Transnasal Esophagoscopy

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Grand Rounds Presentation
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Introduction

• Dysphagia, laryngopharyngeal reflux, gastroesophageal reflux, globus and cancers of the upper aerodigestive tract are all very common problems seen in Otolaryngology practice

• Transnasal esophagoscopy can be an adjunctive tool in obtaining a timely diagnosis
Benefits

• Complete exam of larynx and esophagus with high resolution under distention
• No need for sedation – no long recovery or need to miss work
• Rapid exam
• Biopsies possible
Instrument

- 5.1mm scope with distal video chip, suction, irrigation, biopsy channel
- Allows easy nasal passage
Anatomy

• Extends 18-26cm in posterior mediastinum
• Impressions from UES, trachea, aorta, left mainstem bronchus left atrium, LES, diaphragm

Netter FN. Atlas of Human Anatomy 1997; East Hanover, Novartis. Pg 221.
• UES-junction of inferior pharyngeal constrictor and cricopharyngeus

• LES- 2cm to 4cm segment of tonically contracted smooth muscle within the diaphragmatic hiatus

• Mucosa, submucosa, muscularis propria, and adventitia

• Inner circular and outer longitudinal muscle

• Proximal skeletal and distal smooth muscle

Possible Indications

- Reflux
- Globus sensation
- Dysphagia
- Head and neck cancer screening
- Surveillance of Barrett’s esophagus
- Evaluation of possible foreign body
- Biopsy of known laryngopharyngeal lesion
- Placement of tracheoesophageal puncture
- Tracheoscopy
- Dilation of esophageal stricture
Techniques

• Patient in seated position facing examiner
• Topical decongestion/anesthesia of nose with 1:1 mixture of 0.05% oxymetazoline and 4% lidocaine
• Topical anesthesia of oropharynx with 1-2 sprays of 20% benzocaine or 1-2 benzonatate (Tessalon Perles)
• Transnasal endoscope is lubricated with 2% viscous lidocaine
• Endoscope is passed either along floor of nose or between middle and inferior turbinate on most open side
• Nasopharyngeal closure, tongue base, hypopharynx, vocal fold motion, pooling of oral secretions are evaluated
• Patient’s head is flexed forward as scope is passed to upper esophageal sphincter
• Patient is asked to swallow as scope is gently advanced
• Air is insufflated into esophagus and entire length is evaluated
• If mucosal lesions or irregularities are found multiple biopsies are taken with biopsy forceps passed through the biopsy port
Postma et al 2005

- 711 patients in a retrospective review at Wake Forest
- 17 procedures aborted due to tight nasal vault
- 2 aborted due to vasovagal reaction
- Reported 50% “significant” findings

# Indications

<table>
<thead>
<tr>
<th>Indication</th>
<th>( N_1 ) (%)</th>
<th>( N_2 ) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening examination in patients with reflux/globus/dysphagia</td>
<td>79 (79)</td>
<td>490 (80)</td>
</tr>
<tr>
<td>Screening examination in head and neck cancer patients</td>
<td>5 (5)</td>
<td>45 (7)</td>
</tr>
<tr>
<td>Biopsy of known lesion in laryngopharynx</td>
<td>8 (8)</td>
<td>42 (7)</td>
</tr>
<tr>
<td>Evaluation of possible esophageal foreign body</td>
<td>2 (2)</td>
<td>12 (2)</td>
</tr>
<tr>
<td>Tracheoscopy</td>
<td>4 (4)</td>
<td>10 (2)</td>
</tr>
<tr>
<td>Dilation of esophageal stricture</td>
<td>1 (1)</td>
<td>6 (1)</td>
</tr>
<tr>
<td>Replacement of tracheoesophageal puncture under direct vision</td>
<td>1 (1)</td>
<td>6 (1)</td>
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</tbody>
</table>

\( N_1 = 100 \) and \( N_2 = 611 \) attempted examinations. 

