Crane-Heise Syndrome: Novel CT Findings of the Temporal Bone

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Abstract

Objective

To report a patient with cardinal features of Crane-Heise syndrome (CHS) who presents with novel CT findings within the temporal bone.

Study design

Literature review and case report.

Methods

We report a patient with cardinal features of CHS who presents with novel CT findings within the temporal bone. A chart review was performed, and a literature review was conducted using PubMed.

Results

A 14-year-old patient with CHS presented for evaluation of life-long acalvaria. A CT scan without contrast revealed novel temporal bone abnormalities. The external auditory canals were patent but appeared atretic and abnormally angulated. Both cochleae were mildly dysplastic with widening of the interval between the basal and middle turns. Fluid was also present within the middle ear cavities. Prior tympanometry showed flat tympanograms in the context of pneumatized middle ear spaces, which may suggest ossicular fusion as a manifestation of CHS.

Conclusion

This is the first report to describe the radiographic temporal bone findings associated with CHS. Further research will require collaboration between geneticists, otolaryngologists, and families of CHS patients to encourage donation of temporal bone specimens from the few individuals living with this rare condition.

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Background

Crane Heise Syndrome (CHS) is a rare, autosomal recessive condition characterized by a poorly mineralized calvarium, characteristic facial anomalies and extracranial musculoskeletal anomalies.[1]

A non-specific finding of "hearing loss" has also been associated with this condition but has never been characterized. As CHS may be associated with cleft palate and other craniofacial anomalies, something as simple as chronic serous otitis media may be the source of this loss.

Methods

- We report a 14-year-old patient with CHS
- A literature review on CHS was performed using PubMed
- The patient's electronic medical records were reviewed

Case Report

- A 14-year-old female patient with CHS presented for evaluation of life-long acalvaria.
- Despite the prenatal ultrasound initially indicating a nonviable fetus, the patient was born at 31 weeks via caesarean section.
- The patient had multiple musculoskeletal anomalies, the most notable of which was severe progressive scoliosis.
- Additional craniofacial and musculoskeletal anomalies present included hypertelorism and hypoplastic clavicles.
- A behavioral audiogram was not possible given developmental delay; however, tympanometry showed flat, normal volume tracings c/w middle ear effusion or ossicular fixation. Otoscopic exam revealed clear middle ear spaces.
- A CT scan was obtained at age 14 to evaluate the extent of acalvaria. The frontal, occipital temporal and parietal bones were hypoplastic (Fig 1). There were markedly widened metopic and sagittal sutures and essentially no mineralized bone overlying the anterior, superior or vertex aspects of the brain.
- To our knowledge, the patient is still alive, and at 19 years old, she the longest living patient with CHS reported in the literature, providing a unique opportunity for examining imaging findings of the skull and temporal bones.

Case Report (cont.)

- A non-contrast CT scan revealed numerous bony anomalies:
  - Pneumatized middle ear cavities with pockets of fluid (Fig 2)
  - Possible ossicular fusion at the incudo-mallear joints and at the stapes crura and footplates (Fig 2)
  - Mildly dysplastic cochleae with apparent widening of the interval between the basal and middle turns (Fig 2)
  - Narrowed but patent, up-sloping external auditory canals.
  - Dysplastic configuration of the sphenoid body, with a midline fusion defect of the spheno-occipital synchondrosis
  - Incomplete zygomatic arches anteriorly (Fig 3)

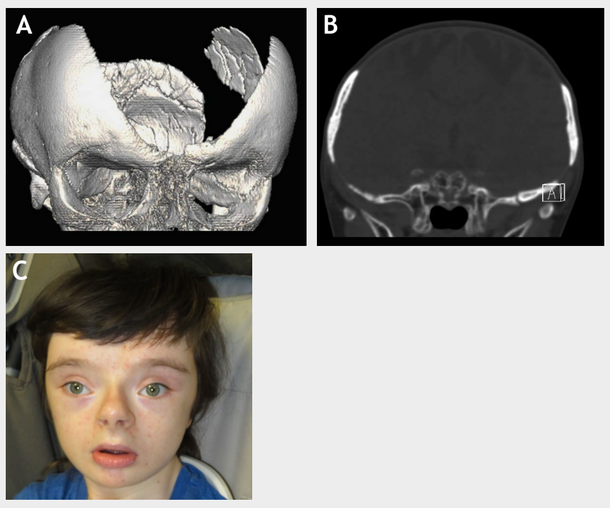

Figure 1. Acalvaria in CHS
A) 3D reconstruction of a non-contrast CT head displaying hypoplastic frontal, parietal, and occipital bones
B) Coronal non-contrast CT head, again showing large missing portions of calvarium
C) Patient displays hypertelorism and characteristic facial features

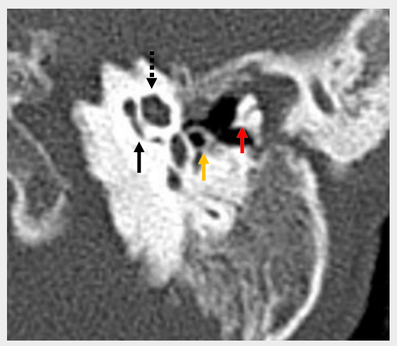

Figure 2. Axial Non-contrast CT Head at Level of Temporal Bones
Images suggest possible fusion of incudomallear joint (red). The posterior crus of stapes (yellow) also appears to be fused to the bone of the hypotympanum. Lastly, the cochlea appears dysplastic (dashed; basal turn in solid black).

Case Report (cont.)

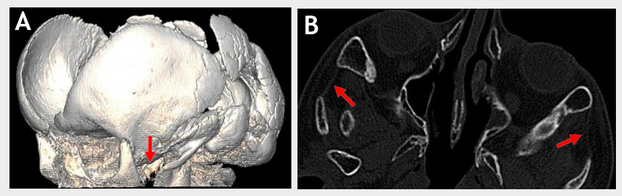

Figure 3. Incomplete Zygomatic Arches
Zygomatic arches are incomplete anteriorly. Indicated by red arrows in both A) 3D CT head reconstruction and B) axial non-contrast CT head

Discussion

Crane and Heise originally reported three siblings all affected by this syndrome in 1981.[1] Since then, there have been six other reported cases of CHS, including the patient presented here.[2-4] All six patients had characteristic craniofacial and musculoskeletal anomalies. Other than our patient, all other patients either died in utero or within two weeks after birth, making this case the oldest CHS patient in the current literature at 19 years of age.

Chronic otitis media has previously been proposed as the source of hearing loss in CHS and related diseases such as cleidocranial dysplasia.[5] This patient was nonverbal with significant developmental delays, making formal audiologic evaluation difficult; nonetheless, CT images suggested temporal bone findings such as cochlear dysplasia and ossicular fusion, which could also be a source of conductive hearing loss. This, in conjunction with flat tympanograms in the context of pneumatized middle ear spaces, further support ossicular fusion as a potential etiology for hearing loss associated with CHS.

Conclusion

This is the first report to describe radiographic temporal bone findings associated with CHS.

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Bilateral Antrochoanal Polyps Presenting as Obstructive Sleep Apnea: An Unusual Case and Literature Review

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BACKGROUND & LITERATURE REVIEW

- Antrochoanal polyps (ACPs) are benign hyperplastic masses from the sinonasal mucosa. A cystic antral mass connects via a pedicle through the middle meatus to a **solid mass in the upper airway**, potentially extending into the naso- or oropharynx.[1,2]

- ACPs are typically unilateral. Retrospective studies have identified 0-5.8% of ACPs as bilateral (Table 1).[3-18] The **relative prevalence of bilateral cases was 1.6% of ACPs** (binomial 95% CI: 0.9-2.7%) across these 16 studies. In light of the low prevalence of ACPs, **bilateral ACPs are therefore extremely rare**.

- Nasal obstruction is the most common presenting symptom of ACPs; other symptoms may include rhinorrhea or post-nasal discharge, mouth breathing or dyspnea, snoring, epistaxis, headache, inflammation, dysphonia, dysphagia, or hyposmia.[3-18]

- Rarely, ACPs may contribute to obstructive sleep apnea (OSA). **Fewer than 50 cases of OSA and ACPs have been documented**.[6,8,11,19-24] To our knowledge, this report is **the first in the literature to describe bilateral ACPs manifesting as OSA**.

CASE REPORT

- A 15-year-old female patient presented with complaints of snoring and sleep disturbances, as well as nighttime and intermittent daytime mouth breathing. **The tonsils and adenoids were not obstructing her airway**; she had undergone an adenotonsillectomy for recurrent tonsillitis at 3 years of age**.** She was **recently diagnosed with OSA**. Her polysomnogram recorded an apnea hypopnea index (AHI) of 1.3.

- She was referred to our otolaryngology clinic for a marble-sized oropharyngeal mass noted on the left side of the uvula. Her medical history included Turner's syndrome, periodic limb movement disorder, attention deficit hyperactivity disorder (ADHD), and generalized anxiety disorder. **Her history was negative for constant daytime nasal obstructive symptoms, epistaxis, rhinorrhea, dysphagia, odynophagia, and headache.**

- Physical examination confirmed the presence of a polypoid oropharyngeal mass. **Nasopharyngeal laryngoscopy revealed bilateral nasal polyps that extended through the nasal passages and choanae into the nasopharynx.** Her nasal septum and turbinates were normal. Her tonsils were absent and her larynx appeared normal. The patient underwent a CT scan of the sinuses (Figure 1). The right maxillary sinus showed multiple polyps or retention cysts, and the left was almost completely opacified with soft tissue. Mucosal thickening was greater than 5 mm in both maxillary sinuses. All other sinuses were clear. **A soft-tissue mass measuring 5.5 cm in length extended from the medial margin of the left maxillary sinus to the superior aspect of the oropharynx.** The right-sided mass was smaller, extending partly into the nasopharynx. Findings were consistent with bilateral ACPs.

- The patient received **bilateral functional endoscopic sinus surgery (FESS)** with bilateral maxillary antrostomy, anterior ethmoidectomy, and polypectomy (Figure 2). The polyps were resected at their base with debridement of the mucosa and removed transnasally (Figure 3). No complications occurred during the surgery or postoperative period. The patient used nasal saline irrigations during recovery.

- After 20 and 45 days, she was healing well with no epistaxis, rhinorrhea, or pain. The family reported **considerable improvements in her breathing at baseline and while sleeping**. Nasal endoscopy at 20 days, 45 days, and 8 months postoperatively showed no signs of polyp recurrence. She was scheduled for 2 years of follow-up visits at 6-month intervals to monitor for recurrence.

CONCLUSIONS

- Bilateral ACPs are especially rare; ACP prevalence is low, and 98.4% of cases are unilateral. The polyps and symptoms in this case were nonclassical and highly unusual.

- Although OSA is multifactorial, our patient's medical history showed no other anatomical explanation for her symptoms, which resolved after ACP resection. These findings implicated the polyps as the root cause of her apnea. ACPs may be considered in the differential diagnosis of OSA etiologies, particularly after ruling out common causes like adenotonsillar hypertrophy.

- FESS was effective in our case and did not lead to disease recurrence.

Table 1. Literature Review of Bilateral Antrochoanal Polyps (ACPs)

Study and Reference	Bilateral Cases (*n*)	Total ACP Cases (*n*)	Relative Bilateral Prevalence (%)
Frosini et al 2009[3]	3	200	1.5
Sarafraz et al 2015[4]	5	87	5.7
Perić et al 2019[5]	0	78	0.0
Pagella et al 2018[6]	0	58	0.0
Lee et al 2016[7]	1	56	1.8
Aydin et al 2007[8]	2	53	3.8
Atighechi et al 2009[9]	0	40	0.0
El-Sharkawy 2013[10]	0	36	0.0
Al-Mazrou et al 2009[11]	2	35	5.7
Balikci et al 2013[12]	0	34	0.0
Lee and Huang 2006[13]	0	26	0.0
Orvidas et al 2001[14]	0	25	0.0
Malik et al 2010[15]	0	24	0.0
Bozzo et al 2007[16]	0	23	0.0
Frietas et al 2006[17]	0	16	0.0
Başak et al 1998[18]	0	8	0.0
TOTAL	**13**	**799**	**1.6 (95% CI: 0.9-2.7)**

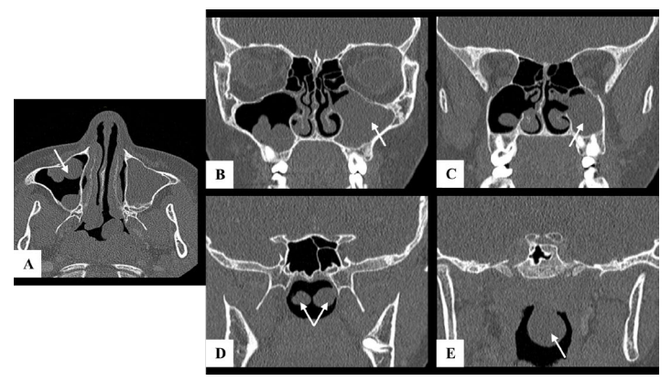

Figure 1. Axial (A) and coronal (B-E) CT scan of the sinuses showing bilateral antrochoanal polyps that extended from each maxillary sinus into the nasopharynx (D) on the right and the oropharynx (E) on the left. White arrows indicate polyps.

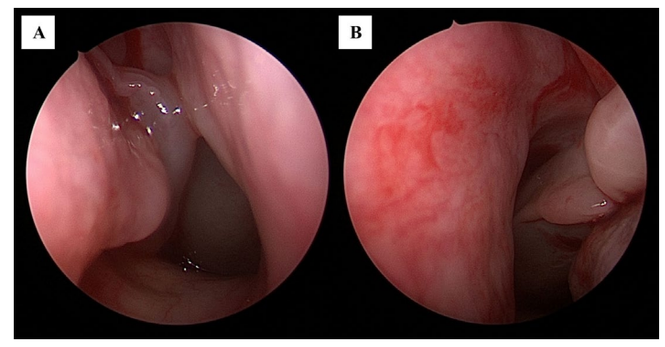

Figure 2. Fiberoptic images of the right (A) and left (B) antrochoanal polyps in the nasal cavity.

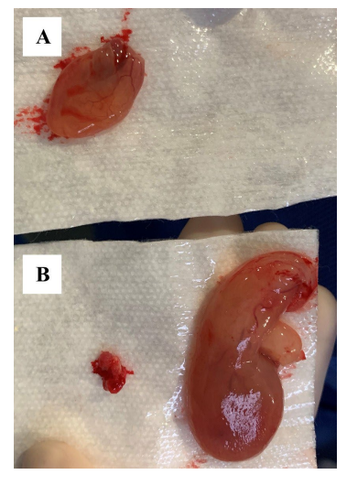

Figure 3. The right (A) and left (B) antrochoanal polyps after resection.

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Congenital Oral Obstruction: Synechia with Submucous Cleft Palate

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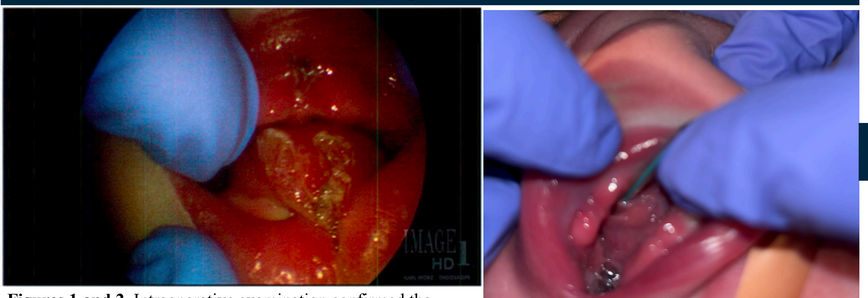
Introduction

Congenital oral synechiae are soft tissue adhesions that may lead to feeding difficulties and airway compromise. This rare anomaly may present as an isolated defect or in concert with cleft palate deformity, known as cleft palate-lateral synechiae syndrome (CPLSS).[1] To our knowledge, the presence of intraoral synechia with a submucous cleft palate, but intact hard palate, has yet to be reported in the literature.

Methods

A review of cases of congenital oral synechiae published in PUBMED was conducted to place our case in the context of the available literature on this topic.

Figures



Figures 1 and 2. Intraoperative examination confirmed the presence of a synechiae between the ventral tongue and hard palate. The patient was also found with a bifid uvula and zona pellucida, findings consistent with a submucosal cleft palate with an intact hard palate.

Case Presentation

- 1-day-old male with no syndromic features was transferred to our tertiary care center due to an inability to tolerate secretions or feed by mouth
- On exam, was found to have two distinct fibromuscular synechiae between the tip of the ventral tongue and the hard palate
  - Significantly limited the oral airway and tongue mobility, and prevented a thorough examination of the oropharynx
- Performed an uncomplicated excision of the synechiae under general anesthesia
  - Identified a bifid uvula and zona pellucida, consistent with a submucosal cleft of the soft palate

After intraoperative approximation of the tongue, the patient progressed to meet feeding goals by mouth without any subsequent nasal regurgitation prior to discharge.

Discussion

- Literature suggests that oral synechiae in conjunction with orofacial cleft deformity is very rare, around 6/4000 cleft lip/palate cases[2]
- 17 cases of CPLSS have been reported[3]

Discussion

- A clear pathophysiologic mechanism explaining the development of congenital oral synechiae has not been established, but theories include pressure on the first branchial arch due to amniotic bands and mutations of *IRF6*[3,4]
- A number of syndromes have been associated with orofacial cleft and synechiae, including Van der Woude syndrome, popliteal pterygium syndrome, and Fryns syndrome[2,4]. In addition to orofacial cleft and oral synechiae, these syndromes may be associated with musculoskeletal and thoracic abnormalities
- Our review did not reveal any cases in which oral synechiae were reported with a submucous cleft palate
- Our patient did not exhibit any significant extra-orofacial physical examination findings

Conclusion

This case contributes to a growing knowledge of rare congenital obstructions of the oral cavity. Prompt evaluation and intervention may be required in these cases as obtaining a safe airway and restoring feeds by mouth may prove difficult.

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Pediatric Head and Neck Abscess: Organisms and Susceptibility

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Background

- Methicillin resistant staphylococcus aureus (MRSA) is a growing clinical problem that has increased in head and neck infections in the pediatric population.
- A previously published study done at our institution investigating pediatric head and neck infections found that the MRSA cases rose from 0% (July 1999-Deceober 2001 to 65% (January 2002-June 2004).
- Results from that study showed that the infections were susceptible to Clindamycin, thus the recommendation was to treat with empiric Clindamycin until susceptibility results were obtained.
- A study using the Pediatrics Health Information database showed that from 1998-2008 MRSA rates increased 10 fold, and clindamycin prescribing rates increased from 21% to 63%.
- Continued rising concern for Clindamycin resistance, which is detected by disk-diffusion (D-test).
- The previous study at our institution did not find constitutive or indibuble resistance to Clindamycin.
- Previous studives have found varying results for Clindamycin sensitivity in MRSA for community acquired skin and soft tissue infections CA-SSTI) ranging from 81-97%

Objective

- Investigate changes in bacterial organisms and susceptibility patterns in head and neck abscesses in pediatric patients at the University of Chicago.
- Compare organisms & susceptibility to previous study (1994-2004) to more recent data (2016-2020)
- Track the prevalence of MRSA in abscesses and identify resistance patterns.
- Evaluating resistance patterns to clindamycin

Methods

- Retrospective Chart review of pediatric patients <18 who underwent incision and drainage of head and neck abscesses at a single academic center from January 2016-December 2020
- Demographic information: age, sex, race, date of admission, date of surgery, location of abscess, preoperative diagnosis, antimicrobial treatment prior to surgery, date of culture, and organissms that grew from each culture
- Cultures that grew staphylococcus aureus were classified as Methicillin sensitive staphylococcus aureus (MSSA) or MRSA.
- Noted results of D-test, as well if patient were switch don antibiotics following culture results.
- Compared date from current review to previously published study at our insitution using a binomial test. Significance for confidence intervals set at $p<0.05$.

Resistance Patterns

Table 3: Resistance Patterns

Total Erythromycin Resistant	30	35%
Clindamycin resistance (constitutive)	4	5%
No. of D-tests performed	26	31%
Positive	4	5%
Negative	22	26%
Total Clindamycin Resistant	8	9%
MSSA	5	6%
MRSA	2	2%
Other species	1	1%

8 cases of Clindamycin resistance, 9% of total abscess and 16% of MRSA Abscesss (previous study showed no MRSA isolates resistant to Cllindamycin)

Table 4: Summary of Susceptibility Patterns of Clindamycin-Resistant Abscesses

	Abscess 1	Abscess 2	Abscess 3	Abscess 4	Abscess 5	Abscess 6	Abscess 7	Abscess 8
Clindamycin	R	R	R	R	R	R	R	R
Erythromycin	R	R	R	R	R	R	R	R
Cefazolin	S	R	S	R	S	S	S	R
Methicillin	S	R	S	R	S	S	S	R
Tetracycline	S	S	S	S	S	S	S	R
Gentamicin	S	S	S	S	S	S	S	S
Rifampin	S	S	S	S	S	S	S	S
TMP-SMX	S	S	S	S	S	S	S	S
Vancomycin	S	S	S	S	S	S	S	S

Antibiotics that clindamycin-resistant abscesses were uniformly sensitive to are highlighted

Clindamycin-resistant abscesses were uniformly sensitive to gentamicin, rifampin, TMP-SMX, and vancomycin,indicating the existence of multiple reserve drugs that could be used in these minority cases.

Comparison to Previous Study

Table 5: Comparison of Data

	Ossowski, et al.		*Current study*			*P-value*
Total No. of abscesses	32		85			
Growth	29	*91%*	80	*94%*	(89% - 99%)	0.181
Non-*S. aureus* growth	12	*38%*	37	*44%*	(33% - 54%)	0.150
S. aureus	17	*53%*	43	*51%*	(40%-61%)	0.359
MSSA	6	*19%*	21	*25%*	(16% - 34%)	0.105
MRSA	11	*34%*	22	*26%*	(17% - 35%)	0.060
No. of D-tests performed	4	*13%*	26	*31%*	(21% - 40%)	9.0901E-06
Positive	0	*0%*	4	*5%*	(0% - 9%)	0
Negative	4	*13%*	22	*26%*	(17% - 35%)	0.00061254

Results

Table 1: Demographics of the Study Population

Age	<1 year	20	*24%*
	1-2 years	36	*42%*
	3-4 years	7	*8%*
	5+ years	22	*26%*
	Mean	22 mos	
	Median	39 mos	
Sex	Female	43	*51%*
	Male	42	*49%*
Race	African American	57	*67%*
	White	18	*21%*
	Other	7	*8%*
	Unknown	3	*4%*

85 Patients underwent incision and drainage of a neck abscess from January 1, 2016 to Devmeber 31, 2020.

26% Submandibular region
24% Anterior triangle
16% Posterior triangle
14% Retrophrynx

Table 2: Number of Abscesses and Growth Characteristics of Isolated Pathogens

Total No. of abscesses	85	
No growth	5	*6%*
Non-*S. aureus* growth	37	*44%*
S. aureus	43	*51%*
MSSA	21	*25%*
MRSA	22	*26%*

Future Aims

- Evaluate Clindamycin resistance patterns across all pediatric infections treated with antibiotics in the hospital.
- Expand geographic locations (multiple hospitals, nationwide metaanalsis) to examine resistance patterns

Conclusions

- Similar proportion of MRSA organisms isolated from pediatric head and neck abscess compared to earlier study
- Majority were sensitive to Clindamycin.
- Results suggest an increasing tendency towards Clindamycin resistance in both MSSA and MRSA organisms.

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Severe Sleep Apnea as a Presenting Symptom of Rett Syndrome in a Male Child

Albany Medical College[1], Albany Medical Center[2]
Shreya Srivastava, MBA[1], Suzanne Barry, MD[2], Lara Reichert, MD[2]

BACKGROUND

- **Pediatric sleep apnea** is a common condition caused by **obstructive** airway anatomy and/or decreased **central** breathing drive.
- Identifying sleep apnea in children is important as it may be a symptom of underlying **neurologic and genetic conditions.**
- Sleep apnea in children often present **differently than in adults**
- We present a unique case of **severe sleep apnea** in a **male child** that was found to be a presentation of **Rett syndrome**, a rare X-linked dominant disorder almost always observed only in females.

CASE REPORT

10-month-old male with a history of hypotonia and neonatal encephalopathy presenting for an adenoidectomy due to excessive adenoid hypertrophy and severe sleep apnea. Patient recently had multiple apneic episodes while sleeping, which led to a polysomnography assessment that showed an AHI score of 99.5 with severe mixed central and obstructive sleep apnea. He was unable to tolerate CPAP/BiPAP due to adenoid hypertrophy, and an adenoidectomy was conducted. The post-op period was complicated by respiratory distress, and the patient was intubated and admitted to the PICU. The PICU course involved continued respiratory distress and difficulty with weaning the patient off the ventilator. The patient remained intubated for seven days.

QUESTION

What was causing this patient's severe sleep apnea and significant respiratory distress after adenoidectomy?

CLINICAL HISTORY

Birth

- At term vaginal delivery complicated by COVID-19 infection and positive GBS.
- Developmental delay, failure to thrive, chronic hypotonia, nystagmus, GERD
- Metabolic screening was normal, 24-hour EEG showed no seizure activity.

5 months

- Coughing fits followed by apneic episodes with cyanosis, bicycling movements of the legs.
- Positive for rhino/enterovirus.

7 months

- 2 days of worsening lethargy and increased mucus secretions7 months, desaturations during sleep around 78-80%.
- Tested positive for RSV.

10 months

- Inpatient admission post adenoidectomy due to desaturations.
- **Genetic Consult:**
  - Does not roll over, sits with support, cannot hold neck up well.
  - Holds breath, does not breath fast when exhales
  - Negative family history
  - **MECP2 positive for pathologic variant**

MODE OF INHERITANCE	VARIANT	ZYGOSITY	INHERITED FROM	CLASSIFICATION
X-Linked	c.316 C>T p.(R106W)	Hemizygous	De Novo	Pathogenic Variant

DISCUSSION

- **Rett syndrome** is characterized by seizures, regression, dysautonomia, motor issues.
- There are approximately **60 reported cases** of Rett syndrome **in males.**
- Dysfunctions of **breathing-motor coordination** lead to frequent **hypoxia** and **hypercapnia.**
- This case is the **first** that depicts **severe sleep apnea (central and obstructive)** in a male child as a rare presentation of **Rett syndrome**.

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Poster 12

Case Report: Chronic Airway Foreign Body Presenting as Brain Abscess

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1. The University of Colorado School of Medicine, Aurora, CO. 2. Children's Hospital Colorado Department of Pediatric Otolaryngology, Aurora, CO. 3. The University of Colorado Department of Otolaryngology- Head and Neck Surgery, Aurora, CO.

BACKGROUND:

- Airway foreign bodies are a common reason for pediatric emergency room visits.
- It is uncommon for airway foreign bodies to be incidentally diagnosed, and exceptionally uncommon for the presenting symptom to be a brain abscess.

HISTORY & WORK-UP:

- 14-year-old girl presented to emergency department after several days of headache, vomiting, and rapid development of confusion. She was found to have a large intracerebral abscess with midline shift.
- Further imaging incidentally found a metal foreign body in the left mainstem bronchus; per report aspiration of a thumbtack occurred one year prior (she was evaluated at another facility at that time and was reportedly told that it was esophageal and would pass without intervention).

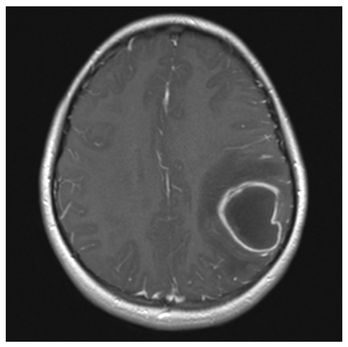
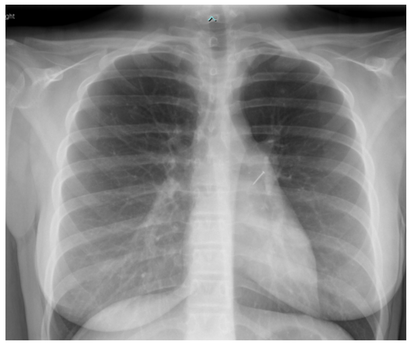


Figure 1: T1 post-contrast MRI Brain showing abscess



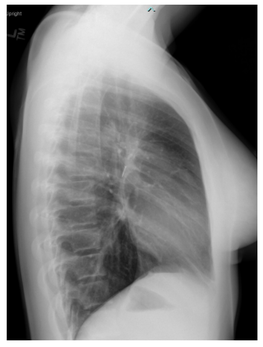


Figure 2: AP and lateral chest x-ray showing metal foreign body in left mainstem bronchus

TREATMENT:

- Craniotomy with abscess drainage- cultures growing out Aggregatibacter and Actinomyces species.
- Bronchoscopy- 2cm thumbtack lodged in the left mainstem bronchus, which could not be removed initially due to granulation tissue and bleeding.
- After two weeks of inhalational steroids, she returned to the operating room for successful removal of the foreign body.

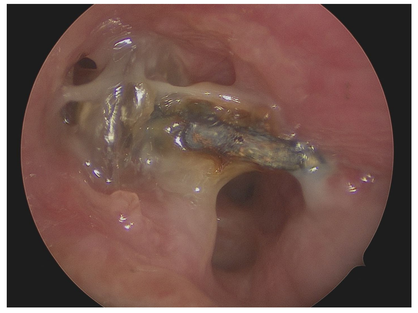


Figure 3: Thumbtack in airway

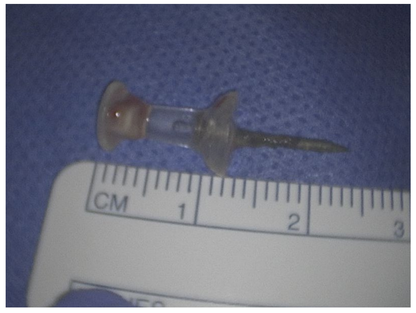


Figure 4: Thumbtack removed from patient

Procedure video

CONCLUSIONS:

- Aggregatibacter is in natural oral flora and may cause brain abscesses in patients with recent dental work or periodontal infections. This patient had neither and inpatient workup revealed no other infectious source, so the foreign body became our diagnosis of exclusion for etiology.
- Intra-operative challenges included the nail being stuck in granulation tissue and mucosa, and being near pulmonary vasculature. This required scrupulous handling of granulation tissue and maneuvering of the sharp thumbtack.

Children's Hospital Colorado

University of Colorado Anschutz Medical Campus

Abstract # 13

The American Speech-Language Hearing Association's Updated Developmental Milestones

Stefanie LaManna, MS, CCC-SLP, CNT, Associate Director, Health Care Services in SLP
Lindsay Creed, AuD, CCC-A, Associate Director, Audiology Practices

The Problem: ASHA's content related to developmental milestones and expectations needed updating to be in line with current evidence base. Feeding and swallowing data was not included in previous content.

The Background

ASHA's resources titled "How Does Your Child Hear and Talk?" (HDYCHT) were the primary content used to communicate milestone data to members and consumers and were last updated in 2015.

At the time, the process for developing HDYCHT was not well documented and many of the references were not primary sources.

The Purpose

- Help parents and caregivers understand what to expect as speech-language and swallowing develops. about development.
- Identify concerns based on developmental expectations.
- Help parents know when to seek audiology and/or SLP services.
- Encourage physicians and other professionals to refer families to an audiologist and/or speech-language pathologist when they recognize a developmental concern.
- Facilitate referrals to a state's early intervention system (e.g., Child Find) and/or make referrals to audiologists or SLPs directly.
- Draw attention to the importance of early identification and intervention.

The Process

A cross-organizational work group was convened with representatives from ASHA's audiology and speech-language pathology practices, office of multicultural affairs, and national center for evidence-based practice.

ASHA used the following process to develop the developmental milestone checklist:

- Each milestone is substantiated by research using primary research studies.
- The hearing, speech, and language milestones and cutoffs are for American English speakers. Children learning multiple languages may learn at a different rate. Other languages may have different percentages.
- Subject matter experts reviewed the milestones in each area and their comments were incorporated.
- These milestones will be reviewed and updated at least every 5 years.

The Results

ASHA's developmental milestones provide audiologists, speech-language pathologists, and other health care providers with detailed, evidence-based information surrounding expectations for communication and feeding development.

Communication milestones (expressive and receptive language skills) provided for ages birth – 5 years.

Feeding and swallowing milestones provided for ages birth – 3 years.

Lessons Learned

- The age of the literature was a concern: some of the seminal work was rooted in the 80s-90s or even earlier and has not been duplicated.
- The homogenous population represented in the normative data raised questions surrounding equity and inclusion for ethnically and culturally diverse populations.
- Feeding and swallowing literature was limited and much of the seminal work is not primary sources.
- Communication milestones only address American English-speaking children.

Why it Matters

These milestones can inform health care providers practice patterns and support early identification of communication and feeding difficulties, especially in medically complex or high-risk pediatric populations.

References can be found at the QR code

Cochlear Implantation in Pallister Killian Syndrome: A Case Report and Otolaryngologic Considerations

Department of Surgery
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

Daniel Traverzo, BS; Josh Verhagen, BS; Samuel Floren, MD; Jessica Van-Beek King, MD

Background

Pallister-Killian Syndrome (PKS) is a rare genetic disorder characterized by mosaic tetrasomy 12p chromosome. PKS typically presents with developmental delay, neurocognitive issues, syndromic facies, hypotonia, and epilepsy. Recent data estimates the incidence of PKS to be approximately 5.1 per million live births, with a potential association with maternal age.

Prior research has provided a detailed insight into the clinical features and progression of PKS, encompassing various organ system involvement. More recent research has focused on prenatal diagnosis, aiming for improved post-natal care. Despite these developments, the otolaryngologic implications of PKS remain poorly documented, with no documented successful cochlear implants (CI) in the PKS population.

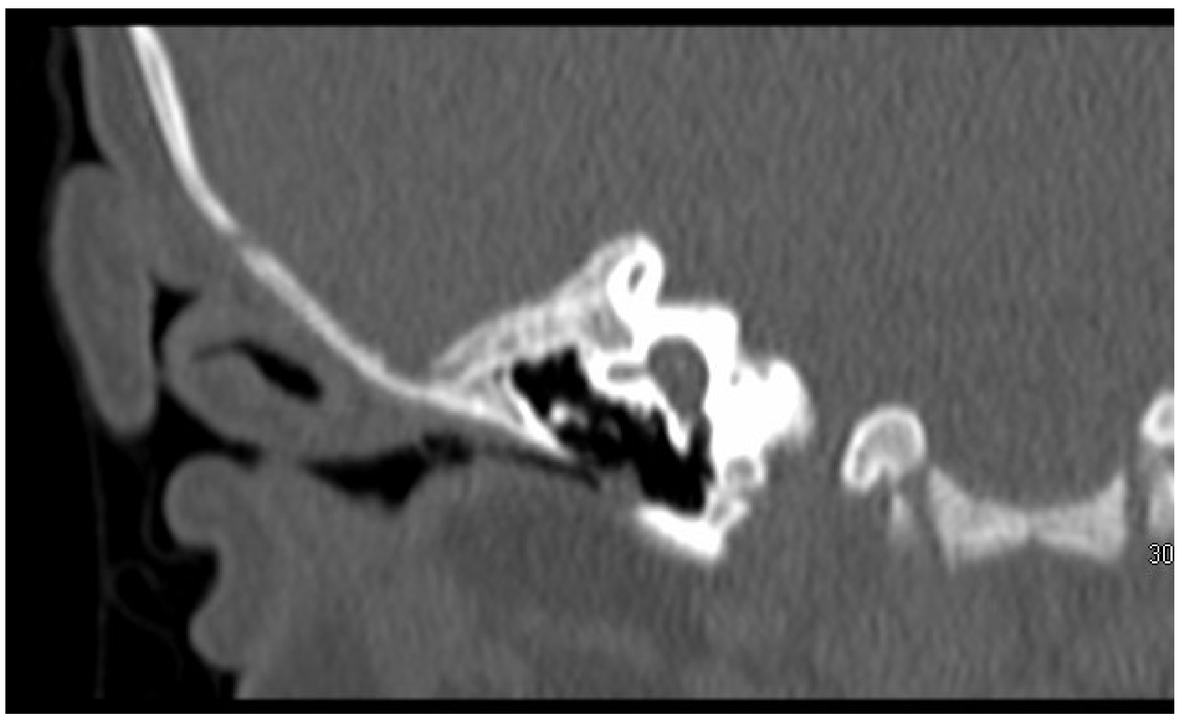


Figure 1. Coronal CT scan in the bone window of the right temporal bone demonstrating low lying tegmen typani and tegmen mastoideum.

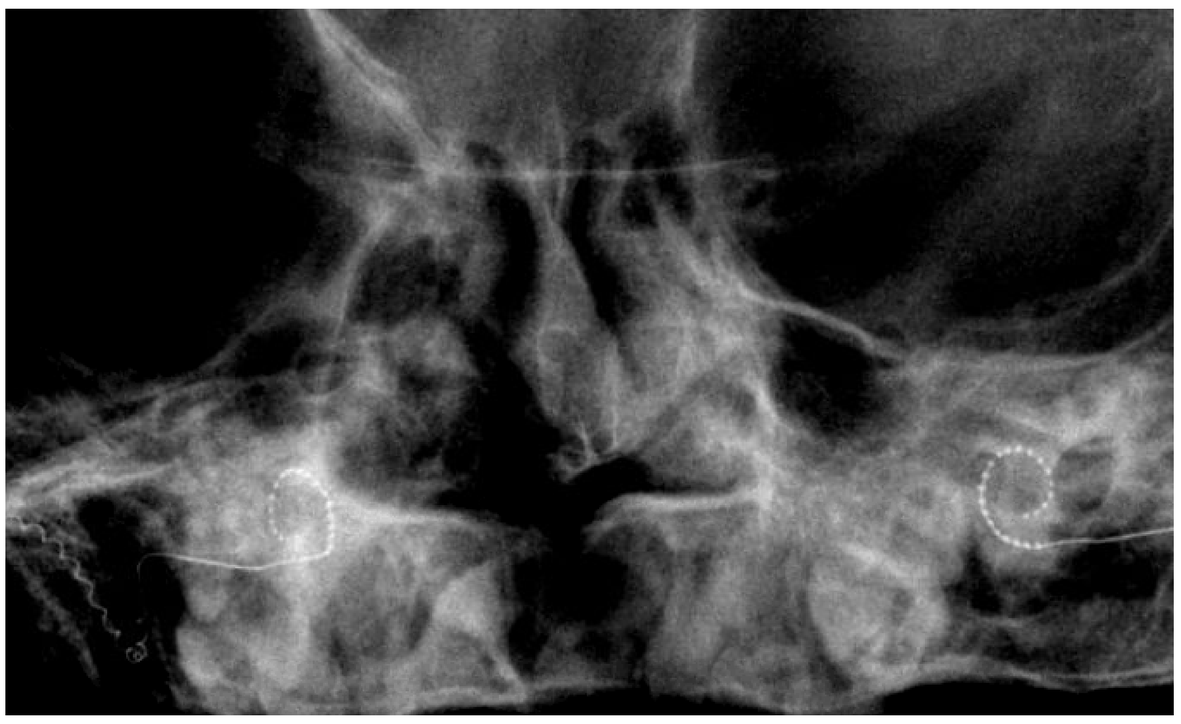


Figure 2. Plain film X ray immediately post operatively demonstrating full insertion of bilateral cochlear implant electrodes.

Case Presentation

We present the case of a patient born with gestationally confirmed PKS at 36 weeks and 1 day. After birth, the patient experienced respiratory distress, requiring intubation, followed by diagnoses of pulmonary interstitial glycogenosis and pulmonary hypertension. The patient exhibited various stereotypic comorbidities, including imperforate anus, cleft palate, bicuspid aortic valve, infantile spasms, and optic nerve hypoplasia. Eventually, due to need for prolonged ventilation and pulmonary toilette, the patient underwent tracheostomy.

At six months, the patient underwent an ear exam, bilateral myringotomy tubes, and sedated auditory brainstem response testing, revealing serous effusion and severe to profound sensorineural hearing loss. At 20 months, the patient received successful bilateral CIs. Through his course, he has also required submandibular gland excision, parotid duct ligation, tympanostomy tube replacement, as well as eventual decannulation, and adenotonsillectomy.

