Diagnosis of ENT Disorders: You Make the Call

A127 Audience Response Case Discussion

Ellen S. Deutsch, MD, FACS, FAAP
AI duPont Hospital for Children, Wilmington, DE

Bruce R. Maddern, MD, FACS, FAAP
Jacksonville, FL
Faculty Disclosure Information

- In the past 12 months, we have **not** had significant financial interests or other relationships with the manufacturers of products that will be discussed in our presentation.

- This presentation will include discussion of pharmaceuticals which are not approved by the FDA or "off-label" uses
  - Medications to inhibit or treat
    - Scar formation
    - Recurrent respiratory papillomas
    - Otorrhea
    - Lymphangioma
Family reports acute otitis media a couple of weeks ago, which seemed to have resolved. Otherwise she was well until this morning.

On examination, there is no tragal tenderness, canal edema or otorrhea.
Acute Coalescent Mastoiditis

Notice:
Pinna is “down and out”
Effacement of post-auricular sulcus
Epicenter is over the mastoid antrum
Acute Coalescent Mastoiditis
Acute Coalescent Mastoiditis

Diagnosis: exam, CT scan

Treatment:
- intravenous antibiotics
- myringotomy +/- tube
  - or laser fenestration +/- tube
- +/- I&D of subperiosteal abscess
- +/- mastoidectomy
- ? steroids if facial nerve paralysis
- MRI if suspicious of intracranial complication
Otitis Media with Effusion

Can be symptomatic (pain or hearing loss) or can be a "Silent Effusion"

May cause hearing loss and, if severe, destruction of ossicles, without other symptoms.
What condition is this?

1. Acute otitis media
2. Cholesteatoma
3. Chronic eustachian tube dysfunction
4. Tympanic membrane perforation
Otitis Media with Effusion: “Glue Ear”

Despite tympanic membrane retraction, a thick middle ear effusion may be present.
Eustachian tube dysfunction

- Treatment considerations for this patient may include all of the following EXCEPT:

1. Treat nasal or nasopharyngeal obstruction
2. Remove adenoids
3. Place tympanostomy tube
4. Tympanoplasty
5. Watchful waiting
What is the best diagnosis?

1. Tympanosclerosis
2. Tympanic membrane perforation
3. Cholesteatoma
4. Otitis media with effusion
5. Other

Image courtesy of Glenn Isaacson, MD
What causes tympanosclerosis? (aka myringosclerosis)

1. Tympanostomy tube
2. Chronic ear disease
3. Tympanic membrane perforation
4. Other
A 5 yo boy accidentally injured his right ear with a wooden matchstick. He had bloody otorrhea, otalgia, vertigo, nausea and an unsteady gait.

The best management is:

1. Ear drops, refer to ENT
2. Oral antibiotics, refer to ENT
3. Ear drops, oral antibiotics and refer to ENT
4. Urgent referral to ENT
Posterosuperior Tympanic Membrane Perforation

- **Emergency if**
  - Posterosuperior quadrant
  - Vertigo
  - Emesis
  - Ataxia

- **Risk of**
  - Inner ear damage
  - Sensorineural hearing loss
Post-operative audiogram

Pre-operative audiogram
Otorrhea

The family of a 2 year old calls because he has thick white drainage in his ear canal.

He underwent placement of middle ear ventilation tubes about 6 months ago. He is otherwise well, has not been swimming, and his family denies trauma.
Does otorrhea mean that the middle ear ventilation tube is working?

