Types of Bariatric Procedures

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A Brief History of Bariatric Surgery

• First seen in pts with short bowel syndrome → weight loss

• First weight loss operations (ca. 1950s)

• Intestinal bypass
  • Low-risk surgically BUT many patients developed serious and often fatal complications
Types of Bariatric Surgery

- **Purely Restrictive**
  - Gastric Balloons (not approved for use in USA)
  - Vertical-banded gastroplasty / **sleeve gastrectomy**
  - **Gastric adjustable banding**

- **Restrictive > Malabsorptive**
  - **Short-limb/Roux-en-Y gastric bypass**
  - Long-limb/distal Roux-en-Y gastric bypass

- **Malabsorptive > Restrictive**
  - Biliopancreatic diversion (BPD)
  - BPD with duodenal switch
  - Very long limb Roux-en-Y gastric bypass

- **Purely Malabsorptive**
  - Jejunooileal bypass
  - Jejunocolonic bypass
Strictly Restrictive Procedures

* Non-Adjustable Gastric Banding (Molina)
* Adjustable Gastric Band-LapBand (Kuzmak)
* Horizontal Gastroplasty (Carey)
* Vertical Banded Gastroplasty (Mason)
* Silastic Ring Vertical Banded Gastroplasty (Laws)
Adjustable Silastic Gastric Banding (ASGB): LapBand™

- **GENERAL FEATURES**
  - Inflatable balloon within the band orifice can be adjusted via a reservoir under the skin

- **Average Weight loss**
  - 50% of excess weight
Adjustable Silastic Gastric Banding: Complications

- Splenic injury
- Esophageal injury
- Wound infection
- Persistent vomiting
- Acid reflux
- Band slippage
- Reservoir leak/deflation
- Band erosion

Re-operation: 5 - 20%

Death: 0.3 %
Vertical Banded Gastroplasty (VBG)

- General Features
  - Pouch size: 1 oz
  - Triple staple line
  - Pouch opening: 0.5 in

- Average Weight Loss
  - 50 % of excess weight
Vertical banded gastroplasty: Complications

- Stomal narrowing with persistent vomiting
- Staple line leak or disruption
- Band erosion
- Wound infection or hernia
- Death 0.1%
- Overall re-operation rate 43%
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Restrictive Procedures with some Malabsorption

* Gastric Bypass with Loop Gastro-Jejunostomy (Mason)
* Roux-en-Y Gastric Bypass (Torres)
* Transected Roux-en-Y Gastric Bypass (Miller)
  Laparoscopic Roux-en-Y Gastric Bypass (Wittgrove)
  Transected Silastic Ring Vertical Gastric Bypass (Fobi)
Roux-en-Y Gastric Bypass (RYGBP)

- General Features
  - Pouch size: 1 oz, 5cm
  - Pouch opening: 0.5 in
  - Roux-en-Y limb
    - Standard: 100-150 cm

- Average Weight Loss
  - 70 % of excess weight
MALABSORPTIVE + RESTRICTIVE

**ROUX-EN-Y GASTRIC BYPASS:**
Small proximal gastric pouch divided and separated from rest of stomach; food passes through this
Larger portion receives no food but secretion of gastric acid, pepsin, intrinsic factor continues
Short proximal (biliopancreatic) limb, the Y-loop, transports secretions from pancreas, liver, gastric remnant
Longer distal portion, the *Roux limb*, anastomosed to small pouch and receives its food
Y-loop and Roux limb connected distally to feed into jejunum; most digestion in this common channel
Gastric Bypass: Complications

**Early:**
- Staple line leak 1-5%
- Acute gastric distention
- Roux-Y obstruction
- Death 0.5%

**Late:**
- Stomal narrowing / vomiting 15%
- Marginal ulcer 13%
- Heartburn / inflammation of esophagus
- Anemia
  - Folate deficiency
  - Vitamin B12 deficiency
  - Iron deficiency
- Calcium deficiency / osteoporosis
- Gallstones 10%
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Malabsorptive Procedures with some Restriction

- Distal Roux-en-Y Gastric Bypass (Torres, Fobi)
- Biliopancreatic Diversion (Scopinaro)
- Bilio-pancreatic Diversion with Duodenal Switch (Hess)

Strictly Malabsorptive Procedures

- Jejuno-Ileal Bypass (JIB) End-to-End (Scott)
- Jejuno-Ileal Bypass (JIB) End-to-Side (Payne)
Biliopancreatic diversion:
- Horizontal partial gastrectomy
- Closure of the duodenal stump
- Gastrojejunostomy with a 250 cm Roux limb
- Anastomosis of long biliopancreatic limb to the Roux limb 50 cm proximal to the ileocecal valve
- Creating an extremely short common channel
Duodenal switch operation:

- Lesser curvature gastric tube, approx 100 ml
- Greater curvature gastric resection, preserving pylorus, dividing duodenum
- Closure of distal duodenal stump
- Anastomosis of enteric limb to the postpyloric duodenum
- Common channel, as practiced in the USA today, varies in length (75 to 150 cm)
Biliopancreatic Diversion with Duodenal Switch (BPD-DS)

- General Features
  - Gastric pouch size:
    - Standard: 14 oz (1.5 cups)
  - Three segments
    - Alimentary tract: 6.5 ft
    - Biliary tract: 13 ft
    - Common channel: 1.5 ft

- Average Weight Loss
  - 80% of excess weight
Duodenal Switch (BPD-DS) : Complications

- Protein malnutrition 15%
- Anemia < 5 %
- Marginal ulcer < 3 %
- Peripheral neuropathy 1.3 %
- Night Blindness 3 %
- Osteoporosis 14 %
- Renal stones
- Nausea 65 % (First 6 mo)
- Diarrhea 62 %
- Vitamin deficiencies: A, D, E, K, B₁₂
- Incisional hernia 10 %

- Death 1.1 %
Weight Maintenance after Bariatric Surgery

POST-OP COMPLICATIONS

- Phase I: one to six weeks
- Phase II: seven to twelve weeks
- Phase III: thirteen wks to 12 months

Overall operative mortality = 1%
# POST-OP COMPLICATIONS: PHASE I

<table>
<thead>
<tr>
<th>Medical</th>
<th>Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>-pulmonary embolism (1%)</td>
<td>-anastomotic leak (2-3%)</td>
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<tr>
<td>-myocardial infarction</td>
<td>-postop bleeding</td>
</tr>
<tr>
<td>-respiratory failure</td>
<td>-bowel perforation</td>
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<tr>
<td>-pneumonia</td>
<td>-bowel obstruction</td>
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<tr>
<td>-urinary tract infection</td>
<td>-wound infections</td>
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</tbody>
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POST-OP COMPLICATIONS PHASE II

RESTRICTIVE:
- staple line disruption or band erosion
- pouch/esophageal dilatation
- port failure
- GERD/ulcers
- infection (foreign body)

ROUX-EN-Y:
- gastric remnant distention → perf
- stomal stenosis
- wound infection
- cholelithiasis
- ventral hernia
- incisional hernia
POST-OP COMPLICATIONS PHASE III

- GERD/esophagitis/gastritis
- small bowel obstruction
- staple/band erosion
- dehydration due to severe constipation or freq vomiting
INTRA-GASTRIC BALLOON
What the....?
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