Discussion

The decision to proceed with CI in this patient with PKS is challenging. Our patient struggles with consistent usage of his device, and his neurocognitive delay has limited his language progression. However, PKS has a predilection for optic nerve hypoplasia (as seen in our patient), increasing the import of auditory stimulation. Despite the frequent incidence of both conductive and sensorineural hearing loss in PKS patients (1), this also represents the first known case of a CI in this population, demonstrating feasibility and safety. Additional challenges with this case, was the presence of chronic otitis media with effusion, necessitating multiple sets of tympanostomy tubes, which were present during CI (although this has been shown to be safe) (2).

From a technical standpoint, CI in this patient was challenging. Bilateral stapes suprastructures were altered, with absent anterior and posterior crura bilaterally. Additionally, the patient had a low lying tegmen mastoideum on the right side (Figure 1), as well as bilateral facial nerve dehiscence in the tympanic segment. Despite the patient's unique anatomical features, the surgery resulted in the full insertion of CI electrodes (Figure 2). This demonstrates the feasibility of CI in PKS patients, as well as anatomic considerations of temporal bone aberrancies.

In addition to otologic concerns, PKS has many other systemic ramifications which were manifested in our patient. Our patient required tracheostomy for prolonged ventilation/need for pulmonary toilette and comorbid pulmonary interstitial glycogenosis (not a typical trait of PKS). The patient required multiple surgeries for airway modifications, including tracheostomy, bilateral submandibular gland excision/parotid duct ligation, and adenotonsillectomy for sleep disordered breathing. Thankfully, he has weaned from ventilation and has ultimately been decannulated, though still has a persistent tracheocutaneous fistula (which is scheduled for surgical closure in the coming months). There is little in the otolaryngologic literature regarding Pallister-Killian syndrome, however, there have been reports of tracheostomy for subglottic stenosis (3) and severe laryngomalacia (4). Given frequency of diaphragmatic hernia (1), need for long term ventilation in these patients has increased likelihood, increasing likelihood of need for tracheostomy.

Conclusion

This case exemplifies a successful bilateral CI in a patient with PKS and underlines the importance of a multidisciplinary approach in managing these complex cases. Further research and case studies are needed to improve our understanding of PKS, its associated challenges, and optimal treatment strategies.

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Mycobacterium abscessus in treatment-resistant recurrent acute otitis media and otomastoiditis

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[2]Department of Otolaryngology – Head and Neck Surgery, Children's Healthcare of Atlanta

Introduction

Background

- ***Mycobacterium abscessus*** is a rare treatment-resistant **non-tuberculous mycobacterium** (NTM) cause of **pediatric recurrent acute otitis media** (RAOM)[1-2]
- Only **10 cases** previously well-documented[1]
- Cases are typically treated with a combination of **antibiotics** and **surgery**[3-4]

Purpose

- To present a **unique case** of *Mycobacterium abscessus* RAOM/otomastoiditis

Methods

Study Design

- Case report

Database Utilized

- PubMed

Data Collection

- PubMed was queried for:
  - *Mycobacterium abscessus*
  - NTM otitis media
  - NTM otomastoiditis
- Relevant articles from 2005 to 2021 were analyzed and used for literature review
- Patient's electronic medical record was reviewed to inform the longitudinal case study

Case Description

Patient

- **Eight-year-old boy** with chronic skin/soft tissue infections, pneumonias, RAOM, and moderate conductive hearing loss
- Patient has had **RAOM** requiring tympanostomy tube placements **since three-months-old**
- Had multiple episodes of otomastoiditis requiring **three mastoidectomies** complicated by **surgical site infections** and extended **PO and IV antibiotics** between **2019-2022**
- Surgical **pathology** repeatedly showed **granulation tissue**

Case

- Presented 4/2023 with clinical exam and imaging concerning for **left postauricular abscess without bony destruction**
- Underwent **needle aspiration of abscess** and course of PO antibiotics 4/2023
- Subsequently developed **wound bed abscess** and underwent postauricular wound **debridement** and **deeper tissue culture** from necrotic appearing temporalis muscle 5/2023
- Culture positive for ***Mycobacterium abscessus***
- Completed extended antibiotic regimen of **amikacin, imipenem, and cefoxitin** (6-7/2023) with improvement in symptoms and clinical appearance

Figure 1. Appearance of left postauricular region in 5/2023 following needle aspiration of abscess.

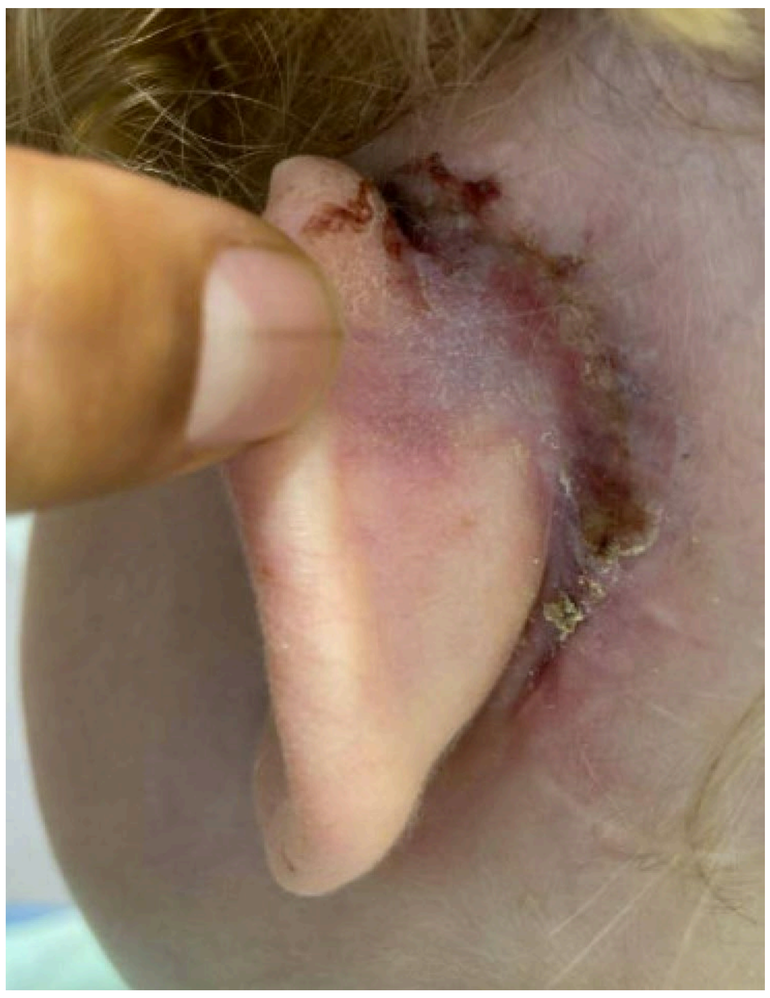
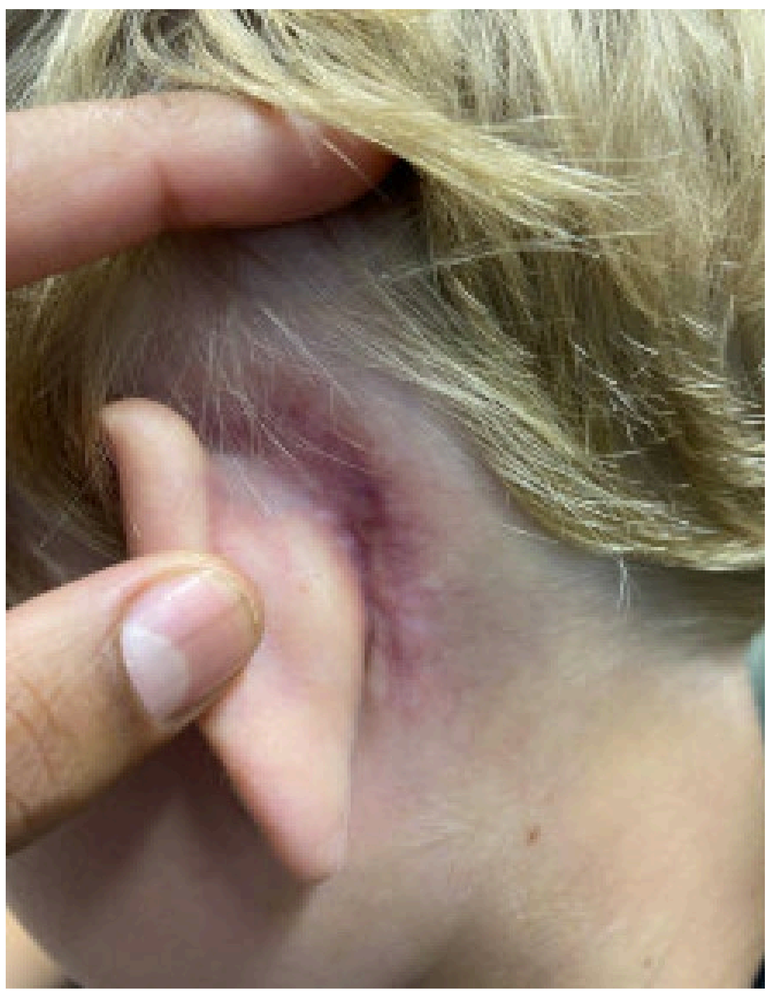


Figure 2. Appearance of left postauricular region in 8/2023 following wound bed debridement and extended course of IV amikacin, imipenem, and cefoxitin.



Conclusions and Significance

- **Rare example** of NTM causing otitis media/otomastoiditis
- Persistent **otorrhea** and overlying **crusting skin changes** can be seen with NTM infection
- Pediatric RAOM/otomastoiditis unresponsive to typical therapy should raise concern for an **NTM pathogen** even in patients **without bony destruction** on CT imaging
- Consider **deeper tissue sampling** of bone/muscle in these cases
- Future studies should highlight **symptomatology** caused by NTM subspecies and typical **antimicrobial susceptibilities**

Contact

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Endonasal Endoscopic Repair of Encephaloceles and Meningoceles in Younger Children: A Systematic Review

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[2]Department of Otolaryngology – Head and Neck Surgery, Mount Sinai Hospital, Toronto, Canada

Introduction

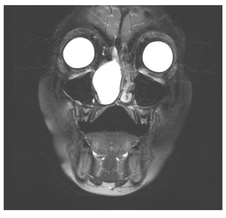


Figure 1. Right basal meningoencephalocele

- Meningoencephaloceles: skull base defects with herniation of dura, cerebrospinal fluid (CSF), brain
- May present with CSF rhinorrhea, meningitis, nasal obstruction
- Endoscopic endonasal repair has emerged as an alternative to craniotomy—less morbidity
- Younger children with small nasal apertures present potential challenges for endoscopic access

Objectives

1. Describe the landscape of endoscopic endonasal meningoencephalocele repair in children ≤2 years old
2. Describe the incidence of common intra-operative and postoperative complications in children <1 year and 1-2 years old

Methods

SYSTEMATIC REVIEW:

- 3 databases: MEDLINE, EMBASE, CENTRAL
- Grey literature sources
- Inclusion criteria: all articles discussing endoscopic endonasal meningoencephalocele repair in patients ages 0-2 years
- Exclusion criteria: reviews, meta-analyses, letters
- Primary outcomes: intra- and postoperative CSF leak, recurrence, revision surgery

QUALITY ASSESSMENT:

- Cohort studies: Newcastle-Ottawa
- Case series: ROBIN-I, NIH

STATISTICAL ANALYSIS:

- Chi square/Fisher statistics, unpaired t-test

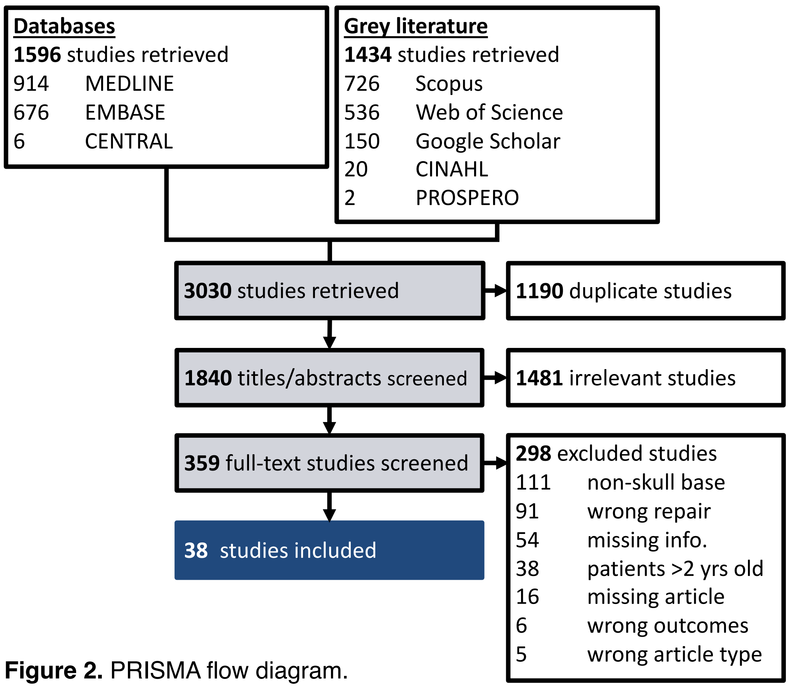


Figure 2. PRISMA flow diagram.

Results

Table 1. Baseline patient demographics (n = 79)

Median age (range, n = 79)	0.83 years (0–2.0 years)
Sex (%, n = 59)	
Male	30 (50.8%)
Female	29 (49.2%)
Diagnosis (%, n = 79)	
Meningoencephalocele	57 (72.2%)
Encephalocele	20 (25.3%)
Meningocele	2 (2.5%)
Etiology (%, n = 60)	
Congenital	56 (93.3%)
Traumatic	2 (3.3%)
Iatrogenic	2 (3.3%)
Defect location (%, n = 72)	
Transethmoidal	53 (73.6%)
Transsphenoidal	19 (26.4%)
Median follow-up (range, n = 57)	12 mo. (1-74 mo.)

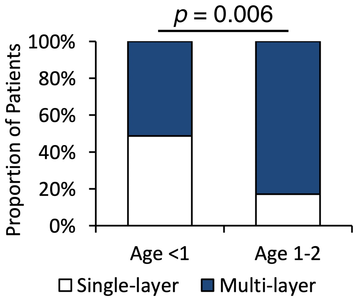


Figure 3. Children age <1 years more frequent underwent single-layer repair compared to children ages 1-2 years old (n = 42)

Table 2. Patient outcomes (ages 0-2 years).

Intraoperative CSF leak (n = 20)	3 (15.0%)
Postoperative CSF leak (n = 56)	4 (7.1%)
Meningoencephalocele recurrence (n = 66)	9 (13.6%)
Surgical reintervention (n = 22)	5 (22.7%)
Mortality (n = 19)	1

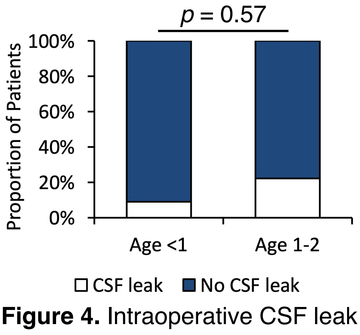


Figure 4. Intraoperative CSF leak by age group (n = 20)

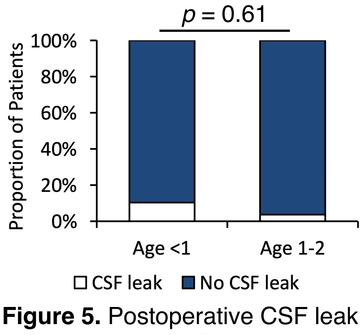


Figure 5. Postoperative CSF leak by age group (n = 56)

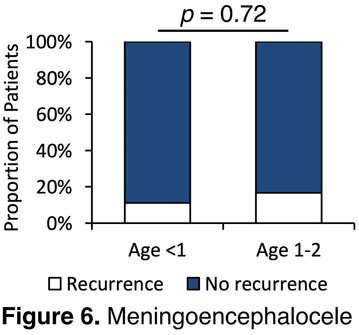


Figure 6. Meningoencephalocele recurrence by age group (n = 66)

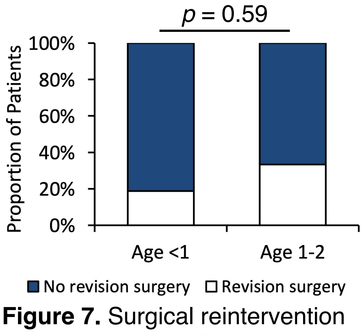


Figure 7. Surgical reintervention by age group (n = 22)

Conclusions

- Children <1 yr more frequently underwent single-layer repairs
- No differences in patient outcomes between age groups

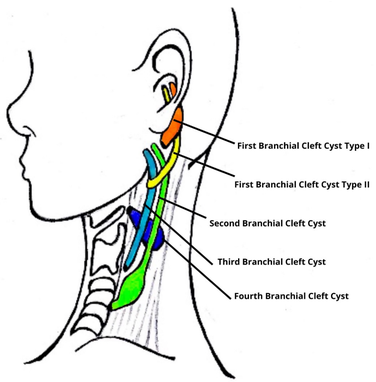
Poster 22

EXCISION OF TYPE II-IV BRANCHIAL CLEFT ANOMALIES IN PEDIATRIC PATIENTS WITHOUT THE USE OF INTRAOPERATIVE DYE: A SINGLE CENTER STUDY

NAADIR JAMAL, KALPANA PATEL, HEIDI CHEN, PHD, CHRISTOPHER T. WOOTTEN, MD MMHC, RYAN H. BELCHER, MD MPH

Monroe Carell Jr. Children's Hospital at Vanderbilt

Figure 1. Overview of Branchial Cleft Anomaly Anatomy (2)



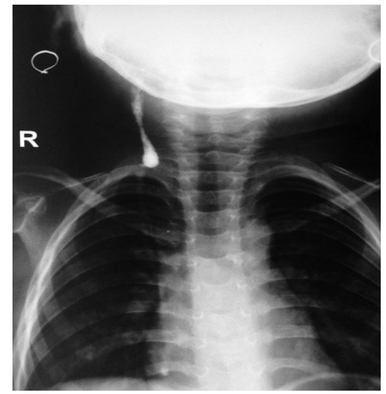
INTRODUCTION

- Branchial cleft cysts are rare pediatric congenital anomalies that can present as sinus tracts to the neck.
- **Intraoperative methylene blue dye with fibrin glue** has been suggested as an effective tool for tracking the tract's depth to help definitively excise. (1)
- At our institution, these tracts have been **surgically excised without intraoperative dye for several decades**.
- With this large, 11-year retrospective case series, we examine outcomes for surgical excision of type II, III, or IV branchial cleft anomalies without the use of methylene blue dye or fibrin glue.

METHODS

- A retrospective review was conducted with patients who received surgical excision of Type II, III, or IV branchial cleft anomalies at Monroe Carrell Jr. Children's Hospital from June 2012 to June 2022.
- Only patients whose anomalies presented with sinus tracts per operative notes were included.

Figure 2. Fistulogram of Type II Lesion (3)



RESULTS

Table 1. Demographics (N=118)

	n (%)
Gender	
Male	61 (52%)
Female	57 (48%)
Ethnicity	
Hispanic or Latino	10 (8%)
NOT Hispanic or Latino	68 (57%)
Unknown/Declined	41 (35%)
Race	
Asian	1 (1%)
Black or African American	18 (15%)
White	90 (76%)
Unknown/Not Reported	1 (1%)
Declined	2 (2%)
Other	6 (5%)

Figure 3. Data Summary

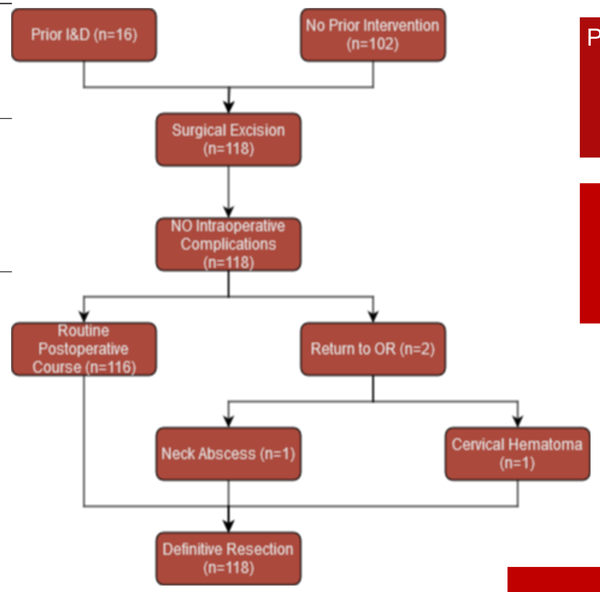


Figure 4. Key Findings

Patients receiving no preoperative imaging: 83 (71%)	Patients requiring only one follow-up visit: 108 (91%)
Tract recurrences requiring revision surgery: 0	Median sinus tract length: 3.0 cm (n=30)

CONCLUSIONS

- Patients with type II-IV branchial cleft sinus tracts that were surgically excised without intraoperative dye **achieved definitive resection with no recurrence and limited post-op complications.**
- While not a direct comparison, these results suggest that we **may be incurring unnecessary costs** without benefit in outcomes through use of intraoperative dye.
- Limitations
  - Variations in surgeon technique
  - Lack of comparator group

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2. Massachusetts General hospital
3. Radiopaedia

Poster 23

Single Stage Pediatric Airway Reconstruction in Solid Organ Transplant Recipients

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Introduction

- Historically, single stage laryngotracheal reconstruction (ssLTR) has been reserved for patients with involvement of two or fewer laryngotracheal units and who exhibit normal-range pulse oximetry without recent oxygen or ventilator requirements
- DsLTR is indicated in children with complex multilevel stenosis, co-morbid conditions such as significant lung disease or history of transplant, and/or history of difficult intubation [1].
- Children with solid organ transplants (SOT), theoretically face an increased risk of graft failure and have been considered candidates for dsLTR only.
- In this case series, we present our results from performing ssLTR in two SOT patients.
- These cases serve to outline the pre-, intra-, and post-operative modifications and precautions necessary for success of ssLTR in children with SOT.

Methods

- A retrospective case series review was conducted by examining an open airway reconstruction database curated by a senior surgeon.
- Medical records of children with laryngotracheal stenosis who underwent ssLTR in the context of SOT at a tertiary care center from 2019 to 2023 were identified.
- Two cases meeting these criteria were included and are detailed in the results section.

References

[1] Sohit Paul Kanotra, & Hernandez, S. (2018). Advances in the Management of Pediatric Laryngotracheal Stenosis. In *Recent Advances in Otolaryngology: Head & Neck Surgery (Volume 6)* (1st ed., Vol. 6, p. 24).
[2] Smith, L. P., Zur, K. B., & Jacobs, I. N. (2010). Single- vs Double-Stage Laryngotracheal Reconstruction. *Archives of Otolaryngology–Head & Neck Surgery*, *136*(1), 60–65. https://doi.org/10.1001/archoto.2009.201

Results

Table 1 Transplant type	Past medical history	Pre-operative findings	Pre-operative management modifications	Intra-operative management modifications	Post-operative management modifications	Post-operative complications
Renal Transplant	• 3-year-old male • Prematurity • Pulmonary hypoplasia • Bilateral renal dysplasia	• Grade II subglottic stenosis • Significant suprastomal collapse	• Mycophenolate mofetil (MMF) and tacrolimus lowered • Two-week course of inhaled tobramycin • Pre-operative admission for fluid optimization and increase of immunosuppre-ssant medications	• Sevoflurane was used sparingly	• LTR protocol was unchanged • MMF dosing was unchanged and tacrolimus was titrated to blood levels of 5-7ng/mL • Nonsteroidal anti-inflammatory medications (NSAIDs) were avoided • One month-long course of inhaled tobramycin	• Intermittent hypoxia, secondary to excessive secretions • PICU readmission • Resolution with aggressive pulmonary toilet
Cardiac Transplant	• 3-year-old female • Hypoplastic left heart syndrome • Tracheobro-chomalacia • Unilateral vocal cord paralysis • Chronic kidney disease	• Epiglottic prolapse • Grade II subglottic stenosis • Significant suprastomal collapse	• Cardiac catheterization • MMF increased and tacrolimus titrated to blood levels of 4-6ng/mL • Two-week course of inhaled tobramycin	• None	• LTR sedation protocol was unchanged • Immunosuppressant levels were unaltered • Monitored on continuous telemetry with close monitoring of Hemoglobin and hematocrit levels • One month-long course of inhaled tobramycin	• None

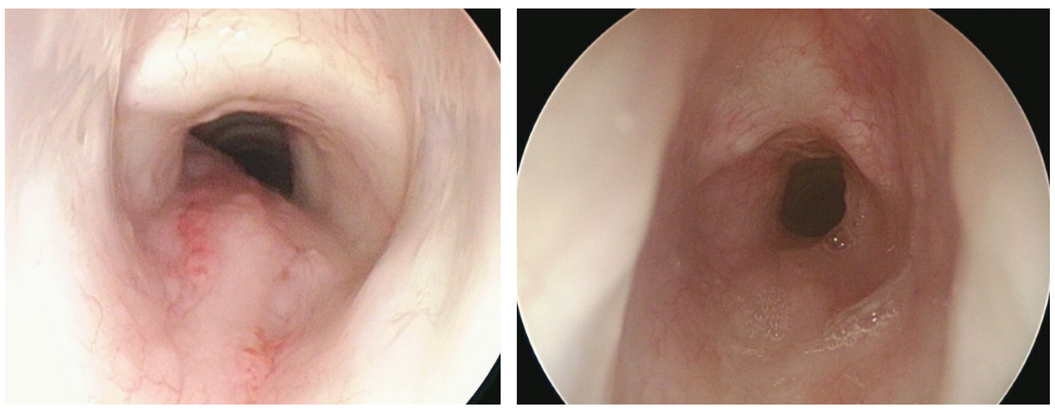

Figure 1*:* 4–6-month post-operative follow-up for renal transplant (Left) and heart transplant patient (Right) demonstrating well-healed anterior grafts with complete mucosalization.

Discussion

- Modifications of immunosuppressive regimens, pre, intra and post-op protocols can improve the success of ssLTR in children with SOT and decrease the risk of graft failure (table 2).

Table 2 Phase of Care	Recommendations
Pre-operative modifications	- Multidisciplinary Evaluation with Transplant team and the Transplant pharmacist - Exhaustive preoperative evaluation with MRSA and pseudomonas culture - Triple endoscopy with BAL - Secretion management - Lowering of immunosuppressive medications by transplant team - Decolonization antibiotic treatments which minimize drug interactions and organ toxicities.
Intraoperative modifications	- Standard preoperative anaesthesia evaluation. - Type of Anaesthesia determined on a case-by-case basis. - Familiarize with immunosuppressive medication drug interactions with benzodiazepines, propofol and dexmedetomidine. - Avoid the use of steroids to treat post-operative nausea and vomiting.
Post-operative modifications	- Lower threshold for diagnosis of infection. - A shorter-term interval should be considered after surgery to diagnose graft failure. - Weekly diagnostic bronchoscopies to diagnosis graft infection. - Timing of surveillance bronchoscopies can be shorted due to theoretical increased risk for graft failure. - Refamiliarize with immunosuppressive medication drug interactions with dexmedetomidine, propofol and opioids - Consider lower doses of periextubation steroids. - CNIs and mTORis serum levels may require more frequent monitoring and adjustments to maintain drug level goal.

Conclusions

- Although, previously considered candidates for dsLTR, single-stage is a viable option in patients with SOT transplant.
- Success of surgery depends on a multidisciplinary approach and alterations in immunosuppressants to balance transplant rejection with graft rejection.

Poster 27

Congenital Syphilis in Pediatric Otolaryngology

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University of Mississippi Medical Center, School of Medicine
University of Mississippi Medical Center, Department of Otolaryngology

INTRODUCTION

Congenital syphilis (CS) is a severe infectious disease affecting newborns and infants, with notable implications for the field of pediatric otolaryngology. Despite what was thought to be substantial progress in controlling syphilis, the incidence of CS has been on the rise. This infection has the propensity to influence disease and symptoms pertinent to our field including nasal symptoms, head and neck lesions, and hearing loss[1]. Being aware of CS and its possible complications is imperative for intervention to occur as early as possible to prevent downstream effects.

Like other states, Mississippi has experienced a resurgence of syphilis, contributing to the increase in congenital syphilis cases[2]. According to the CDC, the past five years have demonstrated a 900% increase in the incidence of congenital syphilis[3]. This underscores the need for proactive measures to address this alarming trend.

Of particular interest to this study is the effect that congenital syphilis may pose on hearing. Sensorineural hearing loss is a proposed consequence of congenital syphilis. Otolaryngologists are instrumental in diagnosing and managing hearing impairments in affected infants to ensure optimal development. We aim to describe characteristics of this subset of patients at our institution.

METHODS

A retrospective chart review was performed at our tertiary academic hospital to identify children born from January 1, 2015 to March 1, 2023 with the diagnosis of congenital syphilis. Chart review was performed to gather demographic, clinical and audiologic data. If patients presented to an otolaryngologist as either an inpatient or outpatient, this was further investigated to identify pertinent symptoms and treatment. Special attention was paid to audiologic testing and adherence to Joint Commission on Infant Hearing Guidelines. Additional review of general considerations in CS will also be presented.

RESULTS and DISCUSSION

- The primary descriptive characteristics were elaborated using frequency and percentages for categorical variables and Mean (std deviations) for continuous variables for a total of 167 syphilis patients. Demographic data for our patient population are presented in **Figure 1**.
- ENT Visits: a majority of patients (74.9%) were not seen by an ENT. Among those who did, the majority were inpatient (20.4%) compared to outpatient (9.6%). For the patients that had an ENT consult, reason for consult is highlighted in **Figure 2**. A relatively small portion of patients had multiple ENT visits (9.6%).

Demographics	
Race	
White	35 (21%)
African American	103 (61.7%)
American Indian/Alaskan Native	1 (0.6%)
Multiracial	8 (4.8%)
Other	3 (1.8%)
Insurance	
Medicaid	107 (64.1%)
Mscan Molina	36 (21.6%)
United	3 (1.8%)
Tricare	1 (0.6%)
None	8 (4.8%)

Figure 1. Demographic characteristics of our study. The majority of patients were African American and insured by Medicaid.

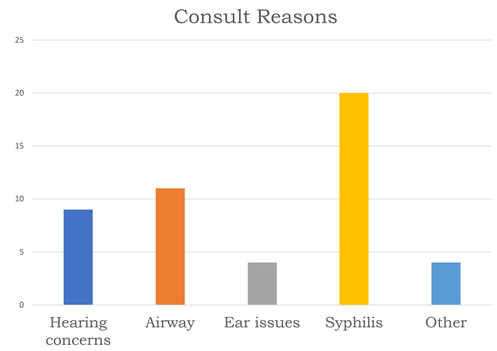

Figure 2. Illustrates the reasons for ENT consult in this patient population. As seen above, 42% (20 patients total) were referred for testing secondary to congenital syphilis diagnosis. This indicates that 147 patients with this diagnosis were not referred.

- Only 25.7% (43 patients) of 167 had an audiogram. Results for audiogram studies showed that 15.6% of participants had a normal audiogram, 3% had hearing loss, 1.8% had inconclusive results, and 2.4% had absent Otoacoustic Emissions (OAE).
- The assumption is made that this population is receiving a newborn hearing screen. The Joint Committee on Infant Hearing recommends hearing testing and follow up in patients with in-utero infections (including CS) by 9-months of age, though our patient population does not appear to demonstrate adherence to this recommendation, which is an important consideration in this setting[4].

CONCLUSIONS

Congenital syphilis is a growing concern in Mississippi, with significant ramifications for pediatric otolaryngology. Early detection and specialized care provided by otolaryngologists are pivotal in managing the disease and enhancing outcomes for affected infants. Addressing the rising incidence of syphilis in pregnant women and improving access to prenatal care are essential steps toward reducing the prevalence of congenital syphilis, with improved adherence to JCIH guidelines.

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Intraoperative Maxillary Frenectomy for Maxillary Diastema in Infants and Young Children: Clarifying the Indications

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Background

Background: Maxillary diastema – "Tooth Gap" – in older children and adults is often considered a cosmetic dental defect which can affect one's self perception and is corrected with elective oral surgery and orthodontia. Parents usually identify these upper lip ties in infancy or young childhood, especially during primary dental eruption where thick tissue extending to the dental surface of the upper alveolus prevents medial alignment of the central incisors. Spontaneous closure in childhood can occur without intervention but is inconsistent across the population. Otolaryngologists commonly operate on infants and young children and are in an ideal position to safely perform a maxillary frenectomy as an adjunctive procedure while under general anesthesia.

Purpose

- The goal of this retrospective review is to determine if a maxillary frenectomy that is performed as a secondary operative task can improve closure of maxillary diastema.

Data Analysis

- Statistical analysis of distance of reduction in surgical and control groups using a 95% confidence interval. Additional analysis of effect size using Cohen's d.

Literature Cited

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Methods

Study Design

- In this retrospective and prospective clinical review, patients with maxillary diastema of their deciduous teeth were assessed for closure rates after an intraoperative maxillary frenectomy and the rate of maxillary diastema closure was compared with control patients that did not receive maxillary frenectomy.
- Retrospective and prospective analysis of 15 years of data for 60 patients, including 10 controls.
- Specifics of anatomic presentation were identified and reassessed at follow up appointments.
- In the surgical group, 50 patients' deciduous maxillary diastema was measured in millimeters (mm) at time of surgery. Patient age in months, amount of closure in mm, as well as duration of months until complete closure or the maximum duration of time that any maxillary diastema measurement change occurred was recorded.
- In the non-surgical group, 10 patients' deciduous maxillary diastema was measured in millimeters (mm) at initial clinical presentation. Patient age in months, amount of closure in mm, as well as duration of months until complete closure or the duration of time in months that any maximum duration of time that any maxillary diastema measurement change occurred was recorded.
- A two sample t-test was performed to compare millimeter closure of maxillary diastema over time between surgical maxillary frenectomy and non-surgical controls.

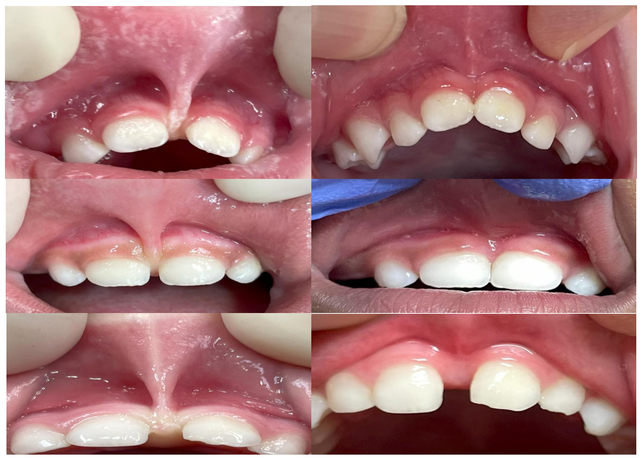

Figure 1: pre-frenectomy (left) and post-frenectomy (right).
Note: the first two patients had adequate closure of deciduous teeth during follow-up while the third patient had persistent deciduous maxillary diastema.

Results

Maxillary Frenectomy vs. Non-surgical Observation of the Distance of Maxillary Diastema

Group	N	Average Age (months)	Follow up duration until maximum closure (months)	Mean closure (mm)	SD (mm)	SE	Coefficient of variation
Surgical	50	16.5	9.7	1.270	0.645	0.092	0.508
Non-Surgical	10	13.3	13.3	0.950	0.369	0.117	0.388

- There was a significant difference in millimeter closure of maxillary diastama between maxillary frenectomy (M = 1.27, SD = 0.645) and no surgical treatment (M = 0.950, SD = 0.369); t(22.1) = 2.155, p = 0.042, 95% CI [0.012,0.629].
- Duration until maximum closure at follow-up was 9.7 months in surgical group, and 13.3 months in non-surgical group.

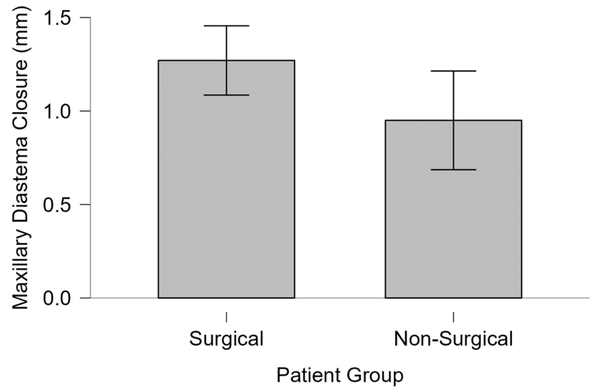

Figure 2: Average maximum closure of deciduous maxillary diastema in surgical and non-surgical groups

Maxillary Frenectomy vs. Non-Surgical Observation of the Distance of Maxillary Diastema Independent Samples T-Test

						95% CI for Mean Difference				95% CI for Cohen's d	
	t-value	df	p	Mean closure difference (mm)	SE Difference (mm)	Lower	Upper	Cohen's d	SE Cohen's d	Lower	Upper
Surgical vs non-surgical	2.155	22.124	0.042	0.320	0.149	0.012	0.629	0.610	0.352	-0.100	1.306

Discussion

- A common "blanching test" involves lifting of the upper lip; if the maxillary frenum blanches, or if the maxillary diastema > 2 mm in size, this space rarely closes without intervention.[1,2]
- Studies performed by oral surgeons on maxillary frenectomy alone vs. frenectomy with orthodontia showed benefit in both population groups, however maximal benefit was with combined approach.
- Some oral surgeons prefer frenectomy after orthodontia for deferred scar formation until after teeth are realigned. However, this study and similar studies show that frenectomy alone does not impede and may hasten closure of maxillary diastema.[3,4]
- Maxillary frenectomy is a low-risk procedure and parents' express satisfaction with the improved dental spacing appearance. There is the recognized potential for reduction of future orthodontic intervention and requirement for teeth re-alignment.

Conclusion

- There is a significant distance in the measurement of maxillary diastema closure over a shorter period of time time with maxillary frenectomy as opposed to non-surgical observation.
- Resection of obstructive soft tissue from between the deciduous central upper incisors down to the periosteum in infants and young children may help promote natural closure of the upper incisor space before eruption of permanent teeth.
- Future studies may follow the need for orthodontia after maxillary frenectomy is performed in similar patient groups with deciduous maxillary diastema to further elucidate both the aesthetic and functional
- Establish reasonable expectations. If a significantly extended maxillary frenum with visible bolster separating teeth is resected, a better outcome is anticipated.

Poster 34

Parotid Gland Giant Cell Tumor in a Toddler Case Report and Review of Literature

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All authors have no relationships or commercial affiliations to disclose

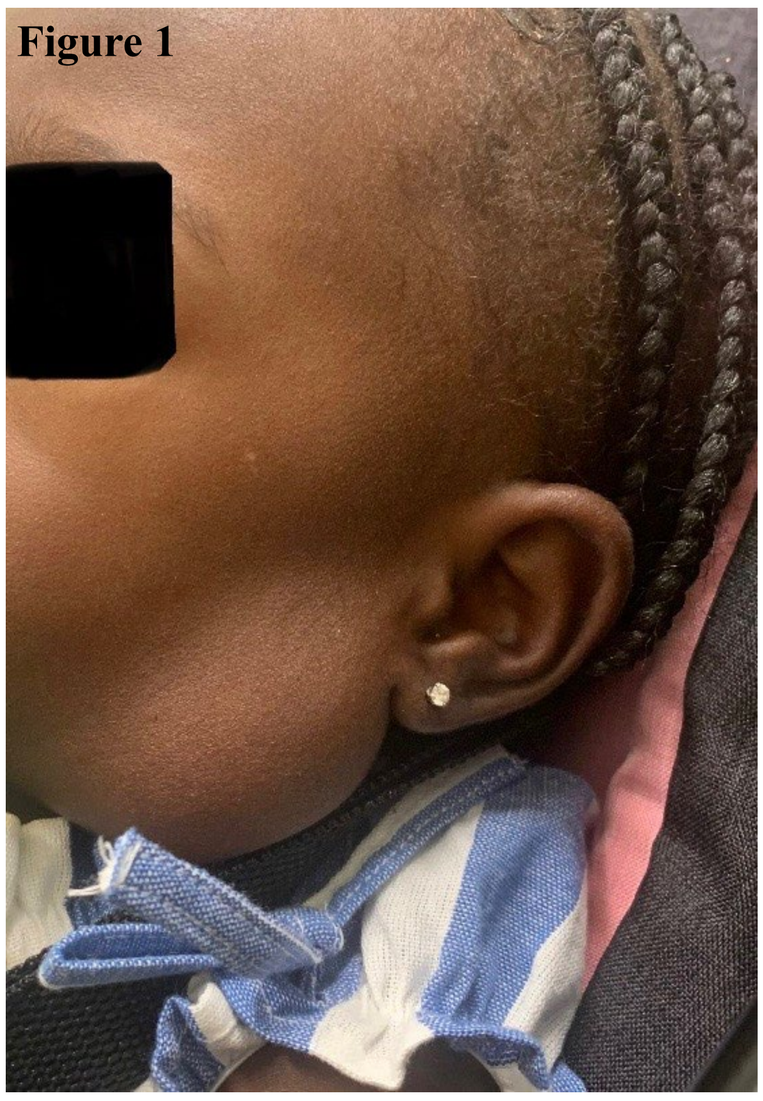
Background

Giant cell tumor (GCT) is rarely described in extra-skeletal sites with only 20 cases reported in the salivary glands in the English-language literature. This neoplasm can present as an isolated tumor or associated with a carcinomatous component. We report a rare case of GCT of the parotid gland in a 15-month-old female.