1. YES
2. NO
Otorrhea

For uncomplicated tube otorrhea, I recommend EAR DROPS:

1. Never
2. Rarely
3. Occasionally
4. Usually
5. Always
Treatment of Tube Otorrhea

- **EAR DROPS!**
  - Antibiotic with steroid
- Aural toilet, remove granulation tissue; consider placing a wick
- Consider culture
- Consider oral antibiotic if other URI symptoms or treatment failure
Acute Perichondritis

• Often Pseudomonas, can be Staph., etc.
• Treatment:
  – IV Antibiotics
    • Cefepime (4th gen) active against Staph. and Pseudomonas
    • Ceftazidime, Imipenim (3rd gen) active against Pseudomonas, poor against Staph
  – Debridement
Acute Perichondritis

Before treatment

After treatment
Relapsing Polychondritis

- **Differential Diagnosis:**
  - acute perichondritis

- **Diagnosis:** ≥ 3 of McAdam’s criteria
Relapsing Polychondritis

McAdam’s criteria*: ≥3 of the following:
- recurrent bilateral auricular chondritis
- non-erosive inflammatory polyarthritis
- nasal cartilage chondritis
- ocular inflammation
- laryngotracheal chondritis
- vestibulocochlear inflammation

Tx: corticosteroids, cyclosporin
(dapsone in adults)

Hearing Assessment

Given a skilled audiologist and a cooperative child, the best hearing test is

1. ABR / BEAR / AEBR (auditory evoked brainstem response)
2. OAE (otoacoustic emissions)
3. Behavioral audiogram
Behavioral Hearing Assessment:
Behavioral Observation Audiometry

Ages  •  Birth - 4 months

Response  •  eye widening, wakening, startle, quieting, head-turn

Photos courtesy of Aly Lent
Behavioral Hearing Assessment: Visual Reinforcement Audiometry

Ages • 6 months - 2 years
Response • head-turn

Photo courtesy of Aly Lent
Behavioral Hearing Assessment: Conditioned Play Audiometry

Ages • 2 to 5 years
Response • perform task
Yield • full audiogram

Photos courtesy of Aly Lent
ABR
(ABER, BEAR, etc.)
Auditory evoked brainstem response
Test for:
Threshold
Site of lesion

Photo courtesy of Aly Lent
Otoacoustic Emissions “OAEs”

- sounds generated in the cochlea, recorded by microphones in EAC
- “present” is normal
1st Branchial Cleft Cyst

Notice:
- location: inferior post-auricular sulcus
- evidence of recurrence
1st Branchial Cleft Cyst

Diagnosis:
- clinical
- CT
- ?U/S, ?MRI
1st Branchial Cleft Cyst

- Type I cyst is medial to the concha, often in post-auricular crease
- Type II may be found below the angle of the mandible, along the anterior border of SCM, superior to hyoid bone
- can cause otorrhea

Diagnosis & Management of Congenital Head & Neck Masses SIPAC 1981 AAO-HNS
1st Branchial Cleft Cyst
1st Branchial Cleft Cyst

Treatment:

Acute:
- antibiotics
- avoid I&D

Definitive
- excision after inflammation subsides but before involution occurs
Temporal Bone Fracture

Notice: ecchymosis over mastoid tip

• Evaluate
  – Ear canal and tympanic membrane
  – Facial Nerve
  – Hearing

• Consider CT Scan
NOSE
Choanal Atresia

View of unilateral choanal atresia from nasopharynx

CT scan of bilateral choanal atresia
Choanal Atresia

I assess for nasal patency by:
1. Passing a catheter through the nose
2. Listening for airflow at the nares
3. Using a cotton wisp to visualize airflow
4. Other
Choanal Atresia

- If bilateral, in a neonate: medical emergency
- Open the mouth
- Intubate
Intranasal Foreign Body

Notice:
unilateral
excoriation
odor
Most likely diagnosis?

1. Glioma
2. Dermoid
3. Encephalocele
4. Insect bite
5. Foreign body
6. Other
Nasal Dermoid

CT and/or MRI to evaluate possibility of intracranial extension for midline or near midline nasal lesions

Notice: midline nasal pit often with hair, sometimes has drainage
EXAMINATION

- anterior rhinoscopy
- nasal endoscopy
Nasal polyps
ORAL CAVITY
Epulis

Treatment:
excision
The family of a 7 year old girl complains of "swollen tonsils." They report that she snores "a very little bit;" they deny apnea or increased work of breathing.
“Swollen tonsils”

Sleep study demonstrated an obstructive apnea index of 2.6 (>1 is abnormal) and mild hypoventilation
In a child with OSA (obstructive sleep apnea) I am concerned about adverse neuro-cognitive or behavioral effects:

1. Always
2. Frequently
3. Occasionally
4. Rarely
5. Never
Which of the following is NOT true?

In selected patients, adenotonsillectomy may alleviate / improve:

1. Enuresis
2. ADHD
3. Polyarteritis nodosa
4. PFAPA
5. Psoriasis (Palmoplantar pustolosis)
6. Reactive Airway disease
Which of the following IS true?

