

Obesity: Scope of the Problem

- 13% of world's population is obese (BMI $\geq 30\text{kg/m}^2$)
- Prevalence of obesity has tripled from 1976 to 2016
- #1 lifestyle related risk factor for premature death

Indications for Bariatric Surgery

- BMI $\geq 40\text{kg/m}^2$ without comorbidities
- BMI $\geq 35\text{kg/m}^2$ w/ obesity related comorbidities (e.g. T2DM, OSA/OHS, NAFLD/NASH, OA & HTN)

Benefits of Bariatric Surgery

- Most consistently effective method for sustained weight reduction
- Decreases severity of T2DM, metabolic syndrome, NAFLD and \uparrow QOL

Types of Bariatric Surgery

Adjustable Gastric Banding

- Decreasing in prevalence, 3% of bariatric surgeries performed
- Adjustable silicone band creates a 30-40ml gastric pouch
- High rate of weight regain, complications (slippage of band, re-operation)

Sleeve Gastrectomy

- Most common bariatric surgery performed worldwide
- Longitudinal gastrectomy, 75-100ml gastric pouch
- \downarrow intake, \downarrow ghrelin levels, \uparrow gastric emptying
- Low complication rate, \downarrow risk of malnutrition
- Common complications - staple line leak, mid-gastric stricture, GERD

Roux-en Y Gastric Bypass - RYGB

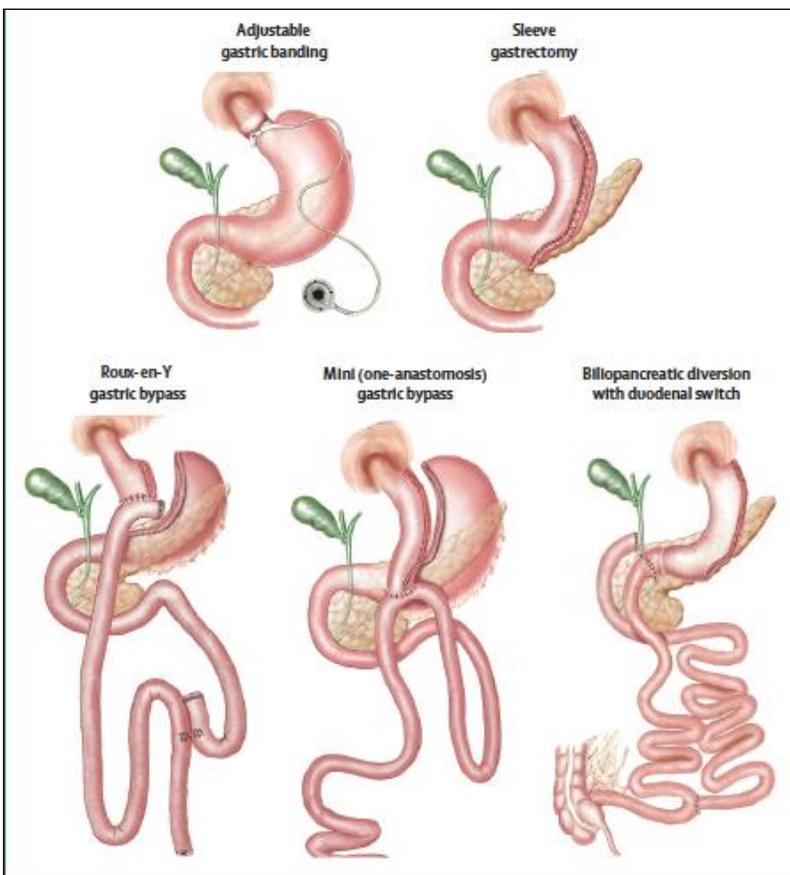
- 2nd most common procedure performed
- 15-30mL gastric pouch, 150cm alimentary limb bypassing excluded stomach + duodenum, biliopancreatic limb (200cm)
- Restrictive (small gastric pouch), malabsorptive (bypassing small bowel i.e. reduced gastric acid, bypass of bile salts and pancreatic secretion causing malnutrition), Hormonal changes (GLP1, glucagon, GIP)
- Common Complications – dumping syndrome, marginal ulcers, internal hernia, bowel obstruction & SIBO