Methods

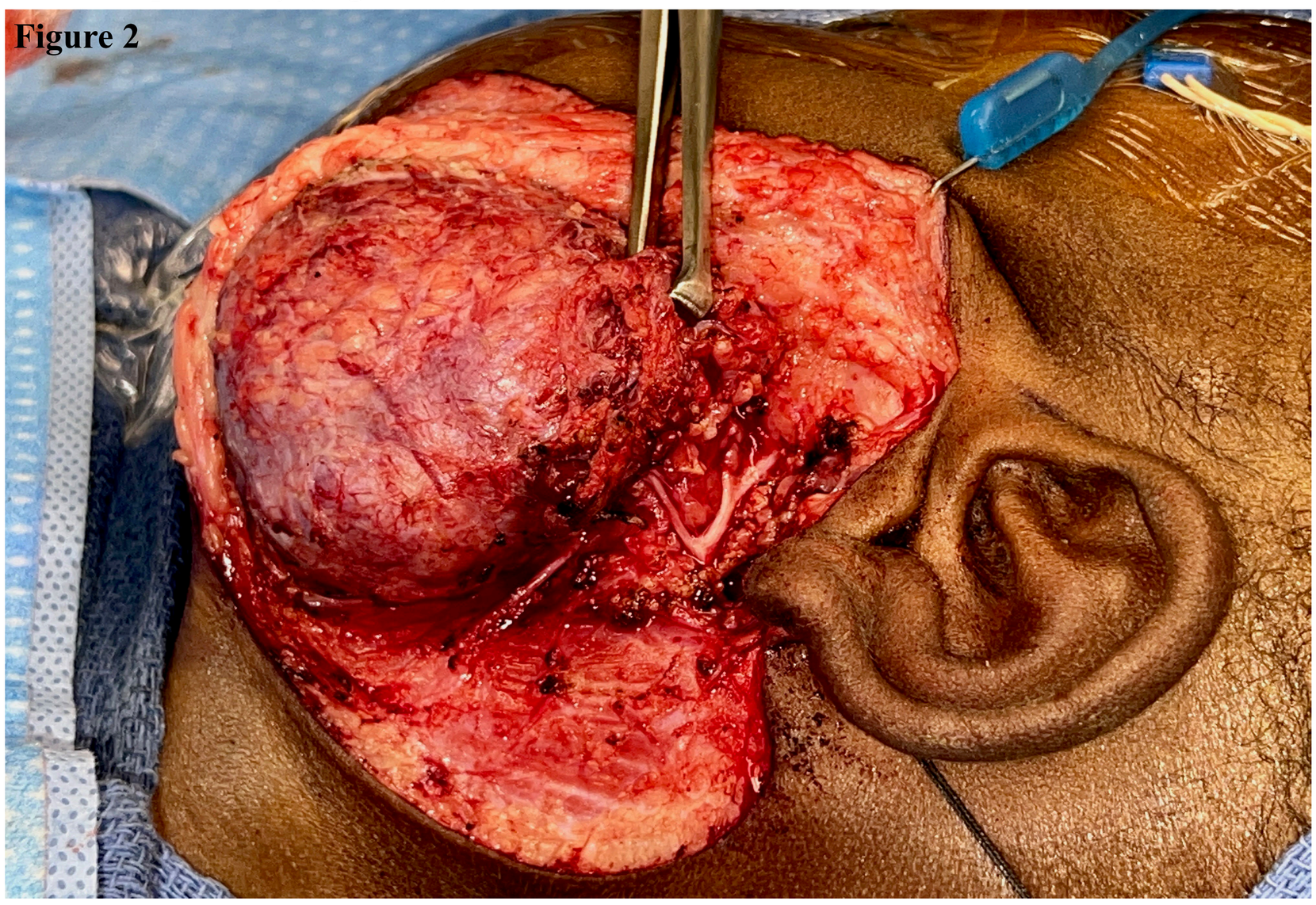
A 15-month-old female presented with a firm left-sided parotid mass following an uncomplicated upper respiratory infection. This was treated with two courses of oral antibiotics without improvement, and ultrasound demonstrated a 2.7 x 1.7 x 1.4 cm solid mass. She was referred for surgical assessment 6 weeks later and follow-up ultrasound demonstrated growth to 4.7 x 3.5 x 2.4 cm. Laboratory studies revealed serum lactate dehydrogenase elevation to 457 U/L. Patient underwent a left superficial parotidectomy with facial nerve dissection. The procedure was well-tolerated, and the patient was discharged on postoperative day 2.

Figure 1



Images of parotid giant cell tumor in a 15 year old female preoperatively (**Figure 1**) and intraoperatively (**Figure 2**)

Figure 2



Results

Fine needle aspiration smears exhibited hypercellular proliferation of oval to plasmacytoid to spindle, suggestive of mesenchymal origin. Histopathology of excised mass demonstrated hypercellular tumor with spindle cells and fibrous pseudocapsule and diagnosis of giant cell tumor of low malignant potential was made.

Conclusion

GCT of the parotid gland is a rare tumor not previously reported in a pediatric patient. Definitive diagnosis can be made using histopathological examination with surgical excision being the preferred treatment modality. Radiotherapy may be considered following resection, depending on cellular and molecular tumor characteristics.

Infection Rate Following Mandibular Distraction with Internal and External Devices in Infants

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Introduction

Mandibular distraction osteogenesis (MDO), a surgical option for addressing micrognathia and its associated sequelae, may be performed using either internal or external hardware. Postoperative infection is a common complication following MDO, with severity of such infections ranging from localized pin site cellulitis to fulminant osteomyelitis.

The objective of this study was to investigate the rate and severity of post-operative infection within a cohort of infants who underwent MDO with internal or external devices.

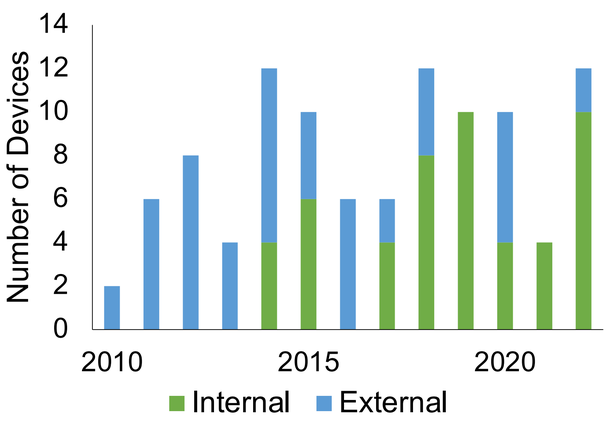

Figure 1. The utilization of external multivector devices vs internal univector / curvilinear devices over the course of the study period

Methodology

The records of infants <12 months of age who underwent MDO at a single tertiary medical center were examined retrospectively. The rate and severity of infections were primary outcomes. Statistical analysis was performed using Chi-Square and Fisher Exact Tests.

Results

Between 2010-2022, 36 infants (7 days-12 months) underwent bilateral MDO, amounting to 72 unique surgical sites (26/72 internal devices (36.1%); 46/72 external devices (63.9%). There were no differences in age, weight, or syndromic diagnosis among internal and external device groups. In total, 41.7% of patients (26.4% of surgical sites) developed post-operative infection; the majority (14/19 sites (73.7%) were minor in severity. Rates of minor infection were 6/26 (23.1%) among internal devices and 8/46 (17.4%) among external devices (P=0.56). Rates of major infection were 4/26 (15.4%) among internal devices and 1/46 (2.2%) among external devices (p=0.05).

Table 1. Severity of Infections by Surgical Site with Internal and External Devices

	Total (n=36 cases; 72 devices)	Internal Hardware (n=13 cases; 26 devices)	External Hardware (n= 23 cases; 46 devices)	P-value
Infection, n (%)	19 (26.4)	10 (38.5)	9 (19.6)	0.08
Minor, n (%)	14 (19.4)	6 (23.1)	8 (17.4)	0.56
Major, n (%)	5 (6.9)	4 (15.4)	1 (2.2)	0.05

Discussion

Postoperative infection is a common complication following mandibular distraction, regardless of which device is utilized, and is in fact found to be the most common complication in one meta-analysis of 49 studies[1]. While prior studies have reported greater rates of infection with external devices[2-4], a recent systematic review suggested that internal devices have a significantly greater number of surgical site infections than external devices[1].

In our analysis, we found no difference in overall infection rates between patients with internal and external devices, and a trend towards increased infection rate in internal devices when analyzed by devices.

Conclusion

Infants undergoing MDO with internal or external devices may experience similar rates of postoperative infection. Implanted, internal devices may be more prone to major infection compared to external hardware.

Contact

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Poster #44

Case Report: Tracheal Agenesis in Neonate

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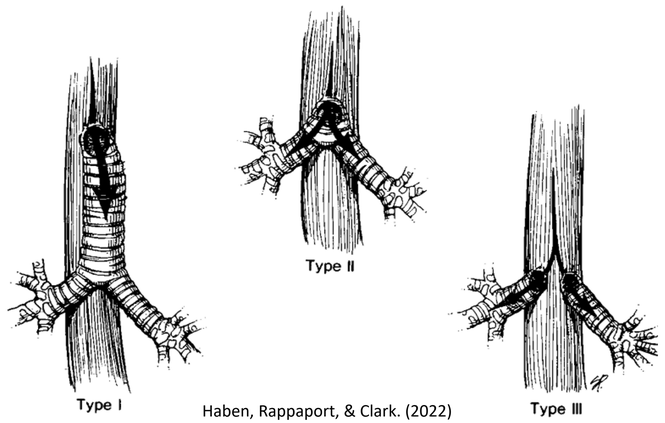
Introduction

Tracheal agenesis (TA) is a rare and nearly universally fatal diagnosis first described in 1900 as a complete interruption or absence of the trachea. The incidence is estimated to be <1/50,000. This condition presents with a 2:1 predilection for males and with prematurity and polyhydramnios in roughly 50% of cases.[1]

The three widely accepted subtypes of TA were first characterized by Floyd et al. in the 1960s:

- Type I agenesis describes a proximal defect with a distal tracheoesophageal fistula (TEF).
- Type II agenesis, the most common type comprising 50-60% of known cases, is defined by a complete absence of the trachea and normal bifurcating bronchi. This usually presents with polyhydramnios, respiratory distress, aphonia, cyanosis, and an inability to undergo endotracheal intubation.[2]
- Type III agenesis demonstrates the mainstem bronchi arise independently from the esophagus.[3]

With a prenatal diagnosis, oxygenation may occur through a congenital TEF or transitioned to extracorporeal membrane oxygenation. Here, we present a case of undiagnosed TA in a newborn.



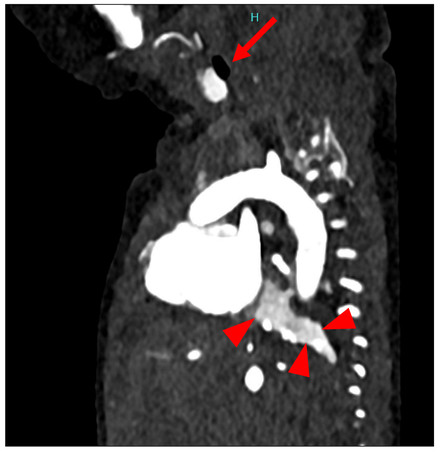
Haben, Rappaport, & Clark. (2022)

Case Description

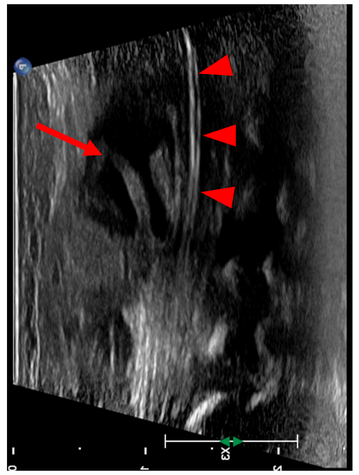
A neonate was delivered via emergent caesarean section for preterm labor at 33 weeks gestation with known polyhydramnios and a double outlet right ventricle. No prenatal evaluation of polyhydramnios was performed due to parental refusal to obtain fetal MRI. After delivery, the patient developed respiratory distress, prompting intubation attempts. Neonatology and Anesthesia teams attempted intubation unsuccessfully, and the Otolaryngology team was called emergently. Laryngoscopy yielded no visible glottic opening.

Oxygen saturations were maintained in the 60% range with mask ventilation. Emergent ECMO cannulation was performed because of the suspicion of TA and severe perinatal acidosis during resuscitation. CT revealed no discernible trachea and Scimitar syndrome with partial anomalous pulmonary venous return. A neck ultrasound confirmed the absence of a trachea. After a discussion with the family, the decision was made to withdraw care, and the patient expired.

Imaging



CT Angiogram, Sagittal View
Air bubble located at the level of the larynx (arrow) adjacent to the thyroid without a discernable trachea distally and diffuse pulmonary atelectasis, partially visible (arrowheads). Also noted on CTA were cardiovascular anomalies including a right-sided aortic arch, complex atrioventricular septal defect with a double outlet right ventricle.
Left is Anterior, Top is Superior



Ultrasound Neck, Midline "Sagittal" View
The larynx (arrow) is seen anterior to the orogastric tube (arrowheads) without any discernable cartilage rings or tracheal lumen distally. Posteriorly, the spine is seen.
Left is Anterior, Top is Superior

Discussion

Tracheal agenesis is a severe congenital disorder with absence of the trachea. One theory that explains TA development states that the lower respiratory tract develops as a respiratory diverticulum from the ventral aspect of the foregut, elongating caudally to form the trachea. Arrested elongation of the trachea results in Type I, while arrested elongation with fusion to form the carina results in Type II and without fusion to Type III.[5]

If a TEF is absent, the fetus will have features of congenital high airway obstruction syndrome (CHAOS) such as enlarged hyperechogenic lungs, a flattened diaphragm, fluid-filled dilated trachea and bronchi, and polyhydramnios. Prenatal MRI may provide a definitive diagnosis when CHAOS is not observed, and postnatal diagnosis depends on recognition of several clinical signs in the newborn: respiratory distress without appropriate air entry, absence of audible cry, and failed endotracheal intubation.[6]

Presently, management options fail to prolong life expectancy meaningfully. Esophageal intubation can temporize respiratory failure, and attempts at surgical management, most commonly with neotrachealisation of the esophagus, may offer short-term survival at the cost of multiple operations and high morbidity.[7]

Tracheal agenesis and congenital heart conditions are diagnoses with surgical treatment options. However, survival with TA is limited and typically requires the absence of other congenital anomalies. Given the combination of tracheal pathology, congenital heart disease, and suspected genetic anomalies, the decision was made to withdraw care. This case highlights the importance of proper prenatal evaluation of conditions like polyhydramnios and the complexity of diagnosing and managing emergent pathologies like TA. Surgical management and tissue engineering are active areas of basic science and translational research, but until definitive treatments are invented, parental counseling regarding the lethality of this diagnosis remains paramount.

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Clinical and Neurophysiologic Characteristics of Pediatric Laryngeal Dyskinesia

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Introduction & literature review

Aside from laryngeal paralysis (LP), there are clinical variations of laryngeal mobility disorders (LMD), e.g. arytenoid dislocation / subluxation and laryngeal dyskinesia (LD) that are scarcely reported[1]. Denoyelle described a group of stridulous infants with feature simulating LP. But she contended that LD exhibits paradoxical adduction of vocal folds upon inspiration while awake (similar to LP), but under sedation a degree of abduction is observed[2]. Rogers has also corroborated the same observation, in addition to a favorable outcome over time[3]. We aim to present the clinical parameters of a consecutive series of these patients in addition to their laryngeal electromyographic (LEMG) findings and their functional outcomes.

Methods & Materials

This is a retrospective, uncontrolled study at a tertiary pediatric center. Eligible children (<18 years old) presented with stridor & were suspected of a LMD. We included those diagnosed with LD based on the endoscopic criteria previously described by Denoyelle & were followed for >3 months. They were identified from a prospectively kept surgical database.

Variables collected were demographics, clinical and instrumental assessments of swallowing dysfunction (SwD), gastroesophageal reflux disease (GERD), sleep disordered breathing (SDB) and overnight pulse oximetry (PO) or polysomnography (PSG) data, significant respiratory symptoms, intubation, associated diagnoses, procedures performed, findings on airway endoscopy, LEMG scores according to AlQudehi et. al., (median, range, and side), outcome (resolution or persistence), and duration of follow up (months). The results were presented and analyzed using descriptive statistics. The sample size was too small for testing.

Outcome Measures

Primary:

Prevalence of LD amongst LMD

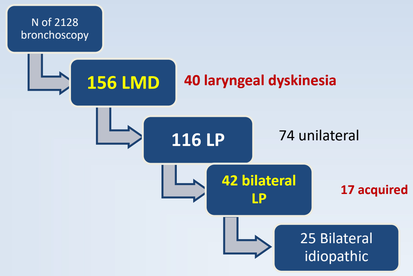
Discrepancy between LEMG scores of each side

Secondary:

a. Overnight oximetry grade

b. Instrumental swallowing test result (FEES, VFSS)

Result



Between 2007 - 2023, n of 40 were identified (25 males). Median age 9.79 months (range 0.42 – 266.25). Median follow 31.08 months (range 5.25 - 242.50). LD constituted 25% of all LMD patients.

All patients satisfied endoscopic criteria.

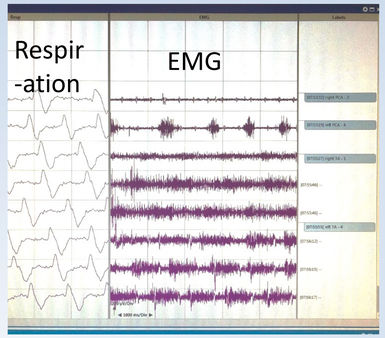
Asymmetry of movement between the two sides was noted in several patients. Three were intubated previously, and four exhibited recurring blue spells.

Fourteen patients underwent airway intervention for 2ry airway lesion (4 type 1 laryngeal cleft repair or deflux injection, 5 supraglottoplasty, 4 botulinum toxin injection). Two patients required tracheostomy and were decannulated after short period of time.

Seven patients had concomitant laryngeal cleft, 7 had laryngomalacia, one had subglottic stenosis, 2 anterior larynx, one laryngeal web, 3 various cardiac anomalies. One one had 22 q11 del syndrome. None had a neurological disorder.

Table 1 : Laryngeal EMG Grading Scoring system[4]

Grade	Amplitude %	Timing with respiratory cycle
4 (normal)	>75	Appropriate
3	50	Appropriate
2 (no activity)	<25	NA
1	50	Inappropriate
0 (abnormal)	>75	Paradoxical



PCA: posterior cricoarytenoid
TA: Thyroarytenoid

Rt PCA: no MUP (2)
Lt PCA: normal (4)

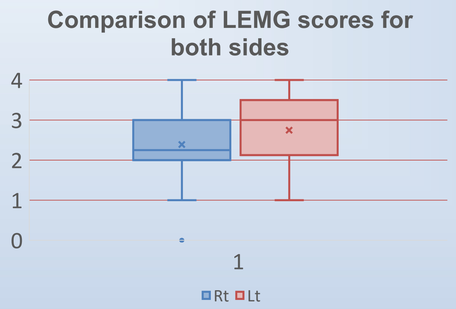
Rt TA : Continuous paradoxical (1)

Lt TA: Normal (4)

Sample of LEMG

Table 3 : LEMG scores (n of 32)

	Rt PCA	Rt TA	Lt PCA	Lt TA	Rt	Lt
Median	**2**	**2.25**	**3**	**3**	2.25	**3**
25%	2	2	2	2.25	2	2.25
75%	3	3	4	3.5	3	3.5



Median **LEMG scores** for each muscle sampled were **higher in the left side** than the right. So was the **median score for the whole of the left side**. Although that did not mirror the asymmetry of the abduction function between the two sides noted on endoscopy. All symptoms resolved or improved except for one patient.

Table 4 : Overnight home oximetry result for 31 patients who reported snoring. The figures demonstrate **abnormal parameters of oximetry at baseline** followed by an improvement over time.

	Baseline			Follow up		
	Mean O_2 sat	Nadir O_2 sat	Desat index	Mean O_2 sat	Nadir O_2 sat	Desat index
Median	**97**	**82**	**17.35**	**98**	**87**	**5.99**
Min	94	62	0.8	95	74	0.62
Max	100	93	63	100	95	43.90

Table 5 : Twenty-six families reported feeding and swallowing difficulties **(14 FEES, and 6 VFSS)**. The results of instrumental swallowing tests showed penetration and aspiration at baseline in all the tested subjects. These improved over time with diet modifications and or surgical intervention.

	Baseline		Follow up	
	Penetration	Aspiration	Penetration	Aspiration
Non-silent	16	13	8	7
Silent	6	9	0	1

Conclusions & extrapolations

LD appears to be mostly self-limiting. We reproduced the symptom complex and endoscopic criteria described by Denoyelle. We also added the asymmetry of movement, LEMG grades between the two sides of the larynx and a male predominance. It can affect sleep and swallowing both of which may require supportive measures till resolution takes place. The high prevalence among all LMD in this series, and lack of reporting in most large series of LP, may suggest that its natural history contaminates that of true bilateral LP.

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Adenoid Tissue as a Source of Persistent "Hemoptysis": a Case Report

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INTRODUCTION

- Hemoptysis: expectoration of blood originating from the lower respiratory tract. Common causes: respiratory infection, foreign body aspiration
- Pseudohemoptysis: expectoration of blood from other areas of the aerodigestive tract, such as upper respiratory tract, oropharynx, nasopharynx, or gastrointestinal trac

OBJECTIVES & METHODS

OBJECTIVES

Describe a case of pseudohemoptysis originating from adenoidal hypertrophy

METHODS

Case Report

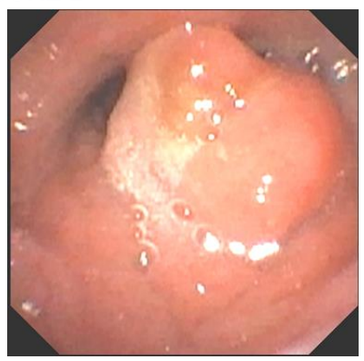
PRESENTATION

- 17-year-old previously healthy female presenting with 3-month history of intermittent "coughing up blood"
- Additional background:
  - Epistaxis
  - Lower GI bleeding
  - Iron deficiency anemia
  - Headaches
  - No identified telangiectasias

EVALUATION & MANAGEMENT

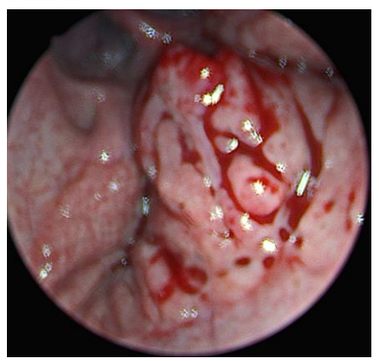
- Patient initially presented to their primary care provider with reports of coughing up blood. They were referred to otorhinolaryngology and pulmonology to assess for source of presumed hemoptysis.
- In-office flexible nasolaryngoscopy revealed prominent adenoid tissue (figure 1) but no source of upper airway bleeding.
- The patient underwent chest CT angiogram, which revealed 2 mm pulmonary left upper lobe arteriovenous malformation. There was concern for hereditary hemorrhagic telangiectasia.
  - Genetic testing was initiated.
  - CT Brain was ordered to rule out cerebral arteriovenous malformations. CT Brain did not reveal evidence of intracerebral malformations.
- Patient was taken to the operating room for flexible fiberoptic bronchoscopy and bronchoalveolar lavage to confirm lungs as the source of bleeding, and trip was coordinated with gastroenterology and otorhinolaryngology for comprehensive aerodigestive evaluation with esophagogastroduodenoscopy and rigid bronchoscopy.
- Bronchoscopy revealed normal appearing lower airways. The bronchoalveolar lavage was non-neutrophilic, and cultures grew normal upper airway microbiotic. Hemosiderin macrophage index was 0, making lungs a low likely source of bleeding. During bronchoscopy, prominent adenoid tissue was noted, which bled heavily with light manipulation (figure 2). Esophagogastroduodenoscopy did not reveal a bleeding source.
- Decision was made to perform adenoidectomy, which was uncomplicated. Biopsy was obtained which revealed nasopharyngeal mucosa with lymphoid hyperplasia.
- Follow up: Hereditary hemorrhagic telangiectasia genetic testing was negative. No further hemoptysis. Intermittent epistaxis being managed conservatively

FIGURE 1



Flexible nasolaryngoscopy evaluation revealing adenoid polypoid lesion

FIGURE 2



Adenoid pad after manipulation

DISCUSSION

- Extensive literature evaluating prevalence and etiologies of hemoptysis – adenoidal hypertrophy is a rare/not reported etiology in many studies
- Adenoidal hypertrophy/polyps should be considered in cases of aerodigestive bleeding
- Patients without a clearly identified source of hemoptysis or aerodigestive bleeding may benefit from comprehensive multidisciplinary care with otorhinolaryngology, pulmonology, gastroenterology to ensure appropriate evaluation and management

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Poster #49

Pediatric Nontuberculous Mycobacterial Cervicofacial Lymphadenitis: Outcomes Based on Treatment Modality

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Introduction

- Nontuberculous mycobacteria (NTM) can cause cervicofacial lymphadenitis in immunocompetent children.
- Incidence is estimated to range between 0.8 to 3.5 per 100,000 with highest rates in children below 4 years of age.[1,2]
- Clinical presentation typically includes:
  - Slowly progressing, unilateral, non-tender enlargement of lymph node(s).[3]
  - Purple discoloration of overlying skin with discharge of purulent material.[4]
  - No systemic symptoms.[5]
- Surgical excision is considered the standard treatment with the highest eradication rate; however, recent literature has reported success with conservative management.[6-8]
- The purpose of this study was to characterize outcomes in pediatric patients with NTM lymphadenitis based on treatment modality.

Methods

- Retrospective observational cohort study of children diagnosed with NTM lymphadenitis between 2011 and 2022 at a tertiary pediatric medical center.
- Descriptive statistics regarding treatment modalities, outcomes, and complications were calculated.

Results

Table 1. Demographics (n=37)

Age, median, months	33.1±29.8
Gender, % (no.)	
Female	45.9 (17)
Male	54.1 (20)
Race, % (no.)	
White	83.8 (31)
Black	2.7 (1)
Other	5.4 (2)
Unknown	0.2 (3)
Ethnicity, % (no.)	
Hispanic or Latino	16.2 (6)
Not Hispanic or Latino	81.1 (30)
Unknown	2.7 (1)

Results

- Among 37 children, 20 were male (54.1%) and average age was 33.1±29.8 months (Table 1).
- Six (16.2%) of patients were treated with antibiotics alone and 3 were observed (8.1%) (Figure 1).
- The remainder (n=28) underwent procedural intervention, including curettage alone (42.9%), excision alone (21.4%), or both (35.7%) (Figure 1).
- 43.2% of patients who had a procedure required another operation.
- The average number of procedures performed was 1.9.
- Overall, the average time to cure was 191.3 days among all patients.
  - For curettage alone, average time to cure was 128.7 days (Figure 2).
  - For excision alone, average time to cure was 167.4 days (Figure 2).
  - Those undergoing multiple procedures had an average time to cure of 277.7 days (Figure 2).
- Three patients developed marginal mandibular nerve injury following complete excision.

Figure 1. Number of patients by treatment modality

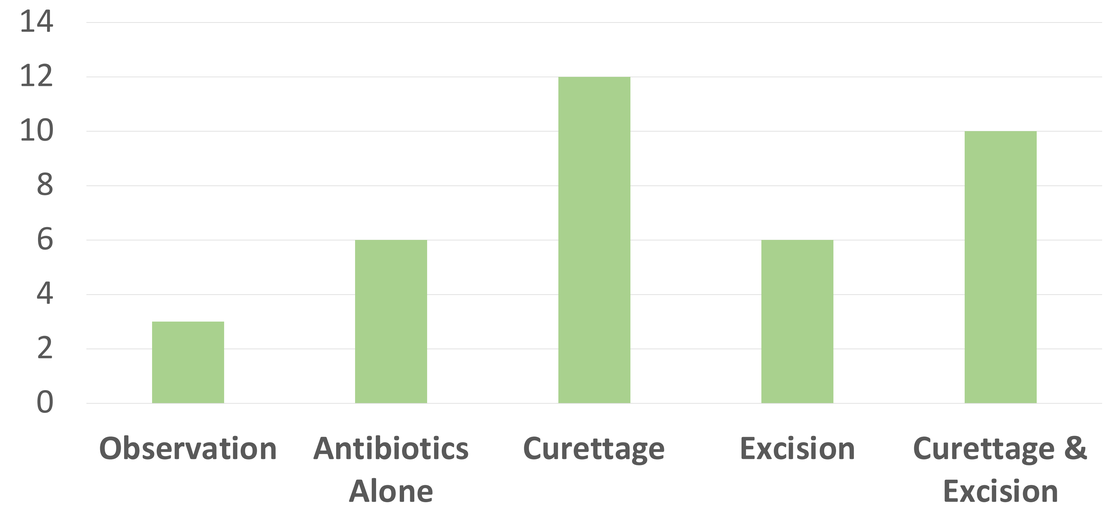
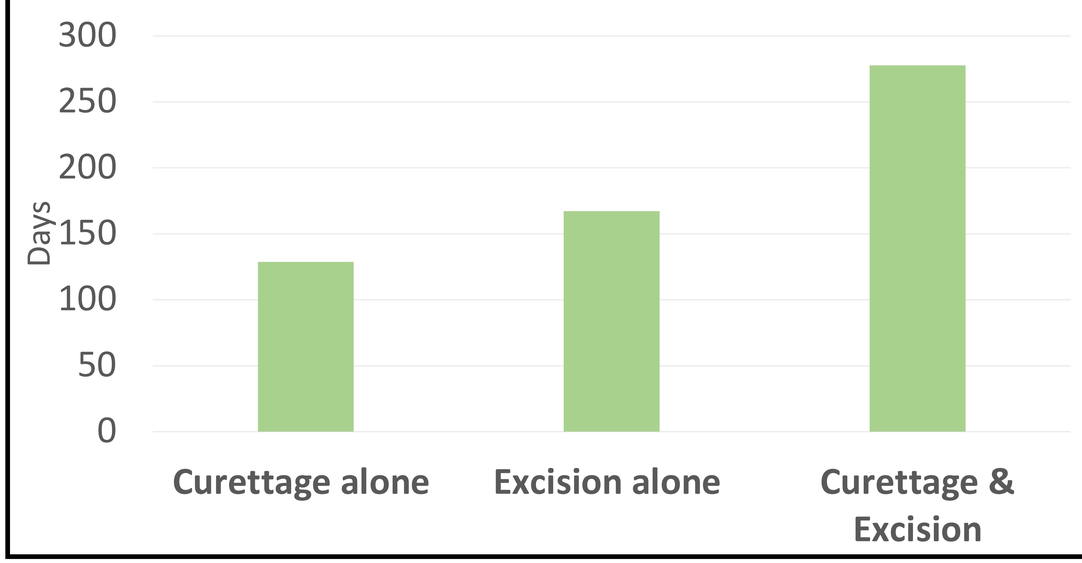


Figure 2. Time (days) to cure based on treatment modality



Discussion

- Children diagnosed with NTM lymphadenitis in our study predominantly underwent surgical intervention.
- Time to cure was prolonged amongst all surgical treatment modalities.
- Previous literature suggests that complete excision is the best treatment option, however, this carries the highest risk of complications.[9,10]
- Conservative treatment with antibiotics and observation has been shown to be effective, however, can lead to slow resolution. A trial of antibiotics prior to surgical excision or as an adjuvant may be considered.[6-8]
- Limitations include a lack of time to cure or complications for patients treated with antimycobacterial antibiotics alone due to patients being lost to follow-up or transfer in care.
- These findings and previous data suggest that choice of treatment should be based on patient presentation and provider experience.

Conclusion

- Clinical presentation, risks of complications, and extended time to cure should be weighed when counseling patients about treatment options.
- Further research regarding the efficacy of nonsurgical treatment options for NTM lymphadenitis is warranted.

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Poster #50

The Red Rubber Will Not Pass: Diagnosis of Unilateral Choanal Atresia during Adenoidectomy

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Introduction

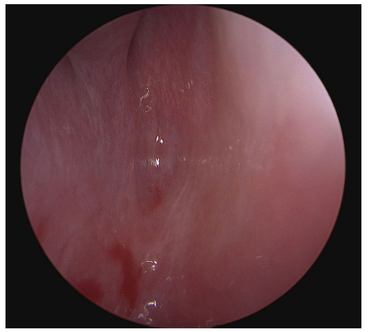
Choanal atresia is a congenital disorder in which the nasal choanae do not recanalize during fetal development. This leads to the absence of communication between the posterior nasal cavity and the nasopharynx. Incidence ranges from 1 in 5,000 to 1 in 8,000 live births. 67% are unilateral and occur most commonly on the right side. Bilateral choanal atresia is an ENT airway emergency and classically presents with cyanosis during the first few hours of life that worsens with feeding and improves with crying. 50-75% of patients with bilateral choanal atresia have other congenital abnormalities. The hallmark features of choanal atresia are a narrow nasal cavity, lateral obstruction by the pterygoid plates, medial obstruction by the vomer, and membranous obstruction. Choanal atresia always has some degree of bony obstruction. The incidence of pure bony atresia is 29%, mixed bony-membranous atresia is 71%. Classically, the diagnosis is made with the inability to pass a 6 French catheter transnasally. However, unilateral choanal atresia may present later in life with rhinorrhea and nasal obstruction. Surgical repair can be done via a transpalatal or endoscopic transnasal approach, which is favored. Surgery is carried out using a combination of soft tissue dissection and bony drilling. Sometimes stents are employed to prevent the risk of re-stenosis. Revision surgery is often indicated due to scarring.

Case Report

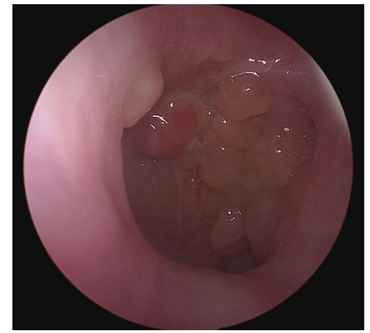
We describe the case of an 11 year-old obese male who presented to clinic with chronic snoring, bilateral nasal congestion, and a sleep study confirming severe obstructive sleep apnea. In clinic, anterior rhinoscopy confirmed bilateral inferior turbinate hypertrophy and bilateral tonsillar hypertrophy. Nasal endoscopy was deferred. There was no history of nasal surgeries or abnormalities. Decision was made to proceed with a tonsillectomy, adenoidectomy, and bilateral inferior turbinate reduction. At the beginning of the case, an 8 French red rubber catheter was passed in the right nasal cavity and would not advance past the nasopharynx after multiple attempts. The red rubber was then passed into the left nasal cavity. Indirect nasopharyngoscopy demonstrated a large adenoid pad that was cauterized. Upon inspection of the right choana, it was noted that the choana appeared atretic. Further, saline irrigation would not pass in the right nasal cavity. We proceeded with bilateral inferior turbinate reduction and nasal endoscopy confirmed a right-sided unilateral choanal atresia. CT was obtained showing a bony and membranous choanal atresia. The patient ultimately underwent a transnasal endoscopic choanal atresia repair. He healed well postoperatively and notes significant improvement in his snoring and nasal symptoms.

Conclusions

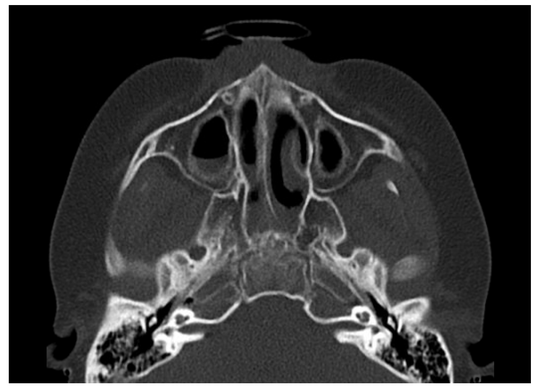
While bilateral choanal atresia is diagnosed early in the neonatal period, unilateral choanal atresia can go undiagnosed in children due to vague symptomatology. In a patient with nasal obstruction or rhinorrhea, preoperative nasal endoscopy should be strongly considered in every patient. Further, choanal atresia and other posterior nasal cavity abnormalities should be closely ruled out during all adenoidectomies.



Pre-op



Post-op



Pre-op CT

Contact
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Poster #51

Designing a Patient Navigator to Promote Health Equity and Outcomes for Children Who Are Deaf or Hard-of-Hearing

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Background

Infant hearing loss is the most common neonatal sensory disorder, with an incidence of 1.7 per 1000 births. Early Hearing Detection and Intervention (EHDI) guidelines have established benchmark screening, testing, and intervention for affected newborns; however, there exist many barriers to achieving full adherence to these guidelines across all populations. Parents from vulnerable patient populations, including immigration status, socioeconomic status, and English-comfortability, are primarily at risk for delays in care navigation for supporting children born deaf/hard of hearing (DHH).

Delays in care navigation place children at higher risk for deficits in cognitive development. We sought to understand and collate provider perspectives on the existing care navigation process, in order to inform the design of a new Patient Navigator role.

Methods

Provider perspectives were elicited through hour-long interviews. Two representative interviews were coded separately by two investigators (NR and ML) and then cross-coded to formulate the codebook. Interviews were then coded and organized into overarching themes. Within the larger themes, insight statements were derived as areas of opportunity for the Patient Navigator role.

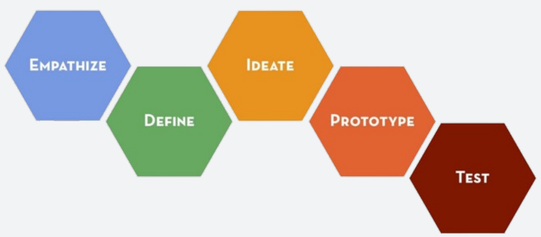
Selecting Provider Interviewees

We prioritized diversity in role and geographic location in our 12 interviewees, which included:

- 2 Otolaryngologists
- 3 Speech Language Pathologists
- 1 Social Worker
- 2 Program Coordinators
- 3 Educational Providers
- 1 Audiologist

The Human Centered Design (HCD) Process

For this project, we utilized a Human Centered Design approach, in which in-depth interviews are conducted with stakeholders in order to understand needs and challenges in a complex system. The HCD process is pictured below; this project is currently in the Empathize, Define, and Ideate phases.



