What Clinicians should know about Bariatric Surgery Complications

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Disclosure

None
Thank Dr. Brams and Dr. Scheiry
Obesity Epidemic - Costs

- $147 Billion annually
- #1 predictor of DM
  - 40x more likely to develop DM II
- BMI > 30 is 30% of population but 60% of cost
- By 2030, predicted to be 50-60% of US population
- RWJF report 2012

Age-adjusted % of adults ≥20 years old who are obese, 2007

MMWR 58:1259-1263, 2009

Obesity Epidemic - Costs

- Bariatric Surgery – $25,000
- Quality Adjusted Life Year - the number of years of life that would be added by the intervention
  - Laparoscopic Gastric Bypass $12,500/QALY
  - Screening Colonoscopy $10 – 25,000/QALY

L. Salem et al, SOARD 2008
Bleich et al, Medical Care 2012
Long-Term Outcomes of Bariatric Surgery - Sweden

- Prospective cohort matched study 1997
  - 11,000 screened
    - 2000 each arm – matched
- Surgery
  - Fixed/Adjustable Band
  - Vertical Banded Gastroplasty
  - Open Gastric Bypass
- Medical
  - Intense lifestyle/behavior modification +/- meds
  - none

MORTALITY

- 25% reduction in mortality
- Heart Disease
- Diabetes
- Cancer
- Current surgery more effective and safer
CANCER

- Start recording 3 years after surgery
- No difference in men
- Not just estrogen sensitive tumors
  - Melanoma, bone marrow
- Role of insulin and insulin like growth factors, steroid

Lancet Oncology 2009, vol 10

Surgery vs Control

- 12,000 Medicare pts matched for BMI
- 30 day Mortality
  - 1.5% surgery
  - 0.5% control
- 2 year Mortality
  - 4.5% surgery
  - 8.6% control

Perry, Annals of Surgery 2008
Bariatric Surgery

- Multiple long term studies demonstrating 25-40% survival advantage
- Significant reduction in comorbidities and improvement in quality of life
- 80% of patients are women
- Medication costs?
- Complications

Surgical Procedures for Morbid Obesity

- LAP-BAND
- Sleeve Gastrectomy
- Laparoscopic Roux – Y Gastric Bypass (GBP)
- Bilio-Pancreatic Diversion (BPD)
## Bariatric Surgery Complications

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Gastric Bypass</th>
<th>Sleeve Gastrectomy</th>
<th>Lap Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>0.3%</td>
<td>0.1%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Acute Morbidity</td>
<td>1.25%</td>
<td>1.0%</td>
<td>0.2%</td>
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<tr>
<td>Leaking</td>
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<tr>
<td>Bleeding</td>
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<tr>
<td>Dehydration</td>
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<tr>
<td>Pulmonary emboli</td>
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<tr>
<td>Late Morbidity: 5-10%</td>
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<tr>
<td>Bowel obstruction</td>
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<tr>
<td>Nutritional deficiency</td>
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<tr>
<td>Need for re-operation</td>
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<tr>
<td>Weight Re-Gain</td>
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<tr>
<td>Late Morbidity: 5-10%</td>
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<tr>
<td>Worsening Reflux</td>
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<tr>
<td>Weight Re-Gain</td>
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<tr>
<td>Late Morbidity: 10-20%</td>
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<tr>
<td>Band Erosion</td>
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<tr>
<td>Slip</td>
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<tr>
<td>Tubing/Port Problems</td>
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<tr>
<td>Need for re-operation</td>
<td></td>
<td></td>
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<tr>
<td>Failure of Weight Loss</td>
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</tbody>
</table>

“Education is that which remains when one has forgotten everything learned in school.”

Albert Einstein
Case Presentation

- 45 yo woman 2 year s/p lap band.
- Initial weight 285, now 190.
- Excellent restriction, but severe reflux
- Presents acutely with vomiting and epigastric LUQ pain

Lap Band “slippage”: Gastric Herniation

- 1-4% of patients after lap band
- Most present sub-acute
- Treatment
  - Remove Fluid
  - Surgery – urgent if symptoms persist

Normal Appearance

Band Too Tight
Case Presentation

- 50 y.o. woman presents with sudden onset n/v 1 year s/p lap band
- On further questioning, she consumed a coconut 1 week ago

Endoscopy
Case Study

A 56-year-old woman, who had a Lap Band 4 years ago, was last followed up 2 years ago, presents to OSH because she has less restriction for band fill and is noticed to have redness over the port. There are no systemic symptoms.

