Refactory Esophageal Strictures

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Definitions

• **REFRACTORY:** Inability to successfully keep lumen dilated to a diameter of 14mm over 5 sessions at 2 week intervals.

• **RECURRENT:** Inability to maintain a satisfactory luminal diameter for 4 weeks once the target diameter of 14mm has been achieved.
Distinguish

If you see this, you’re gonna need this!!!

If you see this....
Malignant Dysphagia

- Intrinsic tumors
  - Esophageal adenocarcinoma
  - Esophageal SCCA
  - Junctional tumors
- Extrinsic compression
  - Lung cancer
  - Mediastinal lymphadenopathy
  - Mediastinal masses

Endoscopic Methods of Palliation

- Dilation
- Ablation
  - Laser, APC, PDT, Cryotherapy
- Stenting
Ablation

- Argon Plasma Coagulation
    - 93 pt’s randomized to APC with HDR, PDT or APC alone
    - Time to first dysphagia recurrence was 88, 59 and 35d respectively
    - APC with HDR fewest complications and highest QoL

- Photodynamic Therapy
    - PDT equally efficacious and better tumor response
    - Easier to perform
    - Less complications than Nd:Yag (1% vs 7%)
    - Use is limited by photosensitivity and high cost

- Cryotherapy
  - Used for early or superficial recurrent esophageal cancer
  - Not routinely used for palliation

Esophageal Stents

- Restore luminal patency
- Relieve dysphagia
- Resume oral feeding
- Maintain nutrition
- Quality of life
Performance: Dysphagia Scoring System

Table 1

<table>
<thead>
<tr>
<th>Dysphagia Score</th>
<th>Symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No dysphagia</td>
</tr>
<tr>
<td>1</td>
<td>Dysphagia to normal solids</td>
</tr>
<tr>
<td>2</td>
<td>Dysphagia to soft solids</td>
</tr>
<tr>
<td>3</td>
<td>Dysphagia to solids and liquids</td>
</tr>
<tr>
<td>4</td>
<td>Inability to swallow saliva</td>
</tr>
</tbody>
</table>

Mellow Arch Int Med 1985
Performance

- Relief of dysphagia
- Complications
  - Pain
  - GERD or aspiration
  - Bleeding
  - Perforation
  - Fistulas
- Stent dysfunction
  - Re-obstruction
  - Migration

Plastic vs Metal

- RCT
- 39 pts w/locally adv esopha ca

Table 2. Plastic stents versus metal stents in palliative treatment of esophageal thoracic cancer: immediate results

<table>
<thead>
<tr>
<th></th>
<th>Plastic prosthesis</th>
<th>Metal stent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 20)</td>
<td></td>
<td>(n = 19)</td>
</tr>
<tr>
<td>Technical success (%)</td>
<td>18 (90)</td>
<td>18 (94.7)</td>
</tr>
<tr>
<td>Median dysphagia score after treatment</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Complications*</td>
<td>4 (22.2%)</td>
<td>0</td>
</tr>
<tr>
<td>Perforation</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Seven-day mortality*</td>
<td>3 (16.6%)</td>
<td>0</td>
</tr>
</tbody>
</table>

*p = 0.001.
Soooo.... Came the shift to metallic stents

Uncovered = Stent Reobstruction

Tumor Ingrowth

Tissue Overgrowth

**PC-SEMS**

<table>
<thead>
<tr>
<th>n</th>
<th>Stent Type</th>
<th>Major Compl</th>
<th>Minor Compl</th>
<th>Recurrent dysphagia</th>
<th>Tissue in/over-growth</th>
<th>Food impaction</th>
<th>Stent migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>Evolution</td>
<td>4 (9%)</td>
<td>GED 11 (25%)</td>
<td>11 (25%)</td>
<td>6 (14%)</td>
<td>3 (7%)</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>37</td>
<td>Wallflex</td>
<td>3 (8%)</td>
<td>-GERD 7 (19%)</td>
<td>8 (22%)</td>
<td>4 (10%)</td>
<td>2 (6%)</td>
<td>2 (6%)</td>
</tr>
</tbody>
</table>