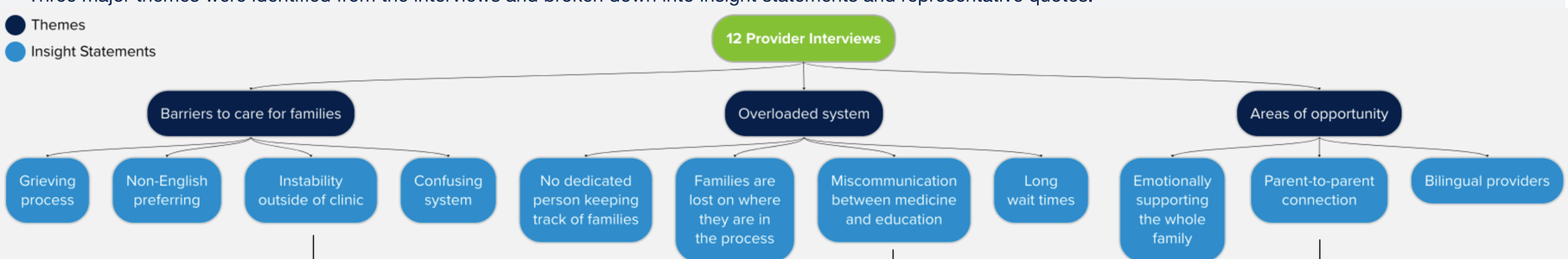
Code Applications

Media	barriers	distance	financial	language	stigma	transportation	need for a patient navigator	emotional support	empowering families	logistics	training/skills	overloaded system	insurance	inter-provider communications	lost to follow up	many hats	shortstaffed	who does what?	Totals
Interview_12.pdf	4	3	4	3	1	3	3	19	2	6	16		4	2	3	6	3	1	83
Interview_11.pdf	10	3	1			5	11	14	6	12	3	11		6	3	5	3	3	96
Interview_10.pdf	8	2	5	7	2	2	3	6	8	13	17	8		4		1	3	3	92
Interview_09.pdf	6	3	3	1		4	2	5	9	7	3	3		2		4	5	1	58
Interview_08.pdf	11		3	2			6	7	2	1	15	2		11	3	1			64
Interview_07.pdf	2	3	5	7		4	4	4	2	16	34	4	2	3	2	2	2		96
Interview_06.pdf	3	2	9	5		6	10	7	7	15	2		1	3	5	3	6	8	92
Interview_05.pdf	7	5	6	7		4	16	8	4	16	9			16	8	8	2	7	123
Interview_04.pdf	4	1	7	8	2	4	14	7	2	13	12	1	7	4	7	3	17	3	116
Interview_03.pdf	17	1	16	7	4	6	2	7	6	14	6			13	2	4		8	113
Interview_02.pdf	5	2	2	15		2	1	5	1	26	28		3	2		1	5	1	99
Interview_01_Combined_.pdf	7	2	4	4	2	9	13	17	2	24	18	1		7	4	6	13	1	134
Totals	84	27	65	66	11	49	85	106	51	163	163	30	17	73	37	44	59	36	

Table 1: Visualization of how often different codes within the codebook were applied across interviews

Results

Three major themes were identified from the interviews and broken down into insight statements and representative quotes.



"We have a very chaotic population and they spend their entire life putting out fires and trying to figure out like how to navigate, I don't want to say trauma, but serious things happening that takes up most of their time. And then maybe they're not in that state of mind to navigate a complex system."

- Audiologist

"If I'm spending less time trying to figure out who at the school district I'm supposed to talk to, I can probably do more and better therapy,"

- Speech Language Pathologist #2

"There is something about going through the lived experience that is just not replaceable."

- ENT #2

Conclusions

- Our qualitative analysis of provider interviews indicates major needs for additional support to both families and providers of DHH children.
- The emotional labor of grieving a DHH diagnosis, low-English comfort, and other socioeconomic factors can exacerbate the difficulties in navigating an already complex system, leading to delays in care and worse outcomes for these families.
- Medical and educational providers recognize how existing infrastructures do not place enough emphasis on supporting families through the DHH pathway nor on effective communication with the other parallel system.
- One area of opportunity for a future Patient Navigator role could include facilitating some form of parent-to-parent connection in addition to supporting families throughout the process.
- Next steps of this project will include conducting a similar analysis with families of DHH children and conducting a cross-thematic analysis prior to final design of the Patient Navigator intervention.

Pediatric Tracheostomy Practices and Rates of Postoperative Complications during the COVID-19 Pandemic

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Background

- During the early months of the COVID-19 pandemic, aerosol-generating procedures, including tracheostomies, were generally avoided
- The lack of a consensus in regards to tracheostomy practices presents a unique opportunity to further explore the relationship between our practices during and after the peak of COVID-19 as compared to the pre-COVID-19 era

Hypothesis

- We hypothesize that pediatric tracheostomy practices, as well as associated postoperative complications, will not differ significantly between the early stages of the COVID-19 pandemic and the immediate pre-COVID-19 era

Specific Aim

- We aim to investigate whether practices in tracheostomy placement were affected by the COVID-19 pandemic, and if there were changes in tracheostomy-related complications when compared to the prior year

Methods

- We conducted a **retrospective chart review** of tracheostomies placed pre-COVID-19 (Cohort 1: March 1, 2019-February 29, 2020) compared to the first year of the COVID-19 pandemic (Cohort 2: March 1, 2020-February 28, 2021)
- Demographics, medical comorbidities, duration of intubation, and post-tracheostomy complications were collected and analyzed
- Additional sub-analyses were performed on neonatal intensive care unit (NICU) patients

Results

- A total of 47 tracheostomies were performed during the study period **(Cohort 1: 34 patients, Cohort 2: 13 patients**). The median ages of patients in cohort 1 and 2 were **5.46 months** and **6.46 months**, respectively
- Among NICU patients, the mean duration of intubation for non-excluded individuals in cohort 1 was **114.48 days**, which was similar to cohort 2 at **118.82 days**. The mean number of extubation trials was similar between the two cohorts (**2** for cohort 1 and **2.27** for cohort 2)
- Rates of post-op complications between the cohorts were not statistically significant **(p>0.05)**

Conclusion

- Post-op complication rates between patients in the pre-COVID19 era and early COVID19 era were **not** statistically significant
- Although there were perceived changes in practices regarding aerosol-generating procedures, this did not appear to impact timing of tracheostomy placement or post-operative complication rates

Tables/Figures

All Patients	**Pre-COVID-19**		**COVID-19**	
	Number of patients	% of patients	Number of patients	% of patients
Total	34	100	13	100
Median Age at Tracheostomy (in months)	5.46		6.46	
Race				
White/Caucasian	16	48.5	6	46.2
Black	12	36.5	6	46.2
Asian	3	9.1	0	0
Hispanic/Latino	0	0	0	0
Multi-racial	1	3	0	0
Decline to answer	1	3	1	7.7
Comorbidities				
Genetic	6	18.18	3	23.08
Musculoskeletal	2	6.06	0	0
Cardiopulmonary	9	27.27	3	23.08
Neurological	1	3.03	1	7.69
GI/Renal	3	9.09	1	7.69

- Table 1: Demographic data

Neonatal Patients	**Pre-COVID-19**	**COVID-19**
Total Patients following exclusion*	29	12
Mean Duration of Intubation (in days)	114.48	118.82
Mean Number of Extubation Trials	2	2.27
Mean Age at Tracheostomy (in months)	10.67	7.15
Post-Op Complications (# of patients) (% of total)		
Granuloma/Granulation Tissue	21 (72.41)	11 (91.67)
Subglottic Stenosis	5 (17.24)	1 (8.33)
Dysphagia	2 (6.90)	0 (0)
Vocal Cord Paralysis	1 (3.45)	0 (0)
Laryngomalacia	2 (6.90)	0 (0)
Tracheomalacia/Bronchomalacia	7 (24.12)	2 (16.67)
Bleeding	3 (10.34)	0 (0)
Accidental Decannulation	1 (3.45)	0 (0)
Persistent TC Fistula	8 (27.59)	0 (0)
Hoarseness	2 (6.90)	0 (0)
Tracheitis	5 (17.24)	1 (8.33)
Stomal Infection	3 (10.34)	2 (16.67)
Total Deaths	4	2
% of Deaths Tracheostomy Related	50	0
***Patients with tracheostomy performed due to trauma/non-study related reasons not included in analysis**		

- Table 2: Tracheostomy data and rates of post-op complications

Acknowledgements

- Thank you to Dr. Sophie Shay and Dr. Axel Shum, as well as the entire Department of Otolaryngology and Communication Sciences for all of your time and assistance in conducting this project

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Poster #53

A 10 Year Analysis on Baseball And Softball injuries of the Head and Neck

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Introduction

Youth baseball/softball fields are community cornerstones in fostering camaraderie and health. However, participation is not without danger, particularly regarding head and neck injuries.

Traditionally, contact sports like basketball, football, and soccer have received attention for the risk associated with head and neck injuries. Recent studies have even noted that head and neck injuries among these sports have progressively decreased over the past decade, likely resultant of increased use of protective equipment and education in response[1].

However, baseball has made minimal progress and advances in baseball-related injury safety have focused largely on concussion protocol[2]. Further, these children are at an especially increased risk of head and neck injury when considering factors such as decreased balance and coordination, cartilaginous tissue instability, and underdeveloped muscles in the context of playing baseball, where they are also at risk for accidents such as player collisions and being struck by aberrant balls.[2]

This retrospective study aims to estimate the nationwide incidence of ED visits attributed to pediatric head and neck injuries sustained during baseball/softball activities as well as identify common modes of injury.

Method

- **National Electronic Injury Surveillance System (NEISS)**
  - Randomized sampling of hospitals with 24 hour emergency department services across the United States
- **Inclusion Criteria**
  - Year of ED visit: 2013-2022
  - Population: pediatrics
  - Injury: head and/or neck, resultant from baseball or softball activity
- **Population demographics**
  - 15,527 eligible injuries identified
    - *Adjusted to 486,648 cases nation-wide*
  - Mean age: 9.9 years old
  - Sex: ***68.5% male***, 31.5% female
  - Race: ***56.1% white***, 8% black, 30.8% unspecified

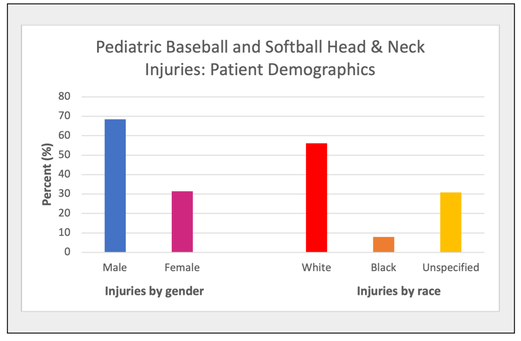

Figure 1. Population demographics of pediatric baseball and softball head and neck injury patients.

Results

Sport:

Baseball Injury	Softball Injury
75.2%	24.8%

Injury Type:

Injury Type	Percent
Internal	22.1%
Contusion	19.0%
Lacerations	18.0%
Fractures	12.7%
Concussions	1.4%

Bones Fractured:

Bone	Percent
Nasal bone, maxilla	96.0%
Skull	4%

Treatment:

Treatment Approach	Percent
Treated and released	96.1%
Treated and hospitalized	1.8%
Left without evaluation	1.2%
Treated and transferred	0.6%

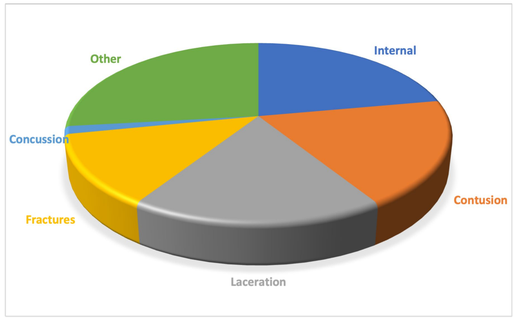

Figure 2. Major injury types identified in baseball and/or softball-related head and neck ED visits.

Conclusions

The study highlights pediatric head and neck injuries in baseball/softball, with 486,648 ED cases. Males and whites were mostly affected. Baseball caused nearly three times the injuries as softball, mainly lacerations and contusions.

While concussions and fractures were less common, they still composed a significant number of ED visits. Other less prevalent but noteworthy injuries also include stains/sprains (1.2%) and blunt traumas (0.2%). Though most patients were treated and released, the percentage requiring hospitalization indicates the importance of preventive measures, including using proper equipment and implementing rule modifications in non-contact youth sports.

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THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Proliferative Myositis Presenting as a Rapidly Enlarging Neck Mass

Anderson White, Benjamin Clark, Adam Van Horn, MD

Objective

To present the case and management of a proliferative myositis presenting as a rapidly enlarging neck mass.

Introduction

Proliferative myositis is a rare, benign proliferative process that can produce a soft tissue mass. Sometimes termed a pseudosacrcomatous lesion, proliferative myositis can present as a rapidly enlarging mass concerning for malignancy. Proliferative myositis often presents in adult patients in upper extremities or trunk. Head and neck involvement is less frequently seen, and pediatric cases are rare.

Case Report

A 2-month-old male presented to the clinic with the presence of a right neck mass. Imaging studies, including ultrasound and computed tomography, revealed a well-defined mass within the sternocleidomastoid muscle, displacing the surrounding tissues. Cytology from fine needle aspiration showed atypical spindle cells, prompting an incisional biopsy due to concern for neoplasm. Histopathological assessment unveiled a diagnosis of proliferative myositis. The lesion exhibited proliferation of benign fibroblasts and myofibroblasts, accompanied by distinctive ganglion-like polygonal cells and spindle cells. Immunohistochemical staining proved invaluable; S-100 and keratins remained consistently negative, while smooth muscle actin stained positively in myofibroblasts and ganglion-like cells.

Clinical Images

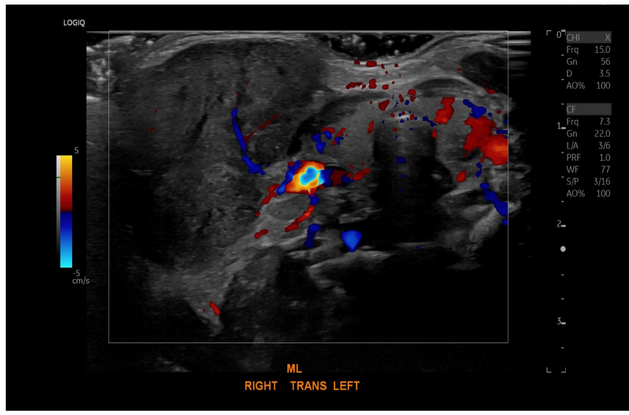

Figure 1. Color Doppler Ultrasound

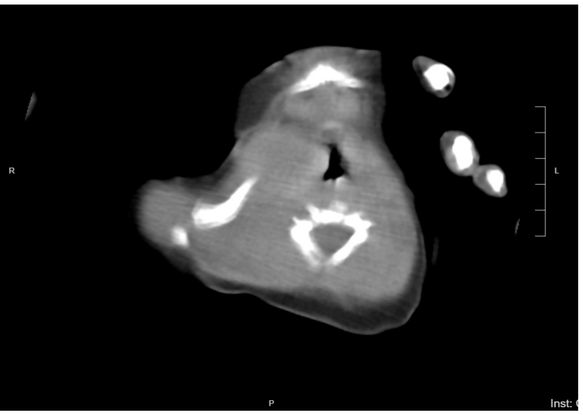

Figure 2. Computed Topography Scan

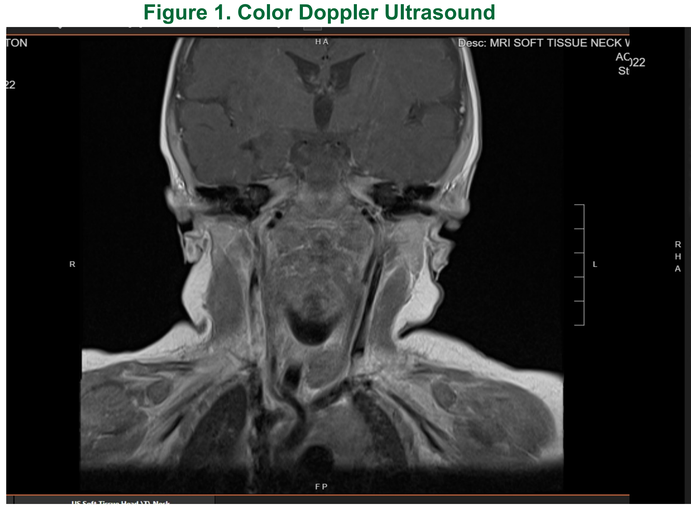

Figure 3. MRI Soft Tissue of the Neck

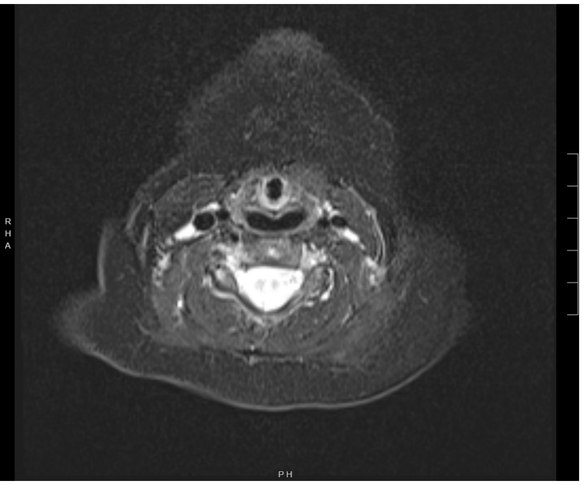

Figure 4. MRI

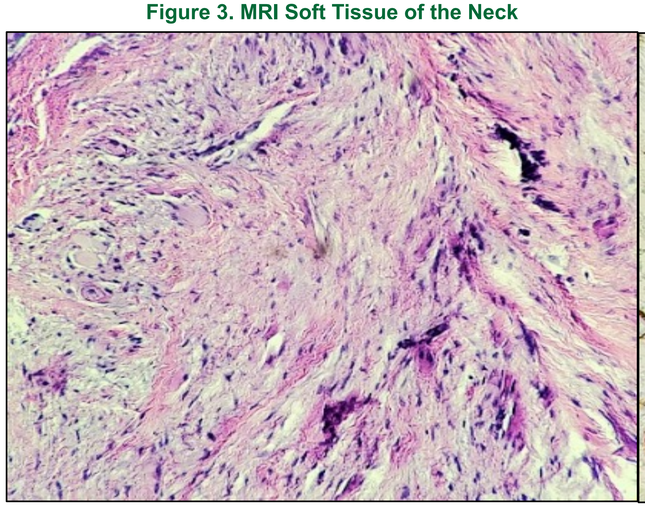

Figure 5. A1-1 H&E 200X

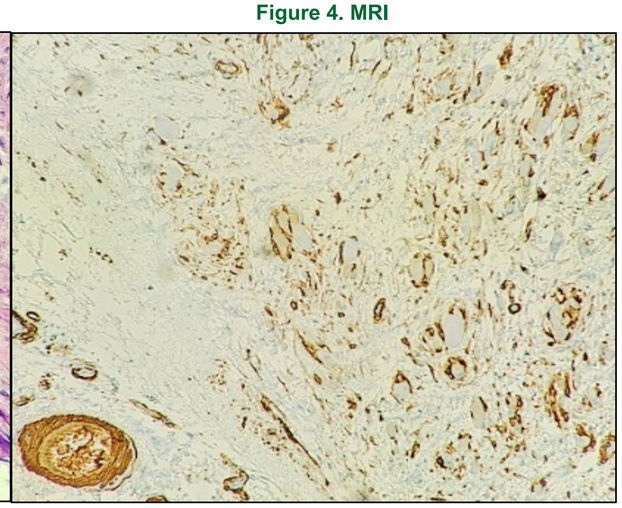

Figure 6. A1-1 Smooth Muscle Actin 200X

Discussion

This case underscores the importance of considering proliferative myositis in the differential diagnosis of rapidly growing neck masses in pediatric patients. The combination of clinical evaluation, radiological imaging, and precise histopathological analysis is imperative to distinguish proliferative myositis from neoplastic or malignant entities, such as soft tissue sarcomas. Remarkably, the lesion followed a spontaneous resolution trajectory, without the necessity for surgical intervention. Four months post-initial presentation, the mass resolved completely, highlighting the self-limiting nature of this condition in some cases.

Conclusion

This case demonstrates the challenges in diagnosing proliferative myositis and stresses the need for a comprehensive approach. Understanding how the condition naturally evolves is crucial. It helps avoid unnecessary surgeries, ensuring the patient receives the most appropriate care.

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Presentation of Inverted Papilloma in an Adolescent Male

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Objectives

To better understand the atypical presentation of inverted papilloma in the pediatric population

Introduction

Inverted papilloma is a benign, locally aggressive sinonasal tumor with malignant potential which usually present in the 5th and 6th decades of life with a 3:1 male predilection. It is typically found in adults with rare and possible more aggressive disease in the pediatric population. The disease process makes up 0.5-4% of nasal masses. Pathogenesis is likely secondary due to allergy, chronic sinusitis, viral infections and most commonly occurs the lateral nasal wall. Pathology demonstrates benign epithelial growth extending into the underlying stroma of the paranasal sinuses.

Methods and Materials

Case report and review of literature

Case

A 16-year-old boy presented to the pediatric otolaryngology clinic with six months of left nasal mass with complaints of nasal obstruction, purulent rhinorrhea, and intermittent epistaxis. CT imaging demonstrated expansile opacification of the left nasal cavity with broad differential without definitive characteristics of inverted papilloma. Intraoperatively, there was noted to be a left polypoid mass filling the nasal cavity and extending to the nasopharynx, entering the opposite nare. An abnormal bony segment was identified lateral to the left middle turbinate. Pathology returned as inverted papilloma. Decision was made to return to the OR for revision surgery for definitive resection The patient will continue with long term post operative surveillance to monitor for evidence of recurrence or transformation.

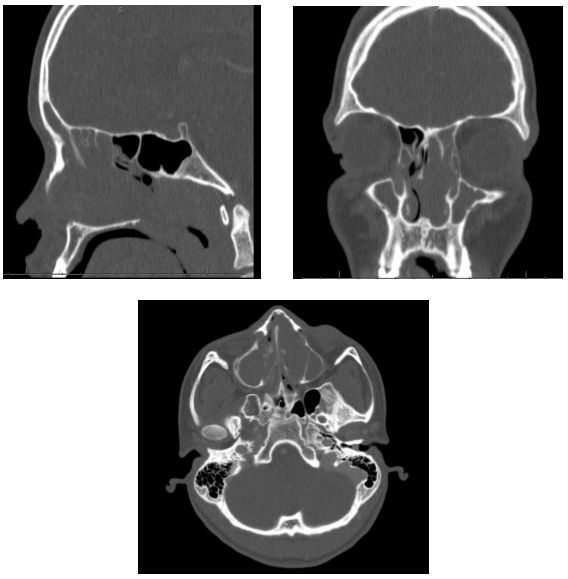
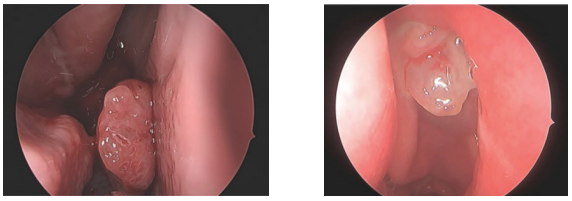


Figure 1: Preoperative CT Imaging



A B

Figure 2; A) Disease in visualized in the nasopharynx at time of the first surgery, B) Residual disease seen at second procedure

Discussion

Though rare, inverted papillomas do present in the pediatric population and should be considered in with unilateral nasal obstruction, especially when the constellation of symptoms or imaging findings do not fit more typical pediatric nasal masses. Given the risk of recurrence and malignant potential, complete excision and post operative monitoring is vital.

Conclusions

Inverted papillomas should be a consideration in pediatric unilateral nasal obstruction

Contact

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#63

Concurrent Pediatric Lingual and Submental Dermoid Cysts

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Background:

- Cysts involving the tongue, floor of mouth, and submental neck are varied and may represent congenital, inflammatory, or neoplastic sources—dermoid cysts involving these regions are uncommon.[1]

- This case report describes a novel combination of lingual and submental dermoid cysts.

Methods:

- Case report and review of literature.

Case Presentation:

- An otherwise healthy 6-year-old female who presented with a slowly enlarging, nontender submental mass.

- History reported no concerns for dysphagia, voice changes, or stridor, but endorsed gradual onset of fullness in the lower tongue that was noted with swallowing over the past year

- Physical examination revealed a midline 2 cm oval mass in the submental neck that moved with swallowing, was non-tender, and was sluggishly mobile to palpation.

Imaging:

- Subsequent ultrasound suggested the presence of two masses, prompting MRI.

- Confirmatory MRI showed two well-circumscribed, nonvascular ovoid lesions in lingual and submental tissues with similar MRI characteristics (hyperintense on T1, heterogenous on T2), suggesting the masses to be dermoid or epidermoid cysts (Figure 1).

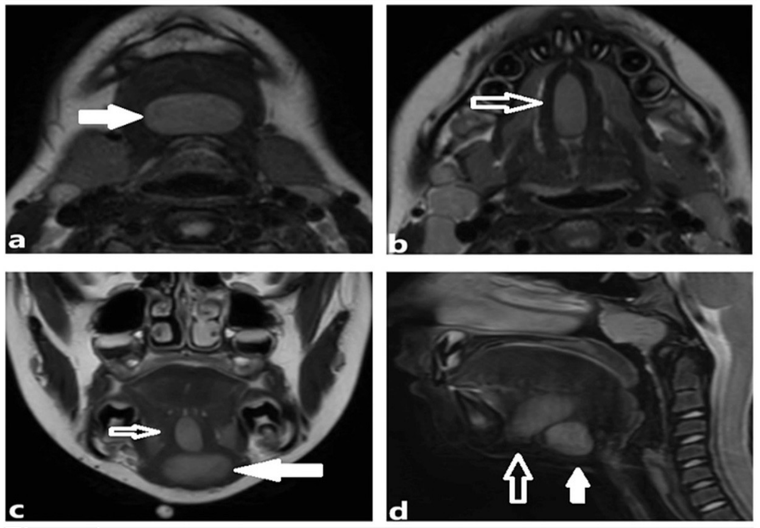

Figure 1. Axial T2 MRI demonstrating (a) submental space and (b) lingual masses. Coronal and sagittal T2 MRI (c & d) demonstrating relative positions of both lesions (submental space mass: solid arrow, lingual mass: clear arrow).

Clinical Course:

- Surgical excision was performed through a transcervical approach without intraoperative or postoperative complications (Figure 2).

- Pathology confirmed both masses to be cysts of dermoid origin—histologically, both masses showed cystic spaces consistent with dermoid cysts (Figure 3).

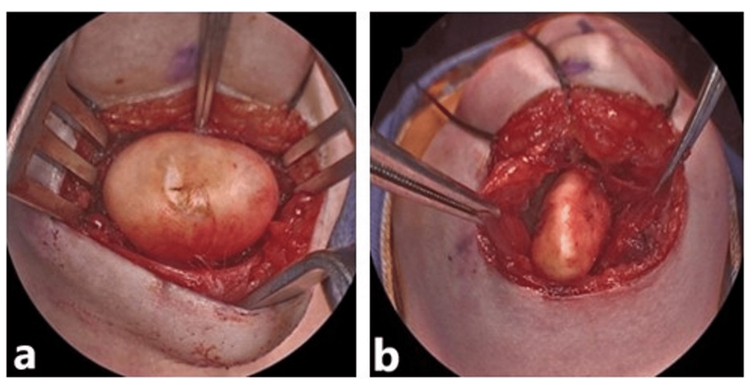

Figure 2. Excision of submental (a) and lingual (b) dermoid cysts.

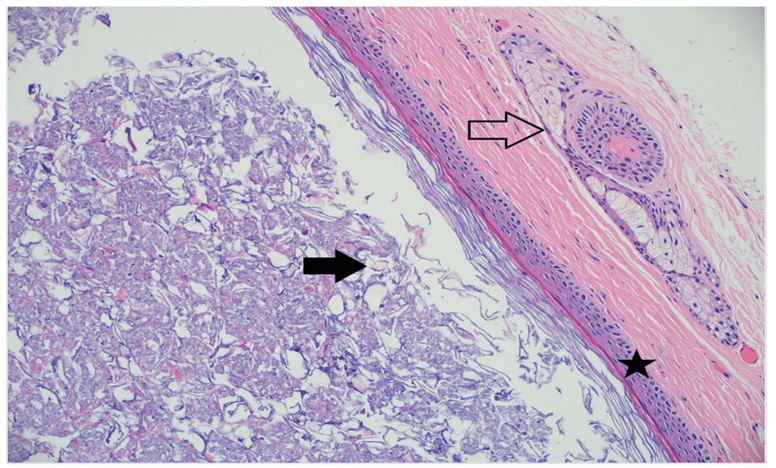

Figure 3. Unilocular cyst lined by stratified squamous epithelium (star). Lumen contains abundant keratin debris and rare hair-like fragments (solid arrow). Cyst wall contains skin adnexal structures such as pilosebaceous units (clear arrow).

Discussion:

- Dermoid cysts involving these regions are uncommon, and are most frequently reported in the submental, sublingual, and lingual spaces.[2]

- Presenting symptoms vary with cyst size and position relative to the mylohyoid muscle.

- MRI is the preferred modality to differentiate dermoid cysts from other etiologies.[3]

- While interventional techniques have been utilized in the treatment of dermoid cysts in other head and neck locations, surgical excision remains the preferred treatment for those involving the oral and floor of mouth structures.[4]

Conclusion:

- This report describes the simultaneous presence of submental and lingual dermoid cysts—which to our knowledge has not been previously reported in the literature—as well as the clinical management and excision of this novel finding.

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Percutaneous Tracheostomy in Critically Ill Children

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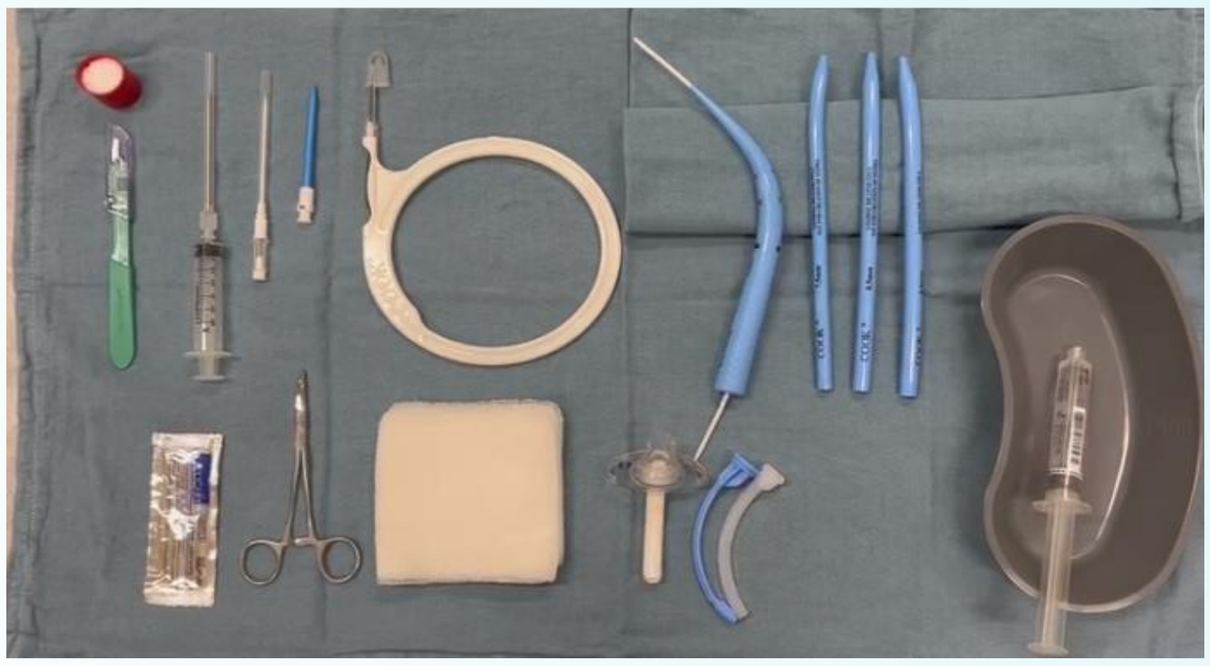
Introduction

- Tracheostomy is frequently performed on patients with prolonged intubation in the Intensive Care Unit (ICU)[2]
- Percutaneous tracheostomy (PT) has generally replaced open tracheostomy in adults because of the reduced procedural time and cost savings[2,4]
- PT is less routinely performed in children because of anatomical differences in airway anatomy and surgeon comfort[1,3]

Figure 1. Percutaneous tracheostomy instrumentation



Objectives

Our objective was to determine the safety and effectiveness of PT in children

Methods

- Retrospective chart review from 2021 to 2023
- Inclusion Criteria: All children <18 years of age undergoing bedside PT in the Pediatric ICU
- Data on time to tracheostomy from consultation, procedure time, intraoperative and postoperative complications, and time to decannulation was collected

Results

Table 1. Patient demographics (n=6)

Median age (range)	15.6 years (12.6-18.0 years)
Sex	
Male	4 (66.7%)
Female	2 (33.3%)
Weight (range)	56 kg (42.2-80 kg)
Diagnosis	
ARDS (VV-ECMO)	3 (50%)
Neuromuscular	2 (33.3%)
Cystic Fibrosis	1 (16.7%)
Indication for Tracheostomy	
Chronic ventilation	1 (16.7%)
Prolonged intubation	5 (83.3%)

Results

Table 2. Bedside PT statistics

Length of intubation prior to tracheostomy (range)	15.5 days (9-22 days)
Time from consult to procedure (range)	2 days (1-4 days)
Procedural time (range)	40 minutes (28-45 minutes)
Time from tracheostomy to discharge (range)	55 days (27-82 days)

Figure 2. Tracheostomy size at insertion

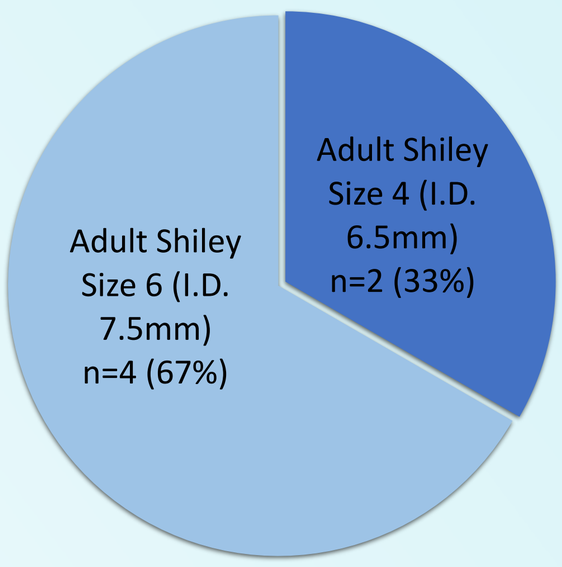


Table 3. Long-term outcomes

Patient status	
Alive	5 (83.3%)
Deceased	1 (16.7%)
Decannulation	
Decannulated	4 (66.7%)
Deceased	1 (16.7%)
Lost to follow up	1 (16.7%)

Table 4. Complications

Intraoperative complications	0 (0%)
Postoperative complications	
Minor peristomal bleeding	3 (50%)
Suprastomal granuloma	4 (66.7%)
Persistent tracheocutaneous fistula	1 (16.7%)

Conclusion

- PT was performed effectively in six children at our institution
- There were no major intraoperative or postoperative complications in our series
- With proper patient selection, PT may be a feasible option for some older children
- Continued research is needed regarding the safety and feasibility of PT in children

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Poster Number 66

Predominantly unilateral laryngomalacia in infants with unilateral vocal fold paralysis

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Introduction

- Vocal fold paralysis (VFP) is the second most common cause of stridor in infants and presents with a weak cry, difficulty swallowing, and respiratory distress [1].
- The etiologies of VFP in neonates include birth trauma, nervous system dysfunction, idiopathic, or iatrogenic (such as following cardiothoracic procedures) [2].
- Diagnosis of VFP is typically made on flexible laryngoscopy though ultrasound may also be used [3].
- Immediate treatment for infants with unilateral VFP typically consists of feeding therapy and potential diet modification, but some patients may have more significant respiratory symptoms and require earlier procedural intervention.
- We observed some infants develop predominantly unilateral laryngomalacia in the setting of a unilateral VFP, which presented with stridor, increased work of breathing, difficulty feeding, and prolapse of the ipsilateral arytenoid on flexible laryngoscopy.

Purpose

- We seek to describe a series of five infants with predominantly unilateral laryngomalacia in the setting of unilateral VFP in terms of presentation, etiology, and supraglottoplasty outcomes.

Methods

- Retrospective review that was approved by the University of Iowa and University of Utah institutional review boards.
- Patients were identified from July 2021 to April 2023 and identified by surgeon recall over that period (MES, MRH).
- Three consecutive neonates evaluated at the University of Iowa and two at the University of Utah were identified.
- Charts were reviewed for etiology of paralysis, presenting symptoms, exam and procedure findings, postoperative course, and treatment outcomes.

Results

- Etiology of VFP was iatrogenic in four patients and idiopathic in one (case 2).
- For the four patients with iatrogenic VFP, it occurred following cardiothoracic surgery.
- All patients underwent flexible laryngoscopy for diagnosis and unilateral or predominantly unilateral supraglottoplasty for treatment (some had division of contralateral aryepiglottic fold)

Case Presentations

Case 1
- Male with 3q26 deletion who underwent left lateral thoracotomy at 14 days old.
- Presented with stridor and increased work of breathing three days after surgery.
- Patient was initially only allowed nasogastric feeding.
- He underwent microlaryngoscopy with predominantly unilateral supraglottoplasty at six weeks.
- Respiratory support weened by POD 5 and thick feedings restarted.
- At five months of age, he was doing well with feeds and had no respiratory symptoms.

Case 2
- A 2-week-old male born at 34 weeks had stridor and feeding difficulty.
- He had persistent feeding difficulty and underwent microlaryngoscopy with predominantly unilateral supraglottoplasty at five weeks.
- He was stable on room air after surgery.
- At one month follow-up, he was completely orally fed, voice had improved to 60% of normal volume, and breathing was quiet.

Case 3
- 6 day old female with DiGeorge syndrome underwent cardiac surgery.
- In PICU, she demonstrated a moderate feeding impairment, weak cry, and increased respiratory effort with stridor, tracheal tugging with crying.
- She underwent microlaryngoscopy with predominantly unilateral supraglottoplasty. Tube feeds were restarted on POD1.
- Omeprazole was continued for one month postoperatively.
- Respiratory status improved significantly. Oral feeds were restarted for 10-15 minutes twice daily and then advanced to 15 minutes, six times per day, with plan for ongoing follow-up for feeding and vocal fold motion assessment.

Case 4
- One day old female who underwent pulmonary artery reconstruction.
- Found to have a weak cry, stridor, and increased work of breathing on POD2.
- Underwent left unilateral supraglottoplasty.
- Respiratory support was weaned.
- Discharged seventeen days later on 0.5L nasal cannula.
- She remained on NG tube feeds and is now followed by an outside otolaryngologist.

Case 5
- A four-week-old male underwent aortic arch reconstruction.
- He had weak cry, stridor, increased work of breathing, and feeding difficulty postoperatively.
- He underwent microlaryngoscopy with unilateral supraglottoplasty, after which he had improvement in his breathing and feeding difficulty.
- Stridor improved, most noticeable with sleeping.
- He was discharged on postoperative day two.
- He remained on NG feeds during the admission of his hospital stay.

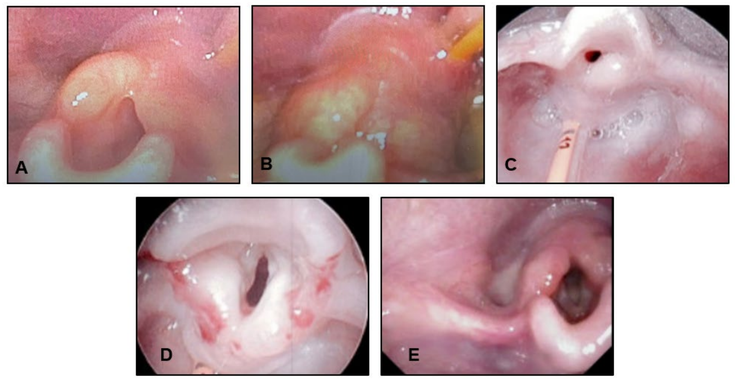

Figure 1. Series of images from one patient. A) Preoperative flexible laryngoscopy showing hooding of left arytenoid complex. B) Preoperative flexible laryngoscopy showing predominantly unilateral left-sided prolapse of arytenoid complex with omega-shaped epiglottis. C) Intraoperative laryngoscopy demonstrating supraglottic collapse. D) Intraoperative laryngoscopy after predominantly left-sided supraglottoplasty with right-sided aryepiglottic fold division. E) Postoperative flexible laryngoscopy showing improved supraglottic airway.