Adenotonsillectomy can contribute to?

1. Immune Deficiency
2. Asthma
3. Weight gain
4. Increased number of infections
She complains of a sore throat; won’t swallow; and has trismus

Most likely diagnosis?

1. Acute tonsillitis
2. Peritonsillar abscess
3. Retropharyngeal abscess
Peri-Tonsillar Abscess

Treatment:
- antibiotics
- +/- I&D
- +/- tonsillectomy ("hot" or interval)
New onset of neck pain and torticollis; poorly defined fullness in right neck; recent URI

Most likely diagnosis?

1. Acute tonsillitis
2. Peritonsillar abscess
3. Retropharyngeal abscess
Retropharyngeal Abscess/
Parapharyngeal Abscess

Evaluation:
- Lateral neck radiograph
- Neck CT with contrast

Group A strep, Staph

Treatment:
- Intravenous antibiotics
- ?steroids
- +/- transoral I & D

Risks:
- Airway obstruction
- Mediastinal extension
FACE
Non-tuberculous Mycobacteria (atypical mycobacteria)

Diagnosis:
- Clinical, generally indolent
- PPD weakly (+)
- Microbiology can be difficult to confirm with stains or cultures
- Histology may be supportive
Non-tuberculous mycobacteria (Atypical Mycobacteria)

Notice:
- location: angle or body of mandible
- age: toddlers
- color: purple
- number: sometimes multiple

DDx:
- other adenopathy, including cat scratch
Non-TB Mycobacteria

Treatment:
- Medical: usually at least 2:
  - Macrolides
  - Fluoroquinolones
  - Rifamycins
  - Ethambutol
- Surgical
  - I&D contraindicated
  - Excision
  - Serial curettage
- Combined Medical/Surgical
Endobronchial Non-TB Mycobacteria

- 10 month old presented with new onset unilateral wheezing
SINUSES
Is it sinusitis?

- A 7 year old boy has had purulent rhinorrhea for 10 days, not improving; with day and nighttime coughing. He has not taken an antibiotic.

Is it sinusitis?
1. Yes
2. Not sure
3. No
In the clinical context of URI, the best indicator of sinusitis is?

1. Character of the rhinorrhea
2. Low-grade fever
3. Duration of symptoms
4. Headache
5. Purulent rhinorrhea in the middle meatus
SINUSITIS DEFINITIONS

• Sinusitis remains a difficult [clinical] diagnosis to confirm, even for experienced specialists.
  Annals ORL Oct. 1995

• The diagnosis of acute bacterial sinusitis is based on clinical criteria in children who present with upper respiratory symptoms that are either persistent or severe (strong recommendation based on limited scientific evidence and strong consensus of the panel)
  AAP Clinical Practice Guideline: Management of Sinusitis 2001
At this point, the best radiologic study is?

1. Plain Xrays (“sinus series”)
2. CT scan
3. MRI
4. UltraSound
5. Other
RADIOGRAPHS

NOT USUALLY USEFUL:

- plain sinus radiography
- tomography
- ultrasonography
- MRI
RADIOGRAPHS

USEFUL: CT scans

Nasal polyps without sinusitis

(known allergic rhinitis)

Unilateral sinusitis with nasal septal deviation
Nasal polyps with cystic fibrosis

Nasal congestion without sinusitis

Chronic sinusitis
Orbital Complications of Acute Sinusitis

Consult ENT, Ophtho
CT Scan
- axial AND coronal
- WITH contrast
- ?format for image guided sinus surgery

