have undergone inferior turbinate reduction with prospective completion of the NOSE scale are eligible for inclusion. Descriptive statistics will be provided. Symptom improvement, need for revision surgery, and complications will be reported.

Results: We hypothesize that children who have undergone inferior turbinate reduction surgery will have significant improvement of their nasal obstruction as indicated by scores NOSE scores below 30 and that surgical revision is rare. Data is currently being collected with an end date of September 1, 2022.

Conclusions: Validated assessment of nasal obstruction is an important tool in the evaluation of children who have undergone surgical management for their symptoms. More research is needed to understand the quality of life implications of surgery in pediatric nasal obstruction.

140

CI Patient Adherence to Post-Implant Care Recommendations

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Abstract

Background: Parents and patients are counseled preoperatively about the lifelong commitment of follow-ups after cochlear implantation. Following the initial year of adjustment, our center's recommendation is for patients to follow-up at least annually to both their Otolaryngologist and Audiologist. Data regarding the adherence to this recommendation is not easily accessed in the literature. Identification of barriers to adherence as well as recommendations to improve return rates have not been widely available.

Methods: Retrospective chart review of cochlear implant patients followed at a large cochlear implant center. Data assessed included patient demographics, lost to follow-up rates and reasons.

Results: Of the 509 patients, 143 (28.1%) are current patients of both Otolaryngology and Audiology at this center, 125 (24.6%) are lost to follow-up for either Otolaryngology or Audiology, 117 (23.0%) patients moved, or their insurance changed causing them to seek care elsewhere, 76 (14.9%) are lost to both specialties at our facility, 29 (5.7%) with unknown status, and 19 (3.7%) are non-users or deceased.

Conclusions: 230 patients (45%) were lost to follow-up for at least one specialty, Otolaryngology or Audiology at our center, or have an unknown status. This highlights the importance of monitoring the attendance of cochlear implant patients and having a system for flagging no-shows. Protocols need to be in place to ensure that all patients continue to receive appropriate care, and that there is a system available to ensure a smooth transition of care to adult centers.

142

Supraglottitis, an unusual complication after adenotonsillectomy in a child

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Abstract

Background: Adenotonsillectomy (T&A) is the second most common surgical procedure performed on an annual basis in the United States. Most often T&A is performed for sleep-disordered breathing or recurrent pharyngitis. Expected complications after T&A include pain, dehydration, and oropharyngeal hemorrhage. Supraglottitis has not been reported as a complication of T&A. This potentially life-threatening condition occurs when bacteria, usually Haemophilus influenzae type b or Streptococcus pneumoniae, penetrate the mucosal barrier causing bacteremia that seeds the epiglottis causing inflammatory edema and acute airway obstruction.

Methods: Case report and literature review

Results: A 7 year-old female with cerebral palsy underwent an uneventful T&A for recurrent streptococcal pharyngitis. She was in her usual state of health on the day of surgery and her last course of antibiotics was over one month prior. On post-operative day 1 she presented to the emergency department with stridor, odynophagia, and facial edema. Flexible fiberoptic laryngoscopy revealed erythema and edema of the epiglottis and arytenoids. She was taken to the operating room for flexible fiberoptic intubation. Tracheal aspirate was positive for group A streptococcus. Appropriate antibiotics were started, she was extubated 3 days later, and discharged home 3 days after extubation.

Conclusions: Supraglottitis is an unreported but not implausible complication of T&A for recurrent streptococcal pharyngitis. The otolaryngologist should have a high index of suspicion if a patient presents with stridor during the post-operative period. Judicious airway management is key to a successful outcome.