Discussion & Conclusions

- While laryngomalacia is common [4], the phenomenon of a predominantly unilateral laryngomalacia ipsilateral to a unilateral vocal fold paralysis has not been described previously in detail.
- In our cohort, the laryngomalacia occurred *subsequent to* the onset of unilateral VFP, and was predominantly unilateral, ipsilateral to the immobile vocal fold. This may indicate the laryngomalacia may have occurred as a result of the paralysis, likely due to loss of posterior cricoarytenoid function.
- There are several important clinical considerations in this population:
- This phenomenon emphasizes importance of early involvement of the otolaryngologist for neonates with unilateral vocal fold paralysis, as child may require early surgical intervention to improve breathing and feeding
- These infants may require more respiratory support postoperatively than the otherwise healthy infant undergoing supraglottoplasty for isolated laryngomalacia.
- Feeding impairment is predictably greater preoperatively and postoperatively than in infants with isolated laryngomalacia and thus, close collaboration with the speech-language pathologist with periodic instrumented swallow assessment is critical.
- Use of flexible fiberoptic endoscopic evaluation of swallow (FEES) is generally tolerated in infants and can allow for more frequent re-assessment without the radiation exposure required for videofluoroscopy.
- The supraglottoplasty itself can be tailored to the problem and may be limited to solely unilateral aryepiglottic fold division and excision of the prolapsing portion of the arytenoid complex or can also include contralateral aryepiglottic fold division as needed.
- These infants will require longer follow-up than those with isolated laryngomalacia due to the unilateral VFP.

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Re-evaluating post-discharge treatment paradigms in pediatric acute mastoiditis

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Introduction

Consensus regarding a treatment algorithm for acute mastoiditis is lacking, with significant variation in rate and type of surgical intervention, antibiotic choice, and antibiotic duration. (4,5) Little literature directly addresses the appropriate antimicrobial treatment of acute pediatric mastoiditis. Some argue that osteal involvement—as evidenced by coalescent mastoiditis—necessitates prolonged, parenteral antibiotics. We reviewed all cases of pediatric acute mastoiditis hypothesizing that, in pediatric patients undergoing surgical intervention for acute mastoiditis, post-discharge treatment with oral antimicrobials would result in equivalent outcomes compared to prolonged parental regimens.

Methods and Materials

Retrospective review of all patients having operative intervention for acute mastoiditis at a free standing, academic children's hospital from 2014-2023. ICD-10 codes were used to screen operative records. Children with intracranial infection or having elective surgery for chronic ear disease were excluded.

Results

Fifty-eight patient records met inclusion criteria—thirty-six in the oral antibiotic group and twenty-two in the PICC group. No significant demographic differences existed. There were no differences in average lab values on presentation between groups.

	PICC (n=22)	PO (n=36)	P value
WBC	16.2±7.1	14.5 ± 6.5	0.79
CRP	6.8±6.3	6.0±5.8	0.67
ESR	76.1±38.8	62.0±40.1	0.65
Temperature	99.8±2.0	99.4±1.8	0.46

Table 1. Pre-Treatment Labs and Vitals

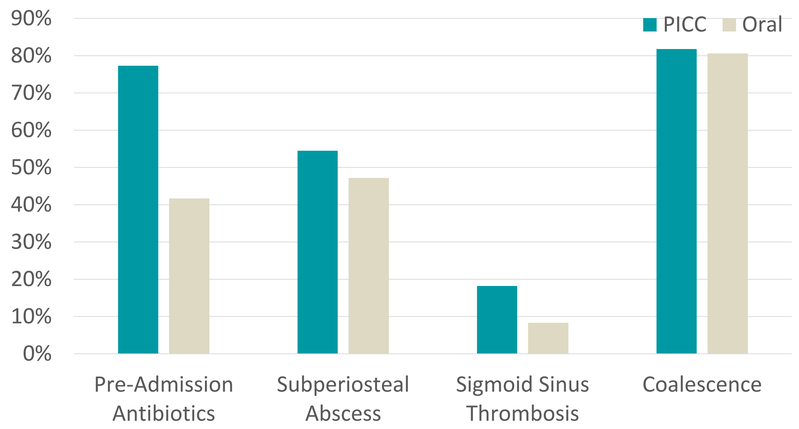

Figure 1: Pre-Treatment Characteristics by Group

Pre-admission antibiotics were more common in the PICC group. Radiographic findings were similar between groups. There was no difference in the types of surgery performed by group.

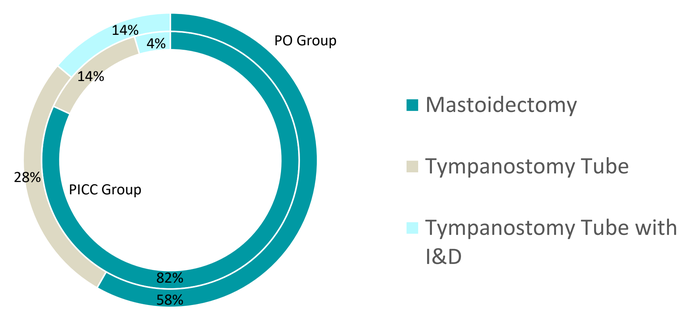

Figure 2: Surgery Performed by Group

Patients in the PICC cohort has longer (10 vs 5 days; 0.02) duration of inpatient stay and received more antibiotics (3 vs 2; 0.01). Post-discharge antibiotic treatment was significant longer in the PICC group (32 vs 18 days; p<0.001). There were no differences in cultures or number of resistances by group. Cure rates were similar between groups. PICC related complications occurred in 60% of patients.

PICC related complications occurred in 60% of patients. Severe complications (27%) included dislodgement (18%, PICC infection (5%), and DRESS (5%).

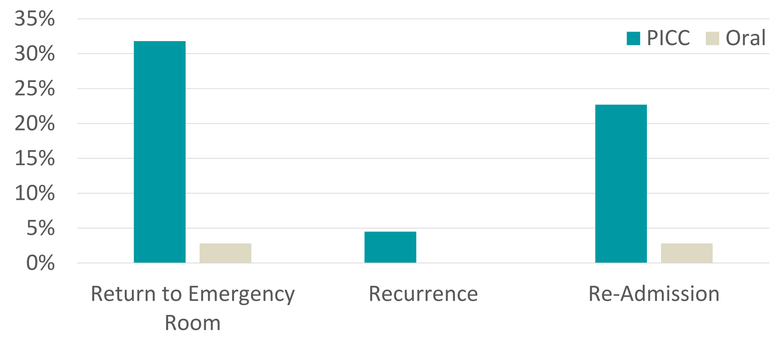

Figure 3: Complications

Discussion

These results mirror the sole comparative study previously published, with no difference in treatment outcomes for oral versus PICC antibiotics following surgery for mastoiditis. PICC complications in this series were higher than those seen in Moore et al, highlighting the burden associated with PICC placement. Similarly, these results correlate with findings in the non-ENT literature that osteitic infections can be adequately treated with oral antibiotics.

This study is limited by its retrospective nature, lack of standardized treatment approach between patients, and potential for more significant disease in children in the PICC cohort based on findings such as longer duration of antibiotics and higher rate of pre-treatment antibiotics.

Conclusions

In children with acute mastoiditis who undergo operative intervention, discharge on oral antibiotics has similar treatment outcomes to prolonged parenteral antibiotics while reducing the burden of PICC related complications.

Contact

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Poster #74

In The Rough: Decade-Long Analysis Examining Golf Injuries of the Head and Neck in Children

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Introduction

Golf is a popular sport among players of all ages, and it offers a relaxing and enjoyable way to spend time outdoors. However, like any sport, there are potential risks associated with golfing activities and the equipment used.

Traditionally, sports like football and basketball, which are often dominated by males, have been known for the increased risk of head and neck injuries. Recent studies conducted in the last five years have shown that awareness and safety measures in these sports have led to a gradual decrease in head and neck injuries.

Surprisingly, the conversation surrounding volleyball has been somewhat overlooked in this context. While there has been some research on maxillofacial trauma injuries related to volleyball in adults, these injury rates have only seen marginal improvements and have failed to consider the pediatric population2. Recognizing the elevated risk of head and neck injuries in young players participating in volleyball is crucial, given their vulnerability to long-term consequences and potential disruptions in development.

This study aims to investigate the frequency of emergency department visits nationwide for head and neck injuries in pediatric patients resulting from incidents related to golfing activities.

Method

- **National Electronic Injury Surveillance System (NEISS)**
  - Randomized sampling of hospitals with 24 hour emergency department services across the United States
- **Inclusion Criteria**
  - Year of ED visit: 2013-2022
  - Population: pediatrics
  - Injury: head and/or neck, resultant and/or related to golf
- **Population demographics**
  - 2,002 eligible injuries identified
    - *Adjusted to 65,842 cases nation-wide*
  - Mean age: 8.82 years old
  - Sex: ***64.9% male***, 35.1% female
  - Race: ***53.4% white***, 9.3% black, 29.5% unspecified

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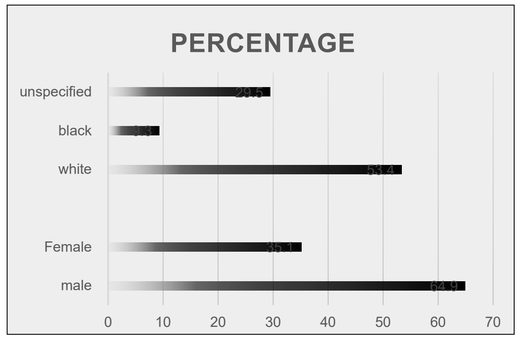

Figure 1. Population demographics of pediatric golf head and neck injury patients.

Results

Injury Type:

Injury	Percent
Lacerations	42.7%
Internal Injuries	25.4%
Concussions	9.3%
Contusions	7.6%
Fracture	7.6%
Hematoma	2.1%

Most common areas of injury:

Body Part	Percent
Head	71.1%
Face	15.0%
Neck	5.9

Treatment:

Treatment Approach	Percent
Treated and released	89.7%
Left without evaluation	0.9%
Treated and admitted OR held for observation	1.8%

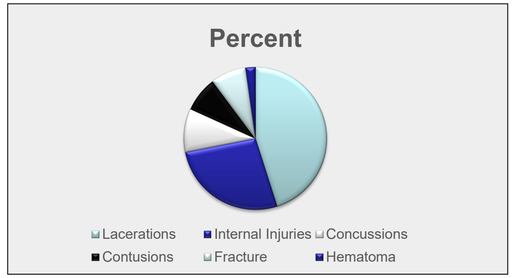

Figure 2. Major injury types identified in golf-related head and neck ED visits.

Conclusions

Golf-related incidents have led to a substantial number of pediatric patients seeking emergency department care. Over the past decade, there have been an estimated 65,842 head and neck injuries associated with golf among this age group.

These injuries are more commonly seen in males, with the most frequent types being concussions, followed by internal injuries. Although head and neck strain/sprains (5.9%) and fractures (7.6%) occur less frequently, they are still noteworthy due to the potential for long-term consequences such as limited range of motion in head and neck joints and persistent pain.

In light of these findings, it is imperative that safety measures and supervision are prioritized when children are engaged in golf activities. Furthermore, raising awareness among coaches and parents about recognizing and responding to these injuries is of paramount importance to ensure the well-being of young golfers.

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THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

A Decade-Long Analysis Examining Head and Neck Injuries in Children Caused by Volleyball Activities, Apparel, and Equipment

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Introduction

Volleyball is a popular sport among children, particularly adolescent females. However, there is considerable risk of injury associated with both sport and use of apparel and equipment.

Traditionally, male-dominated contact sports, such as football and basketball, have been recognized for increased risk of head and neck injuries. Studies within the last 5 years have noted that head and neck injuries among these sports have gradually decreased, likely in response to this robust awareness[1].

However, volleyball has been notably absent from these conversations. While there has been some recent research on volleyball-related maxillofacial trauma injuries in adults, these rates have only marginally decreased and have overlooked the pediatric population.[2] Recognizing increased risk of head and neck injuries from volleyball in the pediatric population is critical due to this population's vulnerability to long-term sequelae and developmental disruption.

This study aims to assess the frequency of emergency department visits nationwide for head and neck injuries in pediatric patients resulting from volleyball-related incidents.

Method

- **National Electronic Injury Surveillance System (NEISS)**
  - Randomized sampling of hospitals with 24 hour emergency department services across the United States
- **Inclusion Criteria**
  - Year of ED visit: 2013-2022
  - Population: pediatrics
  - Injury: head and/or neck, resultant and/or related to volleyball
- **Population demographics**
  - 2,065 eligible injuries identified
    - *Adjusted to 60,087 cases nation-wide*
  - Mean age: 14.10 years old
  - Sex: ***79.0% female***, 21.0% male
  - Race: ***53.4% white***, 9.3% black, 29.5% unspecified

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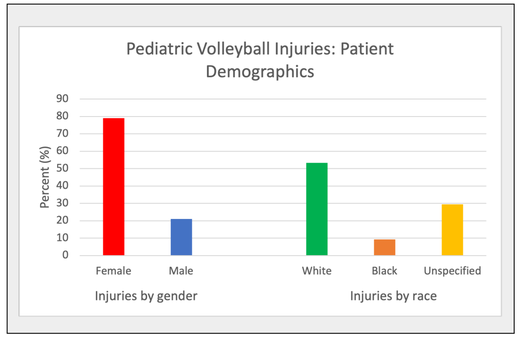

Figure 1. Population demographics of pediatric volleyball head and neck injury patients.

Results

Injury Type:

Injury	Percent
Concussions	35.6%
Internal Injuries	30.8%
Lacerations	9.1%
Contusions	8.6%
Strain/Sprain	4.6%
Fracture	2.1%

Most common areas of injury:

Body Part	Percent
Head	71.1%
Face	15.0%
Neck	5.9

Treatment:

Treatment Approach	Percent
Treated and released	96.9%
Left without evaluation	1.5%
Treated and admitted OR held for observation	1.3%

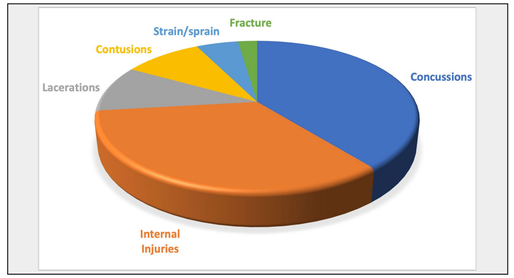

Figure 2. Major injury types identified in volleyball-related head and neck ED visits.

Conclusions

Volleyball related injuries contribute to emergency department visits among pediatric patients. There are an estimated 60,087 volleyball-related injuries of the head and neck in pediatric patients over the last ten years.

These injuries are more common in females and the most common injuries were concussions followed by internal injuries. While head and neck strain/sprains (4.6%) and fracture (2.1%) were less common, these injuries are still noteworthy due to risk of long-term sequelae, including reduced range of motion of head and neck joints and chronic pain.

In all, it is important that children are supervised when playing volleyball and that their equipment is safe for use. Further, coaches working with organized volleyball teams should be encouraged to be familiar with the signs and symptoms of concussion.

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THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

Presentation of Nasal Foreign Bodies in the Emergency Department in Children

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Introduction

- Nasal foreign bodies (NFBs) in pediatric patients will cause patients to present to the emergency department (ED).
- Inadequate observation by adults and the tendency for children to explore their surroundings with their mouths and open cavities allows access and the ability for small objects to get stuck.
- Given the size and cavity of the pediatric nasal body, a foreign object can get trapped and cause complications like mucosal damage, bleeding, infection, and aspiration.
- This study aims to estimate nationwide ED visits for pediatric NFBs and the associated products.

Methods

- The National Electronic Injury Surveillance System (NEISS) analyzed ED visits for facial foreign bodies from 2013-2022.
- Cases with FB located outside the nares and other parts of the face were excluded from analysis.
- This database collects data from 100 participating EDs that are used to calculate the probability of ED visits to the 5,000 EDs nationwide to determine the nationwide incidence.
- The data collected included demographics, age, disposition, product type, and 1-2 sentence narrative about the event.
- Data was analyzed quantitively using descriptive analysis to determine the incidence and compare cohorts.

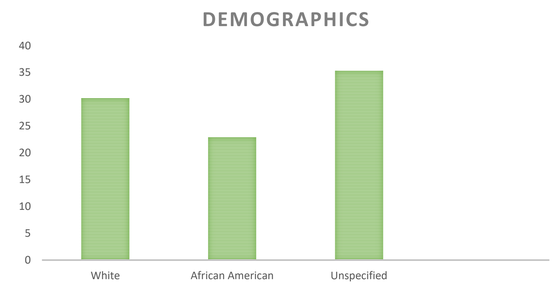

Figure 1. This graph displays the breakdown of the demographics of the cohort used in the analysis.

Product Description	Product Code	Percentage of Cases
Jewelry (Beads)	1616	44.4
Paper Products	1137	9.2
Building Sets	1345	8.7
Plastic Products	1145	1.1
Molding Compounds	1376	2.1
Toys, Unspecified	1395	3.9
Desk Supplies	1650	1.9
Hair Curlers, Curling Irons	1682	2.7
Pens/Pencils	1685	1.4
Coins	1686	1.0
Crayons or Chalk	5010	3.1
Balls	5016	1.8

Table 1. This table shows the percentage injuries that were caused by specific products and the product code that they were coded under.

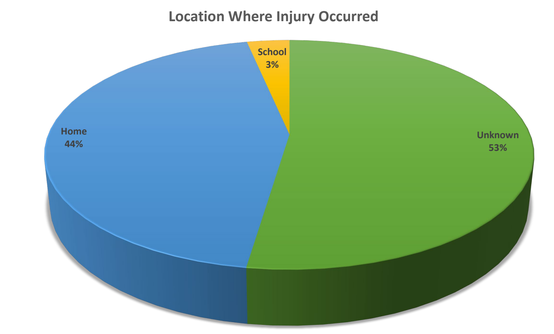

Figure 2. This chart displays the location of where patients happened to get objects stuck in their nose prior to presenting to the ED.

Results

- 11,954 ED incidents of NFB were recorded and analyzed after excluding 589 cases.
- The mean age was 3, with 57.7% females and 42.3% males. The cohort comprised 30.2% White, 22.9% African American, and 35.3% unspecified.
- Common NFBs were jewelry/beads (44.4%), paper products (9.2%), building sets (8.7%), unspecified toys (3.9%), crayons/chalk (3.1%), and batteries (1%).
- 44% at home, 3.3% at school 52% occurred at other locations.
- After the ED presentation, 96.2% were treated/examined and released, while 3% left without treatment.

Conclusion

- This updated study over a 10-year period estimated over 320,000 ED visits nationwide.
- Batteries, crayons, building sets, and balls were common in males, while jewelry and hair accessories were more common in females.
- With new consumer products being introduced to markets every year, many carry an inherent risk of becoming NFBs.
- Quick recognition and retrieval of these objects is important to avoid any potential complications that can arise.

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Quality and Readability of Parent Education Resources for Laryngeal Clefts

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ABSTRACT

Background:

- This study evaluates the quality and readability of websites on laryngeal clefts.

Methods:

- Google was queried with the search term "laryngeal cleft" and the first 50 results were search for patient education resources, yielding 18 websites. Website quality was assessed using the DISCERN instrument. Readability was evaluated using the Flesch-Kincaid Reading Grade Level (FKGL) and Flesch Reading Ease Score (FRES). Correlations were calculated. Website metrics were compared to information provided on the topic by the online artificial intelligence language model ChatGPT.

Results:

- Mean DISCERN score for the websites was 38 (SD = 10.2, median = 35.5). Mean score for the FKGL was 10.1 (SD = 2.9, median = 9.9). Only four websites were within the optimal range of 8 and below. Mean FRES was 49.2 (SD = 13.8, median 50), with only two websites in the optimal range of scores above 65. ChatGPT's FKGL and FRES were 13.8 and 33.2 initially but improved to 7.5 and 65.8 when requesting plain language. Initial DISCERN score was 27 but could be improved to 66 with more nuanced questioning.

Conclusions:

- Most websites about laryngeal clefts were lacking in quality and above the recommended reading level for public health information. As parents increasingly depend on supplementing their medical information online, available resources need to improve in quality and readability. Advanced artificial intelligence products such as ChatGPT may represent viable solution but ensuring the accuracy of the information provided represents an ongoing challenge.

INTRODUCTION

- Understanding medical jargon can be daunting for the non-medical population, underscoring the importance of personal health literacy for informed healthcare decisions[1,2].
- In today's digital age, the internet is the primary source of publication education including health information[3].
- The quality and readability of health materials is crucial, with guidelines recommending a sixth-grade reading level due to the average American adult's reading skills being at an eighth-grade level[3,4].
- Artificial intelligence, exemplified by ChatGPT, plays a pivotal role in delivering fast and accurate healthcare information, benefiting education, research, and practice[6].
- Accessible and high-quality health information is essential for patients and parents to make informed medical decisions.
- **We aim to assess the quality and readability of online health information on laryngeal clefts, both from search engine websites and ChatGPT-generated content.**

METHODS

- Search term "laryngeal cleft" was inputted into Google on July 15, 2023. First 50 results were screened for patient education resources, yielding 18 websites
- The DISCERN instrument assessed quality of the website
  - scaling from 16-80 with higher numbers equating to higher quality.
- Flesch-Kincaid Reading Grade Level (FKGL) and Flesch Reading Ease Score (FRES) assessed readability of the website
  - FKGL: determines grade level of material
  - FRES scale: 0-100 with 0 being unreadable and 100 being the most readable.

RESULTS

- For initial website review:
  - Mean DISCERN score was 38 (SD=10.2, median= 35.5). Mean score for FKGL was 10.1 (SD=2.9, median= 9.9)
    - Only 4 websites were within optimal range of 8 and below.
  - Mean FRES was 49.2 (SD=13.8, median= 50)
    - 2 websites in the optimal range of scores above 65
- For ChatGPT analysis:
  - Initial DISCERN score was 27 but improved to 66 with nuanced questioning
  - Initial FKGL was 13.8 and FRES was 33.2
  - When requesting plain language- FKGL improved to 7.5 and FRES to 65.8

DISCUSSION

- The results of our study reveal that the majority of websites discussing laryngeal clefts fell short in terms of quality and exceeded the recommended reading level for public health information.
- Previous studies in otolaryngology have found similar findings to ours with many resources out there regarding medical conditions and treatment exhibiting too high of language for an eighth grade reading level[7].
- Patients who possess a good understanding of their treatment plans tend to become more engaged in the decision-making process, which has been demonstrated to enhance their overall outcomes[1].
- ChatGPT can possibly represent a promising tool for the assessment as well as improvement of the quality and readability of medical content on the internet[6].

CONCLUSION

- With a growing reliance on online medical information among parents, it is crucial for the available resources to enhance their quality and readability.
- Advanced artificial intelligence tools like ChatGPT could potentially offer a solution, but ensuring the accuracy of the information they provide remains an ongoing challenge.

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Complications of Surgical Management of Velopharyngeal Insufficiency: A Scoping Review

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INTRODUCTION

- Velopharyngeal insufficiency (VPI) has various etiologies, including as a result of adenoidectomy or from cleft palate, persisting even after cleft palate repair in up to 20-30% of patients.[1]
- Surgical interventions for VPI have demonstrated promising results in improving speech and velopharyngeal function, but potential complications include: obstruction of nasal airflow, sleep apnea, hyponasal speech, dehiscence, and respiratory distress.
- Limited research exists examining the full scope of surgical complications, so **the aim of our study was to use a systematic approach to study the post-operative complications associated with each major VPI surgery among pediatric patients: Pharyngeal Flap, Sphincter Pharyngoplasty, Furlow, Buccinator, and implant procedures.[2]**
- This is important for a better understanding of surgical outcomes to help guide decision-making and to provide patients and their families a fuller context.

METHODS

- This scoping review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[3]
- A search was conducted in January 2023 of the following databases: PubMed, Web of Science, Scopus, and Embase (**Figure 1**).
- Inclusion criteria: studies published in English which described complications associated with corrective surgery for VPI in pediatric patients (either Pharyngeal Flap, Sphincter, Furlow, Buccinator, and implant procedures) and delineated complications for each surgery type or patient.

Figure 1: PRISMA Diagram

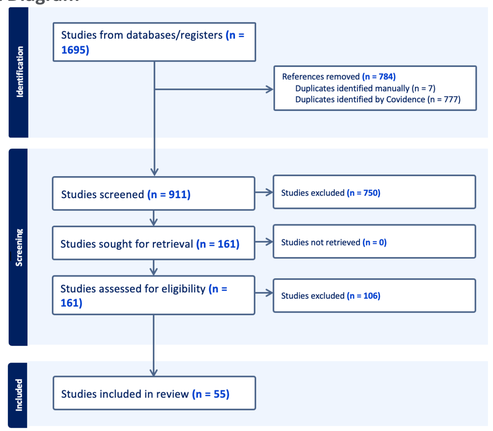

Table 1: Most common complications, by surgery type

Surgical Technique	Top complications (% Frequency)
Pharyngeal flap	Hyponasality (2.9%), obstructive sleep apnea (2.0%), snoring (1.9%)
Sphincter	Snoring (2.1%), hyponasality (2.0%), dehiscence (0.9%)
Furlow	Snoring (1.9%), fistula (1.2%), delayed wound healing (1.2%)
Buccinator	Difficult mastication (10.6%), dimple formation (6.0%), tubing of flap (6.0%)
Implant	Implant lost (10.2%), infection (0.6%), obstructive sleep apnea (0.6%)

RESULTS

- Our search yielded 911 unique abstracts; 55 publications fulfilled eligibility criteria and were included in the study (**Figure 1**).
- 11 studies were prospective. The remainder were retrospective, including 3 database reviews.
- Across the studies, there were 5,947 patients treated for VPI.

RESULTS, CONT'

- Surgical techniques reported: Pharyngeal flap (37/55 studies, 3828 patients), Sphincter pharyngoplasty (20/55, 1125), Furlow (7/55, 430), Buccinator (2/55, 66), and implant procedures (3/55, 157). The remaining patients received unspecified techniques or a combination of multiple techniques.
- Complications categories: aspiration, death, dehiscence, desaturation, difficult mastication, dimple formation, fistula persistence, flap necrosis/ischemia, unspecified flap/graft complication, hyponasality, implant lost, infection, laryngobronchospasm, nasal/airway obstruction (snoring) persisting 6 months post-op or requiring surgery, nasopharyngeal stenosis, obstructive sleep apnea, pneumonia, bleeding/hematoma, reintubation or prolonged ventilation, respiratory distress, and tubing of flap. **Table 1** displays the most common complications by surgery type.

DISCUSSION

- Hyponasality, sleep apnea, and snoring were among the most common complications associated with VPI corrective surgery.
- While snoring was the most common complication associated with Sphincter pharyngoplasty and Furlow, hyponasality was the most common for Pharyngeal flap.
- Additional studies are needed to assess the complications resulting from less commonly used techniques.

CONCLUSION

- We believe that our study findings will be informative for surgeons treating children with VPI. Addressing the challenges posed by VPI requires a multidisciplinary team of healthcare professionals, including speech-language pathologists, otolaryngologists, and plastic surgeons.

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Poster # 84

Challenges in Diagnosing and Managing Third or Fourth Branchial Cleft Cysts in Neonates: A Case Report

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The Children's Hospital

Background

Third and fourth branchial cleft cysts are rare congenital anomalies.

They present unique challenges in both diagnosis and treatment.

Methods

Case Report

Conclusions

This case **underscores** the role of comprehensive and iterative **diagnostic and therapeutic approaches** in managing complex **branchial cleft cysts**.

Early and recurrent interventions, as demonstrated by the multiple readmissions and procedures, **may be required** to fully address and resolve such anomalies.

Implications

Presentation and **management** of **third and fourth branchial cleft cysts** in neonates can be intricate and necessitate a **multifaceted and iterative approach** to both diagnosis and treatment.

Imaging, flexible laryngoscopy, and other diagnostic modalities aids in identification and treatment of branchial cleft cysts as well as **monitoring potential complications** such as vocal cord weakness.

Proper follow-up, even in a telehealth setting, ensures timely identification of recovery and potential complications, leading to better patient outcomes.

Results – Case Timeline

Day of Life 3: Neonate admitted due to enlarging neck mass and positional oxygen desaturations. IR aspiration and a pigtail catheter was placed. Gentamicin started.

Day of Life 18: Neonate readmitted. I&D conducted (16-gauge angiocath drain). Bugbe Cautery performed. Flexible laryngoscopy reveals vocal cord weakness. Inpatient ampicillin/sulbactam started. Discharged with amoxicillin.

Day of Life 31: Readmission with I&D and vessel loop drain placed. Direct laryngoscopy identified no tract hence no re-cautery was done. Discharged with Levofloxacin.

Day of Life 47: A planned flexible laryngoscopy showed vocal cord recovery. Piriformis sinus tract identified. Left hemithyroidectomy. Transcervical excision of a third branchial cleft cyst.

Day of Life 90: Telehealth follow-up. No redness, drainage, or phonation abnormalities. Complete resolution of symptoms. No further complications noted up to the present.

*No Disclosures

Obstructive Sleep Apnea in Patients with Spinal Muscular Atrophy

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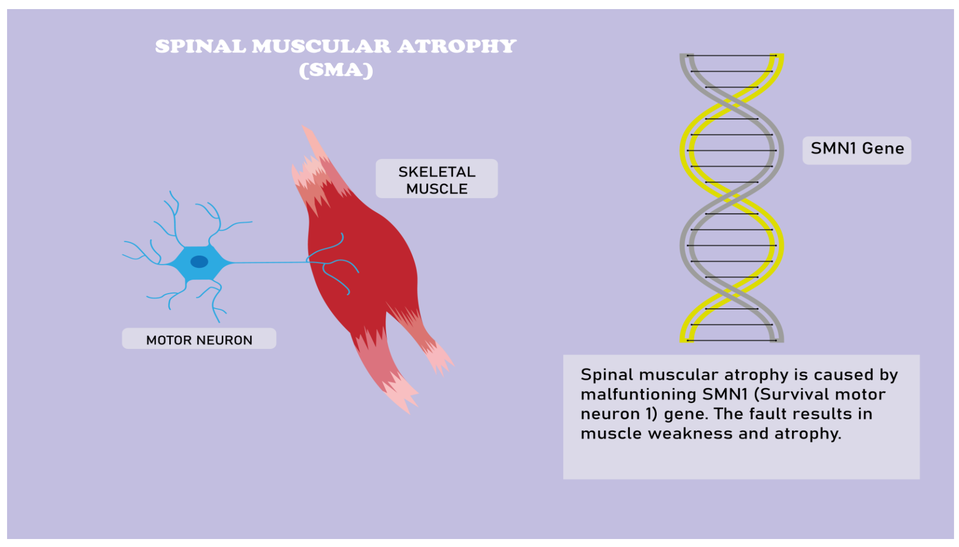
abstract

Spinal muscular atrophy (SMA) in pediatric patients has been associated with sleep disturbances whose treatment is not well understood. In this case series, we describe diagnosis and surgical management of obstructive sleep apnea (OSA) in patients with SMA type III treated with novel gene therapy who presented to the otolaryngology department of a tertiary level hospital.

background

SMA is a genetic disorder resulting from a deletion of the *SMN 1* gene on chromosome 5. This inherited neuromuscular disorder causes a loss of motor neurons and a subsequent inability for muscle movement that can cause breathing and sleeping issues.



methods

Two patients were pulled from a data search for patients with a history of SMA and tonsillectomy. These patients' charts were then analyzed for past polysomnogram (PSG) scores before surgery, after surgery, and over the course of biphasic positive airway pressure (BiPAP) titration.

acknowledgements

I would like to express my gratitude to the faculty within the otolaryngology department at Nationwide Children's Hospital, particularly Dr. Chiang, Dr. Pattisapu, and Dr. Bassett.

results

Patient 1 is a 16 year old male. He started novel gene therapy with nusinersen at age 10 and then switched to risdiplam at age 14 and gene therapy with risdiplam is currently ongoing.
Patient 2 is a 27 year old male. He started novel gene therapy with risdiplam at age 26 and gene therapy is ongoing.

	Patient 1			Patient 2		
Age of OSA diagnosis	5			18		
Initial PSG scores (AHI/LSAT/ETCO2)	6	85	46	17	78	52
Age at tonsillectomy	5			18		
Post-tonsillectomy PSG (AHI/LSAT/ETCO2)	2.9	92	47	3.7	90	47
BIPAP settings	--			17/11		
Post-BIPAP PSG (AHI/LSAT/ETCO2)	--			2.2	92	52

discussion

While tonsillectomy may be initially effective and show initial improvement in PSG scores in patients with SMA and OSA, its improvement might only be limited. Future directions would entail looking at a larger cohort of patients with SMA and OSA to describe their management and respective sleep scores to elucidate the role of tonsillectomy in these patients.

references

Spinal Muscular Atrophy (SMA): Types, Symptoms & Treatment (clevelandclinic.org)

Graphics: SMA Awareness Month 1: What is SMA? – Bilkent UNAM iGEM Team

Vertigo and Hypothyroidism: A Case Report and Scoping Review

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51st SENTAC ANNUAL MEETING
Charleston, SC · Nov 30-Dec 2, 2023

Introduction

- Vertigo is a common yet challenging presenting complaint in medicine
- It is estimated that ~ 1.5 million Canadians suffer from vertigo [1]
- Common causes of vertigo are related to **inner ear balance** or **systemic** insults [2]
- In 2020, a patient presented with **vertigo with initially no cause** and with completely normal vestibular tests – upon further testing, it was found she was also **hypothyroid**.
- Curiously, the patient's vertigo only **ceased when treated for her thyroid**
- As hypothyroidism and vertigo are a **rare clinical association**, the aim of this scoping review of literature is to evaluate the **association between hypothyroidism and vertigo.**

Methods

Design

- Case report: **verbal consent** obtained
- Scoping review strategy: **PRISMA-ScR checklist**

Inclusion Criteria

- Studies identified through e-searches of 5 databases with citation searches: OVID, PubMed, Cochrane, Embase, and CINAHL
- **Inclusion** criteria: min. 1 case of hypothyroidism-related vertigo in both pediatric and adult populations
- **Exclusion** criteria: abstracts and conference proceedings, nonhuman studies or foreign language

Primary Outcomes

- Population demographics, **thyroid & vestibular exams performed, treatment offered** and response to treatment, theories proposed

Results

Case Report

- **15F** competitive speed skater
- Chief complaint: **3 mo. history of vertigo**
- No headache/otologic sx
- ROS: fatigue and menorrhagia
- No FMHx thyroid disease
- **O/E:** all vestibular testing normal
- **Labs**: Iron profile & CBC WNL. **TSH : 10.2 mIU/L**
- Tx: Synthroid
- Patient **euthyroid & symptom-free** after 4 mo

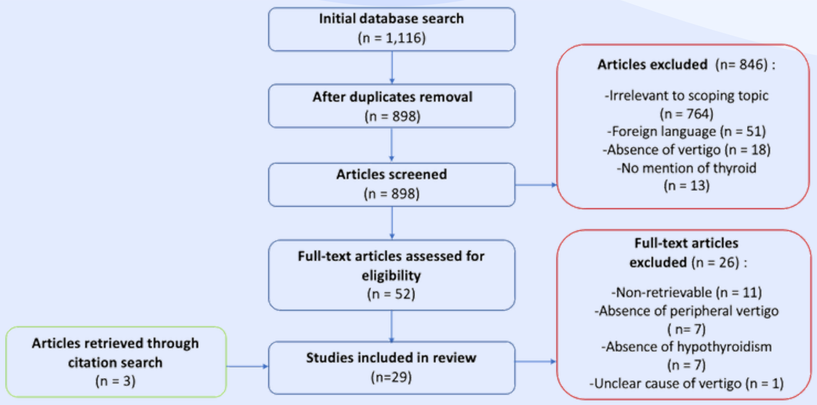

Figure 1. PRISMA flow diagram for study selection.

Scoping Review

Publications years	1963 - 2022
Study type	24/29 papers clinical 5/29 literature reviews
Age range	8 – 85 + years old
Population focus	21/24 adult 1/24 pediatric 2/24 both
Total no. of H x V cases	**2,485**

Table 1. Demographics of included articles.

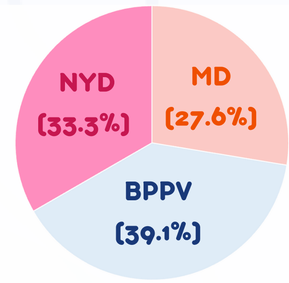

Figure 2. Vertigo class distribution.

Figure 3. Effect of Synthroid on vertigo.

- 13/24 studies **did not define vertigo**
- Other common ENT sx : **hearing loss, tinnitus, aural fullness, dysarthria**
- Most common thyroid tests : **TSH/T4/T3/TPOAb/TgAb**
- Most common vestibular tests: **Dix-Hallpike, neuro exam & audiometry**
- No two studies did the same thyroid & vestibular investigations

Discussion

- Hypothyroidism could **modify endolymphatic flow of the inner ear**
- Inflammatory/metabolic changes --> inner ear **inflammation** --> dysregulation of endolympathic homeostasis
  - Arrival of thyroid complexes could trigger the release of **additional cytokines** & cascade of inflammatory/ immune reactions [3]
- Thyroid x MD: Both could derive from an **underlying common susceptibility** to autoimmune disturbance
- Thyroid x BPPV: thyroid autoimmunity could…
  - allow its complexes to travel through the perilymph barrier and **mimic displaced otoliths**
  - change the expression of ion transporters of the inner ear, increasing **endolymphatic volume** (Pendred-like)
  - **impair circulation** of inner ear blood flow
- Impact of Synthroid treatment: currently **no consensus** on its effect on vertigo
  - In MD: mixed response. Some studies demonstrate symptomatic control of vertigo, while other studies show that thyroid dysfunction increases
  - In BPPV: there is an increased risk of recurrence of BPPV in patients with a history of hypothyroidism on Synthroid [4]

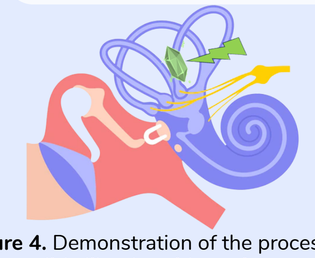

Figure 4. Demonstration of the process of **otolith-like thyroid autoimmune complexes** in the SCC, triggering BPPV.

Limitations

- **Heterogeneity** of the definition of vertigo
- Significant **heterogeneity** in age & gender distribution
- Heterogeneous **design** & **methodology** (especially in **thyroid and vestibular tests**)
- Review limited by a **small number of studies & small sample size** of patients actively being treated with **Synthroid**

Conclusion

- **1st scoping review** of hypothyroidism x vertigo covering vertigo NYD, MD, BPPV, Synthroid effect
- More studies are supporting the role of **thyroid autoimmune processes** as a causative factor in **vestibular conditions**
- Next step: cohort studies testing **thyroid hormone levels in dizzy patients**
- Next step: administering the **Dizziness Handicap Inventory** to hypothyroid pts

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Poster #93

Factors associated with suprastomal collapse in pediatric tracheostomies

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Background

Suprastomal collapse is a potential complication of tracheostomy, occurring in an estimated 1-18%[1-3] of children, which can act as a barrier to successful decannulation. Suprastomal collapse results from loss of structural integrity of the tracheal cartilaginous framework above the stoma site. The etiology of suprastomal weakening and collapse has been hypothesized as chronic compression secondary to the tracheostomy tube, although few studies have investigated this topic.[1-5]

Research Objectives

The goal of our study was to review factors associated with suprastomal structural changes following pediatric tracheostomy tube placement.

Methods

A retrospective cohort study of all children who underwent tracheostomy tube placement at a tertiary care children's hospital between 2/2018-12/2022. Baseline characteristics were summarized as means and standard deviations (SD) or proportions. Unadjusted comparisons and group differences were assessed using a t-test. Categorical variables were tested with Chi-square or Fisher's exact texts as appropriate.

