Bariatric Surgery: Patient Selection, Complications, What the Internist Should Know

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Surgical Overview

- Indications
- Contraindications
- Surgical complications
- Post operative management
Defining Obesity

BMI = weight/(height x height) x 703 (English)

- Normal Weight (BMI 18.5 to 24.9)
- Overweight (BMI 25 to 29.9)
- Obese (BMI 30 to 34.9)
- Severely Obese (BMI 35 to 39.9)
- Morbidly Obese (BMI 40 or more)

Guidelines for Bariatric Surgery

National Institutes of Health (NIH), 1998

- BMI of 40+ OR 35–39.9 and a serious obesity-related health problem (e.g., Type 2 diabetes, coronary heart disease or severe sleep apnea)
- Acceptable operative risks
- Ability to participate in treatment and long-term follow-up
- Understanding of operation and lifestyle changes required (e.g., counseling, nutritional education, and long-term follow-up, including aftercare visits)
Study Overview
• Five-year data showed that among patients with type 2 diabetes and a BMI of 27 to 43, bariatric surgery plus intensive medical therapy was more effective than intensive medical therapy alone in decreasing or resolving hyperglycemia, even among those with a BMI of less than 35.
Mean Changes in Measures of Diabetes Control from Baseline to 5 Years.

A. Glycated Hemoglobin

B. Diabetes Medications

C. Body-Mass Index

D. Glycated Hemoglobin According to Body-Mass Index

Most Common Bariatric Operations

- Gastric Bypass
- Sleeve Gastrectomy
- Gastric Banding
Less common bariatric operations

Duodenal Switch

Vertical Banded Gastroplasty--Historical

Mini or loop Gastric Bypass

USA Bariatric Surgery 2011-2015
Contraindications

Relative
- Cirrhotic liver disease with portal hypertension
- Limited ability to understand with cognitive impairment
- Cancer < 5yr survival
- Mod-Severe Depression untreated
- Current tobacco abuse

Absolute
- Esophageal Varices
- Severe heart disease
- AIDS
- Active psychosis
- Current substance abuse (within 12 months)
- Any medical condition with risk > benefit

Mortality Following Bariatric Surgery
Compared to Other Operations in Finland During a 5-Year Period (2009–2013).
A Nationwide Registry Study

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Patients, total</th>
<th>Mortality, 30 days</th>
<th>Mortality, 90 days</th>
<th>Mortality, 1 year</th>
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<tr>
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<td>3918</td>
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<td>Cholecystectomy</td>
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<td>Knee arthroplasty</td>
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<td>Gastrectomy</td>
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<td>16</td>
<td>41</td>
<td>130</td>
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<td>Gastric resection</td>
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<td>23</td>
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<td>88</td>
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<td>Colorectal resection</td>
<td>10,327</td>
<td>285</td>
<td>465</td>
<td>968</td>
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<tr>
<td>CABG</td>
<td>744</td>
<td>44</td>
<td>58</td>
<td>76</td>
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</tbody>
</table>

Obesity Surgery
September 2017, Volume 27, Issue 9, pp 2444–2451
Post Surgery Complications > 6 weeks
- Gallstones
- Incisional hernia
- Dehydration
- Small bowel obstruction
  - Volvulus
  - Intussusception
  - Anastomotic Ulcer
- Dumping
- GERD
- Nutritional deficiency

Dehydration
- Decreased liquid intake, decreased urine output, and increased urine concentration
- Vomiting, diarrhea, and extreme heat may precipitate clinical dehydration
- Continuous sipping
- IV fluids and treat underlying cause
Diarrhea, Flatulence, Bloating

- Diarrhea—often other causes
  - Food Journal – look for dairy, high sugar, high fat
  - Sugar substitutes can do it
  - Try probiotics

- Flatulence/bloating
  - Antigas agents: simethicone, beano
  - Antidor: Devrom

Roux-en-Y Gastric Bypass

- 1960’s
- 50-70% excess weight loss
- Imaging Choice: Abdominal CT
Small Bowel Obstruction

- Incidence ~1-3% after bypass
- Presents with abdominal pain and vomiting
- All of these patients should be referred to surgeon ASAP

Internal Hernia
Small bowel volvulus
- Difficult Diagnosis
- Variable presentation

Imaging is unreliable!! Surgery is diagnostic

Intussusception

Variable presentation
Anastomotic Ulcer

- Incidence 10-15% over time
- Prevention: routine H pylori screening and treatment
- NO NSAIDs or Tobacco!!
- Epigastric pain and vomiting
- Diagnose with EGD
- Treat with PPI/carafate
- Rarely requires operation

Anastomotic stricture

- Progressive intolerance to solids then liquids
- Diagnosis:
  > Endoscopy
- Treatment:
  > Balloon dilatation
### Dumping Syndrome

#### Early dumping systemic symptoms
- Desire to lie down
- Palpitations
- Fatigue
- Faintness
- Syncope
- Sweating
- Headache
- Flushing

