Pediatric ENT for the primary care provider

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Objective: Discuss the most common pediatric ENT problems requiring referral from primary care to specialist

- Acute otitis media
- Adenotonsillar hypertrophy
  - Recurrent strep pharyngitis
  - OSA
- Stridor

Adenotonsillar hypertrophy
Adenotonsillar hypertrophy

- Extremely common reason for referral to pediatric ENT
- Tonsil size often concerns parents as well
- Main concerns with ATH are upper airway obstruction and recurrent infections
- Many parents present with the request that they “just want the tonsils out”

Adenotonsillectomy facts

- Tonsillectomy is one of the most common surgical procedures performed in the US
- As many as 737,000 tonsillectomies performed per year
- 530,000 of those are < 15 years of age
- Tonsillectomy accounts for 16% of all ambulatory surgery in children
- 2nd most common surgical procedure in children

Mortality rate after tonsillectomy is quoted as being 1 in 16,000

“Those of you who regard a tonsillectomy as a minor procedure underestimate the potential sequelae.”
Indications for adenotonsillectomy:

Obstructive indications vs. Infectious indications

Obstructive indications

Sleep disordered breathing – an umbrella term representing a spectrum of disorders ranging in severity from primary snoring to obstructive sleep apnea
- affects 1–4% of children
- Symptoms: snoring, pausing/witnessed apneas, nocturnal enuresis, behavioral/academic problems, inattention, hyperactivity, somnolence, depression, anxiety, somatic complaints, restless sleep

Obstructive sleep apnea

- Sleep study sometimes ordered to confirm diagnosis or quantify severity prior to surgery
- OSA associated with decreased QoL scores, similar to what is seen in children with chronic conditions like asthma or JRA
- 30–40% of kids with SDB have behavioral problems of some kind
**Infectious indications**

Recurrent throat infections with fever > 38.3 F, cervical adenopathy, tonsil exudate, + group A strep test

- 7 times/1 yr
- 5 times/yr x 2 yrs
- 3 times/yr x 3 yrs

Other infectious considerations: PFAPA, recurrent peritonsillar abscesses, multiple antibiotic allergies

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**PFAPA**

PFAPA = Periodic Fever, Aphthous stomatitis, Pharyngitis, and cervical Adenitis

- Episodes of fever every 3–8 weeks
- Lasting 3–6 days
- Fever accompanied by at least one of three: aphthous stomatitis, cervical adenitis, or pharyngitis
- Onset usually before age 5, resolves by adolescence

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**PFAPA**

- Immune mediated disease characterized by cytokine dysfunction
- Possible genetic component
- Infection, abnormal host responses, or a combination of these factors are proposed in the pathogenesis
Table 1
Diagnostic criteria used for PFAPA

| I. Regularly recurring fevers with an early age of onset (<5 years of age) |
| II. Constitutional symptoms in the absence of upper respiratory infection with at least 1 of the following clinical signs: a) aphthous stomatitis, b) cervical lymphadenitis, c) pharyngitis |
| III. Completely asymptomatic interval between episodes |
| IV. Normal growth and development |

Source: Vanoni et al., 2016, Pediatric Rheumatology, 14:38.

PFAPA

Treatment:
• Benign, self-limiting illness
• Usually resolves by adolescence
• Febrile episodes can be controlled with single dose of glucocorticoids (with caveat!)
• Colchicine—shown to be effective at increasing the intervals between febrile episodes in some patients, studies limited by small sample sizes

PFAPA

Treatment:
• Adenotonsillectomy
  • Has demonstrated effectiveness in prospective studies
  • Lack of large randomized controlled studies
  • Problems with some of the study patients not strictly meeting the diagnostic criteria PFAPA
Complications related to adenotonsillectomy

- Post-tonsillectomy hemorrhage (PTH), generally reported in between 2–4% of patients, other sources quote 1–3%. Bleeding accounts for 1/3 of the mortality associated with tonsillectomy.

Post-tonsillectomy hemorrhage

- PTH can be either primary or secondary:
  - Primary hemorrhage: occurs within first 24 hours
  - Usually r/t surgical technique
  - Considered more dangerous d/t risk of aspiration, laryngospasm
  - Rate of occurrence is 0.2–2.2% of patients

PTH, continued

- Secondary hemorrhage—bleeding that occurs > 24 hour postoperatively, most commonly when eschar sloughs off on POD 6–10
- Rate of occurrence is 0.1–3%
- No association with surgical technique
Intraoperative Complications

- Dental injury
- Burns to lips/teeth/gums
- Trauma to larynx, pharyngeal wall, or soft palate
- Laryngeal edema
- Respiratory compromise
- Cardiac arrest
- Laryngospasm
- Difficult intubation

Postoperative Complications

- Nausea/vomiting
- Pain
- Dehydration
- Post-obstructive pulmonary edema
- Velopharyngeal insufficiency
- Nasopharyngeal stenosis

Medical treatment of OSA

- Nasal steroids
- Singulair
- Sleep hygiene
- Iron and vitamin C supplements if RLS component and ferritin < 50
- Usually involve sleep medicine service
- Medical treatment most effective for children with mild OSA, but may also be considered if multiple comorbidities, poor surgical candidate, parental preference
What about tonsil stones?

