Eosinophilic Esophagitis: Extraesophageal Manifestations

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Introduction

• EoE is a relatively new and unique clinicopathologic entity

• Important cause of complaints relating to the upper aerodigestive tract

• Asthma is the most common lower airway finding
Introduction

• The putative cause is hypersensitivity to antigens in the esophagus

• In older children, airway symptoms (rhinosinusitis, asthma) may precede esophageal symptoms, leading some to argue that the initial sensitization may take place in the airway

— J Allergy Clin Immunol 2005 “Eosinophilic esophagitis is frequently associated with IgE-mediated allergic airway diseases”
Common Presenting Symptoms

- Dysphagia with/without food impaction
  - Food refusal in younger children
- Vomiting
- Abdominal Pain
- Cough
- Choking
- Heartburn
- Failure to thrive
Presentation

• 15% of patients may present first to an otolaryngologist!
• A large proportion will get GERD treatment
• If no response to maximal medical therapy, need to think about EoE
• Worsening symptoms during high pollen season noted

ENT Symptoms

• Rhinosinusitis
  – Some believe it is unlikely that EE actually CAUSES rhinosinusitis, but that Eosinophils activation by allergic triggers affect the nose directly

• Laryngeal disorders
  – Hoarseness
  – Cough

• Recurrent croup

• Airway inflammation
  – Subglottic stenosis
Mechanism of Action

• Postulated mechanism of action
  – Direct deposition of pollen in the nose and/or pharynx
  – Subsequent swallowing of secretions
Otolaryngologists may not be doing enough to diagnose pediatric eosinophilic esophagitis

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CHOP Study Findings

  - Of note, the Center for Airway Disorders formalized in 2005
- 144 were also seen by the general ENT division
  - 79% male
  - Average age at diagnosis of EoE 5.5 yr (7mo-18yr)
  - 60% were atopic (n=86)
    - Allergic rhinitis, asthma or atopic dermatitis
Fig. 1. Eosinophilic esophagitis (EE) patients seen at the Children’s Hospital of Philadelphia (CHOP): of the 657 patients with EE who were treated at CHOP, 144 (20%) were also evaluated by an otolaryngologist. Seventy-nine patients (55%) had previously been diagnosed with EE at the time of their initial otolaryngology consultation. Thus, 65 patients (45%) were not previously diagnosed with EE at the time of otolaryngology consultation. Twenty-one of these patients (32%) were referred for evaluation to rule out EE. After being seen by the otolaryngology service, 44 patients (68%) remained undiagnosed.
CHOP Study Findings

- 144 patients received 193 ENT diagnoses

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eustachian Tube Dysfunction (ETD)</td>
<td>27.5</td>
</tr>
<tr>
<td>Adenotonsillar hypertrophy with SDB</td>
<td>24.9</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>13</td>
</tr>
<tr>
<td>Rhinosinusitis/Nasal congestion</td>
<td>9.3</td>
</tr>
<tr>
<td>Airway Stenosis</td>
<td>5.2</td>
</tr>
</tbody>
</table>
21 patients with 26 diagnoses not previously diagnosed with EoE were referred by Otolaryngology to GI

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th># of patients</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glottic or subglottic stenosis</td>
<td>7</td>
<td>27%</td>
</tr>
<tr>
<td>Dysphagia (with or without food impaction)</td>
<td>4</td>
<td>15%</td>
</tr>
<tr>
<td>Eustachian tube dysfunction</td>
<td>4</td>
<td>15%</td>
</tr>
<tr>
<td>Sleep disorder breathing</td>
<td>4</td>
<td>15%</td>
</tr>
<tr>
<td>(adenotonsillar hypertrophy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasal congestion/rhinosinusitis</td>
<td>3</td>
<td>12%</td>
</tr>
<tr>
<td>Chronic cough</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>Hoarseness</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Recurrent croup</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Center for Pediatric Eosinophilic Disorders at CHOP: Criteria for Dx

- At least 1 clinical symptom
- No response to 2 month therapeutic trial of PPI
- EGD with biopsies from proximal, mid and distal esophagus, stomach and duodenum
- +/- colonoscopies as indicated
- EoE diagnosed if >20 Eos/HPF in esophagus with normal stomach and duodenal biopsies
CHOP Study Findings

44 patients with 64 diagnoses were NOT referred to GI for an evaluation

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th># of patients</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eustachian tube dysfunction</td>
<td>21</td>
<td>33%</td>
</tr>
<tr>
<td>Sleep disorder breathing</td>
<td>14</td>
<td>22%</td>
</tr>
<tr>
<td>(adenotonsillar hypertrophy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysphagia (with or without food impaction)</td>
<td>12</td>
<td>19%</td>
</tr>
<tr>
<td>Rhinosinusitis</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Pharyngitis (recurrent)</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Glottic or subglottic stenosis</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Laryngomalacia</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Chronic cough</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Vocal cord nodules</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Sensorineural hearing loss</td>
<td>1</td>
<td>2%</td>
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<tr>
<td>Suspected hearing loss</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Maxillofacial trauma</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Ankyloglossia</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td><strong>100%</strong></td>
</tr>
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*Table 2: Otolaryngology-related diagnoses for the patients who were seen by otolaryngology and not referred for EE evaluation.*
**CHOP Study Findings:**

