Management of Leaks after Gastric Bypass & Sleeves

Chan W. Park, MD, FACS
Assistant Professor of Surgery
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What are the leak rates in the literature?

• Gastric Bypass?
  a. 0.7%
  b. 1.9%
  c. 3.2%
  d. 5.8%
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LRYGB
RYGB Leaks

• A delay in diagnosis can lead to:
  – Peritonitis
  – Sepsis
  – Death
Failure to rescue

• Leak-related mortality
  – Gastric bypass: 14.7 – 16.7%\textsuperscript{1,2}
  – Sleeve gastrectomy: 4.5 – 9.1%\textsuperscript{3,4}

• Review of 100 consecutive bariatric lawsuits by a consortium of bariatric surgeons and an attorney.
• 32% involved an intraoperative complication
• Most common adverse events for litigation:
  – Leaks (53%)
  – Intra-abdominal abscess (33%)
  – Bowel obstruction (18%)
  – Major airway events (10%)
  – Organ injury (10%)
  – Pulmonary embolism (8%)
• Evidence of potential negligence in 28% of cases

In 52 cases, evidence of a leak was found after:

- Laparoscopic RYGB (52%)
- Open RYGB (30%)
- VBG or revisions (18%)

Average time to diagnosis was 4.9 days (range 0–18)

The dominant allegation of negligence was a delay in diagnosis (60%)

Patient outcomes included death (60%), disability (22%), and full recovery (28%)

In many reported cases, the patient is discharged from the hospital after the surgery without a gastric fluid leak being detected. They return home, only to become seriously ill just days after their release from the hospital. The gastric fluid can cause significant infections which lead to damage to other organs. As a result, many patients are forced to undergo numerous additional surgeries and procedures.

Not all poor outcomes from gastric bypass surgery give rise to a medical malpractice lawsuit. To win a lawsuit, the victim must show that the treating surgeon breached the standard of care. In the case of a leak, this usually means that the leak was not timely diagnosed or treated and that the patient was injured as a result. To find out if you have a gastric leak cause of action, you should contact our office immediately.
How to deal with Leaks?
How to deal with Leaks?

• Don’t have them!
LRYGB Key Surgical Points

- Avoid excessive tension at anastomoses
- Intraoperative leak test
- Careful attention to orientation/angulation at JJ
- Avoid ischemia at angle of His/between staple lines
Intra-Op Air Leak test
Dx of RYGB Leaks

- Unexplained tachycardia:
  - Leak until proven otherwise
- Pain out of proportion
- Hypotension
- Fever
- WBC elevation/labs

**RESUSCITATE!!!**

- *UGI/CT*
CT scan might be useful to detect post-operative leaks in some patients, but important limitations exist in its accuracy.

Surgical re-exploration is an acceptable strategy to diagnose and treat patients highly suspected of postoperative leak.

Negative surgical re-exploration should be considered an appropriate and indicated intervention and not a complication.
Re-exploration for Leak

- Laparoscopic vs. open
  - Directed Drainage/Abdominal washout
  - Repair/patch
  - Gastrostomy tube in excluded stomach
    - Allows for enteral feeding
    - Prevents need for hyperalimentation
    - May prevent staple line dehiscence of excluded stomach due to postoperative ileus

- Intra-op Endoscopy
Management of leaks - LRYGB

1. Gastrojejunal anastomotic leak identified radiographically
   - Stable
     - Yes: Re-explore
     - No: Contained leak
6. Contained leak
   - Yes: Drained
     - Yes: NPO, IV Antibiotics, Hyperalimentation
     - No: Percutaneous Drainage and/or Re-explore
   - No: Re-explore

GJ Leak
Angle of His, “dog ear”
Endoscopic Tx

• Stable patient
• Multiple options
  – Apollo® Overstitch
  – Endoscopic clipping
  – Stent
• Maintain future options
Stent migration
Remnant Stomach Leak

Causes:
- Ischemia
- JJ obstruction
- Ileus

Dx:
- Dilation of BP / Remnant

Tx:
- G-tube
- Fix underlying issue
Jejunojunal obstruction

- **Incidence:**
  - <1%

- **Causes:**
  - Jejunojejunal obstruction
  - Bleeding at anastomosis

- **Symptoms:**
  - Emesis of small amounts of food
  - Fullness in LUQ

- **Dx:**
  - AXR
  - CT scan abd/pelvis + po contrast

- **Treatment**
  - Return to OR for laparoscopic revision of anastomosis
Marginal Ulcer → perforation

Causes:
• Ischemia
• Permanent sutures/Foreign body
• NSAIDs
• Smoking

Tx:
• Acute vs. Chronic
• Re-exploration / EGD
Routine Drains?
Routine placement of drains in proximity to gastrojejunal anastomosis

- Serve two major purposes:
  - early detection
  - conversion of a leak into a controlled fistula to avoid major interventional procedures.