Not recommended as first line therapy. Considered clinically on an individual basis if conservative measures fail.

When to refer to ENT?

Child with adenotonsillar hypertrophy
PLUS:

Obstructive symptoms during sleep
- Snoring
- Apneas
- Gasping
- Restless sleep
- Nocturnal enuresis
- Daytime fatigue
- Patient or parent perceives poor sleep quality
- Behavioral/academic problems

When to refer to ENT?

Child with adenotonsillar hypertrophy
PLUS:

Risk factors for OSA:
- Trisomy 21
- Obesity
- Craniofacial abnormalities
  - Surgery less likely to be curative in such patients, but may be part of the overall plan of care
When to refer to ENT?

Child with adenotonsillar hypertrophy
PLUS:

⇒ Meets infectious criteria:
  • 7 strep/year x 1 year
  • 5 strep/year x 2 years
  • 3 strep/year x 3 years
  • PFAPA
  • Recurrent peritonsillar abscesses

Acute otitis media

• “bread and butter” of peds ENT
• AOM is a very common childhood affliction, 2nd most common diagnosis made in pediatric ambulatory settings (#1 = URI)
• Tympanostomy tube insertion is the most common ambulatory procedure performed in the U.S.
• 667,000 children receive PE tubes every year
Acute otitis media

Risk factors for AOM:
• age < 2 years
• Exposure to second-hand smoke
• Bottle feeding and/or bottle propping
• Day care attendance
• Family history

Acute otitis media

AOM landscape has changed!
• Microbiology of AOM has evolved
• PCV and Hib vaccines have caused a microbiological shift in pathogens
• Increased numbers of beta-lactamase producing pathogens, both H. Flu and pneumococcus
• Bacterial resistance is an increasing problem

Acute otitis media

• Before PCV-7 introduced, most common AOM pathogens were:
  • #1–streptococcus pneumoniae
  • #2–non–typeable H. Flu
  • #3–moraxella catarrhalis

• After PCV-7, shift in otopathogens was noted, with predominant organism shifting first to NTHi, then to non–PCV7 strains (with highly resistant serotype 19 A)
Antibiotic treatment of AOM

- 2013 guidelines still list amoxicillin 90 mg/kg/day divided bid x 10 days as 1st line, Augmentin if abx in the previous month
- Cefdinir 1st line for PCN allergy, cefuroxime, and cefpodoxime
- Otitis prone child—consider the likelihood of resistant organism and choose accordingly
Accurate diagnosis of AOM

- In 2013, the AAP revised the clinical practice guidelines for diagnosis and treatment of AOM
- Most important diagnostic feature is bulging or full TM with middle ear effusion
- Cannot make the diagnosis of AOM if no middle ear effusion
- Erythema is not always a reliable sign of AOM

Criteria for insertion of tympanostomy tubes

AAP guidelines: “clinicians may offer PET’s for recurrent AOM (3 episodes in 6 months, or 4 episodes in 1 year, with 1 episode in the preceding 6 months” (quality: grade B, rec. strength: option).
Criteria for insertion of tympanostomy tubes

AAOHS guidelines: focus more on OME and risk factors for speech or developmental delay

Recommendations against PET’s
- OME < 3 months duration
- Recurrent AOM with no MEE at time of evaluation

Recommendations for PET’s
- Bilateral OME ≥3 months and documented HL (rec) OR other sx r/t OME (option)
- Recurrent AOM with unilateral or bilateral MEE at time of evaluation with ENT
- Recurrent AOM or OME of any duration with risk factors for speech/language/learning

Risk factors for developmental difficulties

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<tr>
<th>Risk Factors</th>
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<tr>
<td>Suspected/confirmed speech or language delay/disorder</td>
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<td>Autism spectrum disorder or pervasive developmental disorder</td>
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<td>Any syndromes (e.g. Trisomy 21) or craniofacial disorders that include cognitive, speech, or language delays</td>
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<td>Blindness or uncorrectable visual impairment</td>
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<td>Cleft palate</td>
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<tr>
<td>Developmental delay</td>
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Tympanostomy tube insertion