Mechanism

Initial weight was 265, with a low weight of 175. She had 8 band fills, but has had fluid removed and now without restriction with weight regain to 220.
Case of Indolent Presentation

- 24 y.o. patient lost 80 lbs 2 yrs after lap band, presents with abdominal pain
- UGI
- Pt. still has restriction
- Presented 2 years later with loss of restriction and abdominal pain

Management?
Complication Data on lap band

<table>
<thead>
<tr>
<th></th>
<th>Mittermaier OS 2009</th>
<th>Suter OS 2006</th>
<th>Van Nieuwenhove OS 2010</th>
<th>Pompidou historical</th>
<th>Pompidou SELECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>733</td>
<td>317</td>
<td>656</td>
<td>1000</td>
<td>389</td>
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<tr>
<td>F/U</td>
<td>3yrs</td>
<td>74mo</td>
<td>95mo</td>
<td>7yrs</td>
<td>29mo</td>
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<tr>
<td>Removed</td>
<td>18.1%</td>
<td>21.7%</td>
<td>24%</td>
<td>10.7%</td>
<td>3%</td>
</tr>
<tr>
<td>Reoperated</td>
<td>32%</td>
<td>29.6%</td>
<td>35.7%</td>
<td>17.2%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Complications</td>
<td>50.4%</td>
<td>33.1%</td>
<td>48.6%</td>
<td>19.2%</td>
<td>9%</td>
</tr>
<tr>
<td>BMI Kg/m2</td>
<td>28.3</td>
<td>33.2</td>
<td>32.3</td>
<td>30.8</td>
<td></td>
</tr>
</tbody>
</table>

“Since the mathematicians have invaded the theory of relativity, I do not understand it myself anymore.”

Albert Einstein With Elsa, his second wife, in 1920 at age 41.
Case

42 y.o. female with excellent results after un-complicated gastric bypass presented with GIB requiring blood transfusions

Anastomotic /Marginal Ulcers

Etiology –
- NSAIDS
- Smoking
- Gastro – Gastric Fistula (UGI)
- Chronic ischemia

Therapy
- PPI
- Discontinue NSAIDS
- Smoking cessation
- Treat H. pylori
- SURGERY (rare)

Present:
- Epigastric Pain
- Dysphagia
- Vomiting
- Asymptomatic
- Bleeding
- Perforation
### Endoscopic Findings in Symptomatic GBP Patients

<table>
<thead>
<tr>
<th>Complication</th>
<th>Frequency (n)</th>
<th>All operated patients (%)</th>
<th>Symptomatic patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anastomotic stricture</td>
<td>40</td>
<td>3.7</td>
<td>52.6</td>
</tr>
<tr>
<td>Normal anatomy</td>
<td>24</td>
<td>2.2</td>
<td>31.6</td>
</tr>
<tr>
<td>Marginal ulcer</td>
<td>12</td>
<td>1.1</td>
<td>15.8</td>
</tr>
<tr>
<td>Nonabsorbable sutures</td>
<td>3</td>
<td>0.27</td>
<td>4.0</td>
</tr>
<tr>
<td>Gastrogastic fistula</td>
<td>2</td>
<td>0.19</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Lee et al. AJG 2009;575-582

### Case

- 56 yo male 5 weeks after LGBP
- Increasing dysphagia, now with vomiting
- Benign abdominal exam
Anastomotic Stricture

stricture  TTS balloon  Post-dilation
Anastomotic Stricture

- Common after Roux GBP or VBG
- Common with circular stapler: 4 to 20%
- Incidence <1% with linear stapler
- Generally occurs within 6 months
- Clinically patients have nausea, emesis and pain
- Barium swallow then EGD
- Endoscopic dilation (repeat)

Case

- 48 yo woman s/p LGBP 2 years ago at OH
- Had “Leak” post op, treated non-operatively
- Recurrent marginal ulcer
Gastro-Gastric Fistula

Management?

Case

4 hours after Gastric Bypass patient starts vomiting bright red blood.

