Endotherapy for benign biliary strictures

What’s New?

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Outline

• Etiology of Benign Biliary Stricture (BBS)
• Treatment
  – Endoscopic
  – Surgical
• Definition and predictors of treatment success
  – Stricture related
  – Endoscopic stent choice related
• Single Vs multiple plastic stents
• Multiple plastic Vs covered metal stents
• Cost analysis
Etiology

• Post surgical
  – Cholecystectomy (open or laparoscopic)
  – Liver transplantation (i.e., anastomotic biliary stricture) 10-30%
  – Bilio-enteric anastomosis

• Inflammatory
  – Chronic pancreatitis 25%
  – Primary sclerosing cholangitis
  – Immunoglobulin G4-related cholangiopathy
  – Acquired immune deficiency syndrome cholangiopathy
  – Vasculitis

• Other
  – Ischemia (e.g., post-liver transplantation)
  – Trauma
  – Portal biliopathy
  – Infection (e.g., Clonorchiasis)
  – Radiation injury
Treatment

• **Endoscopic**
  – Balloon dilation
    – although immediately effective, is associated with a high rate of stricture recurrence (up to 47%) depending on the underlying nature of the BBS
  – Stenting
    – maintain stricture patency while permitting scar remodeling and consolidation.

• **Surgical**
  – Choledochoduodenostomy
  – Roux en Y hepaticojejunostomy
Treatment Success

• Definition
  – ≥ 75% improvement in stricture diameter determined by comparing pre- and post-stent cholangiograms obtained at the time of CSEMS insertion and removal, respectively
  – Rapid flow of contrast medium through the anastomosis
  – Easy passage of a balloon catheter through the anastomosis
  – Clinical and biochemical response

Treatment Success

Predictors

• Stricture type related
  – Intrinsic; post-surgical, inflammatory
  – Extrinsic; chronic pancreatitis

• Endoscopic stent placement related
  – Plastic stents
    ○ single vs multiple
  – Fully covered metal stents
### Stricture type

<table>
<thead>
<tr>
<th>Variable</th>
<th>Extrinsic causes (n = 75)</th>
<th>Intrinsic causes (n = 70)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>45</td>
<td>36</td>
<td>0.135</td>
</tr>
<tr>
<td>Median age</td>
<td>55</td>
<td>64</td>
<td>0.278</td>
</tr>
<tr>
<td>Median length of stricture (cm)</td>
<td>2.1 (0.7–5)</td>
<td>1 (0.5–4.2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Type of stent (Wallstent/Wallflex/Viabil)</td>
<td>15/22/38</td>
<td>8/24/38</td>
<td>0.425</td>
</tr>
<tr>
<td>Median duration of stent placement in weeks (range)</td>
<td>30 (1–243)</td>
<td>20 (0.5–176)</td>
<td>0.401</td>
</tr>
<tr>
<td>Success, n (%)</td>
<td>31/65 (48 %)</td>
<td>52/60 (87 %)</td>
<td>0.004</td>
</tr>
<tr>
<td>Recurrence, n (%)</td>
<td>6/62 (10 %)</td>
<td>4/58 (7 %)</td>
<td>0.587</td>
</tr>
<tr>
<td>Follow-up (weeks)</td>
<td>94 (53–340)</td>
<td>87 (54–222)</td>
<td>0.337</td>
</tr>
<tr>
<td>Adverse events, n (%)</td>
<td>20 (27 %)</td>
<td>17 (24 %)</td>
<td>0.897</td>
</tr>
</tbody>
</table>

Biliary stents type

- Chronic pancreatitis strictures.
- 12 with multiple stents vs 34 with single stents followed for about 4 years.
- Clinical success was measured by comparing biochemical tests of liver function, episodes of cholangitis, and the diameter of the CBD stenosis before and after treatment.

• 8.5 F catheter
• 8mm or 10 mm stents
• Radial force permits sustained and maximal dilation of the stricture at the time of initial ERCP as well as longer intervals between stent exchanges

• 10 F each stent
• Balloon dilation is usually required to insert multiple plastic stents
Effect of Covered Metallic Stents Compared With Plastic Stents on Benign Biliary Stricture Resolution: A Randomized Clinical Trial

- Multicenter RCT
- OLT (73), Chronic pancreatitis (35) and postop injury (4)
- Multiple plastic -> reassessed every 3 months
  VS
  cSEMS -> reassessed every 6 months
- Primary outcome is resolution of stricture after no more than 12 months
- Patients followed for 12 months post stricture resolution

Stricture resolution rate and number of ERCPs needed to achieve resolution

**Resolution Rate**
- Multiple plastic: 41/48 (85.4%)
- Covered metal: 50/54 (92.6%)

**P<0.001**

**Number of ERCPs needed**
- Multiple plastic: 3.24
- Covered metal: 2.14

**P<0.001**

Time to stricture resolution

Anastomotic biliary stricture
Non-anastomotic biliary stricture post-OLT

- 10%-25% of post-LT biliary strictures
- Etiology:
  - donor-recipient ABO incompatibility
  - prolonged graft ischemic time peri-LT or post-LT
  - not all NABSs have a clearly ischemic etiology
- Unifocal or Multifocal
- Technically challenging with lower long-term endoscopic treatment success rates (50% to 75%)
Advantages of covered metal stents

• About 3 times larger than plastic stent with a catheter of only 8.5 F
• No need for balloon dilation of the stricture which is usually needed for multiple plastic stents placement
• Higher resolution rate
• Faster resolution rate
• Less ERCPs
  – More cost effective
  – Less risk for anesthesia and procedural complications
Cost analysis

- Open-label prospective randomized trial for post-OLT strictures
- 10 in the FCSEMS arm and 10 in the plastic arm
- Standard overnight stay on the transplant ward
- 3 month assessment

Thank you