- Routine use of drains
  - increases postoperative morbidity
  - Increases cost
  - increases length of stay
  - may erode into the GJ anastomosis
  - misses leaks at the JJ or other small bowel sites

- Additional imaging may be necessary in for management of leaks in clinically stable patients.
<table>
<thead>
<tr>
<th></th>
<th>Drain group ((n=272))</th>
<th>Nondrain group ((n=483))</th>
<th>(p) value (t test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male: female</td>
<td>5:1</td>
<td>5:1</td>
<td></td>
</tr>
<tr>
<td>Mean age (range), years</td>
<td>41.7 (19–70)</td>
<td>43.1 (19–70)</td>
<td>0.808</td>
</tr>
<tr>
<td>Mean BMI</td>
<td>48.5</td>
<td>47.8</td>
<td>0.217</td>
</tr>
<tr>
<td>Number of leaks</td>
<td>4 (1.47%)</td>
<td>3 (0.62%)</td>
<td>0.154</td>
</tr>
<tr>
<td>Leaks requiring reoperation</td>
<td>2 (0.73%)</td>
<td>2 (0.41%)</td>
<td>0.514</td>
</tr>
</tbody>
</table>

**Table 2** Basic clinical information for leaks in patients with and without an operative drain

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Operative drain</th>
<th>Upper GI</th>
<th>CT scan</th>
<th>Reoperation</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>Negative</td>
<td>Confirmed leak at GJ</td>
<td>Yes</td>
<td>Leak not contained with drain; reoperation 2 months post-LRYGB</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>Not done</td>
<td>Contained leak at GJ, no contrast into drain</td>
<td>No</td>
<td>Treated nonoperatively</td>
</tr>
<tr>
<td>3</td>
<td>Yes</td>
<td>Confirmed leak at GJ</td>
<td>Not done</td>
<td>Yes</td>
<td>Leak not contained with drain</td>
</tr>
<tr>
<td>4</td>
<td>Yes</td>
<td>Confirmed leak at GJ</td>
<td>Local collection</td>
<td>No</td>
<td>CT-guided drain placement</td>
</tr>
<tr>
<td>5</td>
<td>No</td>
<td>Not done</td>
<td>Confirmed leak at GJ</td>
<td>Yes</td>
<td>Uncontained GJ leak</td>
</tr>
<tr>
<td>6</td>
<td>No</td>
<td>Not done</td>
<td>Small contained leak at GJ</td>
<td>No</td>
<td>Endoscopic stent placement</td>
</tr>
<tr>
<td>7</td>
<td>No</td>
<td>Not done</td>
<td>Intra abdominal abscess, uncontained leak</td>
<td>Yes</td>
<td>Leaks at GJ and JJ, both revised</td>
</tr>
</tbody>
</table>
• Our series confirms that drains add little or nothing to the evaluation or management of postgastric bypass leaks.

• The majority of which can be diagnosed based on clinical signs.

• The placement of drains does not decrease imaging studies or surgery

• In addition, routinely placed operative drains can have deleterious effects.
# Diagnosis and Management of Anastamotic Leak or Staple Line Dehiscence after Gastric Bypass

**by RAUL J. ROSENTHAL, MD, FACS, FASMBS; SAMUEL SZOMSTEIN, MD, FACS, FASMBS; and EMANUELE LO MENZO, MD, PhD, FACS, FASMBS**

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Anastamotic leak at the gastrojejunal or jejunoo-jejunal anastomosis level are rare but they can have lethal implications or cause of major morbidity if not recognized and managed promptly. Staple line dehiscence along the pouch and gastric remnant have been also described as a source of leaks.

