Pediatric ENT in Primary Practice

Maria C. Veling M.D.
University of Kentucky
October 2009

Objective

- Describe common pediatric ENT problems
- Describe emergent ENT outpatient scenarios
- Discuss current treatment guidelines
- Define indications for referral/surgery

STRIDOR OF THE NEWBORN

STRIDOR

- Harsh, high-pitched musical sound
- Produced by turbulence of airflow through a partially obstruction in the larynx
- Pathologic narrowing of the airway
- The site of the obstruction must be in the airway but the lesion may be extrinsic to the airway

Location of Obstruction

- Supraglottis- Inspiratory and high-pitched
- Glottis and Subglottis (extrathoracic tracheal zone)- Biphasic of intermediate pitch
- Intrathoracic tracheal/bronchial zone- Expiratory often confused with wheezing
History
- Duration and presence of any respiratory distress
- Time of onset- at birth, gradual, progressive, etc
- Relationship to feeding
- Past medical history- History of intubation
- Characteristics of the cry
- Trauma
- Foreign body- Laryngeal or esophageal FB
- Associated symptoms

Physical Exam
CAREFUL INSPECTION OF THE PATIENT IS THE FIRST PRIORITY
- Signs of respiratory distress
  - Respiratory rate, flaring of nasal alae, retractions, fatigue
- Auscultation- Sequential listening over the nose, open mouth, neck and chest
- Respiratory cycle
- Stridor as it relates to infant positioning
- Quality of voice or cry

Radiologic Evaluation
- Plain views of the soft tissues of the neck and chest provide information about airway patency and the presence of mass lesions
- Video Fluoroscopy to ascertain respiratory effort and segmental ventilation
- Barium swallow- Vocal cord paralysis, posterior laryngeal cleft, external compression from vascular structures
- CT/MRA- Vascular compression of tracheobronchial tree
- Ultrasound used in infants with VC paralysis

Flexible Endoscopy
- Transnasal Flexible Endoscopy
- Performed while awake
- Can be performed in the office/clinic
- Examination of the nose, choana, nasopharynx, hypopharynx, supraglottis and glottis
- Vocal cord mobility, laryngeal masses, laryngomalacia and other laryngeal problems

Rigid Endoscopy Indications
- Diagnosis remains in question
- The previous evaluation suggests a subglottic lesion
- A second significant distal lesion in the airway is suspected in addition to the diagnosis of a more obvious proximal lesion

Differential Diagnosis
- Laryngomalacia
- Subglottic stenosis
- Vocal cord paralysis
- Vascular malformations
- Infectious- Croup, Epiglottitis
- Foreign bodies
<table>
<thead>
<tr>
<th>LARYNGOMALACIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Accounts for about 60% of laryngeal problems in the newborn</td>
</tr>
<tr>
<td>• Flaccidity or incoordination of the supralaryngeal cartilages, especially the arytenoids</td>
</tr>
<tr>
<td>• Stridor is typically noted in the first few weeks of life and is characterized by fluttering, high pitched inspiratory sounds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intermittent, high-pitched inspiratory stridor is the hallmark of laryngomalacia</td>
</tr>
<tr>
<td>• Symptoms usually appear within the first two weeks of life</td>
</tr>
<tr>
<td>• An increase in the severity of stridor over the initial few months usually is followed by a gradual improvement</td>
</tr>
<tr>
<td>• Symptoms are usually at their worst at 6 months of age</td>
</tr>
<tr>
<td>• Most patients are symptom free by 18 to 24 months of age</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stridor is exacerbated by exertion</td>
</tr>
<tr>
<td>• crying, agitation, feeding or supine positioning</td>
</tr>
<tr>
<td>• Moderate to severe cases maybe complicated by feeding difficulties, gastroesophageal reflux, failure to thrive, cyanosis, intermittent complete obstruction or cardiac failure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>— Confirmed only by direct observation of movement of the supraglottis during respiration</td>
</tr>
<tr>
<td>— Awake fiberoptic laryngoscopy</td>
</tr>
<tr>
<td>— Direct laryngoscopy and rigid bronchoscopy for severe symptoms and to evaluate the possibility of synchronous lesions (which exist in up to 27% of patients with laryngomalacia)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laryngomalacia</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Expectant observation is suitable for most cases of laryngomalacia</td>
</tr>
<tr>
<td>• Most patient’s symptoms resolve spontaneously without intervention</td>
</tr>
<tr>
<td>• Medical treatment of any primary or secondary gastroesophageal reflux</td>
</tr>
</tbody>
</table>
Surgical Intervention

- Apparent life threatening events
- Feeding difficulties
  - Failure to thrive
  - Stridor with cyanosis
  - Apnea
  - Cor Pulmonale

Otitis Media

- Otitis media is generally defined by the presence of effusion within the middle ear without reference to its cause or pathogenesis
- Acute otitis media (AOM) is usually associated with the rapid onset of symptoms and signs of acute infection in the middle ear space, including fever, otalgia, inflammation or bulging of the tympanic membrane, and purulent middle ear effusion
- Otitis media with effusion (OME) is the presence of serous, mucoid, or mucopurulent fluid in the middle ear without acute symptoms.