**FC-SEMS**

- Decreased risk of stent dysfunction by tumor/tissue in/over-growth
- Stent does not embed
  - Removable
- …Higher risk of migration
PC-SEMS vs FC-SEMS

- Retrospective, 252 pts
  - 209 PC, 112 FC
- Migration higher in FC
  - 37.5% vs 9.1% (p < 0.001)
- Tissue in/over-growth higher in PC
  - 53.4% vs 29.1% (p = 0.004)


FCSEMS in Neoadjuvant Setting

- Prospective study
- 55 pts w/locally advanced esoph ca

- Complications
  - Pain: 13/55 (24%)
  - Migration: 17/55 (31%)
    - Mean time: 44 days (6-154)
    - Only 1/17 had recurrent dysphagia

After stent placement…

- Elevate HOB, PPI
- Starts clears and slowly advance to soft foods
- Give post stent diet instructions
- Analgesics prn for pain

Benign Esophageal Obstruction

- Peptic injury
- Inflammatory (EoE)
- Anastomotic
- Radiation
- Caustic ingestion

www.GInutrition.virginia.edu
Esophageal Strictures

Simple
- Short
- Focal
- Straight
- Allow passage of normal diameter endoscope

Complex
- Longer (>2cm)
- Angulated
- Irregular
- Severely narrowed

Endoscopic Options

- Dilation
- Intraluminal steroid injection
- Incisional therapy
- Stent placement
Endoscopic steroid injection

VIDEO FILE

A Prospective, Randomized, Double-Blind, Placebo-Controlled Trial of Endoscopic Steroid Injection Therapy for Recalcitrant Esophageal Peptic Strictures

Ramage et al. Am J Gastroenterol 2005

• 30 pts randomized to:
  – 0.5cc/quadrant triamcinolone and dilation
  – Sham injection and dilation
• PPI therapy in both groups
• Telephone questionnaires at 1wk, 1,3,6,9,12 months
A Prospective, Randomized, Double-Blind, Placebo-Controlled Trial of Endoscopic Steroid Injection Therapy for Recalcitrant Esophageal Peptic Strictures

Ramage et al. Am J Gastroenterol 2005

• Results: Need for redilation

  – 2 pts (13%) steroid group
  – 9 pts (60%) sham group
  • p=0.011

Endoscopic corticosteroid injections do not reduce dysphagia after endoscopic dilation therapy in patients with benign EG anastomotic strictures

Hirdes et al. Clin Gastroenterol Hepatol 2013

• BOTTOM LINE: Intralesional steroid injections to Savary dilation in patients with benign esophageal strictures did not result in clinical benefit.
Needle Knife Therapy

- Hordijk et al. GIE 2006
  - 20 pts with refractory strictures
    - 12 pts with <1cm segment, 1 treatment needed
    - 8 pts with 1.5-2cm segment, mean 3 treatments needed
- Lee et al. GIE 2009
  - 24 pts
    - 21 pts with <1cm segment, 1 treatment needed
    - 3 pts with >1cm segment needed repeat treatment
Temporary Stent Placement