Results

A total of 146 patients underwent 149 tracheostomy placements and followed by interval Microdirect Laryngoscopy and Bronchoscopy (MLB). The average age at tracheostomy was 3.4 ± 5.2 months old. Comorbidities most commonly included prematurity (n=69, 47.2%), Genetic/ syndromic disorder (n=85, 58%), and hypotonia (n=118, 81%). At the time of tracheostomy, 123 patients (84.2%) were ventilator-dependent, and 30 (20%) had been diagnosed with distal tracheobronchomalacia. Supra-stomal collapse was seen in 27/103 (26%) patients one month after tracheostomy, compared to 24/73 (33%) patients at six months, 41/83 (49.4%) patients at 12-18 months, and 11/17 (78%) patients at three years post-tracheostomy. Age at tracheostomy tube placement (1.84±3.8 months vs. 5±6.3 months, p=0.007), bronchopulmonary dysplasia (n=23 (56.1%) vs. n=12 (28.5%), p=0.015), and the presence of supra-stomal granulation tissue at interval MLBs (n=37 (90.2%) vs. n=28 (66.68%), p=0.015) were associated with an increased risk of supra-stomal collapse one year after tracheostomy. The presence of hypotonia, distal tracheobronchomalacia, and the use of flextend vs. non-flextend tracheotomy tubes one year from surgery were not associated with supra-stomal collapse.

Table 2. Patient Characteristics by Collapse

Characteristic	Collapse	No Collapse	P-value
All	**41 (49.4)**	**42 (50.6)**	**-**
Age at trach (months), Mean (SD)	1.84 (3.84)	5.0 (6.3)	**0.0073**
Medical Background, n (%)			
Prematurity	23 (56.1)	21 (50)	0.8272
Bronchopulmonary dysplasia	23 (56.1)	12 (28.5)	**0.0148**
Syndromic/genetic disorder	20 (48.8)	23 (57.5)	0.6627
Hypotonia	32 (78.0)	36 (90)	0.4052
1 Year ventilation status, n (%)			
Any ventilator dependence	2 (0.07)	9 (0.18)	0.34
24/7 ventilator dependence	23 (56.1)	15 (35.7)	0.0758
Any prior history of, n (%)			
Supra-stomal granulation	37 (90.2)	28 (66.68)	**0.0152**
Skin tract	11 (26.8)	6 (14.3)	0.1828

Limitations

Our study is limited by its retrospective nature. Our cohort is small and has significant comorbidities, which limits generalizability. The authors relied on surgeons' documented descriptions of MLB findings to report operative findings.

Conclusions

The incidence of supra-stomal collapse increased with time from tracheostomy tube placement and is associated with young age at tracheostomy, bronchopulmonary dysplasia, and finding of supra-stomal granulation tissue.

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Neighborhood Level Social Determinants of Health (SDOH) in Pediatric Obstructive Sleep Apnea (OSA):

A Project Outline

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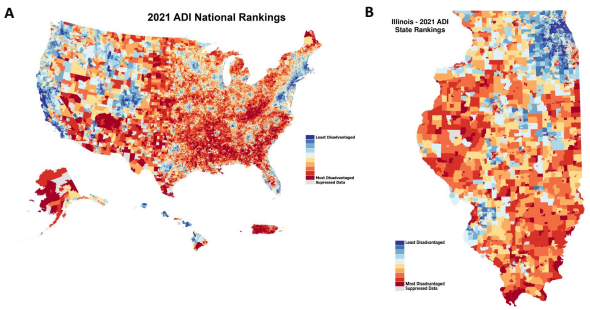
Background

- OSA significantly impacts pediatric well-being and cognitive function.
- Clinicians increasingly recognize the need to integrate SDOH into pediatric otolaryngology research and practice.
- Social determinants of health (SDOH) on an individual factor level such as race, insurance status, and parental education have been shown as contributary to disparities in pediatric OSA outcomes and utilization.[1]
- Social factors' cumulative influence on a geographic basis on pediatric OSA disparities often overlooked in clinical practice.

Research Objectives

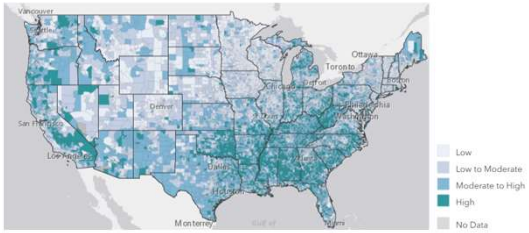
- Investigate links between geographic indices of SDOH and environmental risk and clinicodemographic risk factors, health outcomes, and healthcare use in pediatric OSA.
- Address the knowledge gap of geography's impact on pediatric sleep apnea nationally, in Illinois, and greater Chicagoland.
- Enhance the comprehensive understanding of pediatric OSA by integrating social determinants into holistic care and health services.

Figure 1. Area Deprivation Index (ADI)



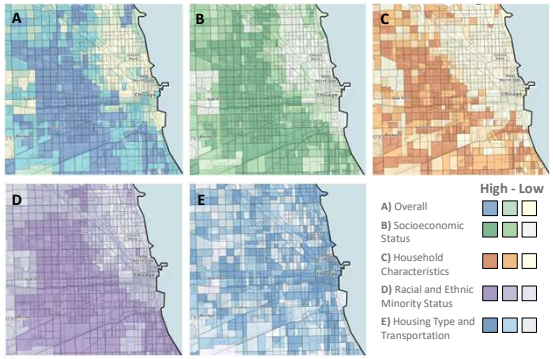
The University of Wisconsin Neighborhood Atlas assigned ADI scores based on 17-components across the theoretical domains of income, education, employment, and housing quality. ADI is provided at the A) national and B) state level for 2021.[2]

Figure 2. Environmental Justice Index (EJI)



The Centers for Disease Control Agency for Toxic Substances and Drugs Registry (CDC/ATSDR assigns EJI scores on 36 environmental, social, and health factors and groups them into three overarching modules and ten different domains with US Census Data from 2020. EJI is operationally defined as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, to develop, implement, and enforce environmental laws, regulations, and policies.[3]

Figure 3. Social Vulnerability Index (SVI)



The CDC/ATSDR assigns SVI scores based on 16 US Census variables where social vulnerability is operationalized as the potential negative effects on communities caused by external stresses on human health. Here maps of greater Chicagoland are depicted for A) Overall SVI, B) Socioeconomic Status SVI, C) Household Characteristics, D) Racial and Ethnic Minority Status, and E) Housing Type and Transportation.[4]

Methods

- Review pediatric OSA medical records spanning 2000-2023 for collection of clinicodemographic risk factors, health outcomes, and healthcare utilization.
- Apply ADI, EJI, and SVI to patients longitudinally, from birth until last follow-up according to address changes collating most recent SDOH database values.
- Assess longitudinal burden of SDOH disadvantage in development of complications, poor outcomes, and healthcare utilization disparities.
- Apply univariate and controlled multivariate analyses to explore associations between SDOH indices and exposures and outcomes variables.

Anticipated Results

- Expected correlation between high SDOH vulnerability and established clinicodemographic risk factors.
- Higher SVI, ADI, EJI scores likely linked to poorer health outcomes in pediatric OSA.
- Reduced healthcare utilization of monitoring and evaluation services with increased surgical and emergent burden in areas with elevated SDOH indices.
- ADI, EJI, and SVI cumulative exposure further contextualizes SDOH risk.

Implications

- Highlights the pivotal role of social determinants in pediatric sleep apnea management.
- Encourages healthcare providers to consider social context in diagnosis and treatment strategies.
- Raises awareness about the broader societal factors impacting pediatric OSA, facilitating community-based interventions.
- Informs targeted interventions and policy-making, promoting health equity for pediatric OSA patients.
- Provides a foundation for further research exploring the intricate relationship between geography, SDOH, and various health conditions in pediatric populations.

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Poster No. 100

To Laser or Not to Laser? A Case Series of Intralesional Steroids as a Novel Treatment for Propranolol-Refractory Airway Hemangiomas

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Introduction

- Airway Infantile hemangiomas (IH) are less frequent than cutaneous IH but can cause life-threatening airway obstruction.
- 29% of beard distribution[1] and 49% of PHACE patients may have upper or lower airway hemangiomas[2]
- Although propranolol is effective for the majority of pediatric IH[3], other treatment modalities should be considered in cases where propranolol is ineffective.
- Multiple interventions for propranolol-refractory airway IH have been described, from systemic steroids to open resection, each with their own risks and benefits.

Objective

The purpose of this study is to:

- Present 3 cases of propranolol-refractory airway IH successfully treated with intralesional steroids (IS) at a single academic institution
- Discuss current literature on treatment options for airway IH

Methods

- Single center retrospective chart review at an academic tertiary pediatric care center
- Date range 2015 to 2022
- Inclusion criteria: pediatric patients with airway IH (supraglottic, glottic, subglottic) refractory to oral propranolol who received IS
- Intralesional steroid injections consisted of triamcinolone acetonide (TAC) at 40 mg/mL
- Patients followed post-operatively with laryngoscopy exams
- Systematic review of current literature regarding current management of airway hemangiomas refractory to oral propranolol using MEDLINE database

Case 1

- 9-month-old female with PHACE syndrome with bilateral V1-V3 facial IH on oral propranolol and systemic steroids since 2-months-old* and escalated to 2.8 mg/kg/day propranolol monotherapy by 6-months-old, presented with stridor.
- Laryngoscopy showed 30% left subglottic IH
- Facial IH improved by 14-months-old, but no change in airway IH size.
- Injected with 0.3 mL (12mg) TAC.
- No evidence of recurrence with on scope exams
- Propranolol tapered at 15-months-old.
- Mild subglottic stenosis noted in OR during unrelated procedure.

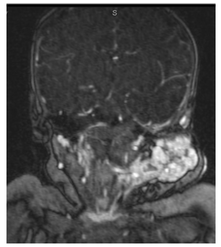

Figure 1. Initial MRI/MRA

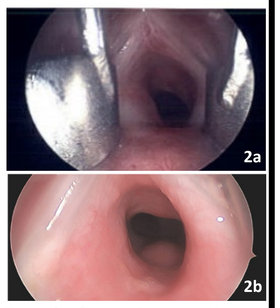

Figure 2a. Subglottic hemangioma pre-intralesional steroid
2b. Subglottic stenosis at 4 years old

Case 2

- 25-day-old female with PHACE syndrome, left V3 facial IH, and stridor.
- Initial scope showed a non-obstructive left subglottic IH and she was started on propranolol 2 mg/kg/day.
- Persistent breathing symptoms 2 months later; repeat scope showed 70% circumferential obstruction.
- 0.2 mL (8mg) TAC was injected, with significant size reduction to 10% obstruction.
- 2nd injection of steroids at **6 months** for regrowth, 3rd injection 2 weeks later at reevaluation.
- Propranolol tapered at 2-years-old.

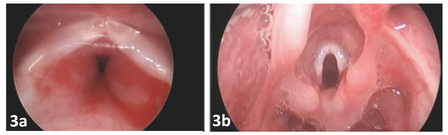

Figure 3a. Subglottic hemangioma prior to steroid injection
3b. Subglottic hemangioma 2 weeks post-injection

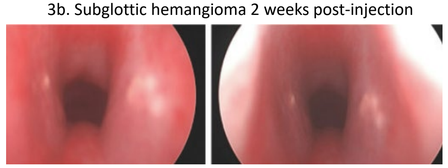

Figure 4. Hemangioma 2 weeks after repeat steroid injection

Case 3

- 42-day-old female with right V3 IH and feeding and breathing difficulties.
- MRI with transspatial mass extending to right supraglottis; biopsy confirmed GLUT1 + IH, started on oral propranolol at 1 mg/kg/day.
- New stridor at 4-months-old, propranolol increased to 2 mg/kg/day
- No improvement 2 months later and R aryepiglottic fold IH visualized during supraglottoplasty for obstructive sleep apnea. Injected with 0.4ml (20mg) TAC

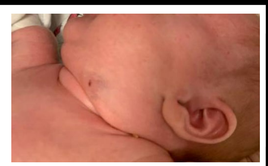

Figure 5. External appearance of hemangioma at 2 months old

- 2nd injection 2 weeks later for significantly improved but persistent airway IH
- Oral propranolol tapered at 15-months-old.
- No additional breathing difficulties noted since.

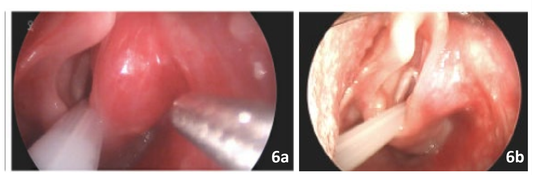

Figure 6a. Right supraglottic hemangioma before 1st injection
Figure 6b. Right supraglottic hemangioma 2 weeks after 1st injection

Discussion

Trends

- **Cutaneous IH:** Segmental beard distribution[2] IH have increased risk of PHACE syndrome and airway IH[3]
- **Repeat injections:** Average number of IS needed = 3 vs. 2 in our case series[4].

Medical Management

- **Oral propranolol:** 1st line treatment, mean stenosis reduction of 40% after 4 weeks[5].
  - Risk of poor response/rebound growth as high as 10-13%[6].
- **Systemic steroids:** 1st line treatment prior to propranolol
  - High risk of systemic side effects (Cushing syndrome, stunted growth, hypertension, and immunodeficiency) – 12.9%[8]

Surgical Management

- **CO2 laser:** Appropriate for small, noncircumferential lesions
  - Varying complication rates, highest risk for subglottic stenosis/scar tissue formation
- **Intralesional steroid injection:** 82% effective as first-line therapy[4].
  - Injectable volume limited; overnight intubation recommended for swelling
- **Open resection**: Similar management to laryngotracheal reconstruction with graft placement.
- **Tracheostomy:** Historically was only option in treatment-resistant airway IH.
  - Typically reserved for when other treatment options exhausted (risks of speech delay, subglottic stenosis)

Conclusion

- Intralesional steroid injections are a safe and effective treatment for airway IH refractory to propranolol
- Intralesional steroid injections can minimize risks related to systemic steroids or ablative options/surgical resections.
- Patients should be closely monitored for reoccurrence of symptoms especially 4-6 months after first injection.

Acknowledgements

Special thanks to MCW Department of Otolaryngology-Head and Neck Surgery, and the Department of Dermatology

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Vestibulocochlear and intracranial abnormalities in cochlear implantees

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Background

- Many vestibulocochlear abnormalities introduce challenges and/or contraindications to cochlear implantation (CI)
- Intracranial abnormalities (e.g. cystic malformations, leukomalacia and gliotic lesions) may also pose challenges to surgical approach or postoperative outcomes, but less is known
- We report the prevalence and concurrence of vestibulocochlear and brain abnormalities in pediatric cochlear implantees, with particular attention to 12 cases of incidental cystic structures
- 461 pediatric patients at a tertiary pediatric hospital from 1998 to 2023
- Evaluated for incidence of brain and inner ear abnormalities

Patient Demographics

Table 1: demographics and clinical findings for the 12 cases of incidental intracranial cysts found on MRI during cochlear implant evaluation.

Case	MRI finding	Sex	Etiology of HL	Age at implantation (months)	Age at SNHL diagnosis (months)	Age @ decision for CI (months)
1	right middle cranial fossa arachnoid cyst	M	ANSD	70	25	68
2	parapineal arachnoid cyst	F	unknown	74	24	71
3	pars intermedia cyst	M	inner ear	138	69	134
4	left ventricle fenestrated choroid plexus cyst	M	inner ear	74	68	69
5	right cerebellar medullary arachnoid cyst	M	genetic	105	91	98
6	intrasellar Rathke cleft cyst	F	inner ear	9	2	7
7	poss. Rathke cleft cyst	M	unknown	10	1	2
8	left temporal arachnoid cyst	M	congenital CMV	18	0	11
9	incidental bilateral middle cranial fossa arachnoid cyst	M	unknown	29	1	24
10	L>R middle cranial fossa arachnoid cyst	M	unknown	14	5	11
11	right temporal lobe arachnoid cyst	M	unknown	9	3	7
12	left middle cranial fossa arachnoid cyst	M	genetic	20	0	14

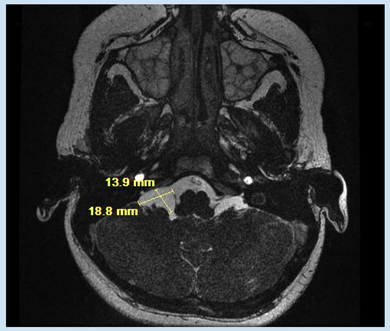

Figure 1: Case 5, right cerebellar medullary arachnoid cyst (MRI).

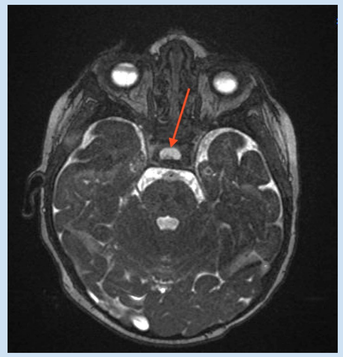

Figure 2: Case 6, intrasellar Rathke cleft cyst (MRI).

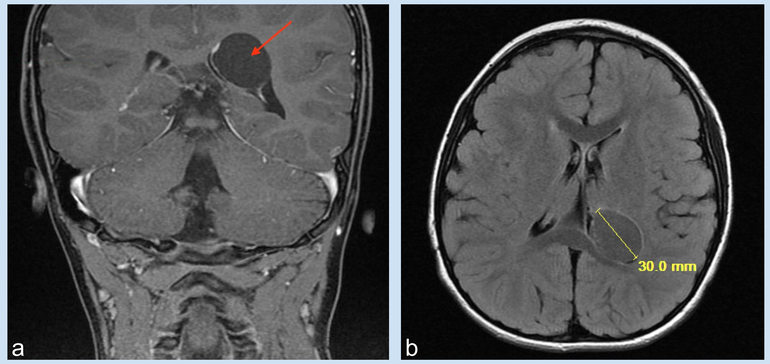

Figure 3: Case 4, left ventricle choroid plexus cyst (MRI), coronal (a) and axial (b) cuts.

Results

- 71 of 461 (15.4%) had vestibulocochlear abnormalities
- 66 of 461 (14.3%) had intracranial abnormalities
- 11 of 461 (2.4%) had both vestibulocochlear and brain abnormalities on MRI
- The most common brain abnormalities uncovered were focal/nonspecific white matter T2 hyperintensities (24%), intracranial cysts (18%), and congenital cytomegalovirus (CMV) infection (7.5%)

Discussion

- The incidence of arachnoid cysts in the general population is similar to that of our patient cohort, at 1-2% of patients undergoing brain imaging[1]
- 87-95% of the time they do not cause symptoms and are discovered incidentally[1,2]
- Incidental cystic structures and other intracranial anomalies may have significant impacts on surgical approach and implantation outcomes
- Next steps: do incidental intracranial cysts found on MRI delay the implantation process, and if so, does the delay affect CI outcomes?

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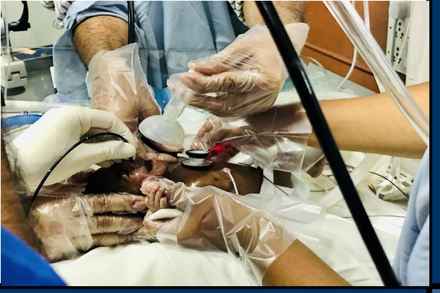
Poster #105



Management of Neonatal Airway -Do We Really Need a Multidisciplinary Team Approach?

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ABSTRACT

Objective: To evaluate the need of a multidisciplinary team for management of neonatal upper aerodigestive airway.
Material & Methods: All newborns (up to age 28 days) referred to Otolaryngology unit for upper airway evaluation from January 2022 to December 2022 were included. A multidisciplinary approach was defined if 3 or more specialties care provider were involved.
Results: Total 118 neonates were included. 82% (97/118) patients were referred for the evaluation of noisy breathing, nasal obstruction and persistent respiratory distress. The remaining 18% (21/118) were referred for suspicion of laryngeal cleft. 59% (70/118) managed conservatively in which 77% (54/70) neonates were seen by neonatologists, otolaryngologists and swallowing therapists. Overall, 93% of neonates were managed with multidisciplinary team involvement.
Conclusion: A Multidisciplinary team approach should be followed for neonatal airway cases. However, case based heterogenicity can happen in team composition.

INTRODUCTION

Neonatal airway disorders are a common challenge in the neonatal intensive care unit.
Due to their smaller size anatomy and physiology, difficulties arise in evaluation and further decision making as compared to the older children or adults.
The airway problems can result from congenital or acquired lesions and can be broadly classified into those causing obstruction or those due to an abnormal "communication" in the airway.
A comprehensive multidisciplinary approach to the neonate with suspected airway pathology can improve timely diagnosis, facilitate early intervention, and potentially help avoid unnecessary additional procedures in the neonatal intensive care unit.
For efficient management of such cases, it is important to have a designated team available for the better outcomes.
To analyze this, we conducted a retrospective study at our institution. Our objective was to evaluate the need of a multidisciplinary team approach for the evaluation & management of neonatal upper airway.

METHODS AND MATERIALS

It was a retrospective study conducted at a tertiary care referral center, Manipal Hospital, Bangalore, India.

All the newborns (up to age 28 days) who were admitted in neonatal intensive care unit and were referred to Otolaryngology unit for upper airway evaluation from January 2022 to December 2022 were included.

Neonates who already enrolled for multidisciplinary team or having gastrointestinal/ congenital anomalies (previously diagnosed) were excluded from this study.

A multidisciplinary approach was defined if 3 or more specialties care provider were involved in the management of upper airway of neonate.

The management of cases with involvement of multispecialty providers, conservative v/s surgical management with team involvement were then evaluated.

RESULTS

Total number of neonates in this study were 118
Male to Female ratio was 1.36 (68:50)
Major reason for referral were:

1. Evaluation of noisy breathing/nasal obstruction and persistent respiratory distress: 82 % (97/118)
2. Suspicion of laryngeal cleft : 18 % (21/118)

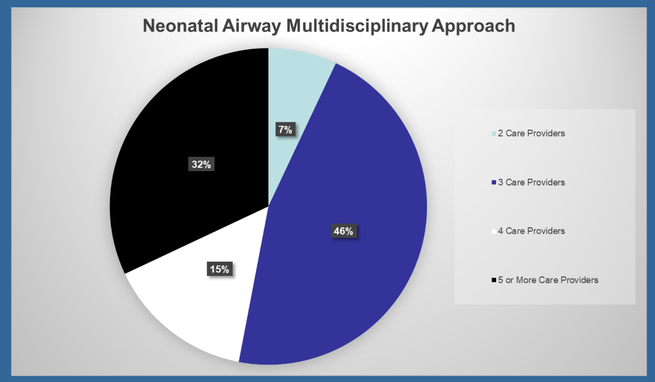
Multidisciplinary conservative management was done in 59 % cases(70/118)

1. involvement of 3 care providers - 77% (54/70) – seen by Neonatologist , Otolaryngologist and Swallowing therapist
2. Involvement of 5 care providers- 11.5% (8/70) additionally seen by Gastroenterologist and Neurologist
3. Less than 3 care providers: 11.5% (8/70)- Only seen by Otolaryngologist and Neonatologist

Multidisciplinary surgical management – 41 % (48/118)

1. involvement of 4 care providers –37% (18/48) – seen by Neonatologist , Otolaryngologist, Pulmonologists and Swallowing therapist
2. Involvement of 5 or more care providers- 63% (30/48) additionally seen by Gastroenterologist, Cardiologist and Neurologist.

Overall, 93 % patients were managed with multidisciplinary team involvement.



CONCLUSIONS

A Multidisciplinary team approach should be followed for neonatal airway cases in terms of optimizing hospitalization, promoting communication, managing, and minimizing the post operative plans.

However, case based heterogenicity can happen in team composition.

Further studies are needed to define the best practices, clinical efficacy, and cost-effectiveness to implementing airway management teams for such neonates.

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Poster # 107

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Nasal saline irrigation for the prevention of otitis media in children: a scoping review.

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1. Montreal Children's hospital, McGill University

BACKGROUND

The role of Nasal saline irrigation (NSI) in preventing otitis media is still debated. While some argue that cleaning the nasopharynx of pathogens prevents reflux of bacteria into the middle ear, others argue that this could cause saline to enter the middle ear, leading to added disease burden . To this day, no consensus has been reached on the efficacy of this intervention and evidence in the literature is lacking.

OBJECTIVES

This scoping review aims to evaluate the gap in the literature with regards to the efficacy of NSI in preventing otitis media in children, with the goal of informing clinical practice, decision making, and providing recommendations to parents and caregivers.

METHODS

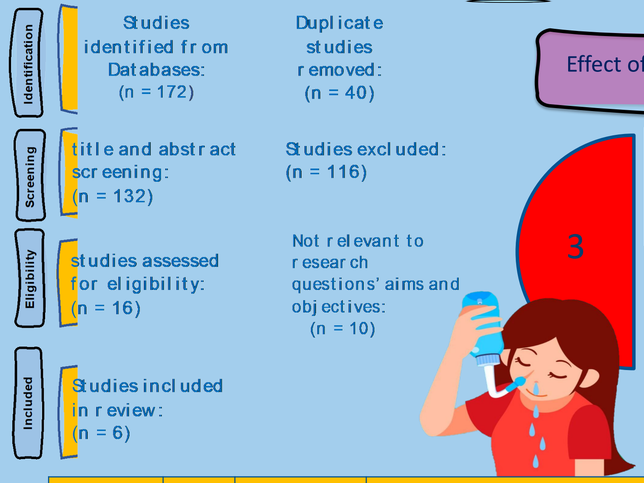
Electronic searches were conducted on Medline (Ovid), Embase (Ovid), CINAHL, and Cochrane databases.

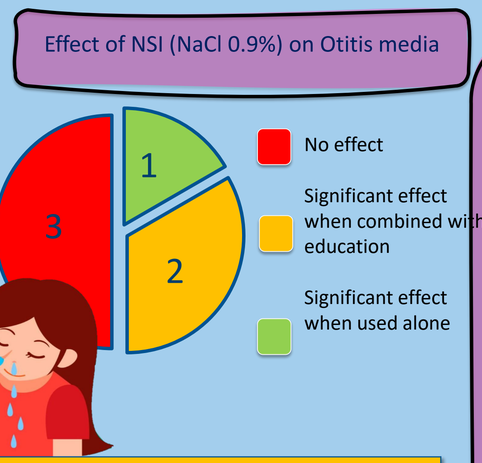
Original articles evaluating the effect of NSI on otitis media in pediatric populations were considered.

Two independent researchers proceeded to screening and data extraction, with a third researcher in cases of disagreement or uncertainty.

Level of bias analysis was performed with validated tools. For randomized controlled trials (RCT), we used the Cochrane risk of bias tool (RoB 2.0) and for our retrospective study, we used the Newcastle-Ottawa scale (NOS).

RESULTS





Study Design	N	Mean age (months)	Conclusion
Factorial Clinical trial	138	23.7	Caregiver education + NSI with NaCl 0.9% reduced the frequency of acute otitis media (AOM; p= 0.042).
Retrospective study	173	31.46	Supervised NSI with NaCl 0.9% reduced the frequency of AOM episodes in children during the 4-month FU (p= <0.001).
RCT	61	72	• Sinuclean Nebules treatment with nasal douche improved otitis media with effusion (OME) compared to isotonic saline in children with OME (p= <0.0001). • NaCl 0.9% alone had no effect.
RCT	177	21.77	Nasal clearance techniques, including NSI with NaCl 0.9% combined with caregiver education reduced the incidence of AOM in children (p= 0.030).
RCT	240	83 (median)	While hypertonic saline irrigation showed a significant reduction in OME in children (p<0.0001), NSI with NaCl 0.9% alone did not.
RCT	103	62.9	Topical administration of 9 mg of sodium hyaluronate in 3 mL of a 0.9 % NaCl was effective in reducing total AOM episodes (p=0.05), but 0.9% NaCl alone showed no significant difference in reducing AOM episodes.

CONCLUSION

our review shows a limited efficacy of NSI as an independent intervention for reducing otitis media in children.

Some other compounds such as sodium hyaluronate and hypertonic saline showed some promising results.

Importantly, no studies in our review reported any adverse effect of NSI.

Further randomized control studies with long term follow up and homogenous interventions should be conducted to draw definitive conclusions.

Poster 115

Does Ibuprofen Increase the Risk of Post-Tonsillectomy Bleeding: An Atlantic Canadian Pediatric Sub-Population

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ABSTRACT

Background: Ibuprofen is commonly used for post-operative pain management in pediatric patients undergoing adenotonsillectomy. Concerns remain regarding the risk for postoperative bleeding. We conducted the first study in the Nova Scotian pediatric in-patient population assessing the relationship between ibuprofen use, post-operative bleeding, and reoperation in this more complex subpopulation of patients. Our post-operative admissions/in-patient population consists of approx 4% of all adenotonsillectomy patients. **Methods:** We conducted a preliminary chart review of children (0-16 years old), upon the addition of ibuporfen to post-operative pain management regume , who were admitted following an adenotonsillectomy at a tertiary care children's hospital for the 4 Canadian Atlantic provinces in Halifax, from 2013-2017. Patients with underlying bleeding disorders were excluded. **Results:** We included 313 patients, 47.6% were given ibuprofen post-surgery. The mean age was 4.8 ± 3.6 years old , and 42.8% were female. Obstructive sleep apnea (77.6%) was the most common indication. In univariate analysis, ibuprofen was not associated with primary bleeding, total bleeding, or reoperation ($p>0.05$). Multivariate logistic regression analyses found no association between ibuprofen and post-operative bleeding (OR: 1.0, 95% CI 0.56-1.9, p=0.9) or re-operation (OR: 1.3, 95% CI 0.62-2.9, p=0.5). Age increased the risk for post-operative bleeding (OR: 1.6, 95% CI 1.4-1.8; $p<0.001$) and reoperation (OR: 1.7, 95% CI 1.4-2.1 $p<0.001$)), while weight decreased the risk for post-operative bleeding (OR: 1.0, 95% CI 0.6-1.9; $p<0.001$) and reoperation (OR: 0.9; 95% CI 0.9-1.0, p=0.001). **Conclusion:** This preliminary study revealed no association between ibuprofen and post-operative bleeding.

BACKGROUND

Background: Ibuprofen is commonly used to manage post-operative pain in pediatric patients receiving an adenotonsillectomy. However, concerns remain as to the risk for postoperative bleeding. This is the first study of the Nova Scotia pediatric inpatient sub-population assessing the relationship between ibuprofen use, post-operative bleeding, and reoperation.

OBJECTIVE

Primary: Among inpatient pediatric patients undergoing an adenotonsillectomy, whether treatment with acetaminophen plus ibuprofen is non-inferior to acetaminophen alone when comparing bleeding events.

METHODS

Retrospective In Patient Chart Review
1. Between 2013 – 2017
2. Underwent an adenotonsillectomy

→

Exclusion Criteria
1. Lost to follow-up
2. Incomplete chart
3. Did not undergo an adenotonsillectomy
4. Bleeding Disorder

→ **313 Patients**

RESULTS

Fig. 1: Key Demographic and Clinical Indicators of Inpatients

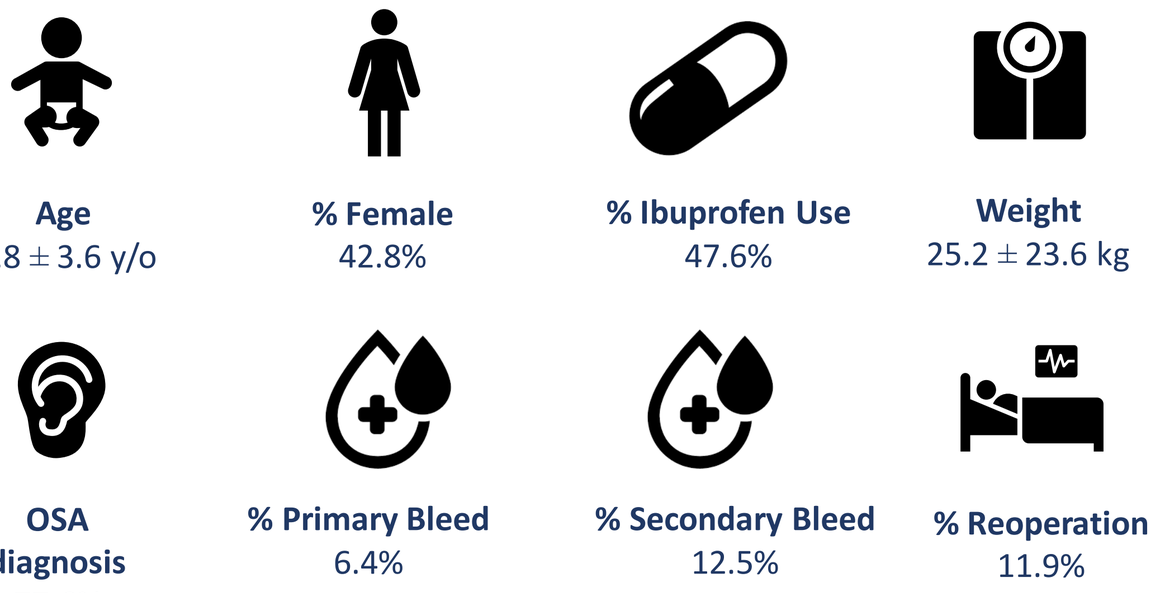


Fig. 2: Ibuprofen Did Not Increase the Risk for a Bleeding Event in Multivariate Analysis

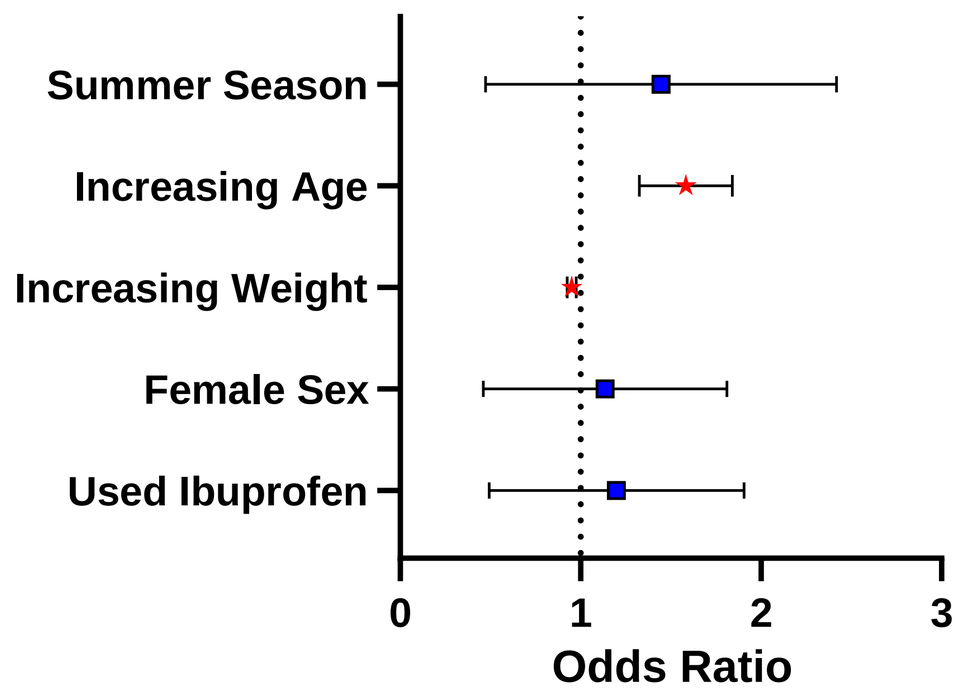


Table 1: Proportion of Bleeding Events Did Not Change with Ibuprofen Treatment

	Non-Ibuprofen	Ibuprofen	P-value
Primary Bleed Event	6.80%	6.00%	0.78
Secondary Bleed Event	13.70%	11.40%	0.78
Reoperation	11.80%	12.10%	0.94

Fig. 3: Ibuprofen Did Not Increase the Risk for a Bleeding Event Requiring Reoperation in Multivariate Analysis

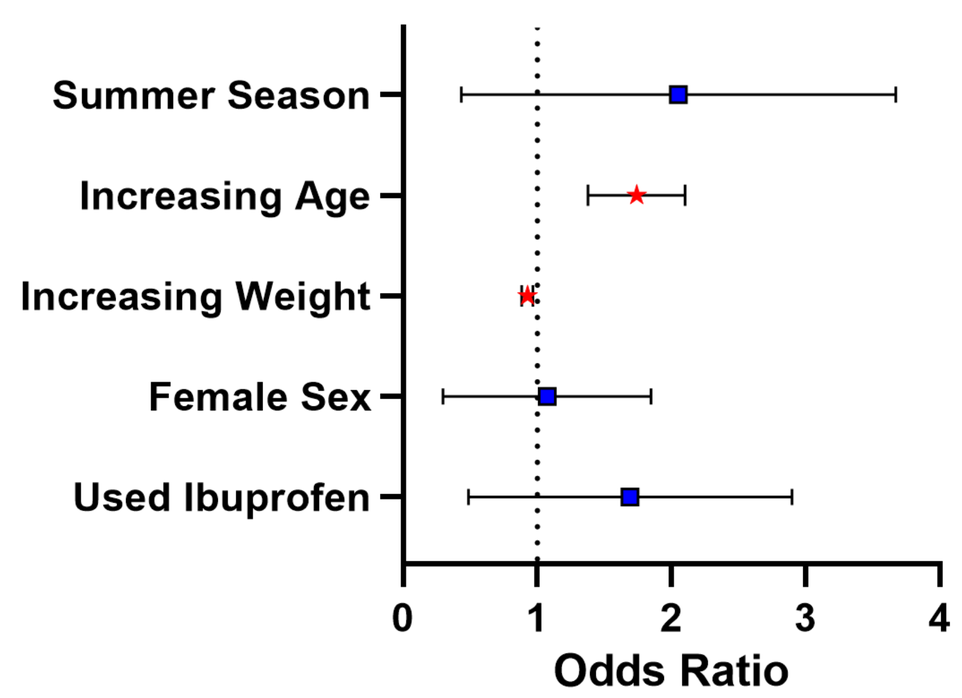
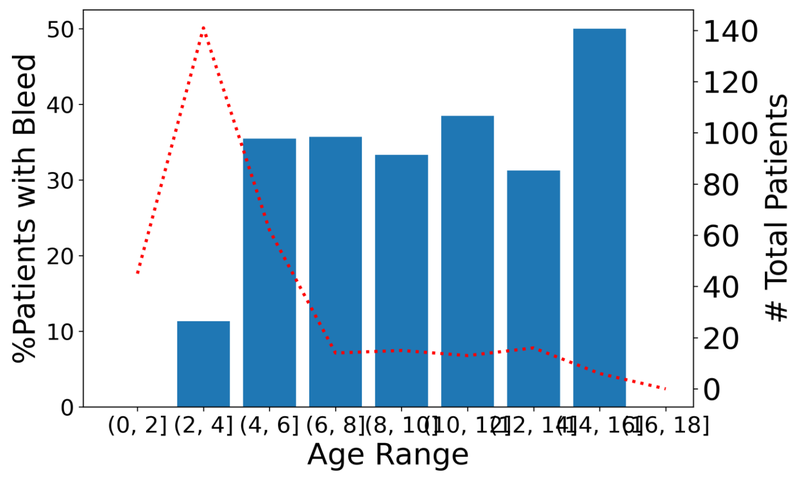


Fig. 4: Proportion of Bleeding Events Increased with Age



CONCLUSION

- In this inpatient pediatric cohort, ibuprofen was not associated with increased primary bleeding (<24 hours), secondary bleeding (>24 hours), total bleeding, or re-operation.
- In regression analyses, age and weight were significant predictors of both post-operative bleeding and re-operation.
- These results suggest that ibuprofen is a safe option for post-adenotonsillectomy pain control.

ACKNOWLEDGEMENTS

We thank Mr. Steve Van Iderstein for his help and navigating hospital permission for data collection.

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Impact of Socioeconomic Disparities on Longitudinal Access to Care in Pediatric Voice Patients

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Introduction

Socioeconomic disparities are ubiquitous across US healthcare and impact clinical outcomes. Though there is literature examining the impact of disparities on pediatric otolaryngology care, there is a dearth of research directly examining how these disparities impact patients receiving care for pediatric voice complaints.

This study investigates the obstacles to care for pediatric patients referred to otolaryngology voice clinic, and how these factors influence patient access and compliance. We hypothesize that patients of lower socioeconomic status (SES) experience more obstacles to care and poorer compliance with follow up appointments.