Natural history

- After an episode of untreated AOM, spontaneous clearance of OME may be expected in approximately 75% of children within 3 months; with treatment of the acute episode, clearance at 3 months may be as high as 90%.
- Patients with effusions with duration of at least 3 months at the time of diagnosis have the poorest prognosis, with only 27% clearance at 6 months and 32% at 1 year.

Otitis Media

The pathogenesis is multifactorial

- Infection
- Impaired Eustachian tube function
- Immature immune status
- Allergy

Surgical treatment of Otitis Media

Acute Otitis Media

- Most studies of myringotomy with or without antibiotic therapy for AOM suggest no significant advantage over antibiotic therapy alone.
- The primary value of myringotomy or tympanocentesis is for culture to guide antibiotic therapy.


Acute otitis media complicated by facial nerve paralysis

- Treatment includes CSF penetrating antibiotics and consultation ASAP for wide myringotomy with possible mastoidectomy

Otitis Media with Effusion

Management is initiated with two goals in mind

- Restoration of normal hearing:
  - Associated with conductive hearing loss causing an average threshold elevation of 25 to 30 dB
- Avoidance of middle ear sequelae:
  - Result from chronic or intermittent negative pressure causing tympanic membrane retraction. This process may result in flaccidity and atelectasis in the posterosuperior tympanic membrane and the pars flaccida, culminating in ossicular discontinuity or cholesteatoma.

Adenoidectomy

- Adenoidectomy may be reserved for the second set of tubes, but should be considered primarily in patients with a history of chronic nasal obstruction or adenitis

  - Many trials now demonstrate that adenoidectomy is efficacious when performed as an adjunctive procedure to tubes.
  - Children with adenoidectomy tend to have fewer episodes of OME and seem to require fewer repeat tube insertions.

Surgical treatment of Recurrent Acute Otitis Media (rAOM)

- Studies of rAOM suggest a trend toward improvement with conservative management
- As a result, for children with rAOM whose episodes are nonsevere or have occurred only for a limited period, watchful waiting is often indicated.
- Surgery for rAOM should be recommended only for patients with severe symptoms and a history of at least three or four episodes in a 6-month period, anticipating at best a modest reduction in the frequency of infection

Surgical treatment of Otitis Media with Effusion

- Tympanostomy tubes are a reasonable consideration in patients with at least 3 months of bilateral or 6 months of unilateral effusion, or in patients in whom a majority of the previous year was spent with middle ear disease
- Patients with effusions for less time but who also have severe symptoms, severe hearing loss, or development of atelectasis or retraction pockets should also be considered

Otitis Externa

Signs and Symptoms

- Severe external auditory canal swelling
- Drainage/debris in canal
- Registers high on the pain scale
- Periaural adenopathy, inflammation
Otitis Externa

Clinical Indicators for Tonsillectomy and Adenoidectomy (T&A)

• Patient with 3 or more infections of tonsils and/or adenoids per year despite adequate medical therapy.
• Peritonsillar abscess unresponsive to medical management.
• Chronic or recurrent tonsillitis associated with the streptococcal carrier state and not responding to beta-lactamase-resistant antibiotics.
• Persistent foul taste or breath due to chronic tonsillitis not responsive to medical therapy.
• Hypertrophy causing dental malocclusion or adversely affecting orofacial growth documented by orthodontist.
• Hypertrophy causing upper airway obstruction, severe dysphagia, sleep disorders, or cardiopulmonary complications.
• Unilateral tonsil hypertrophy presumed neoplastic.

http://www.entnet.org/Practice/indicators/tonsillectomy.html

Adenotonsillar Hypertrophy

• Symptoms
  – Snoring
  – Mouth breather
  – Restless Sleep
  – Apnea
  – Difficulty swallowing solids
  – Muffled voice
  – Hypo nasal speech

Tonsillar Size

• 0 in Fossa
• +1 <25%
• +2 25-50%
• +3 50-75%
• +4 >75%

OBSTRUCTION
Obstructive indicators for T&A

• Upper airway obstruction
• Sleep disorders
• Cardiopulmonary complications
• Dental malocclusion or facial growth abnormalities
• Severe dysphagia

OSA in Children

• > 400,000 T&A’s are performed per year in children mostly for OSA
• Most tonsillectomies are performed in children for mild OSA
• OSA is associated with behavioral problems and is known to significantly affect quality-of-life