• Potential advantages
  – Maintain patency longer
  – Decreased # interventions

• Removable

• Potential Disadvantages
  – Migration
  – Tissue in/over-growth

SEPS for Benign Strictures

<table>
<thead>
<tr>
<th>Study</th>
<th>Technical Success N (%)</th>
<th>Early Stent Migration N (%)</th>
<th>Re-intervention N (%)</th>
<th>Clinical Success N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broto '03</td>
<td>10 (100)</td>
<td>2 (20)</td>
<td>6 (50)</td>
<td>5 (50)</td>
</tr>
<tr>
<td>Evrard '04</td>
<td>17 (100)</td>
<td>5 (29)</td>
<td>5 (29)</td>
<td>13 (76)</td>
</tr>
<tr>
<td>Repici '04</td>
<td>15 (100)</td>
<td>1 (7)</td>
<td>1 (7)</td>
<td>12 (80)</td>
</tr>
<tr>
<td>Barthel '08</td>
<td>8 (100)</td>
<td>-</td>
<td>4 (50)</td>
<td>1 (13)</td>
</tr>
<tr>
<td>Dua '08</td>
<td>38 (95)</td>
<td>-</td>
<td>1 (3)</td>
<td>12 (30)</td>
</tr>
<tr>
<td>Martin '08</td>
<td>18 (100)</td>
<td>1 (6)</td>
<td>2 (11)</td>
<td>17 (94)</td>
</tr>
<tr>
<td>Karbowski '08</td>
<td>12 (100)</td>
<td>5 (42)</td>
<td>-</td>
<td>5 (42)</td>
</tr>
<tr>
<td>Triester '06</td>
<td>5 (100)</td>
<td>2 (40)</td>
<td>2 (40)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Garcia-Cano '08</td>
<td>4 (100)</td>
<td>3 (75)</td>
<td>4 (100)</td>
<td>2 (50)</td>
</tr>
<tr>
<td>Ott '07</td>
<td>1 (100)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (100)</td>
</tr>
<tr>
<td>OVERALL</td>
<td>128 (98)</td>
<td>19 (23)</td>
<td>25 (21)</td>
<td>68 (52)</td>
</tr>
</tbody>
</table>

Temporary Stents

• Meta-analysis
  – 8 studies (6 prosp, 1 retro, 1 case-cont)
  – 2000-2010

• 199 pts w/benign strictures
  – Avg follow-up: 74 weeks
  – Avg length: 4.1 cm
  – Location: mid-esoph (47%)


Temporary Stents

• Outcomes
  – Technical success: 197/199 (98.9%)
  – Successful removal: 172/197 (87.3%)

  – Sustained dysphagia relief: 46.2%
    • Plastic: 55.3% vs Nitinol: 36.7% (p = 0.019)

  – Complications
    • Migration: 26.4%
    • Perforation: 1.5%
    • Pain: 14.4%
    • Tissue overgrowth: 11%

### FCSEMS – Benign Strictures

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Stent Type</th>
<th>Clinical Success, n (%)</th>
<th>Migration, n (%)</th>
<th>Removal, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakken '10</td>
<td>25</td>
<td>AliMaxx</td>
<td>13 (52)</td>
<td>11 (44)</td>
<td>25 (100)</td>
</tr>
<tr>
<td>Senousy '10</td>
<td>7</td>
<td>AliMaxx</td>
<td>7 (100)</td>
<td>8 (39)</td>
<td>13 (93)</td>
</tr>
<tr>
<td>Eloubedi '11</td>
<td>19</td>
<td>AliMaxx</td>
<td>19 (100)</td>
<td>7 (37)</td>
<td>19 (100)</td>
</tr>
<tr>
<td>Buscaglia '11</td>
<td>16</td>
<td>Wallflex, Bonastent, Evolution</td>
<td>16 (100)</td>
<td>3 (16)</td>
<td>16 (100)</td>
</tr>
</tbody>
</table>

### Stent Anchoring to Prevent Migration

- 7 pts
  - Anchor a migrated stent
  - Prevent migration of new stent

- Mean 2.3 stitches
  - SEPS
  - FCSEMS

- No complications
- No further migrations
- Successful removal of sutures/stents
  - 3 pts at 3 months

Over-The-Scope Clips

Be mindful in radiation strictures.....

Seo et al. Gastrointest Endosc 2006
Biodegradable Stents

Issues with Stenting for Benign Strictures

- No comparative trials vs dilation
- Migration risk is high
- Cost of re-intervention
- Cost of adjunctive interventions
  - Suturing (~ $1000)
  - Over-the-scope clip (~ $450)
- Long-term dysphagia relief is poor
In Summary

- Malignant strictures
  - Esophageal stents

- Benign strictures
  - Intralesional steroid injection (peptic strictures)
  - Needle knife therapy (focal strictures)
  - Esophageal stents

Thank you!