Endoscopic management of Barrett’s esophagus

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Disclosures

- None
Outline

- Diagnosis of Barrett’s
- Treatment of nodular Barrett’s
- Endoscopic treatment of Barrett’s
- Surveillance after endoscopic treatment
Definitions on Barrett’s

- Intestinal metaplasia of the esophagus
- Histologically graded as
  - No dysplasia
  - Indeterminate for dysplasia
  - Low grade dysplasia
  - High grade dysplasia
  - Intramucosal carcinoma
  - Invasive adenocarcinoma
Definitions on Barrett’s esophagus

- Preferred method of quantifying the length
- Prague C & M criteria

Sharma. Gastro 2006;131
Screening

- Controversial
- Cost of screening population / risk of cancer
Screening

- Controversial
- Cost of screening population / risk of cancer
- Male, obese, > 50 y/o, family history, smoker, and longstanding reflux.
- 40 % of patients with esophageal cancer have no chronic reflux symptoms

Spechler. Gastro 2011: 140(3)
Diagnosis of Barrett’s

- Pathology results should be assessed by second pathologist
- Significant inter observer disagreement
- Degree of dysplasia will determine future management
Progression to cancer

- Non dysplastic 0.1 per 100 patient years (0.07-0.13)
- Low grade dysplasia 0.54 per 100 patient years (0.32-0.76)
- High grade dysplasia 6.58 per 100 patient years (4.97-8.19)

Hvid-Jensen. NEJM 2011; 365
Singh. GIE 2014; 79
Ratogi. GIE 2008; 67
The role of endoscopy in Barrett’s esophagus and other premalignant conditions of the esophagus

**TABLE 2. Endoscopic management strategies for Barrett’s esophagus**

<table>
<thead>
<tr>
<th>Histology</th>
<th>Intervention options</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDBE</td>
<td>Consider no surveillance. If surveillance is elected, perform EGD every 3 to 5 years with 4-quadrant biopsies every 2 cm. Consider endoscopic ablation in select cases.</td>
</tr>
<tr>
<td>IGD</td>
<td>Clarify presence and grade of dysplasia with expert GI pathologist. Increase antisecretory therapy to eliminate esophageal inflammation. Repeat EGD and biopsy to clarify dysplasia status.</td>
</tr>
<tr>
<td>LGD</td>
<td>Confirm with expert GI pathologist. Repeat EGD in 6 months to confirm LGD. Surveillance EGD every year, 4-quadrant biopsies every 1 to 2 cm. Consider endoscopic resection or ablation.</td>
</tr>
<tr>
<td>HGD</td>
<td>Confirm with expert GI pathologist. Consider surveillance EGD every 3 months in select patients, 4-quadrant biopsies every 1 cm. Consider endoscopic resection or RFA ablation. Consider EUS for local staging and lymphadenopathy. Consider surgical consultation.</td>
</tr>
</tbody>
</table>
Screening methods for Barrett’s

- Using white light
- Seattle protocol of biopsies 4 quadrant q 1cm + nodules
- 4 quadrant q 2cm
- Narrow band imaging
- Confocal endomicroscopy
- Volumetric laser endomicroscopy
## Sensitivity and negative predictive value

<table>
<thead>
<tr>
<th>Diagnostic modality</th>
<th>Sensitivity</th>
<th>Negative predictive value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>96.6 (95-98)</td>
<td>98.3 (95-99)</td>
</tr>
<tr>
<td>Methylene blue</td>
<td>64.2 (36-85)</td>
<td>69.8 (31-92)</td>
</tr>
<tr>
<td>Indigo Carmine</td>
<td>67 (54-78)</td>
<td>96 (86-99)</td>
</tr>
<tr>
<td><strong>Narrow band imaging</strong></td>
<td>94.2 (83-98)</td>
<td>97.5 (95-99)</td>
</tr>
<tr>
<td><strong>Endoscope confocal</strong></td>
<td>90.4 (71.9-97.2)</td>
<td>98.3 (94.2-99.5)</td>
</tr>
<tr>
<td><strong>Probe confocal</strong></td>
<td>90.3 (54.1-98.7)</td>
<td>95.1 (90.7-97.5)</td>
</tr>
</tbody>
</table>

Thosani N. GIE 2016 83(4)
Endoscopic evaluation of Barrett’s

- Use high definition white light
- Clean the distal esophagus
- Spent > 1 minute per centimeter
- Detected more patients with endoscopically suspicious lesions (54.2% vs 13.3%, $P = 0.04$)
- HGD/EAC (40.2% vs 6.7%, $P = .06$)

Gupta N. Gastroenterology 2011;140(5 Suppl 1)
Use adjunctive devices

- For specific biopsies
- Counteract esophageal contractions
- Tortuous esophagus

Choi Y. World J Gastroenterol. 2013; 19(13)
Use of distal attachment cap
Therapy for Barrett’s

- Nodules- Endoscopic mucosal resection
- Radiofrequency ablation
- Cryotherapy
- Photodynamic therapy
Role of endoscopic ultrasound

- For high grade dysplasia or nodules is EUS needed?
Endoscopic ultrasound for HGD

- Systematic review 2015 by Qumseya et al
- Evaluate the utility of EUS to change the therapeutic approach for HGD or early adenocarcinoma.