Treatment
- IV antibiotics
- close observation
- +/- open or endoscopic drainage
Intracranial Complications of Acute Sinusitis

• Location:
  – forehead a/o orbit, adjacent to frontal sinus
• age: adolescent
• sex: male
• possible mental status changes, seizures, neurologic deficits
Intracranial Complications of Acute Sinusitis
Intracranial Complications of Acute Sinusitis

Orbital subperiosteal abscess

Epidural abscess
NECK
Hemangioma

Natural progression
Hemangioma

• Present within few weeks of birth
• Most common parotid neoplasm in children
• Superficial (red), deep (blue) or compound
Hemangioma

- Rapid growth for weeks to months
- Transition from proliferation to involution by age 1, complete by 5-6 years old
- Evaluation:
  - MRI, high flow lesion, bright T2, flow voids T1 and T2
  - CT scan with contrast
Hemangioma

• Complications: Ulceration, airway obstruction, high-output cardiac failure, ophthalmic, Kasabach-Merritt

• Treatment options: Steroids, interferon, laser

• Corrective surgery for residual disease, vital structures
Thyroglossal duct cyst

Notice:
- Midline upper neck
- Moves with tongue protrusion or swallowing

Evaluation:
- Ultrasound of neck to confirm normal thyroid anatomy
- +/- thyroid function tests or scan

Treatment:
- Excision
Congenital Torticollis

- aka
  - Sternocleidomastoid tumor of Infancy
  - Fibromatosis Colli
- Notice:
  - Within SCM
  - present at birth or within weeks
- Fibrosis of SCM muscle
- Evaluation: ultrasound
- Treatment:
  - Physical Therapy
  - Uncommonly, muscle release to avoid hemifacial asymmetry
Branchial Vestige

Notice:
• +/- skin tag
• Involving or anterior to SCM
May extend into SCM
Neck Masses

1. Midline Cervical Defect
2. Branchial Cleft Cyst
3. Lymphangioma
4. Retropharyngeal Abscess
5. Infectious Mono
Midline Cervical Defect

Notice:
- Midline
- 3 components:
  - skin tag
  - sinus with mucosal lining
  - Vertical, non-epithelialized strip
- Rarely, linear bands extend from mandible to sternum

Etiology unknown, F > M

Treatment:
- Excision
Neck Masses

1. Branchial Cleft Cyst
2. Lymphangioma
3. Retropharyngeal Abscess
4. Infectious Mono
Infectious Mononucleosis

• **Notice:**
  – Mouth breathing, massive cervical adenopathy
  – Exudative tonsillitis, adenotonsillar hypertrophy

• **Testing:**
  – Mono spot, EBV titers, CBC: atypical lymphocytes

• **Differential Diagnosis:**
  – lymphoma, other viral illnesses

• **Treatment:**
  – supportive, steroids, maintain airway, antibiotics for superinfection
Lymphangioma

- aka Cystic hygroma
- Variable location
- Notice:
  - large, soft, non-discolored mass
  - “frogs eggs” on dorsal tongue
- Treatment
  - Excision
  - Sclerosis
  - None
Lymphangioma

Sclerosis with OK-432 (Picibanil)

(not FDA approved)
Retropharyngeal Abscess
Branchial Cleft Cyst

- Anterior to SCM
- 2\textsuperscript{nd} BCC most common; 4\textsuperscript{th} rarest
- Differential diagnosis:
  - Other congenital mass
  - Infectious
  - Malignant
  - other
LARYNX, TRACHEA, BRONCHI; ESOPHAGUS
Diagram of airway anatomy

- THYROID CARTILAGE
- CRICOID CARTILAGE
- TRACHEA
- BRONCHI
- subglottis
- LARYNX
  - Vocal folds = glottis
Stridor Qualities

- High pitched (can be low pitched)
- Low pitched
- High pitched
- Inspiratory (extrathoracic)
- Expiratory (intrathoracic)
Stridor Qualities

- high pitched (can be low pitched)
- low pitched
- high pitched
- inspiratory (extrathoracic)
- expiratory (intrathoracic)

★ hoarseness
Otolaryngology
Airway Evaluation

HISTORY

PHYSICAL EXAMINATION

PLAIN RADIOGRAPHS

ENDOSCOPIC (FOL a/o DL,B)

SPECIALIZED RADIOGRAPHS
Organizing the Airway Evaluation:
3 Layers
Basic algorithm
How much is enough?
How urgently to proceed?
Most likely diagnosis is?