Methods and Materials

- Retrospective study of all new pediatric patients seen in the voice clinic at a tertiary children's hospital in 2019; N = 82
- Exclusions: return patient (n=30), age >18y (n=2), and primary complaint not related to voice (n=2)
- Socioeconomic variables collected:
  - Area deprivation index (ADI)
  - Number of adult and children in the residence
  - Insurance status
  - Guardianship
  - Distance traveled to the specialty clinic
  - Referral status
  - Follow up recommendations
  - Adherence to treatment recommendations and follow up
- Analysis with Fisher's Exact test, Wilcoxon rank-sum, and Spearman correlation

Results

Table 1. Patient Demographics

	Voice n = 82
Age at appointment, M	5.4y (30d – 18.6y)
Sex, n =82 (%)	
Male	33% (27)
Female	67% (55)
Race, n=77, n (%)	
White	92% (71)
Black	3% (2)
Asian	4% (3)
Mixed	1% (1)
Ethnicity, n=73, n (%)	
Hispanic	0% (0)
Non-Hispanic	100% (73)
ADI State, M	4 (1-10)
ADI National, M	50.5 (6-99)
Distance from patient home address to CHP in miles, M	18.95 (1.6 – 169)
# adults in primary household, M	2 (1-6)
# children in primary household, M	2 (1-5)
Insurance, n = 82 (%)	
Public	22% (18)
Private	78% (64)
Guardian, n=82, n (%)	
Biological parent	96% (79)
All other**	4% (3)

**Adopted, foster parent, state representative, or other relative

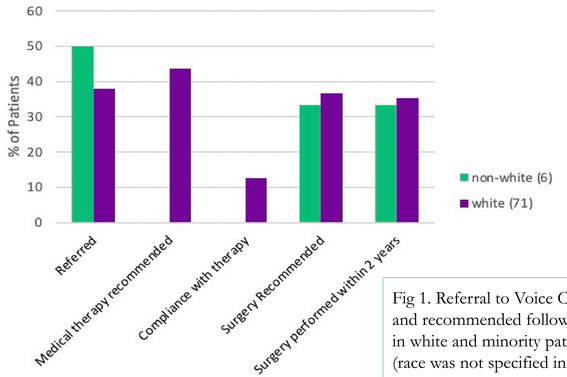

Fig 1. Referral to Voice Clinic and recommended follow-up in white and minority patients (race was not specified in 6)

- Most patients (55/82, 67%) were female and 71 (92%) of the 77 who reported race were White. Median age was 5.4y (30d-18.6y). 65/82 (79%) had private insurance.
- Having ≥ 1 no-show to any specialty was more common in children of minoritized races (4/6, 66.7%) compared with White children (8/71, 11.3%, p=0.005). 1/6 (16.7%) children of minoritized races had ≥ 1 no-show to Otolaryngology Voice clinic compared with 0/71 (0.0%) White children, p=0.08.
- Time from date of service to surgery decreased as number of children in the household increased (ρ=-0.607, p=0.03).

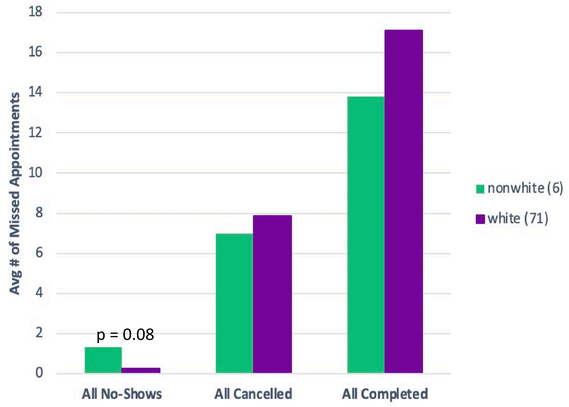

Fig 2. Total no-show, cancelled, and completed appointments within two years from the initial appointment.

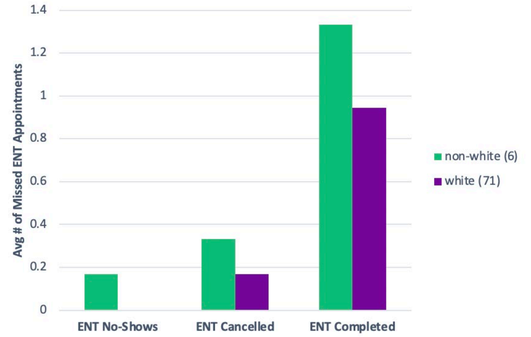

Fig 3. ENT no-show, cancelled, and completed appointments within two years from the initial appointment.

Key Points

- Children born into families of lower SES have higher rates of pulmonary, otologic, and adenotonsillar complications.[1]
- Prior studies have shown associations between younger age, race, and insurance type with lower appointment compliance.[2, 3]
- Minority patients presenting to Voice ENT clinic were more likely to have subsequent no-show appointments compared with white patients.
- Further work comparing these obstacles between pediatric Otolaryngology subspecialties (specifically otology and airway patients) is ongoing.

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Invasive Fungal Sinusitis: A Comparison of Pediatric vs. Adult Cases

THE WARREN ALPERT Medical School

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Background

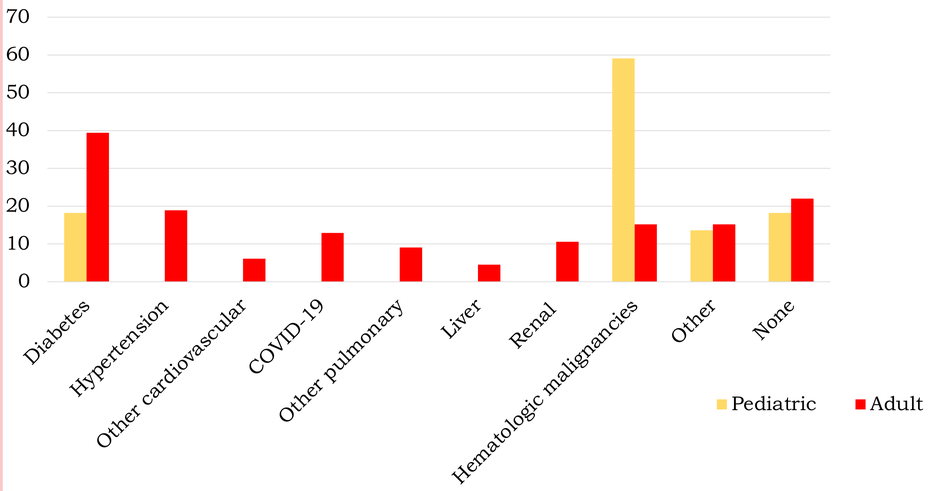
Invasive fungal sinusitis (IFS) is a rare infection with a high mortality rate, mainly impacting immunocompromised patients. It typically presents with evidence of fungal infection that extends outside of the paranasal sinuses and progresses rapidly. Considering this as well as its significant mortality rate, timely recognition and treatment are crucial. This study aims to better characterize IFS and highlight differences in presentation and outcomes amongst pediatric and adult patients to promptly diagnose and treat this condition.

Methods

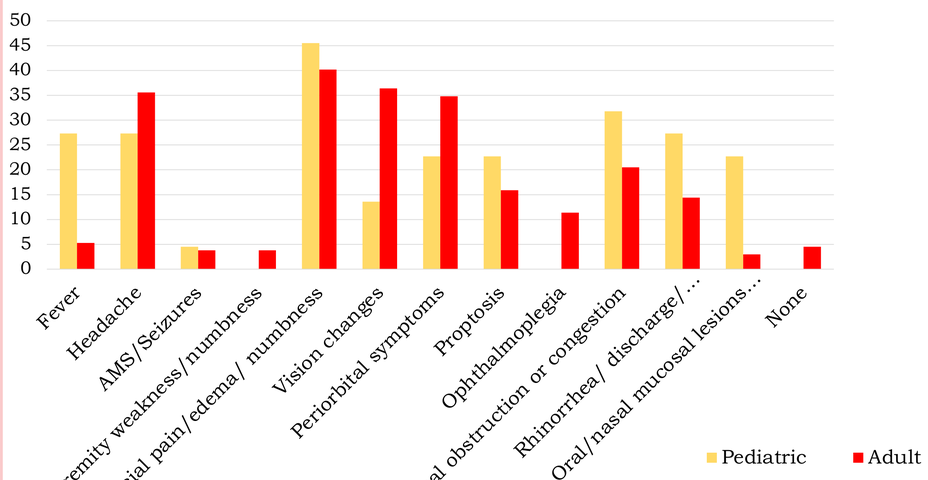
A comprehensive literature search of PubMed, EMBASE, Web of Science, Global Index Medicus, Global Health (EBSCO) and Cochrane Database of Systematic Reviews was conducted to identify articles relating to invasive fungal sinusitis. Patient demographics, comorbidities, presentation, disease characteristics, treatment and outcome were extracted from the studies and statistical analyses were conducted to compare these variables between pediatric and adult patients.

Figures

Comorbidity Percentages: Pediatric vs. Adult



Presenting Symptom Percentages: Pediatric vs. Adult



Results

There were 111 studies that identified 22 pediatric and 132 adult patients, who were on average 53 and 11 years old, respectively. Children were more likely to have hematologic comorbidities than adults (59.1% versus 15.2%, $p<0.001$). Facial symptoms such as pain, edema, and numbness were the most common symptoms for both age groups. In the pediatric population, fever and oral or nasal skin lesions were more common presenting symptoms ($p < 0.001$ for both). Pediatric patients were more likely to present without disease extension beyond the sinuses ($p<0.001$). There was no significant difference in either medication use or mortality between the two cohorts.

Conclusion

IFS often presents with non-specific symptoms and has a unique presentation. As IFS is associated with significant morbidity and mortality, clinical awareness of the varying presentations and complications in both populations is important to prevent disease progression.

Poster #122

Factors Associated with Appointment Attendance in Pediatric Sensorineural Hearing Loss at an Urban Safety Net Hospital

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Background

- Sensorineural hearing loss (SNHL) has a significant impact on language and social development in children
- Although SNHL has a low incidence in children, appointment attendance can be important to manage long-term sequelae of the disease
- Previous studies have demonstrated disparities in accessibility to treatment for hearing loss such as hearing aids and cochlear implants
- Study aim: identify patient- and appointment-related factors associated with SNHL follow-up appointment attendance to understand barriers to care

Methods

- **Setting:** Pediatric otolaryngology clinic at Boston Medical Center (BMC), an urban safety net hospital
- **Design**: Retrospective analysis of patients under 18 years of age seen in the pediatric otolaryngology clinic between 5/1/2015 and 12/31/2021 for SNHL. Collected data on factors such as patient sex, race, language, primary care provider, and timing of appointments
- **Primary outcome**: Appointment attendance at follow-up otolaryngology and audiology appointments
- **Statistical analyses**: Univariate and multivariate analysis comparing patient and appointment related factors to attendance rates

Results

- Overall attendance rates (N=212): 45.00% attended, 32.49% canceled, 22.22% no-show
- Kruskal-Wallis tests:
  - Male patients more likely to cancel appointments than females (p=0.0494)
  - Patients born outside the US more likely to no-show (p=0.0213)
  - Patients with PCPs within same hospital system more likely to attend (p=0.0238)
- Chi-square tests:
  - English speakers more likely to complete at least one appointment compared to non-English speakers (p=0.0427)
  - Patients with commercial insurance more likely to complete at least 50% of follow-up appointments compared to those with non-commercial insurance

Table 1. Multivariate analysis comparing at least 50% of follow-up appointments attended to less than 50% appointment attendance

Variable		OR	95% CI (Lower limit)	95% CI (Upper limit)	p-value
Sex	Male	1.155	0.657	2.030	0.4978
Race	Non-White	REF	-	-	-
	White	0.518	0.201	1.340	0.6170
Primary Language	Non-English	REF	-	-	-
	English	0.725	0.388	1.353	0.3123
Insurance Status	Non-Commercial	REF	-	-	-
	Commercial	3.252	1.277	8.282	**0.0134**
Birthplace	Non-US	REF	-	-	-
	US	0.970	0.532	1.770	0.9218
Distance from BMC	Lives within 10 miles of BMC	1.001	0.550	1.823	0.9971
PCP	BMC Affiliated	1.098	0.562	2.148	**0.7838**
Initial Appointment Timing	During or After March 2020	REF	-	-	-
	Before March 2020	0.0417	0.523	2.078	0.9058

Table 2. Multivariate analysis comparing at least one follow-up appointment attended to no follow-up appointments attended

Variable		OR	95% CI (Lower limit)	95% CI (Upper limit)	p-value
Sex	Male	1.198	0.587	2.446	0.6194
Race	Non-White	REF	-	-	-
	White	0.578	0.206	1.619	0.2968
Primary Language	Non-English	REF	-	-	-
	English	0.460	0.212	0.997	**0.0492**
Insurance Status	Non-Commercial	REF	-	-	-
	Commercial	3.266	0.832	12.821	0.0898
Birthplace	Non-US	REF	-	-	-
	US	0.835	0.393	1.774	0.6395
Distance from BMC	Lives within 10 miles of BMC	1.032	0.483	2.205	0.9360
PCP	BMC Affiliated	1.836	0.711	4.740	0.2095
Initial Appointment Timing	During or After March 2020	REF	-	-	-
	Before March 2020	1.729	0.743	4.021	0.2040

Strengths/Limitations

Strengths:

- Underserved patient population
- Topic not previously studied

Limitations:

- Number of follow-up visits and treatment plan may vary based on etiology of SNHL
- Limited generalizability to general population

Findings

- Pediatric patients with hearing loss already face disparate outcomes, such as children living in rural environments having delayed diagnosis
- In the present study, both patient- and appointment-related factors are independently associated with follow-up appointment attendance for pediatric SNHL

Conclusions

- Patient characteristics such as primary language, insurance status, and PCP group were independently associated with higher rates of missed follow-up appointments in SNHL
- Interventions such as telehealth appointments and reminder systems may be key to ensuring more equitable care

Poster #123

Seeing Double: An aberrant post-auricular mastoid-cutaneous fistula with duplication of the external auditory canal

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Background

- Branchial cleft cyst anomalies can result from embryologic duplication of branchial cleft structures.[1]
- Branchial cleft anomalies present in one of three forms: cysts, sinuses, or fistulae.[2]
- First cleft cysts make up approximately 5% to 25% of all branchial cleft anomalies and are subclassified via the Work classification system.[1] (Figure 1)
- The first branchial cleft is unique in that it gives rise to the external auditory canal and the epithelium of the tympanic membrane, in contrast to the second through sixth branchial clefts, which normally involute.[3]
- First branchial cleft cysts are classically located in the pre-auricular region and do not involve the temporal bone.
- Numerous genetic syndromes, including Goldenhar syndrome, are known to affect branchial cleft development. Goldenhar syndrome classically presents with mandibular hypoplasia resulting in hemifacial microsomia, ear and/or eye malformations, and vertebral anomalies.[3,4]
- We report an unusual case of a duplication of the ear canal with a fistulous tract from the middle ear to the retro-auricular area.

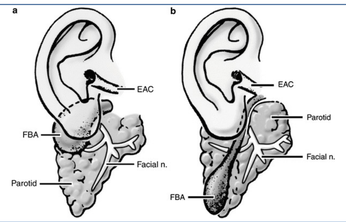

Figure 1. Type I and Type II first branchial cleft cysts with typical tract and adjacent anatomy.

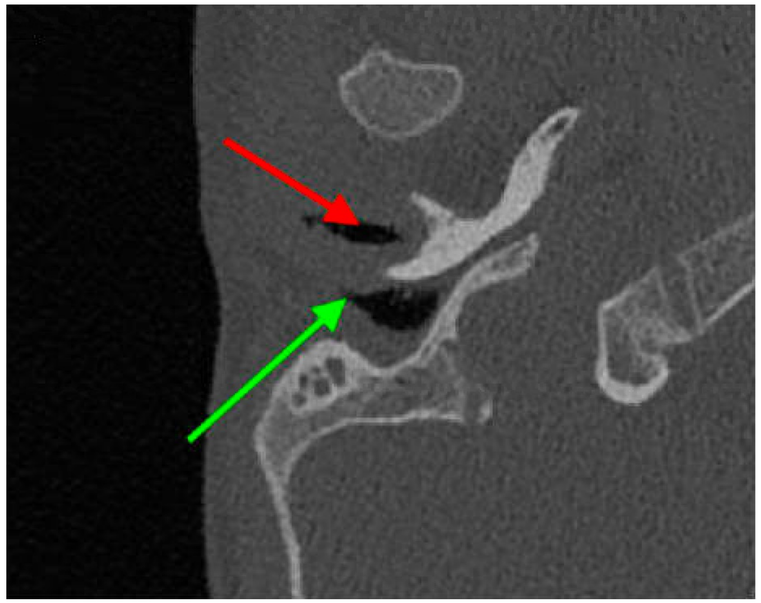

Figure 2. Computed tomography of the temporal bone on axial view demonstrating retroauricular fistula tract from the mastoid cavity to the post-auricular skin (green arrow) adjacent to the normal external auditory canal (red arrow).

Case Report

- An infant male was referred to clinic for failed newborn hearing screening. He was noted to have right Grade III microtia.
- Genetic workup was consistent with Goldenhar syndrome. He was followed at 6-month intervals.
- Parents noted intermittent drainage from the right retro-auricular region. (Figure 3)
- He was noted to have recurrent otitis media with effusion and was taken to the operating room for myringotomy with tube placement and computed tomography (CT) of the temporal bone.

Case Report Continued

- CT revealed a linear right retro-auricular cutaneous fistula posterior and parallel to the EAC, communicating with the mastoid and middle ear. (Figure 2)
- Interestingly, placement of a tympanostomy tube resolved the retro-auricular drainage.

Conclusions

- First branchial cleft anomalies typically involve the pre-auricular region and affect the formation of the auricle.
- In syndromic children, unique embryologic variants may lead to rare patterns of congenital cysts, sinuses or fistulas.
- In this patient, the retro-auricular fistula may be related to abnormal embryologic development of the ear and temporal bone rather than a first branchial cleft anomaly.
- It is important for the surgeon to be aware of these variants to improve diagnosis and treatment of syndromic children.

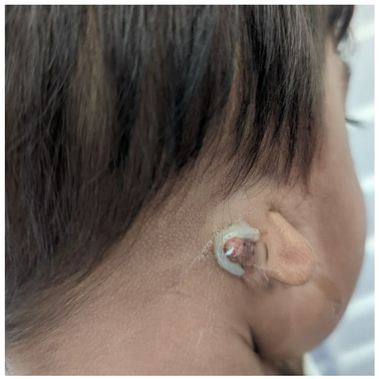

Figure 3. Type I and Type II first branchial cleft cysts with typical tract and adjacent anatomy.

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Practice Patterns in Pediatric Sialorrhea Management: A Survey Based Study

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Introduction

- Pediatric sialorrhea is associated with several comorbidities including cerebral palsy.
- Management techniques for pediatric sialorrhea vary widely and medical decision-making is largely based on institution or surgeon preference.
- No practice guidelines exist for directing management.

Methods

- Survey-based study
- Distributed to American Society of Pediatric Otolaryngology (ASPO) members
- 22 questions
- Queried on
  - Practice model (academic vs non-academic, private vs employed)
  - Commonly encountered comorbidities
  - Referral patterns
  - Treatment modalities
  - Complications secondary to treatment
- Analyzed using chi-square, Fisher's Exact, and student's t-tests

Results

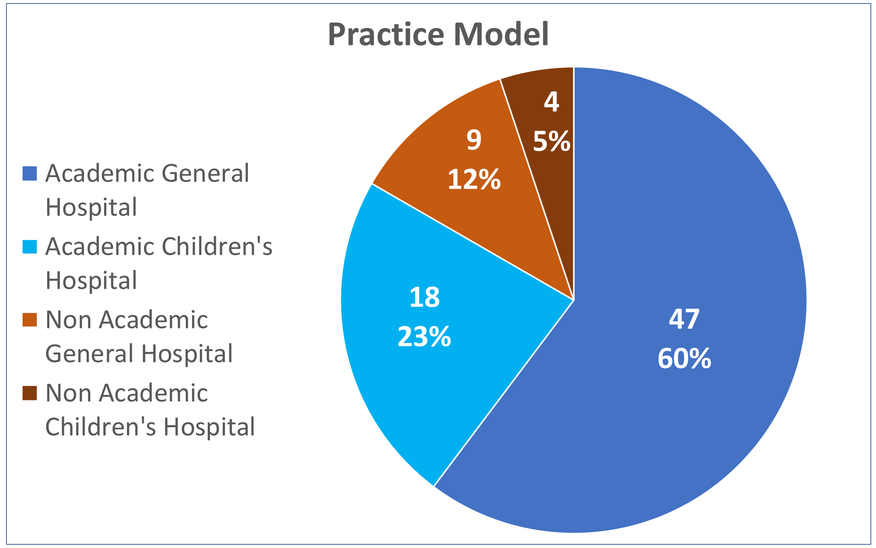

Figure 1. Practice models of survey participants.

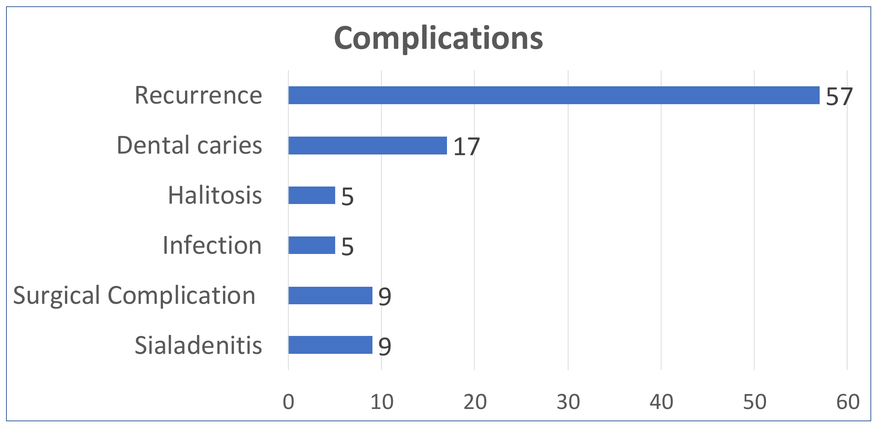

Figure 2. Complications encountered >50% of the time.

Surgical Treatments (n=64)	n	%
Parotid Duct Ligation	52	81.3
Parotid duct rerouting	0	0
Submandibular duct ligation	18	28.1
Submandibular duct rerouting	7	10.9
Submandibular gland excision	53	82.8
Sublingual gland excision	53	82.8
Non-Surgical Treatments (n=64)	**n**	**%**
Behavioral modifications/rehabilitation	35	54.7
Botulinum toxin injections	57	89.1
Pharmacotherapy	53	82.8

Table 1. Responses regarding surgical and non-surgical management.

Discussion/Conclusions

- A multidisciplinary approach to treatment is commonly utilized to treat sialorrhea.
- Management techniques do not differ significantly between academic and private practice otolaryngologists.
- Botulinum toxin injection remains the most frequently used treatment.
- Comprehensive outcomes research is required to develop adequate treatment guidelines.

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Poster # 125

Hearing Loss in Adolescents with Down Syndrome

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BACKGROUND

Hearing loss is common among young patients with Down syndrome (DS)
- Prevalence of hearing loss is 40-80%, with most cases representing conductive hearing loss (CHL)
- CHL is attributable to chronic otitis media with effusion (COME) in 40-60% of cases
- Children with DS demonstrate an increased risk of persistent hearing loss despite management of COME (20-40%)

There is an increased prevalence of sensorineural hearing loss (SNHL) observed with advancing age
- Prevalence of SNHL 4-50%

Literature pertaining to hearing loss in the adolescents with DS is sparse

OBJECTIVES

- Determine rate, type, severity of hearing loss among adolescent patients with DS
- Describe interventions for hearing loss in adolescent patients with DS

METHODS

- Retrospective cohort study of 1203 adolescents with DS born between 2002 and 2011 (ages 10-19 years), presenting to a single tertiary care institution
- Demographic, clinical, and audiologic data were extracted from the electronic medical record and analyzed

RESULTS

Overall, 599 patients with DS (49.8%) completed at least one audiogram
- 3969 audiology encounters
- 1274 audiograms with hearing data
- Only 297 patients completed most recent audiogram at age ≥ 10 years

Table 1: Demographic and clinical characteristics of cohort

	Overall	Audiogram at age <10 years	Audiogram at age ≥ 10 years	*p*
	599	302 (50.4%)	297 (49.6%)	
Age at Most Recent Audiogram Mean (SD)	9.63 (4.6)	5.9 (2.8)	13.4 (2.4)	
Female ŧ	248 (41.7)	129 (43.0)	119 (40.3)	
Male	347 (58.3)	171 (57.0)	176 (59.7)	
Race				
African American/ Black	56 (9.3)	32 (10.6)	24 (8.1)	
Asian	11 (1.8)	6 (2.0)	5 (1.7)	
Caucasian	478 (79.8)	229 (75.8)	249 (83.8)	
More than 1 race	19 (3.2)	11 (3.6)	8 (2.7)	
Other	21 (3.5)	16 (5.3)	5 (1.7)	
Unknown	13 (2.2)	7 (2.3)	6 (2.0)	
Hispanic Ethnicity	38 (6.3)	19 (6.3)	19 (6.4)	
Hearing Loss Type				**<.0001**
Normal	263 (43.9)	150 (49.7)	113 (38.0)	
Conductive Hearing Loss	170 (28.4)	68 (22.5)	102 (34.3)	
Sensorineural Hearing Loss	45 (7.5)	12 (4.0)	33 (11.1)	
Mixed Hearing Loss	46 (7.7)	11 (3.6)	35 (11.8)	
Other	75 (12.5)	61 (20.2)	14 (4.7)	
Hearing Loss Severity ŧŧ				
Normal	176 (46.9)	52 (53.6)	124 (44.6)	
Mild	154 (41.1)	33 (34.0)	121 (43.5)	
Moderate	41 (10.9)	12 (12.4)	29 (10.4)	
Severe	2 (0.53)	0	2 (0.72)	
Profound	2 (0.53)	0	2 (0.72)	
Unknown	224 (37.4)	205 (67.9)	19 (6.4)	

ŧ Unknown sex (n=4)
ŧŧ Determined by PTA (calculated as average threshold response at 500, 1000, 2000, 4000 Hz); Mild 20-40 dB HL, moderate 40-70 dB HL, severe 70-90 dB HL, profound >90 dB HL

RESULTS

Table 2: Laterality of hearing loss by hearing loss type ŧ

		Right Ear			
		Normal	Conductive	Sensorineural	Mixed
Left Ear	Normal	263	26	11	2
	Conductive	29	93	1	4
	Sensorineural	5	3	25	3
	Mixed	5	4	2	26

ŧ Soundfield hearing only (not ear-specific) in 22 patients
Hearing loss categorized as "other" in 75 patients

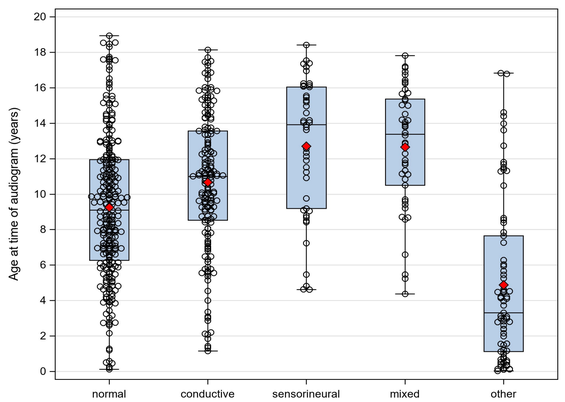

Figure 1: Hearing loss type by age at time of audiogram completion. Elevated rates of sensorineural, mixed hearing loss noted with increasing age among patients with DS.

Table 3: Hearing loss intervention based on most recent audiogram demonstrating conductive, sensorineural, and/or mixed hearing loss (N=261)

	n
Hearing Aid ŧ	85 (32.6%)
Tympanostomy Tube Placement	41 (15.7)
Medical Management of Middle Ear Disease	12 (4.6)
Medical Management of External Ear Disease	9 (3.4)
Tympanoplasty +/- Mastoidectomy	5 (1.9)
Intervention Recommended, Not Pursued	20 (7.7)
No Intervention (Including Observation)	111 (42.5)

ŧ Includes bone conduction device (n=8), cochlear implant (2)

CONCLUSIONS

Hearing loss is common among adolescents with DS
- CHL remains the predominant type
- Ongoing management of tympanic membrane and middle ear disease is necessary

There is an increasing prevalence of SNHL in this age group as well
- Hearing aid evaluation should be recommended when newly diagnosed

Overall rates of hearing testing were low among patients in the study cohort
- Additional analysis is needed to determine clinical and demographic factors associated with adherence to routine hearing evaluation.

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Post-operative Management of Pediatric Patients Undergoing Injection Laryngoplasty of Low-grade Laryngeal Cleft

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Objectives

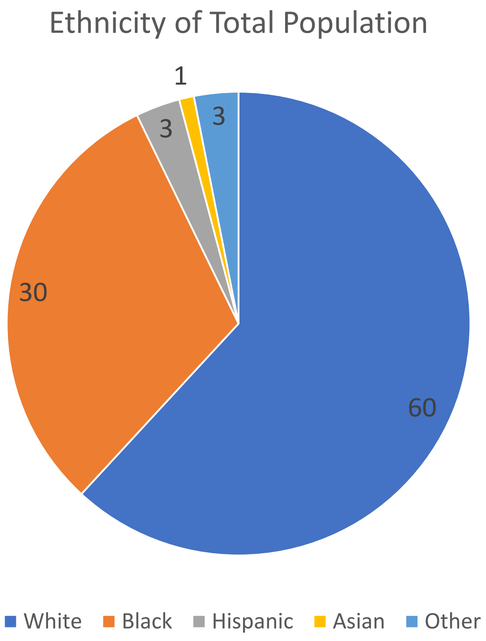
- Retrospectively review of outcomes following injection repair of low-grade laryngeal cleft
- Provide support for standardization of post operative management
- Recent systematic review on this subject did not provide recommendations for post-operative management[1]
- To provide an evidence-based recommendation for clinical decision making in support of or against the necessity of 23-hour observation admission following injection repair

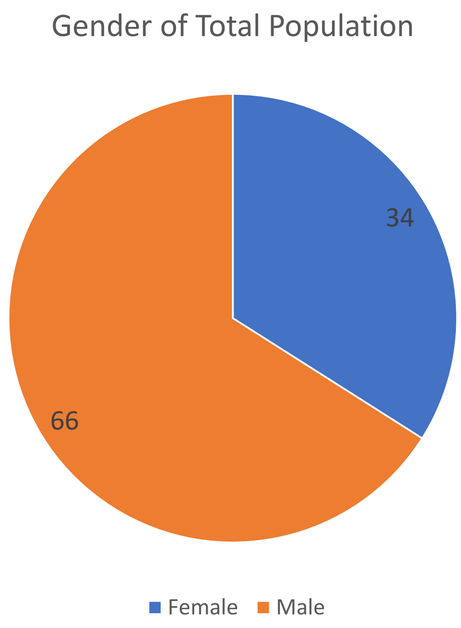
Introduction

Congenital laryngeal cleft can lead to clinical symptoms of dysphagia, chronic cough, recurrent pneumonia, aspiration and respiratory distress. Laryngoscopic injection augmentation of Benjamin Inglis type 1 laryngeal cleft is often utilized as a diagnostic and therapeutic tool for patients with ongoing respiratory and GI concerns recalcitrant to conservative treatment. As in many pediatric otolaryngology procedures, concerns with respiratory issues and nutritional intake are considered in post-operative disposition. Post-operative management of these patients including need for overnight observation postoperatively is not standardized in this population.

Methods and Materials

This study was approved by the University of Tennessee Health Science Center and Lebonheur Children's Hospital Institutional Review Board. We conducted a retrospective chart review by enrolling patients ages 0 to 18 years old who underwent Prolaryn injection augmentation extracted from CPT codes related to patient demographics, operative outcomes, and post operative course over 2-year period. The patient cohort consisted primarily of an urban population but included representation from multiple states and regional rural referrals. Initial data collected included demographic information, pre-operative evaluation, comorbidities, complication, and length of stay. Surgeries were performed at a tertiary pediatric hospital and outpatient surgery facility by six pediatric otolaryngologists. Children with alternate procedure, previous injection augmentation, known coagulopathy/malignancy, or inadequate postoperative follow-up were excluded. Post operative monitoring included oxygen saturation, oxygen support, and enteral intake. All patients in study were observed in post anesthesia care unit for at least 2 hours with consistent recording of oxygen saturation and toleration of PO challenge. Disposition was determined by attending preference and anesthesia clearance. Follow up T-tests, Chi-square, and analysis of variance (ANOVA) were used to calculate differences in complication rates by sex, age, and ethnicity. Pearson correlation coefficient tests were utilized to determine which certain factors were related to developing a complication. A P-value of less than 0.05 was considered significant.





Results

We identified 100 patients who underwent a Prolaryn injection for deep laryngeal notch, type I laryngeal cleft, or type II laryngeal cleft. Of the patients who underwent procedure, 89/100 were admitted to the hospital for planned post-operative observation for at least 23 hours and 11/100 were discharged after PACU observation. Our primary outcome was post-operative events and complications. We considered 8 patients to have a complication or unexpected postoperative course for our evaluation, including 3 acute events (within 23 hours of surgery) and 5 delayed events (within one week of procedure). We had 1 patient with post-operative stridor and prolonged length of stay, two patients with prolonged oxygen requirements outside of PACU, and 5 patients who experienced post procedure emergency department visits or readmissions. Factors that we controlled for included comorbidities, prematurity, prior intubation, prior admission for dysphagia related diagnosis, and concurrent procedures. For comorbidities, we subdivided these into both neurologic and respiratory categories to determine the effect. For procedures, we considered both invasive and non-invasive procedures. None of these subcategories significantly impacted a patients' risk of experiencing a complication.

Factor	Complication		
	N	Y	Total
Total patient analyzed	92	8	100
Average age	2.18	1.38	P=0.07
Previous admission	31/92	5/8	P=0.19
History of prematurity	37/92	2/8	P=0.51
Avg. oxygen saturation	94.54%	92.37%	P=0.011
Secondary invasive procedure	18/92	2/8	P=0.76

Discussion

Injection augmentation of low-grade laryngeal cleft has recently developed as a promising treatment in the management of pediatric dysphagia. Recent systematic review of primarily retrospective data has shown improvement in both subjective and objective symptoms in patient's following these procedures. One advantage of this procedure has been its generally low risk profile and low reported rate of complications. The recent analysis demonstrated a complication rate of less than 1% in the multiple retrospective cohort studies that have been published thus far. In our total cohort, we found that only 3 patients experienced an acute post-operative complication including stridor or persistent oxygen requirement. These patients were all managed similarly with steroid administration and had resolution of their symptoms. We additionally had 5 patients that had complication within one week of the procedure including emergency department visits or readmission for concerns related to the procedure. Many of the other studies on injections did not extrapolate the exact complications their patient cohorts experienced, however one study commented that younger patients were at higher risk of negative outcome. This would be consistent with our findings.
The purpose of this study was to retrospectively identify factors that would support post-operative admission or discharge. We found two factors to be most consistent in identifying patients at risk of complication– age and average oxygen saturation in the post anesthesia care unit. One patient with an acute complication additionally underwent a CO2 laser supraglottoplasty which likely contributed to their post-operative course.

Conclusions

Retrospective data suggests that younger children, children with previous admission related to dysphagia/respiratory concern, or with lower PACU oxygen level could benefit from post operative observation whereas older children without admission could be safe to undergo PACU monitoring of oxygen level and outpatient procedure.

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3D Printed Ear Canals for Advanced Practice Provider Outpatient Simulation

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Introduction

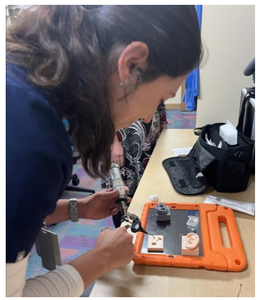
- 3D printing for medical simulation is a common occurrence.
- Simulation for 3D printed ears have been studied in the literature as case preparation for otolaryngology surgeons. However, no literature exists for 3D printing ear simulation in the outpatient setting.
- There is limited literature on 3D printing and advanced practice providers (APPs).
- The purpose of this study was to assess experience, knowledge, and confidence before and after 3 common procedures simulated on a 3D printed ear auditory canal (EAC).
- We hypothesized that the simulation program would increase knowledge and confidence in performing these common procedures during outpatient visits with patients.

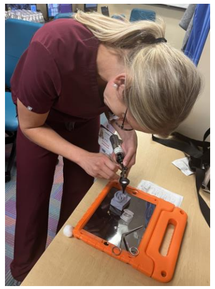
Methods and Materials

Six APPs in otolaryngology participated in simulation using two 3D printed EACs.

Trials were performed with otoscopy and included 3 scenarios: removal of cerumen, tympanostomy tube, or foreign body; 2 tools: curette and alligator forceps; and with and without movement via laboratory oscillator.

Methods and Materials





APPs completed surveys before and after the simulation including experience, impression of the model, and knowledge and confidence regarding each procedure from 0 (lowest)-100 (highest). Knowledge and confidence were compared pre- and post-simulation (Wilcoxon rank-sum or t-test, α=0.05).

Results

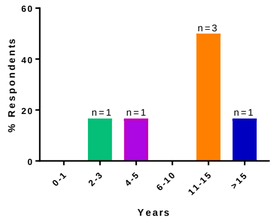


Fig 1. Most (67%) had >10 years of APP experience.

Results

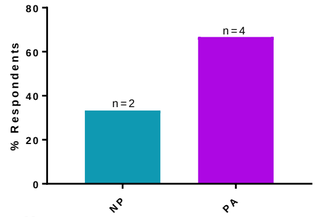


Fig 2. Most (67%) were physician assistants (PA) and 33% were nurse practitioners (NP).

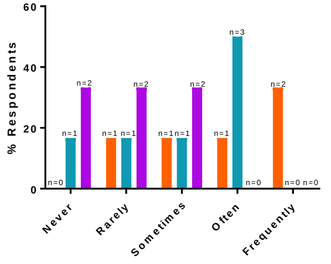


Fig 3. Cerumen removal was performed with the greatest regularity.

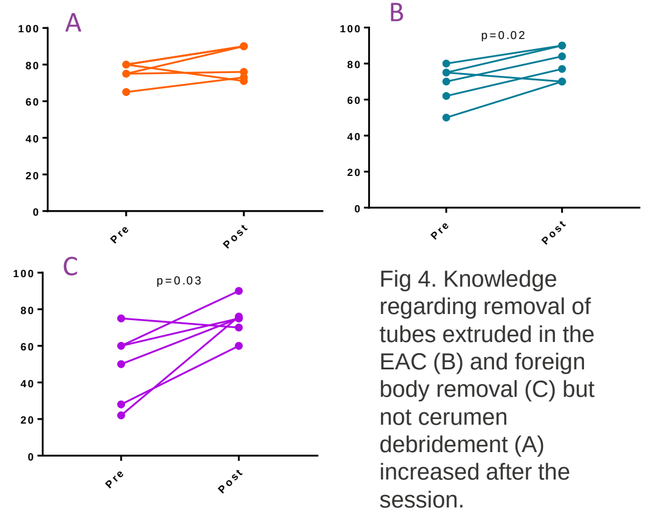
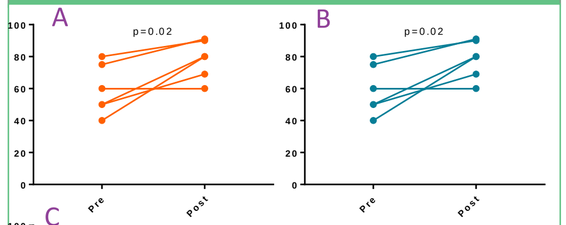


Fig 4. Knowledge regarding removal of tubes extruded in the EAC (B) and foreign body removal (C) but not cerumen debridement (A) increased after the session.

Results



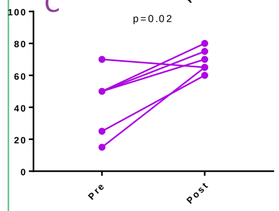


Fig 5. Confidence in cerumen debridement (A), removal of tubes extruded in the EAC (B), and foreign body removal (C) increased after the session.

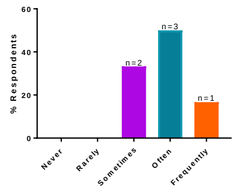


Fig 6. All APPs agreed the 3D printed ear canal replicated a patient's ear canal at least somewhat.

Conclusions

APPs with varying prior experience reported increased knowledge and confidence performing common otologic procedures following one session using a 3D printed ear canal. Future work will explore use in new APP training.