### SIGNS AND SYMPTOMS:
- Sustained sinus tachycardia
- Hypotension
- Fever
- Abdominal pain
- Back and/or shoulder pain
- Shortness of breath/dyspnea
- Leucocytosis
- Diaphoresis
- Increase or change in color of drainage output

### TREATMENT
- Lavage and drainage, drainage, laparoscopy/laparotomy/feeding tube (gastrostomy or jejunostomy)
- Place suture if leak area identified if not just drainage
- Use large bore drains
- Consider remnant gastrostomy
- Continue ICU monitoring
- Avoid doing a major procedure. In an emergency with a patient unstable always choose the safest and quickest procedure. Do not redo anastomosis.
- Transfuse as needed
- Start TPN or EN via G tube as soon as patient is hemodynamically stable
- Follow long-term treatment recommendation

### INITIAL TREATMENT
- Observation in a monitored unit. Patient might deteriorate rapidly and you should be able to make the diagnosis ASAP.
- Patient in a sitting position
- IV access
- Oxygen NC as needed
- Proton pump inhibitors IV
- NPO
- Start TPN ASAP
- Antibiotics/antifungals
- Antiemetic: PRN
- Foley catheter: PRN
- Hydrate (NaCl)
- Prokinetics (?)

### GASTROGRAPHIN SWALLOW WITH PATIENT IN SUPINE, AS WELL

### If febrile:
- CT scan and CT-guided drainage of collections. If not drainable, consider laparoscopy/laparotomy for proper drainage
- Culture and start ATB/antifungals
- Place G/J tube for enteral feeds if not done so before maintain patient NPO until leak closes (on average 4 to 12 weeks).

### BASIC INITIAL MANAGEMENT

If patient is hemodynamically unstable:

- First and foremost, follow the "ABC" rule — airway, breathing, and circulation — basic life support (BLS)
- Early surgical intervention should prevail over any possible delay in radiological studies if there is high index of suspicion

- Transfer to ICU
- Resuscitate
- IV fluids ringer/NaCl
- Antibiotics/antifungal
- Foley
- Oxygen 4L NC
- Type and screen
- Obtain consent for laparoscopy/laparotomy/feeding tube (gastrostomy or jejunostomy)

### LONG-TERM TREATMENT AND OUTPATIENT FOLLOW UP.

If febrile:
- NPO
- TPN/EN
- Maintain ideal nutrition status
- PPI
- Follow up with gastrographin or CT scan every 2 to 3 weeks to monitor closure of anastomotic leak
- Monitor CBC/CMP for anemia, pre-albumin, and electrolyte abnormalities
- Pain management with patches; avoid PO narcotics.

### DIAGNOSTIC ALGORITHM:
- CT scan of the abdomen with oral (gastrographin) and IV contrast. Look for left lower lobe atelectasis. Usually a sentinel sign that something is going on in the LUO
Morbid obesity continues to be an epidemic not only in this country, but across the world. The World Health Organization classifies obesity by body mass index (BMI), which is weight (in kilograms) divided by height (in meters) squared. Obesity is defined by a BMI >30 kg/m², whereas morbid obesity is defined by a BMI >40 kg/m². In the United States, the rate of obesity has at least doubled from 1988 to 1998 and 2003, obesity cost approximately

One of the most commonly performed bariatric procedures is gastric bypass. In 1994, Wittgrove et al. reported the first laparoscopic Roux-en-Y gastric bypass (LRYGB). A series of well-designed, prospective, randomized studies have been performed by Nguyen et al., which demonstrated the effectiveness of LRYGB compared with the open approach.

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**Diagram:**

1. Preoperative Liquid Protein Diet x 2 weeks
2. Intraoperative Upper Endoscopy
   - No leak
     - Difficult Anastomosis?
       - Yes
         1. Fibrin glue
         2. Omental patch?
   - + Leak
     1. Sutures until no leak
     2. Fibrin glue
     3. Omental patch
     4. ? drain
3. POD #1 am: UGI study
   - + Leak
     - Laparoscopic repair
       1. EGD for all GJ or pouch leaks
       2. Suture repair until no leak
       3. Drain
       4. Fibrin glue
       5. Omental patch
   - Normal study
     - Normal laboratory values, normal vital signs, urine output
       - No
         - Observe
         - Repeat UGI
         - CT scan
         - Repeat labs or Lap repair
       - Yes
         - Home
Conclusions

- RYGB leaks are rare
- RYGB leaks cause significant morbidity/mortality
- Early detection/management is key
- Avoid tension/ischemia/angulation at anastomoses during RYGB
- Endoscopes & G-tubes can be helpful
- Don’t forget about distal obstructions