You Need a High Level of Suspicion

- Most children with EoE present to otolaryngologist with routine complaints
- The 3rd most common complaint was dysphagia +/- bolus impaction
Take Home Message

• A thorough review of systems with regards to GI complains (dysphagia, vomiting, FTT)
• Ask about multiple food allergies
• Ask about dermatitis/eczema
• Looked at prevalence of EoE in pediatric aerodigestive center

• Found 3.7% rate of EoE in this group
Eosinophilic Esophagitis and the Airway

Why Does it Matter?
Cotton-Myer Classification

<table>
<thead>
<tr>
<th>Grade</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I</td>
<td>No Obstruction</td>
<td>50% Obstruction</td>
</tr>
<tr>
<td>Grade II</td>
<td>51% Obstruction</td>
<td>70% Obstruction</td>
</tr>
<tr>
<td>Grade III</td>
<td>71% Obstruction</td>
<td>99% Obstruction</td>
</tr>
<tr>
<td>Grade IV</td>
<td>No Detectable Lumen</td>
<td></td>
</tr>
</tbody>
</table>
Gastroenterological Evaluation

• Why should we bother?

• Because 80% of airway reconstruction failures have been linked to active laryngopharyngeal reflux and/or Eosinophilic Esophagitis (EE)
  
  – And 80% success when EoE was discovered and treated

Johnson & Rutter, ABEA 2003
GI evaluation

• EGD and biopsy
  – GERD
  – Eosinophilic esophagitis
  – Patulous lower esophagaeal sphincter
• Decide about pH-Impedance probe

• Role of anti-reflux medication
• Postpone airway procedure if “active larynx”
• Repeat EGD 6-8 weeks following treatment. GI tract needs to be clear prior to airway reconstruction
First Reported Case in ENT Literature

SUBGLOTTIC STENOSIS COMPPLICATED BY ALLERGIC ESOPHAGITIS
CASE REPORT

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Allergic esophagitis is a known entity that had been described in patients with dysphagia. It has not been previously described in association with subglottic stenosis. We report the case of a 2-year-old girl with symptoms suggestive of allergic esophagitis who suffered from subglottic stenosis that recurred despite surgical measures. Her esophageal pH monitoring results were normal, and she did not respond to antireflux medications. She did respond dramatically to corticosteroid therapy with improvement of both her esophageal and laryngeal symptoms. Allergic esophagitis as a clinical entity is discussed.
Untreated Eosinophilic Esophagitis and Failed Airway Reconstruction

- 2 yo female with congenital subglottic stenosis
- Preoperative EGD/Biopsy revealed no reflux
- (+) eosinophilic esophagitis (EE) – recognized, not treated
- Failed cricotracheal resection & Revision laryngotraheal reconstruction
- Treated the EE and airway inflammation markedly improved

Rutter et al, SENTAC 2005
Normal Esophageal Mucosa

- No inflammatory infiltrates
- Papillae, <50%
- Basal cells, <10%
Eosinophilic Esophagitis

- Eosinophilic infiltration
- Papillary lengthening
- Expansion of basal cells

Courtesy of Richard J. Noel, MD PhD
Eosinophilic Esophagitis & The Airway

• Triggered by food or aeroallergens
  – Not all are (+) food skin patch/prick but (+) environmental allergens

• Inflammatory mediators contribute to airway edema

• A minority of patients with EE have airway inflammation
  – 10% according to one unpublished report (Noel et al, CCHMC grand rounds)

• Manifest as failed airway reconstruction

• Treatment of EE
  – diet elimination
  – and/or topical steroids
Reflux and the Airway

• Laryngeal inflammation
• Failure to extubate
• Granulation in airway

• Evaluate with EGD/biopsy, pH probe…..
• Impedance probe testing (IMP)
  – Recognizes missed non-acid refluxate (ie bile)
  – IMP recognized 96% or reflux episodes; pH probe detected 28% (Shay & Richter Dig Dis Sci. 2005 Sep;50(9):1584-90)

• Non-acid reflux may contribute to airway symptoms
  – 45% non-acid episodes in children who failed antireflux medication with persistent respiratory symptoms
  – (Rosen & Nurko Am J Gastroenterol. 2004 Dec;99(12):2452-8)
So What?

• If (+) EE
  – Elimination diet
  – If no response, topical steroid BID
  – Re-evaluate in 3-6 months
  – Must be under control prior to reconstruction

• If significant reflux
  – Treat with proton-pump inhibitors
  – GI to recommend dosing (daily versus BID)
  – GI to recommend Nissen/Fundoplication
  – Re-evaluate in 3-6 months
  – Must be under control prior to reconstruction
Collaboration is Essential

• Airway patients often medically complicated
• Pre- and postoperative follow-up of chronic pulmonary conditions
  – Manage nebulizers
  – Alternative non-invasive ventilation
• Pre- and postoperative follow-up of GI issues
• Do not miss treatable conditions!
• As a group, decide on appropriate timing of reconstruction