- 11 studies evaluated T1sm (656 patients)
- Only 14% (8-22%) had > T1sm

GIE 2015; 81(4)
Endoscopic ultrasound for HGD

- Only 14% (8-22%) had > T1sm
- If no nodules 7% (2-6%)

- Sensitivity 56% (95% CI, 47%-65%)
- Specificity 89% (95% CI, 85%-92%)

GIE 2015; 81(4)
Mucosal resection of nodules

- Database study of registry RFA
- EMR-> RFA versus RFA

- Complications EMR->RFA 8.2% vs 7.2 %
- Stricture 7.1% vs 6.1%
- Bleeding 0.7% vs 0.9%

Li. Dis of Esoph 2016; 19
Mucosal resection of nodules

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Efficacy outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EMR before RFA</td>
</tr>
<tr>
<td>All</td>
<td>331</td>
</tr>
<tr>
<td>patients</td>
<td>312 (94)</td>
</tr>
<tr>
<td>CED</td>
<td>277 (84)</td>
</tr>
<tr>
<td>CEIM</td>
<td>204</td>
</tr>
<tr>
<td>High-grade dysplasia, n (%)</td>
<td>192 (94)</td>
</tr>
<tr>
<td>CED</td>
<td>173 (85)</td>
</tr>
<tr>
<td>CEIM</td>
<td>127</td>
</tr>
<tr>
<td>Intramucosal carcinoma, n (%)</td>
<td>120 (95)</td>
</tr>
<tr>
<td>CED</td>
<td>104 (82)</td>
</tr>
<tr>
<td>CEIM</td>
<td></td>
</tr>
<tr>
<td>Total RFA treatments, (mean ± SD)</td>
<td>3.0 ± 1.9</td>
</tr>
<tr>
<td>Circumferential treatments</td>
<td>0.7 ± 0.8</td>
</tr>
<tr>
<td>Focal treatments</td>
<td>2.3 ± 1.7</td>
</tr>
</tbody>
</table>

CED, complete eradication of dysplasia; CEIM, complete eradication of intestinal metaplasia; EMR, endoscopic mucosal resection; RFA, radiofrequency ablation; SD, standard deviation.
Mucosal resection

- Can give pathologic staging

- Complications:
  - Bleeding 10%
  - Perforation 3-7%
  - Stricture formation 17-37%

Evans. GIE 2012; 76
Cryotherapy

- Uses of freeze-thaw cycles
- C02 or liquid nitrogen
- HGD eradication rate 97%

- Disadvantages
  - Perforation
  - Expense of use

Greenwald. GIE 2010; 71
Photodynamic therapy

- Uses 5-aminovulinic acid or porfimer sodium.
- Eliminates HGD in 77% over 5 years

- Disadvantages
  - Skin photosensitivity
  - High stricture rate

Overholt. GIE 2007;66
Radiofrequency ablation

Fleischer. Dig Dis and Scien 2010: 55(7)
Radiofrequency ablation

- Uses electrical current
- Performed circumferentially or focal
- Circumferential > 3cm
- Treatment of visible Barrett’s
- Repeat 2-3 months
- If negative biopsy q 1cm
Radiofrequency ablation

- Post treatment EAC 7.8/1000 person years
- Death 0.7/1000 person years
- All cause mortality 11.2/1000 person years

- CE-IM 78% (70%–86%)
- CE-D 91% (87%–95%)
- IM recurrence 13% (9%–18%)

Wolf WA. Gastroenterology 2015: 149(7)
Orman ES. Clin Gastro Hep 2013: 11(10)
AGA guidelines for low grade dysplasia

- **Expert GI pathology review**
  - **High-grade dysplasia/intramucosal cancer**
    - Endoscopic eradication therapy
  - **Low-grade dysplasia confirmed**
    - Discuss risks and benefits of endoscopic eradication therapy vs. surveillance
  - **Non-dysplastic Barrett’s esophagus**

Wani. Gastro 2016: 151 (5)
AGA guidelines for low grade dysplasia

Decision to proceed with endoscopic eradication therapy

Yes

Radiofrequency ablation: goal of complete eradication of intestinal metaplasia

Enroll in surveillance program post-endoscopic eradication therapy
- Surveillance EGD every year for 2 years and then every 3 years

No

Surveillance endoscopy
- Every 6 months x 1 year, annually thereafter
- Separate biopsies of visible abnormalities
- 4 quadrant biopsies every 1–2 cm
Treatment of Barrett’s with LGD

**In favor**
- Reduces the risk of progression
- Reduces need of surveillance
- Compliance with surveillance

**Against**
- No decrease in mortality
- Still requires surveillance
- Risk of procedure
Treatment of Barrett’s with LGD

In favor
- White light biopsy misses dysplasia
- EAC 5 year survival is 15%
- No markers for progression

Against
- Cost of procedure
- Buried dysplastic glands
Take home points

- Shared decision screening /management by Patient- MD
- Once Barrett’s is diagnosed- Document extent, and nodules
- Biopsy 4 quadrant q 2 cm if no dysplasia
- Biopsy 4 quadrant q cm + nodule if dysplasia
Take home points

- Nodular Barrett’s -> EMR
- High grade dysplasia -> RFA
- Low grade dysplasia -> RFA vs surveillance
- Indeterminate dysplasia -> PPI repeat 3 mo
- Non dysplastic -> discuss with patient