1. Croup
2. Vascular ring
3. Laryngomalacia
4. Subglottic stenosis
5. Aspirated foreign body
6. Other
Laryngomalacia
Laryngomalacia

Notice

- inspiratory stridor
  - high pitched in infants
  - “vibratory”

Most common congenital laryngeal anomaly

Management

- Usually expectant, treat GERD
- If severe: epiglottoplasty
Most likely diagnosis is?

- Croup
- Vascular ring
- Laryngomalacia
- Subglottic stenosis
- Aspirated foreign body
- Other
Laryngomalacia (acquired)
Selected causes of hoarseness

Vocal fold nodules

Post-intubation granulation tissue, synechiae

Exudative Laryngitis/Tracheitis

Recurrent respiratory papillomas
How quickly should this child’s airway be visualized?

1. Today
2. Within 2 weeks
3. No rush
Proceed urgently if:

- Significant respiratory distress
  - increased supplemental oxygen requirement
  - child uncomfortable or becoming fatigued
  - not explained by other organ system problem

- Stridor of acute onset - risk of progression
  - foreign body
  - infection
  - Trauma

- Significant dysphonia - risk of complete obstruction
  - papillomas
  - exudative infections
  - foreign body
Recurrent respiratory papilloma
Recurrent respiratory papilloma

- Predilection for vocal folds
- If untreated, may progress to stridor and airway obstruction
- Excise with microdebrider, CO$_2$ laser or forceps
- Relentless recurrence
-cidofovir, cimetidine, interferon, other?
- tracheotomy
7 month old male, stridorous since 1 month of age, recently worse with upper respiratory tract infection; Full Term, never intubated, eats without difficulty, stridor worsens with agitation.
Subglottic Stenosis
Acquired Subglottic Stenosis
SUBGLOSSIC STENOSIS

- stridor, cough, persistent or recurrent "croup"
- Congenital or Acquired
  - Acquired is usually a result of intubation
- Diagnosis: endoscopy
The subglottis is at risk because:

- It is the narrowest portion of the airway in infants
- The cricoid ring is the only complete ring and is non-distensible
5 month old male, stridorous for 2 days, Mom thought because of URI, but no other symptoms; FT, never intubated, stridor worsens with agitation.
EXTRINSIC LARYNGEAL COMPRESSION

- post-cricoid foreign body
- deep neck infection
2 1/2 month old female, stridorous since birth, worsening.
VASCULAR RING
DOUBLE AORTIC ARCH

• recurrent “croup,” dysphagia
• reflex apnea
• stridor, staccato cough
• diagnosis: endoscopy and/or barium swallow
• diagnosis: ?CT ?MRI/MRA
• treatment: surgical
New onset stridor
ASPIRATED FOREIGN BODY

- Sometimes the foreign body can be seen in an XRay; but at other times only the consequences of the foreign body are seen
Atelectasis: stop valve effect
Hyperinflation: check valve effect
Sunflower seed, right main bronchus
2 1/2 year old female with chronic cough, fever, and persistent right lower lobe atelectasis despite oral and intravenous antibiotics. XRay from February and March.
ENDOBRONCHIAL FOREIGN BODY

- gagging, coughing, choking
- symptoms may become quiescent
- endoscopy if
  - suggestive history
  - suggestive XRay
  - pulmonary disease with atypical course
Resources

- www.guideline.gov
- www.aap.org
  - http://aappolicy.aappublications.org
- www.entnet.org
- www.kidshealth.org
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