- Typically an outpatient procedure
- Approximately 30 minutes
- General anesthesia (mask)
- Minimal recovery time
- Tubes usually extrude in 9–24 months
- Risks include: anesthesia, bleeding, infection, chronic otorrhea, persistent perforation, premature extrusion or failure to extrude spontaneously, hearing loss
Tympanostomy tubes: Postop considerations

• Drainage normal for first 24 hours after placement
• AOM will present with otorrhea if tubes are patent
• Uncomplicated otorrhea should be treated with topical antibiotic drops, not oral antibiotics
• Water precautions not necessary on a routine basis
• See ENT 6 weeks postop then Q6 months

Pediatric stridor

Pediatric versus adult airway
Assessment of Pediatric Stridor

History is very important:
- Onset (sudden vs. present at birth)
- Constant vs. intermittent
- Course (acute vs chronic, worsening vs. improving)
- Characteristics: inspiratory vs. expiratory, pitch, worse with feeding or certain positions
- Degree of respiratory distress
- If chronic: effect on growth/weight gain and feeding
- Associated symptoms (fever, cough, asthma, birthmarks, etc.)
- Risk factors for airway problems: prematurity, previous intubation

Stridor can be:
- Inspiratory
- Expiratory
- Both (biphasic)

*Type of stridor helps you to narrow down the site of obstruction*

Quality of stridor can be described as:
high, low, or medium–pitched
Differential diagnosis of pediatric stridor

**Congenital**
- Laryngomalacia
- Tracheomalacia
- Subglottic stenosis
- Hemangioma
- Vocal cord paralysis
- Tongue and jaw abnormalities
- Vascular ring

**Acquired**
- **Afebrile**
  - Papillomatosis
  - Injury
  - Foreign body
  - Laryngeal edema
- **Febrile**
  - Epiglottitis
  - Laryngitis
  - Laryngotracheitis
  - Retropharyngeal abscess
  - Peritonsillar abscess
  - Infectious mononucleosis

**Laryngomalacia**
- Collapse of the supraglottic structures during inspiration
- Most common congenital anomaly of the larynx
- Different from tracheomalacia, which has its own unique clinical presentation
- Causes: compliance of laryngeal cartilage, redundant soft tissue in supraglottis, supraglottic edema (GERD), neuromuscular disorders
Laryngomalacia

Clinical features:
- INSPIRATORY stridor
- may be low, medium, or high-pitched
- Often worse when supine, during or after feeds, or when crying/upset, improves when prone
- State-dependent laryngomalacia: present only with sleep or relaxation
- Usually resolves between 12–18 months of age

Laryngomalacia

- Often coexists with reflux (60–70%)
  - Redundant tissues become swollen and inflamed which creates more obstruction
- Concerning if presents with FTT
- Up to 20% of infants have an additional airway anomaly, such as tracheomalacia
- May occur in association with other congenital syndromes

Laryngomalacia

Surgical management:
- Supraglottoplasty—remove redundant supraglottic tissue

Image source: Up to Date
**Laryngomalacia**

**Treatment:**
- Typically supportive treatment and monitoring
- Watch weight closely
- Thriving baby is unlikely to need surgical intervention
- Treat for reflux with H2 blocker or PPI
- Position upright after feeds/reflux precautions
- Watch for apneas, cyanosis, weight loss, worsening stridor

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**Tracheomalacia**

- Common anomaly of the respiratory tract characterized by dynamic collapse of the trachea during breathing, resulting in airway obstruction
- Collapse usually occurs during expiration
  - Type 1—caused by an intrinsic cartilaginous defect in the trachea resulting in collapse
  - Type 2—caused by extrinsic tracheal compression (from CV structures, tumors, or other masses)—may be congenital or acquired
  - Type 3—results from prolonged PPV or infectious/inflammatory process that compromises the cartilaginous support of the trachea

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**Tracheomalacia**

- Presentation is more variable than what is seen in laryngomalacia, depending on the site of the lesion
- More likely to present with biphasic or expiratory stridor
- May have a cough
- Subglottic narrowing typically presents with barking, croup-like cough
- Diagnosed with rigid bronchoscopy in the OR under anesthesia
- Treatment depends on the site of the lesion, severity, and underlying cause
- Children with a Type 1 defect will typically outgrow, treatment is supportive
Stridor

When to refer?
• Significant or progressive stridor
• Apnea
• Cyanosis
• Failure to thrive/weight loss
• Any hemangiomas in the beard distribution on the face
• Airway risk factors: prematurity, prior history of intubation, history of cardiac surgery (esp. PFO repair)
• Aspiration or weak voice (concern for vocal cord function)