Mini (one anastomosis) Gastric Bypass - MGB

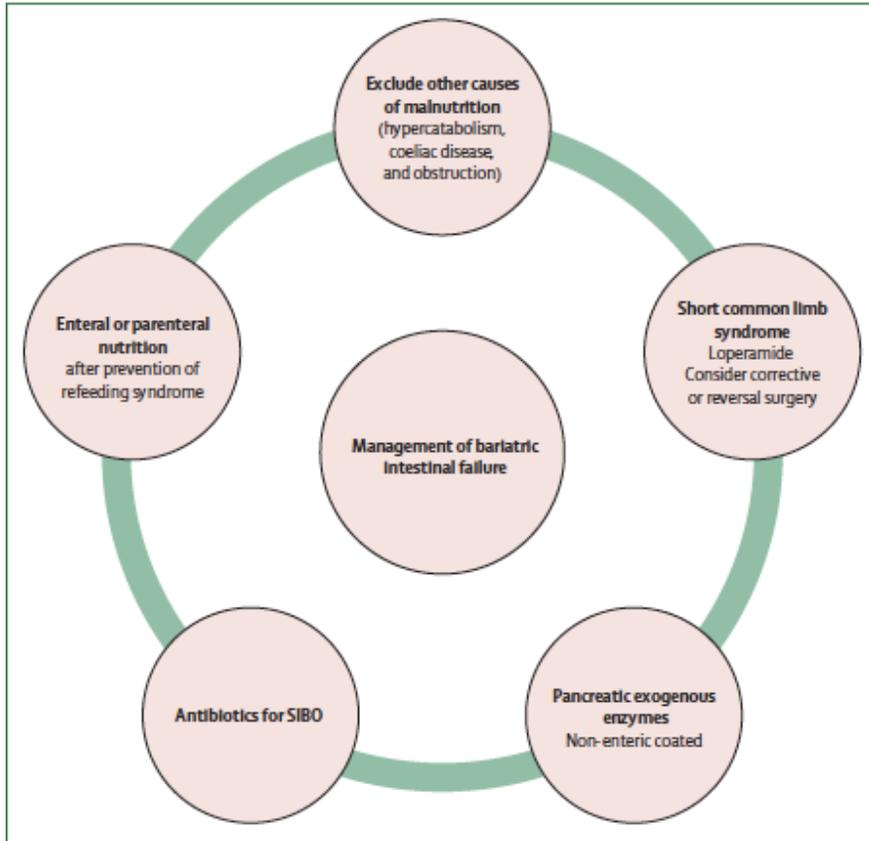
- 3rd most performed bariatric surgery
- Long narrow gastric pouch and 1 anastomosis
- Restrictive and malabsorptive
- Technically easier than RYGB Less complications

Biliopancreatic Diversion with Duodenal Switch (BPD-DS)

- Relatively uncommon procedure
- Combines sleeve gastrectomy and post pyloric RYGB
- Pylorus preserved less dumping syndrome and marginal ulcers



Management of Post Bariatric Intestinal Failure



Post Bariatric Intestinal failure

- Severe protein malnutrition after bariatric surgery
- More common after distal bypass procedures
- Manifests with edema, muscle wasting, hypoalbuminemia
- Consider refeeding syndrome before repleting nutrients
- TPN for treatment, but high complication rate (i.e. infections, thrombosis, hyperglycemia and vitamin deficiencies)

Metabolic Complications of Bariatric Surgery

Dumping Syndrome

- Rapid delivery of hyperosmolar bolus to the small bowel
- Gastrointestinal (N/V bloating, abd pain) and vasomotor symptoms (\uparrow HR, flushing, lightheadedness, perspiration) within minutes to 1hr after eating
- Common after sleeve and RYBG
- Tx: Small and low carbohydrate meals

Hyperinsulinemic Post-prandial Hypoglycemia

- Due to accelerated pouch emptying, excess GLP1 production and excess insulin release leading to hypoglycemia.
- Common after RYGB
- Disorder marked by high variable post prandially glucose (10% asymptomatic)
- Tx: Frequent and less carbohydrate rich meals

Kidney Stones

- Gastric bypass causes increased fat in lumen which saponifies calcium leaving oxalate free
- \uparrow oxalate absorption, calcium binds w/ oxalate in the kidney and forms renal stones
- Tx: hydration, oral calcium, potassium citrate

Gallstones

- Rapid wt loss & bariatric surgery are risk factors for gallstone formation
- Post operative CCY risk is low
- ERCP not an option for bypass patients
- Asymptomatic gallstones in this population should be considered for CCY.

Liver Disease in Bariatric Surgery

- Bariatric surgery is typically beneficial for NAFLD, but steatohepatitis and mortality from hepatocellular failure has been reported (occurs w/ long biliopancreatic limbs)
- Hepatopathy due to microbial proliferation in excluded limb
- Treatment and prevention of hepatopathy with metronidazole
- Alcohol misuse and addiction is higher patients after bariatric surgery
- Compounded malnutrition effects can occur in patients after bariatric surgery with alcohol abuse