Pediatric OSA and Behavior

• Several large studies have shown that children with SDB have behavioral problems
  – Attention
  – Hyperactivity
  – Aggression
  – Irritability
  – Emotional and peer problems
  – Somatic complaints

Pediatric OSA- Outcome Studies

• PSG normalizes in 70-80% of “normal” children after T&A
• QOL of life improves dramatically. Over 95% of caregivers report improvement
• Behavior improves in 50% of children
• Correlation between improvements in PSG, QOL and behavior is poor

Infectious indications for Tonsillectomy

• 6-8 Episodes in one year
• 4-5 Episodes per year for 2 years
• 3 Episodes per year for 3 years

INFECTION
Peritonsillar abscess

- Oropharyngeal asymmetry
- Trismus
- “Hot Potato” voice
- CT scan hardly ever necessary
- 20% will recur

Goals of adenotonsillectomy

- Adenotonsillectomy for sleep disordered breathing (SDB) in children is associated with improvements in sleep, quality-of-life and behavioral problems
- Approximately 20% of normal weight children and 40% of obese children have persistent SDB after adenotonsillectomy
- Diminished rate of infection after adenotonsillectomy

NECK MASSES

EVALUATION OF PEDIATRIC NECK MASS

HISTORY
- Infection elsewhere
- Pain
- fevers
- Trauma
- Progression
  - Slow→Benign
  - Rapid→Infectious or malignant

Physical Exam

- Location
- Nodes >2cm in size warrant further evaluation
- Infants commonly have palpable lymphadenopathy
- Hard, fixed, nontender nodes are worrisome for malignancy
- Fluctuant- abscess or cyst

Radiologic Studies

- CT with contrast
  - Cellulitis/phlegmon vs. abscess
  - Vascular masses such as hemangiomas
- Ultrasound
  - Differentiate solid vs. cystic
  - Identify normal and ectopic thyroid
- MRI
  - Soft tissue evaluation
  - Vascular masses
Lab Studies

- CBC
- EBV
- Bartonella henselae serology
- PPD
- Needle Aspiration

Congenital Neck Masses

- Thyroglossal duct cyst - most common midline mass
  - Failure of involution of thyroglossal duct
  - Usually asymptomatic
  - Primary management is surgical excision- Sistrunk Procedure
  - Recurrence rate 4-6%
- Branchial cleft cyst - usually along anterior SCM
  - Second Branchial cleft cyst - Most common (90%)
- Dermoid and Teratoid Cysts
- Lymphatic malformations- Cystic hygroma/lymphangioma
- Hemangiomas - Most common tumor of infancy
- Vascular malformations- Port Wine stain most common

Infectious and Inflammatory Neck Masses

- Viral cervical adenitis
  - Rhinovirus, adenovirus, enterovirus, EBV, CMV, HIV
- Bacterial cervical adenitis
  - Staphylococcus aureus and Group A Streptococci
- Other Causes
  - Cat-Scratch disease- Bartonella henselae
  - Tuberculous and Nontuberculous mycobacteria
- Kawasaki Syndrome
  - Multisystem vasculitis

Malignant Neck Masses

- Lymphoma
- Rhabdomyosarcoma
- Thyroid Carcinoma
- Salivary Gland Malignancies
- Nasopharyngeal Carcinoma
- Neuroblastoma

FOREIGN BODIES

- Pebbles, erasers, small toys, vegetable matter, etc.
- Usually treated in non-emergent fashion
- Exceptions include damage to the middle or inner ear, live insects, corrosive foreign bodies

EXTERNAL AUDITORY CANAL

- Usually treated in non-emergent fashion
- Exceptions include damage to the middle or inner ear, live insects, corrosive foreign bodies
Foreign Bodies

- Most foreign bodies of the nose or ear are not an emergency
- Exception would be caustic substance which should be removed immediately
- Drops are contraindicated because the electrical charge of the battery will produce electrolysis of any electrolyte-rich fluid
- This produces hydroxides which will cause a severe alkaline burn

Foreign bodies of the nose

Nasal Fractures

- Most common facial fracture
- Rule out CSF rhinorrhea
- Rule out septal hematoma
- Patient should be seen by surgeon within the first 3-5 days of injury

Septal Hematoma

- Blood accumulation which separates the cartilage from the perichondrium
- Diagnosis
  - Usually bilateral reddish septal swelling
  - Severe nasal obstruction
  - Usually painful
- Treatment
  - Fluid removal and packing or plicating suture
  - Rx should be instituted within 24 hours
- Sequelae can include infection, cartilage necrosis, fibrosis, saddle nose deformity
Septal Hematoma

Auricular Hematoma

Traumatic Tympanic Membrane Perforation
  • Usually involves the posterior quadrant
  • Usually heals within a few days
  • Evaluation should include hearing test
  • Immediate referral for complaints of hearing loss, vertigo or facial nerve dysfunction

Auricular Perichondritis

THANK-YOU!