Return to OR for intra-operative therapeutic endoscopy
Case

- 48 year old man 5 years after LGBP
- 110 lbs weight loss
- Multiple episodes of RUQ pain after meals
- Elevated Total Bilirubin
Choledocholithiasis after Gastric Bypass

- Transoral ERCP impossible
- RUQ U/S and MRCP for diagnosis
- PTC
- Transgastric Endoscopic CholangioPancreography
  - Admit to Surgical Service
  - Combined procedure in the Operating Room
  - 1-2 days in hospital

Trans Gastric ERCP
Cholelithiasis and Gastric Bypass

- Approximately 36% of patients develop stone or sludge
  - 18% will become symptomatic
  - 9% cholecystectomy
- Prophylactic Ursodiol (300mg BID)
  - Decreased cholelithiasis from 32% to 2%*

**CURRENT MANAGEMENT**

- Selective CCY at time of GBP if symptomatic
- Significantly more time/risk of complications
- Lap Chole/IOC if biliary colic develops

Sleeve Gastrectomy

- 3 year weight loss similar to bypass
- No small bowel anastomosis
- Leak – 1-2%
  - Can present days to months after surgery
- Reflux
Treatment of Leak after Sleeve Gastrectomy

- Drain collection (surgery/IR)
- Antibiotics
- Stent the leak
  - 22-23mm x 150mm COVERED stent
  - Use only 1 stent
  - Super stiff guide wire
  - Leave 4-8 wks
- Nutrition
The GI docs will bail me out of this one!
Chronic Abdominal Pain after Bypass - Intussusception

Chronic Abdominal Pain After Bypass - Internal Hernia
Chronic Abdominal Pain after Bypass

- US/HIDA – biliary disease
- CT scan – internal hernia/intussusception (SBO requires URGENT surgical consult)
- Endoscopy – marginal ulcer
- Exploratory surgery – look for internal hernias and place feeding tube TPN
- Bacterial overgrowth
- Dysmotility (IBS treatment)
- Pain control – NARCOTICS

Nutritional Deficiencies

- More common in gastric bypass and duodenal switch
- Iron deficiency
  - Up to 15% of patients (literature)
  - Impaired iron reduction by gastric acid
  - Duodenum/proximal jejunum bypassed
  - Iron containing MVI for prevention
  - Iron 325mg TID for treatment
  - IV Iron for refractory cases
Nutritional Deficiencies

- **B12 deficiency** occurs in 26% (literature)
  - ? Inadequate acid, lack of intrinsic factor
  - Unusual with adequate supplementation (IM/SL)
- **Vitamin D and Calcium**
  - High prevalence pre-op
  - Osteoporosis
- **Fat-soluble Vitamins A +D – Duodenal Switch**
  - Fat malabsorption from long limbs
  - Fat aversion from steatorrhea

Recommendation for Supplements

- Monitor Q12month
  - Iron studies, Hct, B12, 25-OH-Vit D, Ca and PTH, thiamine
  - Bone density every 1-2 years?
- Supplements Daily
  - MVI BID
  - Vitamin B12: total 2000mcg weekly (Sublingual, IM)
  - Calcium/Vitamin D: must be *calcium citrate* NOT calcium carbonate. **Calcium citrate** 600-750mg with Vit D 400-500 IUs BID IF NORMAL pre-op
Massive weight loss

More common in older patients with pre-existing large abdominal pannus
Insurance will cover abdominoplasty
<10% require it

Conclusion

- Even though bariatric surgery decreases the cost of care and improves life expectancy of morbidly obese patients, it is associated with significant complications
- 200,000 surgeries are performed each year representing 1-2% of eligible patients
- The number of complications encountered as a result of bariatric surgery will increase.
THANK YOU

Algorithm

- Band – (too tight, slip, erosion)
  - UGI – best first test
  - Endoscopy
- Bypass – (obstruction, perforation)
  - CT scan – free air or obstruction - URGENT CS
  - Endoscopy – marginal ulcer
  - US – cholecystitis
Case – Acute abdomen/SBO

- 43 yo female 2 years after gastric bypass with sudden onset crampy abdominal pain, nausea/wretcing and tenderness on exam
- Internal Hernia
- Adhesions
- Intussusception
- Perforation
Intussusception

Case

59 yo diabetic presents with severe abdominal pain radiating to his back 1 week after gastric bypass
Case

- 49 yo 10 years s/p lap gastric bypass – persistant vomiting (years) – BMI 19
- s/p revisional surgery for resection of marginal ulcer
- Vomiting ? bile