#### Early dumping abdominal symptoms
- Epigastric fullness
- Diarrhea
- Nausea
- Abdominal cramps
- Borborygmi

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### Dumping Syndrome

#### Late dumping
- Sweating
- Shakiness
- Hunger
- Difficulty concentrating
- Decreased consciousness
Dumping Treatment

- 6 meals/day
- Avoid fluids during meals
- Avoid simple sugars
- Avoid milk and milk products
- Increase protein and fat intake to fulfill energy needs
- Lie flat for 30 minutes after meals
- Dietary fiber supplements

Laparoscopic Sleeve Gastrectomy

- Stemmed from duodenal switch
- 40-60% excess weight loss
- No malabsorption
- Technically easier than bypass
- Durability past 10 years unknown
- Imaging choice: EGD or Upper GI

GERD Late leaks
Laparoscopic Adjustable Gastric Banding

- Band lined with inflatable balloon
- Subcutaneous reservoir
- Restrictive
- Least invasive
- Least effective
- Highest rate of reoperation
- Imaging choice: Upper GI

GERD/Dysphagia

Band
- Band should be loosened
- Pill esophagitis
- Temporizing measures
  > Separate pills
  > Take pills later in the day
  > Avoid eating at least 2 hours before bedtime
Band Slippage
- heartburn or vomiting
- +/- obstruction, pain
- stomach slips above to the band
- Refer to bariatric surgeon
- Deflate band
- If suspect gastric necrosis → remove

Band Erosion
- 1-10%
- Band erodes into stomach
- Presents with
  - port infection
  - Inadequate weight loss or weight gain
- EGD
- Requires removal
Micronutrient Deficiencies

- Most common long term complication
- Less prevalent in purely restrictive operations
- Often insidious onset
- Requires yearly follow up
  - Diet and supplement history
  - Surveillance labs
- May have peak incidence > 5 years postop

Vitamin Absorption

- C
- Calcium
- Thiamine
- Iron
- Folate
- Vitamin D
- B12
Micronutrient Deficiencies

- Most can be managed with routine follow-up and oral supplementation
- Iron: 25-50% after gastric bypass
- Vitamin B12
- Calcium: Rare have pathologic fractures
- Folate
- Thiamine: rare without excessive vomiting
- Fat Soluble Vitamins: Malabsorptive operations

Routine Bariatric Care
Vitamin Supplementation

<table>
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<tr>
<th>Supplement</th>
<th>Band/Sleeve</th>
<th>Bypass</th>
<th>BPD/DS</th>
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<tbody>
<tr>
<td>MVI</td>
<td>100% RDA</td>
<td>200% RDA</td>
<td>200% RDA</td>
</tr>
<tr>
<td>B12</td>
<td>--</td>
<td>500 mcg /day</td>
<td>--</td>
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<tr>
<td>Calcium Citrate</td>
<td>1500 mg/d</td>
<td>1500-2000 mg/d</td>
<td>1800-2400 mg/d</td>
</tr>
<tr>
<td>Iron (elemental)</td>
<td>--</td>
<td>18-27 mg/d</td>
<td>18-27 mg/d</td>
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<tr>
<td>Fat Soluble</td>
<td>--</td>
<td>--</td>
<td>10,000 IU A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2000 IU D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>300 mcg K</td>
</tr>
<tr>
<td>D for Oregonians</td>
<td></td>
<td>50,000 IU/wk</td>
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<tr>
<td>B complex (optional)</td>
<td>1 serving/d</td>
<td>1 serving/d</td>
<td>1 serving/d</td>
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</table>
Follow up

Recommended visits
- Post op (1-4 weeks)
- 3 month
- 6 month
- 12 month
- 18 month
- Annually

Multidisciplinary Program
- Medical/Surgical
- Dietician
- Physical Therapy
- Mental Health
- Support Groups

Routine Bariatric Care

Dietary
- Protein intake
  - > 60-80 g/day
  - > 90g/day BPD/DS
  - > Complete Protein concentrates
- Portion control
- Mindful eating

Physical Fitness
- Resistance training
- Non-exercisers
  - > 10,000 steps per day
- Exercisers
  - > 5 hours of vigorous exercise per week
Routine Bariatric Care

Laboratory Studies
- Routine Annual
  - CBC, CMP, B12, D, ferritin, PTH, lipid panel
- PRN
  - B1, B6, A, E, K, Zinc, HgbA1C, TSH

Other Diagnostics
- Sleep Study F/U
- DEXA scan

Locations:
- Portland: Legacy Good Sam OHSU
- McMinnville: Willamette Valley
- Corvallis: Good Samaritan Regional
- Coos Bay: Bay Area Hospital
- Vancouver: Southwest Washington
- Eugene: Sacred Heart Medical Center
- Bend/Redmond: St. Charles Medical Center
- Medford: Rogue Valley Medical Center
- Klamath Falls: Sky Lakes Medical Center
- Tri-Cities: Tri-City Regional Medical Center
- Boise: St. Luke’s Hospital
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