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Poster #130

Readability and Quality of Online Resources for Pediatric Otolaryngology

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INTRODUCTION

- Parents and caregivers are increasingly turning to the internet as a primary source of information regarding medical conditions, which can significantly impact their healthcare decisions.
- With 43 million Americans who have low literacy skills, it is crucial that online health information is communicated in an appropriate manner and is of good quality.
- To our knowledge, this is the first study that examines the readability, complexity, clarity, and quality of online information on common pediatric otolaryngology conditions: hearing loss, acute otitis media, and sleep apnea.
- This research addresses the critical need to evaluate the online resources that parents and caregivers rely on.

OBJECTIVES

- Investigate online resources related to common pediatric otolaryngology conditions: hearing loss (HL), acute otitis media (AOM), and sleep apnea (SA).
- Assess the readability of online resources by using the Flesch-Kincaid Grade Level score.
- Determine the complexity of nonprose information through the Peter Mosenthal (PMOSE) Readability formula.
- Evaluate the clarity of online resources using the Center for Disease Control (CDC) and Prevention's Clear Communication Index.
- Analyze the quality of information provided on these websites using the Discern rating instrument.

METHODS

- Identified the top thirty websites related to pediatric otolaryngology conditions: hearing loss (HL), acute otitis media (AOM), and sleep apnea (SA) using Google Chrome and Microsoft Edge.
- Excluded all advertisements, sponsored websites, and references
- Selected 300-600 words of each website to be input into the Flesch-Kincaid Reading Grade Level calculator to evaluate the readability of the information
- Utilized the Peter Mosenthal (PMOSE) Readability questionnaire to calculate and determine the complexity of nonprose information.
- Evaluated the clarity of the online resources using the Center for Disease Control (CDC) and Prevention's Clear Communication Index questionnaire.
- Assessed the quality of online information using the Discern rating instrument.

RESULTS

- Of the 99 websites identified, 72 satisfied the inclusion criteria.

Website Topics	Flesch-Kincaid Grade Level	PMOSE	CDC Index	Discern
Hearing Loss (n=28)	10	3.9	79.9	59.0
Acute Otitis Media (n=12)	10	2.8	75.1	58.3
Sleep Apnea (n=32)	10	3.1	66.0	58.6
All Websites (n=72)	10	3.2	73.7	58.6

	Readability	Complexity	Clarity	Quality
All Websites	10th grade	very low	poor	good

DISCUSSION

- **Readability:** This was evaluated by the Flesch-Kincaid Grade Level score, which measures the ease of comprehending written content. It quantifies the readability of text by assessing sentence length and the number of syllables in words. A higher score indicates more challenging content.
- The mean overall Flesch-Kincaid Grade Level score was 10, indicating an average reading age at the tenth-grade level. This score is higher than the recommended sixth-grade reading level for health literature and implies that the online resources may be challenging for many parents and caregivers to comprehend, potentially hindering their ability to make informed decisions about pediatric otolaryngology conditions.
- **Complexity:** Peter Mosenthal (PMOSE) Readability Formula assesses the complexity of nonprose information by examining sentence structure and vocabulary. It provides insights into how easily individuals can understand and interpret the content, especially important in the context of medical information.
- The mean overall PMOSE score was 3, reflecting a "very low" complexity of nonprose information. This suggests that the online resources are presented in a straightforward and easily understandable manner. However, this simplicity may not always be sufficient, especially for individuals seeking more in-depth information or clarification.

DISCUSSION

- **Clarity:** Center for Disease Control (CDC) and Prevention's Clear Communication Index was used for this purpose. This index is designed to gauge the clarity of written content, ensuring that information is presented in a straightforward and comprehensible manner. The CDC's tool is instrumental in evaluating the accessibility of health-related materials to a wide audience.
- The mean overall CDC Index score was 74, indicating "poor" clarity in the online resources. This signifies that the information provided may not be effectively communicated to users, which could lead to misunderstanding or misinterpretation of the content. Improved clarity is essential to ensure that individuals can make well-informed decisions about their healthcare.
- **Quality:** The Discern rating instrument focuses on evaluating the quality of information provided on healthcare websites. It encompasses aspects such as the accuracy, reliability, and relevance of the content, ultimately assessing the trustworthiness of the information presented.
- The mean overall Discern score was 59, rating the quality of information as "good." While the online resources scored well in terms of quality, it is crucial to consider that quality alone may not be sufficient if the information is not presented in a readable and clear manner.

CONCLUSION

- The study findings reveal a significant gap in the online resources related to pediatric otolaryngology conditions. Although the quality of information is generally good, online materials often fall short in terms of readability and clarity.
- It is essential to recognize that effective healthcare decision-making hinges on patients' and caregivers' ability to comprehend the information provided. Therefore, providing information in simpler language and improving clarity is imperative.
- Healthcare providers, content creators, and website administrators should strive to make online resources more accessible and user-friendly, ensuring that patients and caregivers can make well-informed decisions about the care of children with otolaryngological conditions.

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ENT Manifestations in Pediatric Ehlers-Danlos Syndrome Patients

Chloe Cottone BA[1], Erin M. Gawel BS[1], Douglas P. Nanu BS[2,3], Alexandra F. Corbin BS[1], Michele M. Carr DDS MD PhD[1]

[1]Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo, Buffalo, NY
[2]Elson S. Floyd College of Medicine at Washington State University, Spokane, WA
[3]Medical University of South Carolina, Charleston, SC

Introduction

- Ehlers-Danlos Syndrome (EDS) is a group of hereditary connective tissue disorders
- Clinically, EDS manifests with skin hyperelasticity, joint hypermobility, atrophic scarring, and fragile blood vessels
- There are no large-scale studies investigating the association of EDS with otolaryngological conditions

Objective

- To discover the ENT presentations likely in children with EDS

Methods

- A Retrospective study conducted within the US collaborative Network TriNetX
- Search was limited to those 17 and younger
- An EDS cohort was defined with CPT code 1013626, marking an outpatient office visit, and ICD-10 code Q79.6, defining EDS
- A non-EDS cohort was defined with CPT code 1013626 and those with ICD-10 code Q79.6 were excluded
- Prevalence of ENT manifestation were tabulated using ICD-10 codes outline in Table 1

Data Analysis

- Propensity score matching was conducted between the EDS and non-EDS cohorts for age, gender, race, and ethnicity
- Fisher's Exact tests were conducted and $p<.05$ was considered significant
- Relative Risk within a 95% confidence interval was calculated and plotted

Results

- Propensity score matching yielded 6,440 (60.5% Female) patients in both the EDS and non-EDS cohorts with a mean age of 9.28 (SD=4.38) and no statistical differences in race or ethnicity.
- See Table 1 and Figure 1 for results of Relative Risk calculation.

Table 1: Relative Risk of ENT Sequala in Children with Ehlers Danlos Syndrome

Pathology	ICD-10 Code	*P* value	Relative Risk	95% CI
Conductive, Sensorineural, or Unspecified Hearing Loss	H90, H91	<.001	2.04	1.67 – 2.49
Suppurative, Nonsuppurative, or Unspecified Otitis Media	H66, H65	.521	.96	.86 – 1.08
Allergic Rhinitis	J30.9	<.001	1.60	1.38 – 1.85
Acute Tonsillitis	J03	.009	.71	.55 – .92
Chronic or Acute Sinusitis	J32, J01	<.001	1.52	1.29 – 1.78
Obstructive Sleep Apnea	G47.33	<.001	4.24	3.33 – 5.41

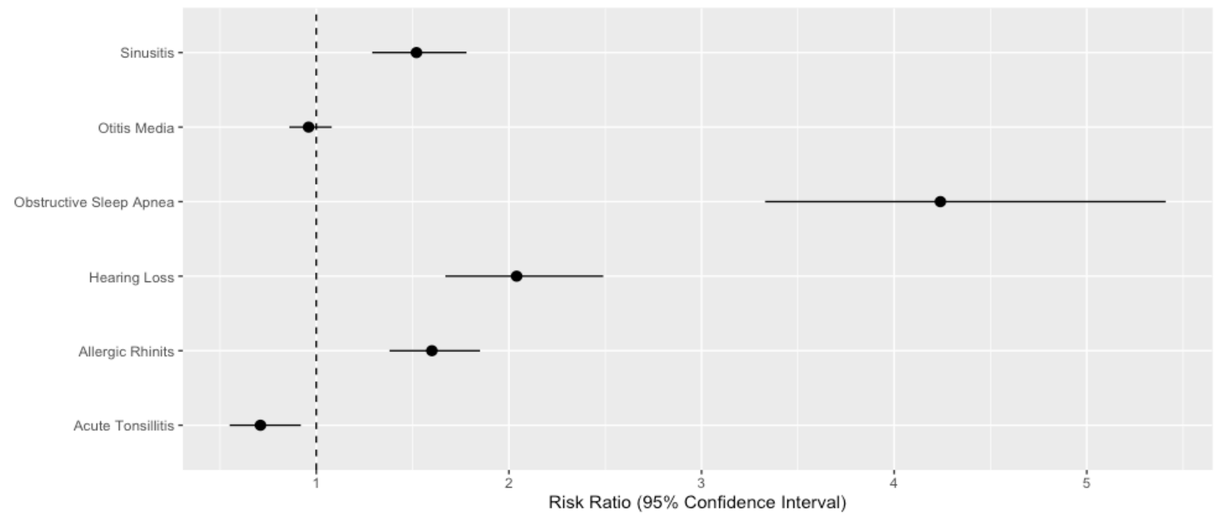

Figure 1: Relative Risk ENT manifestations in Children with Ehlers Danlos Syndrome Compared to Those Without Ehlers Danlos Syndrome

Discussion

- A previous study found a high prevalence of hearing impairment in patients with EDS[1]
- An autosomal recessive variant of EDS, involving a mutation in *FKBP14*, has been found to be characterized by sensorineural hearing loss[2]
- Upper airway and nasal-maxillary cartilage defects can increase the risk of respiratory symptoms, including OSA[3]
- Some patients present with a triad of symptoms, which include hypermobile EDS, postural orthostatic tachycardia syndrome (POTS), and mast cell activation syndrome (MCAS), MCAS may manifest daily as allergic rhinitis[4]

Conclusion

- Children with EDS appear to be more likely to require otolaryngological intervention than do children without EDS

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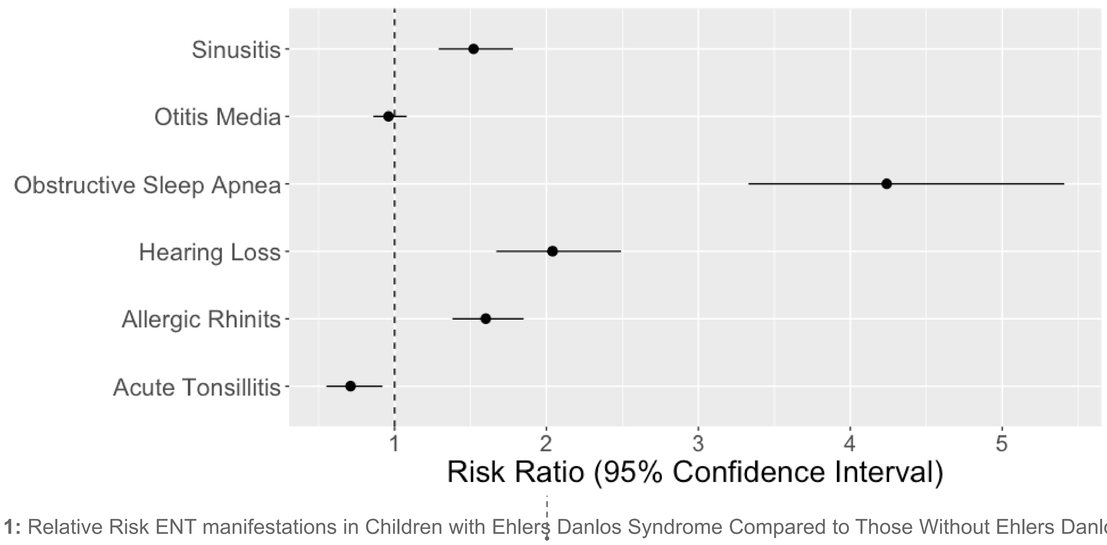

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Appointment Attendance in Pediatric Otolaryngology Versus Other Pediatric Specialties

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Background

- Few studies exist specifically analyzing appointment attendance rates in pediatric otolaryngology clinics
- Reported attendance rates vary widely based on factors such as the hospital system, patient cohort, and appointment timing
- This study aims to compare attendance in pediatric otolaryngology versus other medical specialties in the setting of an urban safety-net hospital

Methods

- **Setting:** Pediatric otolaryngology clinic at Boston Medical Center (BMC), an urban safety net hospital
- **Design**: Retrospective analysis of patients under 18 years of age seen in the pediatric otolaryngology clinic between 1/1/2019 and 12/31/2021 who had appointments in any other specialty. Patient sex, race, ethnicity, language, interpreter use, insurance, housing insecurity, and medical comorbidities were included in the chart review
- **Primary outcome**:
  - Appointment attendance in otolaryngology
  - Appointment attendance in all other specialties
- **Statistical analyses** involved univariate and multivariate analysis comparing appointment attendance in pediatric otolaryngology versus other pediatric specialties

Results

- Overall attendance rates in pediatric otolaryngology appointments (N=4,331): 24.2% attended, 52.4% canceled, and 23.4% no-shows
- Table 1 compares odds ratios for different specialties between attended versus missed (canceled + no-show) categories

Table 1. Comparing attendance rates in pediatric otolaryngology to other pediatric specialties

Specialties	Unadjusted Odds Ratio (95% CI)	Unadjusted p-values	Adjusted Odds Ratio (95% CI)	Adjusted P-Value
Audiology	2.23 (1.92 - 2.60)	**8.221214e-27**	2.16 (1.86 - 2.52)	**1.540086e-31**
Cardiology	5.45 (1.12 - 98.36)	**0.03301616**	6.21 (1.07 - 194.01)	**0.02554194**
Dermatology	1.11 (0.84 - 1.48)	0.4799837	1.05 (0.80 - 1.42)	0.110661
Gastroenterology	0.57 (0.20 - 1.87)	0.3350091	0.51 (0.18 - 1.58)	0.414984
Hematology & Oncology	14215739 (6.69e-307 - NA)	0.3926514	2.52e+12 (7.44e+104 - 7.73e+112)	0.442790
Neurology	1.95 (1.57 - 2.44)	**3.25067e-10**	1.96 (1.57 - 2.45)	**6.009947e-09**
Neurosurgery	0.59 (0.37 - 0.98)	**0.04346903**	0.62 (0.38 - 1.02)	0.1003969
Obstetrics & Gynecology	0.80 (0.32 - 2.24)	0.6453216	0.82 (0.40 - 1.79)	0.9308454
Ophthalmology	1.39 (1.15 - 1.71)	**0.0007521696**	1.31 (1.07 - 1.60)	**2.557038e-16**
Orthopedic Surgery	0.94 (0.68 - 1.33)	0.7270924	0.93 (0.67 - 1.32)	0.9749588
Psychiatry	1.18 (0.91 - 1.53)	0.2100497	1.06 (0.82 - 1.38)	0.1355526
Pulmonology	1.15 (0.81 - 1.66)	0.4452726	0.91 (0.64 - 1.31)	0.4431889
Rheumatology	0.93 (0.50 - 1.88)	0.8310084	0.84 (0.42 - 1.79)	0.05527987
Urology	1.28 (0.19 - 25.23)	0.8227856	1.44 (0.44 - 6.68)	0.8739838

Strengths/Limitations

Strengths:

- Underserved patient population
- Not previously studied

Limitations:

- Data on referral patterns not collected
- Limited generalizability to general population

Findings

- Unadjusted appointment attendance in pediatric otolaryngology correlated with attendance in audiology, cardiology, neurology, neurosurgery, and ophthalmology
- Relationship of adjusted appointment attendance was the same except neurosurgery was no longer significant

Conclusions

- Specialties closely related to otolaryngology such as audiology have similar attendance patterns
- Surgical specialties such as neurosurgery and ophthalmology also correlate with otolaryngology, although this interaction may be affected by confounding variables
- Further studies must explore reasons for the differences in appointment attendance between specialties to provide equitable care

Poster #137

Rates and Management of CRS in Pediatric Patients with Craniofacial Anomalies

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Introduction

Craniofacial abnormalities, characterized by structural deformities of the skull and face, have significant implications for otolaryngologic problems. Our study focused on the impact of craniofacial abnormalities on chronic rhinosinusitis (CRS) rates and treatment.

Methods and Materials

Study Design:

- This study is a retrospective cohort study.

Ethics Approval:

- Ethical approval was granted by the Institutional Review Board (IRB) at The University of Tennessee Health and Science Center, under protocol number 23-09356-NHSR, ensuring adherence to ethical guidelines and principles.

TriNetx:

- TriNetx utilizes Electronic Health Records to provide clinical data and analytical tools to generate real-world evidence (RWE) localized to a single healthcare center, The University of Tennessee Health Science Center. The queries are federated, and only aggregated results are visible on the TriNetX platform. We utilized ICD10 and CPT codes to determine the rates of outcomes within our populations.

Inclusion Criteria:

- Pediatric patients from 2014 to present.
- Analysis 1: Patients with craniofacial abnormalities (n=2,490) vs. those without (n=9,470).
- Analysis 2: Patients with craniofacial abnormalities and CRS (n=140) vs. CRS alone (n=9,000).

Outcome Measures:

- Analysis 1: Rates of: chronic sinusitis, chronic rhinitis, nasopharyngitis, pharyngitis, diseases of tonsils and adenoids.
- Analysis 2: Treatments studied:
  - Anesthetics, Nasal Decongestants, Glucocorticoids, Parasympatholytics, Sympathomimetics, Cholinergics

Data Collection and Analysis:

- Patient data, including demographic characteristics and clinical parameters, were extracted from electronic health records in the TriNetX Database.
- P value of < 0.05 was determined to be statistically significant.
- Odds Ratios were used to compare the 2 cohorts of Analysis 2.
- Significance was determined using 95% Confidence Intervals (CIs).

Results

In our research, we analyzed differences between pediatric patients with and without Craniofacial abnormalities. Among the Craniofacial group, 6% were diagnosed with Chronic Sinusitis, while only a 0.1% of those without these conditions showed the same. Similarly, conditions such as Chronic Rhinitis, Nasopharyngitis, and Pharyngitis were observed in 5% of the Craniofacial group, but in less than 0.1% of the control group. Furthermore, 9% of the Craniofacial patients had Chronic Diseases of Tonsils and Adenoids, in contrast to just 1% in the control group (Table 1).

In a subset analysis comparing patients with Craniofacial anomalies and CRS to those with CRS alone, the two cohorts were matched leaving 140 patients in each group. We found Craniofacial abnormalities and CRS demonstrated an increased utilization of treatments like Anesthetics, Nasal Decongestants, Glucocorticoids, and Parasympatholytics, when compared to those with only CRS. However, there was no noticeable difference in the usage of Sympathomimetics and Cholinergics between the two groups (Table 2).

Discussion

Oftentimes patients with crainiofacial malformations patients commonly have airway, feeding, speech, and hearing problems, requiring frequent otolaryngologic intervention [1]. Our findings suggest this population might be subject to increased rated of , especially in conditions like Chronic Sinusitis and Chronic Rhinitis, and chronic diseases of the tonsils and adenoids.

The uptick in treatment usage in the Craniofacial group underscores the complexity of their needs, suggesting that this population's symptoms might require greater medical intervention. Similarly, Schlosser et al., noted seven cases of refractory CRS requiring surgery in such patients [2]. Together, these results emphasize the importance of specialized care for this population.

While this study has uses a robust database and uses comprehensive analysis it does have its limitations, including a single-organization scope, potential misclassification bias, and reliance on ICD codes.

Table 1

Disease	Craniofacial Anomalies (n=2,490)	No Craniofacial Anomalies (n=9,470)	p-value
Chronic Sinusitis	n=145 (6%)	n=30 (<0.1%)	<0.0001
Chronic Rhinitis, Nasopharyngitis, and Pharyngitis	n=120 (5%)	n=30 (<0.1%)	<0.0001
Chronic Diseases of Tonsils and Adenoids	n=230 (9%)	n=100 (1%)	<0.0001

Table 2

Treatment	CRS w/ Craniofacial Anomalies	CRS w/o Craniofacial Anomalies	Odds Ratio (OR)	95% Confidence Interval (CI)
Anesthetics	60 (42.9%)	30 (21.4%)	2.75	[1.628, 4.646]**
Nasal Decongestants	30 (21.4%)	20 (14.3%)	2.40	[1.319, 4.368]**
Glucocorticoids	90 (64.3%)	60 (42.9%)	1.80	[1.115, 2.906]**
Parasympatholytics	60 (42.9%)	20 (14.3%)	4.50	[2.520, 8.035]**
Sympathomimetics	40 (28.6%)	30 (21.4%)	1.47	[0.85, 2.53]
Cholinergics	20 (14.3%)	10 (7.1%)	2.167	[0.975, 4.815]

** indicate statistical significance

Conclusions

Patients with craniofacial anomalies have a higher risk of CRS and require more medical treatment compared to those without. This highlights the increased rates and disease burden associated with craniofacial abnormalities. Further research is needed to find ways of reducing this burden.

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Exploring Characteristics and Outcomes of Children with Congenital Tracheomalacia or Laryngomalacia who Undergo Subsequent Tympanostomy Tube Insertion: Insights from a Large Comparative Database

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Background and Purpose

- Congenital tracheomalacia and laryngomalacia often resolve without surgery but are associated with systemic abnormalities.
- Children with airway malacia who undergo Tympanostomy Tube (TT) insertion at some point in their life may have higher prevalence of aerodigestive and other comorbidities.
- They may experience worse outcomes compared to children who never undergo TT insertion.
- This is the first study that investigates characteristics and outcomes of children with airway malacia who have undergone TT insertion.

Methods

- A retrospective study on TriNetX – a research network composed of 57 U.S. healthcare organizations – identified children diagnosed with congenital tracheomalacia or laryngomalacia between ages 0 and 18.
- Cohort 1 (n=5,673) had a first instance of TT insertion following diagnosis, while Cohort 2 (n=46,147) had no instances of TT insertion following airway malacia diagnosis.
- Data on aerodigestive and other comorbidities were analyzed using Chi-Squared tests.
- Propensity score matching (1:1) for gender, race, and age at diagnosis created final cohorts (n=5,672).
- Risk Ratios (RR) were calculated for aspiration pneumonia, mortality, intubation, ED service use, and critical care service use within 1 year after diagnosis of airway malacia.

Results

- Within 1 year before diagnosis of airway malacia, children in the TT insertion cohort had significantly higher prevalence of aerodigestive conditions, congenital and chromosomal abnormalities, diseases of the respiratory system, and other conditions (Table 1).
- Within 1 year after diagnosis of airway malacia, patients that did not undergo TT insertion were significantly less likely to have aspiration pneumonia (RR: 0.45, 95% CI: 0.34, 0.58), undergo intubation (RR: 0.33, 95% CI: 0.20, 0.55), use ER services (RR: 0.51, 95% CI: 0.47, 0.56), and use critical care services (RR: 0.42, 95% CI: 0.33, 0.54) compared to children who had TT insertion.
- Notably, the mortality rate within 1 year was significantly higher in the cohort who did not undergo TT insertion (RR: 3.00, 95% CI: 1.60, 5.62).

	# (%) Patients Cohort 1	# (%) Patients Cohort 2	Std. Difference	P-Value
Aerodigestive Conditions				
Feeding difficulties	4,308 (9%)	1,142 (20%)	0.308	<0.0001
Abnormalities of breathing	10,747 (23%)	1,974 (35%)	0.262	<0.0001
Asphyxia and Hypoxemia	1,518 (3%)	393 (7%)	0.166	<0.0001
Nausea and Vomiting	2,695 (6%)	601 (11%)	0.174	<0.0001
Dysphagia	3,618 (8%)	1,074 (19%)	0.330	<0.0001
Gastro-Esophageal Reflux Disease	6,211 (13%)	1,387 (24%)	0.283	<0.0001
Congenital and Chromosomal Abnormalities				
Cleft Lip & Palate	216 (0%)	218 (4%)	0.234	<0.0001
Congenital malformations of the respiratory system	2,033 (4%)	431 (8%)	0.135	<0.0001
Other congenital malformations of the digestive system	1,528 (3%)	366 (6%)	0.146	<0.0001
Chromosomal abnormalities, not elsewhere classified	1,402 (3%)	600 (11%)	0.303	<0.0001
Diseases of the Respiratory System				
Acute Upper Respiratory Infection	5,104 (11%)	1,126 (20%)	0.245	<0.0001
Chronic Lower Respiratory Disease	2,130 (5%)	416 (7%)	0.115	<0.0001
Influenza and pneumonia	1,537 (3%)	352 (6%)	0.135	<0.0001
Other Diagnoses				
Chronic Diseases of Tonsils and Adenoids	1,107 (2%)	365 (6%)	0.197	<0.0001
Lack of expected normal physiological development in childhood and adults	3,946 (9%)	947 (17%)	0.247	<0.0001
Mental, Behavioral, or Neurodevelopmental Disorder	2,531 (5%)	600 (11%)	0.188	<0.0001
Tracheostomy Status	699 (2%)	181 (3%)	0.111	<0.0001

Conclusion

- This study found that children diagnosed with congenital tracheomalacia or laryngomalacia and subsequently found to have TT insertion are more likely to have aerodigestive and other congenital and respiratory comorbidities leading up to diagnosis and have worse short-term outcomes compared to children who did not undergo TT insertion.
- Despite this, they have a lower risk of mortality compared to children that did not undergo TT insertion, possibly due to more stringent medical monitoring of this subpopulation over time.

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Poster # 142

Do Spanish Speaking Patients Experience Delays in Initiating Care for Microtia Compared to English Speaking Patients?

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Background

Importance of Early, Holistic Microtia Care

- Microtia is often associated with aural atresia, therefore many children with microtia experience hearing differences.
- The Joint Committee on Infant Hearing recommend consistent and early hearing device use in children with hearing differences to promote optimal language, social, and academic development[1].
- Children born with craniofacial differences are at increased risk of low self-esteem and bullying[2].

Children's Hospital Colorado Microtia and Atresia Multidisciplinary Clinic (MDC)

- Clinic population: patients with microtia/atresia from birth-21 years of age
- Specialists: Pediatric ENT surgeon, Audiologist, Anaplastologist, Family consultant, Psychologist, Social worker, Speech-Language Pathologist, and Medical Photographer.
- Created in 2008 to support each child's individual needs and educate caregivers by answering questions concerning microtia, aural atresia, and options for audiologic and reconstructive treatments.

Healthcare Disparities Among Patients With Limited English Proficiency (LEP)

- LEP has been recognized as a factor that can impact delivery of care in Otolaryngology[3].
- Even under active care, children with hearing differences from families who do not speak English at home or with public insurance face more difficulty obtaining educational services, cochlear implants and hearing devices[4].

Methods

Retrospective chart review of patients evaluated for conductive hearing loss (CHL) at Children's Hospital Colorado Microtia and Atresia MDC between 2008-2023.

Patient Variables Collected

Demographic information, including sex, ethnicity, language spoken at home, insurance type, and age at first clinic visit, and were recorded.

Measured outcome

Association between primary language and age at first clinic visit.

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Results

	English (N=344)	Spanish (N=101)	P-value	Overall (N=445)
Sex				
Male	183 (53.2%)	51 (50.5%)	0.715	234 (52.6%)
Female	161	50		211
Ethnicity				
Hispanic/Latino	117 (34.0%)	99 (98.0%)	<0.001	216 (48.5%)
Not Hispanic/Latino	188	0		188
Unknown	39	2		41

Figure 1.) Patient demographics.

Insurance

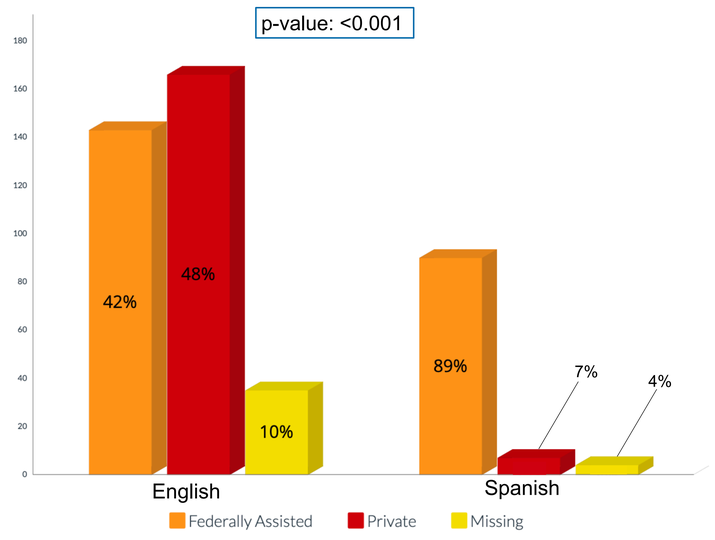

Figure 2.) Type of insurance coverage among patients from English speaking families and patients from Spanish speaking families.

Age at 1st Clinic Visit (Years)

	English (N=344)	Spanish (N=101)	P-value	Overall (N=445)
Mean (SD)	**2.72** (4.15)	**2.82** (3.95)	**0.683**	2.75 (4.10)
Median [Min, Max]	0.62 [0.011, 17.9]	0.54 [0.066, 14.3]		0.61 [0.011, 17.9]
Missing	4 (1.2%)	0		4 (0.9%)

Figure 3: a) Mean age at 1st clinic visit of patients from English speaking families. **b.)** Mean age at 1st clinic visit of patients from Spanish speaking families.

Conclusions

- No significant difference in age at first encounter in microtia clinic between children from families who speak English and children from families who speak Spanish.
- The two patient populations had statistically significant differences in types of insurance coverage.

Discussion

Spanish speaking patients had significantly higher rates of federally assisted coverage compared to English speaking patients. Historically, those with publicly funded insurance face barriers to care, resulting in inequites[5]. Furthermore, patients with LEP also experience healthcare inequities[3]. Despite these barriers, our study showed similar outcomes regarding age at first encounter in microtia clinic, within our MDC support system. Assessing equitable access to care among non-English speaking patients warrants attention given findings suggesting delayed care, particularly in surgical subspecialties[6], among those with LEP. Our findings suggest LEP is not a factor that is impacting access to specialized care.

Limitations

- The study only includes patients from English speaking families and patients from Spanish speaking families who were evaluated in the CHCO Microtia MDC. The findings cannot be directly applied to non-Spanish speaking patients who have language discordance with English speaking healthcare staff.
- Data was collected via retrospective chart review; therefore it was not possible to control for specific patient variables.

References

Scan me!

Disclosures

None of the authors have any disclosures.

Establishment of the efficacy of a power maintenance prototype for use with the Bedside Safe Airway Application (SAA)

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LSUHSC SOM[1],LSUHSC Otolaryngology[2], OLOL Childrens[3], Nemours Children's Hospital[4]

Abstract

Background: Safe Airway Application (SAA) is an interactive tablet-based bedside sign modality with patient specific information and smart algorithms for patients with tracheostomy. Our prior feasibility study identified the loss of the device power source as a major pitfall of the device. The **goal of this study** was to establish the efficacy of a grappling prototype, designed maintain attachment of the power source to the SAA.

Methods: (1) A set of force springs was used to determine the force required to detach the charger from the SAA alone (control) vs. with the grappler prototype. (2) Clinical testing of the device at the bedside was completed for 10 days checking for prototype attachment and power maintenance.

Results: (1) The mean force required to displace the power source alone was 1.38 ± 0.15 N; the mean force required to displace the power source with the grappler prototype was 7.20 ± 0.76N. (2) The SAA remained attached to the prototype and power source for the entire 10-day study, compared to the prior 3 reported detachments in the 11-day feasibility study.

Conclusions: The efficacy studies shows that the prototype requires a statistically significant difference in required force removal. Compared to the device without the prototype, the prototype seems to be better at preventing power loss of the SAA in a clinical setting.

Methods

Design
- SAA prototype measured, OSHA and JCAHO compliant grappler designed to fully encapsulate power source and SAA, then 3D printed

Force experiment
- Force springs (1-10 N) used to find the max force to remove power source (n=10) alone vs power source + prototype (n=10)

Clinical testing
- Device setup at bedside for 10 days to determine if prototype remained attached and SAA maintained charge

Results

Figure 1. Safe Airway Application interface at the bedside (left), grappler prototype device model (right)

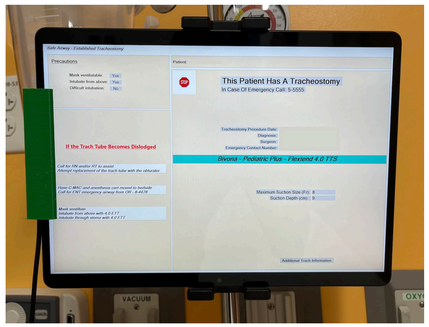
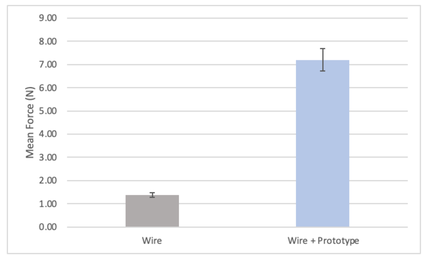


Figure 2. Mean force required to displace power source alone vs. with the grappler prototype attached.



Discussion

The mean force required to displace the wire alone was 1.38 N (SD = 0.15, 95% CI = 1.37-1.39), while the force required to displace the wire with the attached prototype was 7.20 N (SD = 0.76, 95% CI = 7.15-7.25).

Using a two-sample t-test, there was a statistically significant improvement in the required detachment force from the use of the prototype device ($p < 0.05$).

From a previous survey study used a control, a total of 3 out of 11 days the SAA lost connection to a power source, but from the current study out of 10 total days the SAA remained attached to both the prototype.

The only reported problem with the SAA + prototype was a default event to the screensaver, however in-service education was not part of this study and can mitigate this event type.

Table 1. Clinical bedside daily testing of the prototype and power maintenance

	Prototype Attachment	Power Stability?	Performance under Conditions
Day 1	Yes	Yes	Setup successfully at pt bedside
Day 2	Yes	Yes	Stable and checked in the morning
Day 3	Yes	Yes	Stable throughout the day and checked in the afternoon
Day 4	Yes	Yes	Stable throughout the weekend
Day 5	Yes	Yes	Stable throughout the weekend
Day 6	Yes	Yes	Stable throughout the day and checked in the morning
Day 7	Yes	Yes	Stable throughout the day and checked in the afternoon
Day 8	Yes	Yes	Stable throughout the day
Day 9	Yes	Yes	Device turned off but only to screensaver
Day 10	Yes	Yes	Prototype removed

Conclusions

The digital application combined with the grappler prototype appeared to resolve the power disconnection problem identified in the feasibility study, consistent with the basic science force experiment and subsequent clinical testing the prototype.

Optimizing the SAA brings smart algorithms that can consistently, rapidly, and accurately troubleshoot patient-specific situations. Maintenance of power is critical the use of evolving modern strategies in bedside care.

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Poster # 150

Pediatric Type Follicular Lymphoma in Adolescence: A Case Series

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INTRODUCTION

- Pediatric-type follicular lymphoma (PTFL) is a rare B-cell lymphoma that predominantly affects the head and neck region, comprising approximately 1.5-2% of childhood lymphomas. [1,2]
- In 2016, the World Health Organization (WHO) recognized PTFL as a variant of follicular lymphoma (FL). [3]
- This case series focuses on two patients with isolated lymphadenopathy who underwent surgical excision of the mass, leading to the diagnosis of PTFL based on the final pathology findings.

CASE PRESENTATION #1

A previously healthy 14-year-old boy presented with a progressively enlarging mass in the right neck that had been growing over a period of 2 months.

- Pertinent negatives: fever, fatigue, night sweats, weight loss, or discomfort
- Past investigations suggested a reactive lymph node, yet there was no improvement after a 10-day course of amoxicillin treatment.

CASE PRESENTATION #2

A 17-year-old male with a history of growth deficiency on hormone treatment, chronic nausea, and vomiting presented with a fluctuating mass in the left parotid gland.

- Pertinent negatives: pain, redness, broken skin, or discharge from the mass. Trismus, pain while biting down, fevers, chills, difficulty swallowing or breathing, drooling, voice change, ear pain or discharge, and hearing loss
- Pertinent Positives: night sweats, fatigue, changes in appetite, and arthralgias

PATHOLOGY, CASE 1

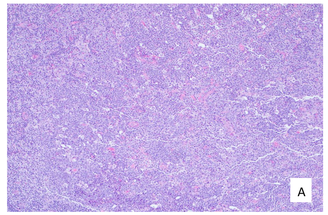
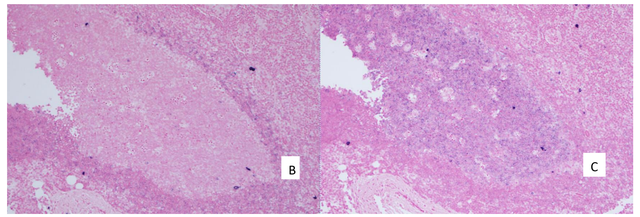


Figure 2: A. Hematoxylin and eosin stained sections from right neck lymph node showing atypical expanded follicles that are non-polarized, monotonous and with attenuated mantle zones



B & C. Kappa (B) and lambda (C) in-situ hybridization staining demonstrating atypical follicles with clear lambda light chain restriction

PATHOLOGY, CASE 2

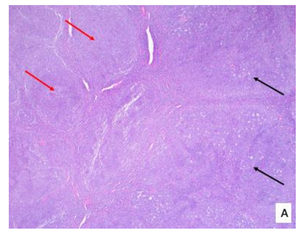
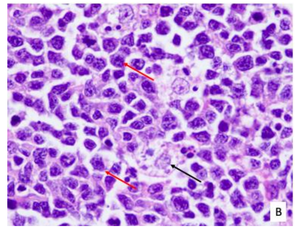


Figure 4. A. Hematoxylin and eosin stained sections from the mass within the left parotid gland showing large expansile nodules of atypical follicles (red arrows) that are surrounded by a rim of reactive lymph node (black arrows) imparting a “node-within-node” pattern.



B. Atypical lymphoid cells are intermediate-size and have blastoid features (red arrow) admixed with occasional tingible-body macrophages (black arrow).

IMAGING, CASE 1

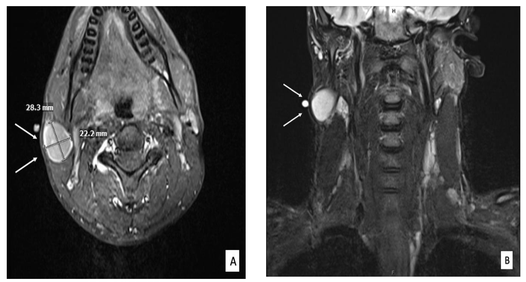


Figure 1: MRI with contrast axial (A) and coronal (B) images of right sided mass. This confirmed the presence of a mass, displaying characteristics suggestive of either lymphadenopathy or a branchial cleft cyst.

IMAGING, CASE 2

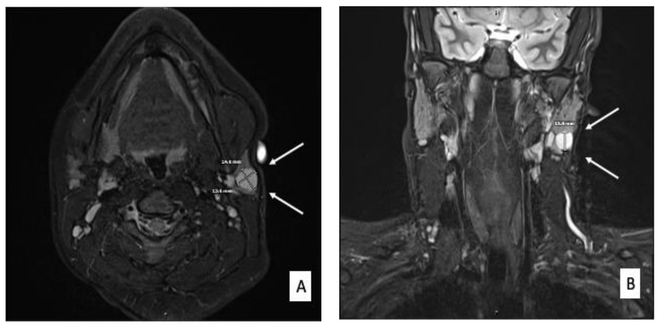


Figure 3. MRI neck with contrast in case 2. Axial (A) and coronal (B) images with white arrows indicating the left sided peri-parotid mass

DISCUSSION

- Clinical and microscopic differences between PTFL and FL are important to distinguish for proper treatment and management
- The differential for head and neck masses are mostly congenital and benign lesions such as cysts and reactive lymph nodes. The threshold to surgically excise a mass is not always clear.
- In patients with a mass that increases in size (> 2cm) and/or concerning imaging, we urge pediatric otolaryngologist to consider PTFL as it can effectively be cured with surgery.

CONCLUSION

- Pediatric otolaryngologist should include PTFL in their differential diagnosis for head and neck masses, especially in adolescent males as it is effectively cured with surgical excision. [8]

REFRENCES

For references, please scan here:

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