Endoscopic Management of Strictures and Leaks

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What can go wrong?

- Bleeding (2%)
- Sleeve too big
- Angulated
- Too narrow/Stricture (1%)
- Leak (0.7-5%)

What can go wrong?

• Sleeve too big
• Angulated
• Too narrow/Stricture
• Leak

Courtesy Mohammed Alkayyal, www.sages.org
All bariatric surgeons should know how to manage leaks and strictures
Sleeve Complications: Stricture

- Stricture may occur on the long staple line
  - Ischemia
  - Oversewing
  - Other Technical Issue
- Leak or bleeding may predispose to stricture.

Complications: Stricture

- Most strictures can be effectively managed with balloon dilation.
- May require a second session, but over 90% are managed with 1 or 2 dilations.
- Perforation is reported in 2% of patients in some larger series (2/94).

Complications: Stricture

- Balloon dilators of 12-18 mm have been described.
- To minimize recurrence, an 18 mm balloon is preferred.
- Procedure may be done with fluoroscopic assistance.
- Inflate the balloon and hold for 1 minute.
- Repeat if necessary.

What if Dilation Fails?

• Dapri.  Laparoscopic Seromyotomy for Stricture after Sleeve.  
  9 patients, 1 leak.  Good success.  

• Sudan.  Robotically assisted stricturoplasty.

• Eubanks.  5/6 strictures success with stents  
  JACS. 2006(5):935-8
Sedation of the obese

- Dosage adjustments?
  - Midazolam
    - Prolonged half life in the obese
  - Fentanyl should be dosed on lean body mass, not total body weight
    - No change in elimination half life in lean vs. obese
  - Recovery time may be increased

Casati. Journal of Clinical Anesthesia 2005
Sedation of the obese

- Obesity hypoventilation syndrome
  - Alveolar hypoventilation
  - Increased PCO2
  - Decreased PO2
- Capnography

Casati et al, Journal of Clinical Anesthesia 2005
Sleeve Complications: Leak
Sleeve Complications: Leak

- Most early uncontained leaks are operatively managed.
- Contained or delayed leaks may be managed nonoperatively in the stable patient.
- Endoscopic techniques are a useful adjunct.
- If combined with stricture, unlikely to heal.
Literature Review

• Nguyen. 3 pts with leak, all successfully treated with stenting
  

• Csendes operative management of leaks. Resuturing ineffective after 3 days. Drainage alone averaged 45 days to resolution
  
Literature Review

• Tan. 14 (10 referred) sleeve leaks
  8 treated non-operatively with drainage
  operative management included drains
  4 successfully stented
  4 stent cx (migration x 2, bleeding, deployment problem)

  1 pt required RY Esophagojejunostomy

Sleeve Complications: Leak

- Most leaks occur at / near the angle of His
- Difficult to suture tissues at site of leak.
- Sutured leaks frequently recur.
- Cannot divert to promote healing.
- Only surgical management is often necessary.
  - T-tube or foley in leak itself
  - Wide peritoneal drainage

- 22% mortality of surgically managed GI leak. (American Surgeon. 72(7):586-90; discussion 590-1, 2006 Jul.)
## Indicators of Leak

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean +/- SD</th>
<th>No. of patients with (+) findings</th>
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<tbody>
<tr>
<td>Epigastric pain</td>
<td></td>
<td>11 (68.7%)</td>
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<tr>
<td>Fever &gt; 37.5°</td>
<td>38.08±0.7 (37.6–40.0)</td>
<td>13 (81.2%)</td>
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<td>Tachycardia &gt;100–150/min</td>
<td>115±9.6 (100–129)</td>
<td>7 (43.7%)</td>
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<td>Leukocytosis &gt;10,000/mm³</td>
<td>15,775±3,148 (10,600–22,300)</td>
<td>12 (75%)</td>
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<td>Left deviation &gt; 4%</td>
<td>10.4±5.5 (7–29)</td>
<td>5 (31.2%)</td>
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<tr>
<td>CRP mg/Lt&gt;11</td>
<td>268±107 (69–547)</td>
<td>16 (100%)</td>
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Operative options

- Widely drain
- Foley catheter in leak
- Graham patch
- Stent
RYGB Complications: Anastomotic Leak
Sleeve Complications: Leak

Use of stents:

• Removable stents have been used as an adjunct for healing fistulae.
  • Used extensively with esophageal injuries
  • Fewer studies after bariatric surgery
• Simple to deploy
• Major concern is stent migration
Stenting

• 21 patients underwent endoscopic treatment for persisting large leaks before considering redo surgery.
  • 8 RYGB
  • 12 sleeve gastrectomy, 8 also with DS
  • 1 BPD
  • 15 GC, 2 DC, 3 GP, GB Fistulas
  • Partially covered self-expanding metal stents (SEMSs) were used, followed by additional endoscopic procedures if the SEMS failed.
  • SEMSs were removed by traction alone or by insertion of a self-expanding plastic stent (SEPS) followed by extraction of both stents together.
  • SEMS insertion led to 62% (13/21) primary closures. 8/8 RYGB
  • Complementary endoscopic treatment led to 4 secondary closures.

Newer Stent recommendations

• May feed early

• Keep at least 2 weeks

• Major complication is migration
  • Nested stents may help
  • Usually caught by pylorus
Sleeve Complications: Leak

Use of endoscopically injected fibrin glue:

- Easy deployment, low risk procedure.

Stenting versus Fibrin Glue?

• Both are straightforward and often successful

• Stenting requires a follow-up procedure for stent removal.

• Glue may be successful with only one endoscopic procedure

• Limited published cases on the use of glue.

• More data is needed to compare these modalities.
Conclusions

• Many complications from sleeve gastrectomy may be treated endoscopically.

• Endoscopic therapy may minimize morbidity when compared to surgery.

• Considerations need to be taken with conscious sedation in the morbidly obese.

• May require more than one treatment.

• Outcomes are generally good with low risk.