TNE = transnasal esophagoscopy.
<table>
<thead>
<tr>
<th>Finding</th>
<th>$N_1$ (%)</th>
<th>$N_2$ (%)</th>
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</thead>
<tbody>
<tr>
<td>Esophagitis</td>
<td>19 (20)</td>
<td>98 (17)</td>
</tr>
<tr>
<td>Hiatal hernia</td>
<td>4 (4)</td>
<td>47 (8)</td>
</tr>
<tr>
<td>Barrett’s metaplasia</td>
<td>6 (6)</td>
<td>27 (5)</td>
</tr>
<tr>
<td>Candidiasis</td>
<td>1 (1)</td>
<td>27 (5)</td>
</tr>
<tr>
<td>Stricture</td>
<td>4 (4)</td>
<td>24 (4)</td>
</tr>
<tr>
<td>Carcinoma</td>
<td>5 (5)</td>
<td>22 (4)</td>
</tr>
<tr>
<td>Abnormal motility</td>
<td>3 (3)</td>
<td>17 (3)</td>
</tr>
<tr>
<td>Esophageal polyp</td>
<td>1 (1)</td>
<td>13 (2)</td>
</tr>
<tr>
<td>Patulous gastroesophageal junction</td>
<td>3 (3)</td>
<td>8 (1)</td>
</tr>
<tr>
<td>Esophageal diverticulum</td>
<td>2 (2)</td>
<td>3 (1)</td>
</tr>
<tr>
<td>Esophageal web</td>
<td>3 (3)</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Foreign body</td>
<td>1 (1)</td>
<td>6 (1)</td>
</tr>
<tr>
<td>Tracheoesophageal fistula</td>
<td>2 (2)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
Reported series of 17 patients with known lesions of upper aerodigestive tract

Underwent TNE with biopsies followed by conventional panendoscopy

TNE diagnostic for cancer 12 of 12 and negative for cancer 5 of 5 compared to panendoscopy

No report of lesion location was made

Saeian et al

• Compared transnasal EGD and conventional EGD in Barrett’s surveillance
• 32 patients underwent both procedures one week apart with biopsies
• Transnasal endoscopy detected Barrett’s metaplasia in 31 of 32 patients, hystopathological yield for dysplasia was comparable with conventional upper endoscopy

Bach et al

- Tracheoesophageal puncture technique using TNE
- Topical anesthesia same as TNE but patient also swallows 5 ml 2% viscous lidocaine and is injected in posterior tracheal wall with 1-2 ml %lidocaine with epinephrine

Dumortier et al

- 1100 French patients who underwent transnasal esophagogastroduodenoscopy
- Feasible in 94%
- Failure
  - Unsuccessful transnasal insertion 62.7%
  - Patient refusal 19.4%
  - Nasal pain 17.9%
- Side effects
  - Epistaxis 2.3%
  - Nasal pain 1.6%
  - Vasovagal reaction 0.3%

Normal Findings

FIGURE 2.1 Upper Esophageal Sphincter
The cricopharyngeus muscle is shown contracting. The proximal esophagus is in the distance.

FIGURE 2.2 Mid Esophagus
The esophageal mucosa has a pearly white color and a delicate vascular pattern.

FIGURE 2.3 Vascular Pattern at the Gastroesophageal Junction
Multiple linearly arranged blood vessels are present proximal to the gastroesophageal junction.

FIGURE 2.4 Gastroesophageal Junction
The squamous mucosa and blood vessels end abruptly with a well-demarcated margin. The orange mucosa of the stomach is opposite the esophageal mucosa.

Belafsky PC, Postma GN, Koufman JA. Normal transnasal esophagoscopy. *Ear, Nose, & Throat Surgery* 2001;80:438
Reflux Esophagitis

Barrett’s Esophagus


Squamous Cell Cancer


Adenocarcinoma


Infections

Diverticuli
Hiatal Hernia

Strictures, Webs and Rings

Esophageal Varices

Biopsies

• Taken with cup forceps passed through biopsy port
• Scope should be angled 90 degrees towards (perpendicular to lesion)
• Suction can be applied to esophageal mucosa to elevate away from deeper tissues
• Multiple biopsies should be taken (i.e. 6)
• Bleeding from initial biopsy site may be controlled with a jet of water or 1:100,000 epinephrine solution
Sources