General and Bariatric Surgery in the Obese Patient

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- Obesity Associated Comorbidities
- Obesity Associated Complications
- Patient Selection
- Laparoscopic Gastric Bypass or Band
- Outcomes

Obesity Trends* Among U.S. Adults
(*BMI ≥ 30, or about 30 lbs overweight for 5’4” person)

General Surgery in Morbidly Obese Patients
- Bariatric Surgery in Morbidly Obese Patients
  - Patient Selection
  - Outcomes

Obesity Trends Among U.S. Adults
2005
Obesity Increases Mortality

“Obesity is one of the most common medical problems in the United States and a risk factor for illnesses such as hypertension, diabetes, degenerative arthritis and myocardial infarction. It is a cause of significant morbidity and mortality and generates great social and financial costs.”

Ethan M. Berke, MD and Nancy E. Morden, MD, Medical Management of Obesity, American Family Physician, American Academy of Family Physicians website.

“Taken together, the diseases associated with morbid obesity markedly reduce the odds of attaining an average lifespan and raise annual mortality tenfold or more.”


BMI and Risk of Death

Obesity Associated Comorbidities

- Osteoarthritis
- Rheumatoid Arthritis
- Birth Defects
- Breast Cancer
- Cancers of Esophagus and Stomach
- Colorectal Cancer
- Endometrial Cancer
- Renal Cell Cancer
- Cardiovascular Disease
- Cataracts
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Economic Costs of Morbid Obesity

US Citizens with BMI >30
Total Cost: 133 Billion Dollars

- Weight loss programs: $33 billion
- Indirect costs: $48 billion
- Direct costs: $52 billion

Wolf, Obesity Research, 1998

Surgery In the Obese Patient

Multidisciplinary Team Approach
- Anesthesia
- Gastroenterology
- Endocrinology
- Cardiology – ICU
- Radiology
- Nursing

Important Concerns
- OSA
- Diabetes
- DVT/PE
- Gerd
- Surgical Complications
- CVASD
Obstructive Sleep Apnea

- 3% prevalence in general population
- 91% prevalence in morbidly obese (sleep study)
- Associated with:
  - CHF, arrhythmias, pulmonary HTN, MI
  - Hypercoagulability
  - Increased post-op respiratory distress, prolonged hospital stay

Surgery In the Obese Patient

Obesity, OSA and Anesthesia

- Pre-op polysomnography to rule out OSA
- Induction/Intubation
  - 2 experienced personnel
  - Consider wake fiberoptic (oral or nasal) intubation
- Intraoperative
  - Poor tolerance of pneumoperitoneum
  - Increased need for relaxation
- Emergence/post-op
  - Overnight intubation, ICU stay

Diabetes Mellitus

- 35% prevalence in patients with BMI >40
- 90% type II, therefore insulin resistant
- Post-operative Management
  - Liberal use of insulin gtt
  - Early resumption of preop OHA or long-acting insulin
  - May need high doses of insulin (>60-100U/day) once taking po's

Hypercoagulability

- Obesity strong risk factor for DVT/PE
- Increased risk with prolonged surgery
- Reverse Trendelenburg, pneumoperitoneum increase venous stasis
- SCD's, SQ heparin or enoxaparin (better) recommended
- Consider removable IVC filter in high risk pts
Rhabdomyolysis

Few studies:
Bostanjian (UCLA)
- 6 pts with severe rhabdo due to gluteal muscle ischemia
- 5/6 male, median BMI 67 (BMI 55 in controls)
- Median operative time 5.7 hrs (4 hrs in controls)
- Peak CPK 26,000-29,000 (controls 450-9,000)
- 3/6 developed ARF – all died

Mognol (France)
- CPK>1,000 in 3/50 LAGB pts, 12/16 Lap GBP pts
- CPK >10,000 in 4/12 Lap GBP pts; all had BMI>60
- Long operative time and high BMI were risk factors

Recommendations:
- team effort to minimize anesthesia and operative time
- better padding
- routine CPK monitoring in high risk pts, treat CPK’s >5000

Incisional Hernias

Sugerman AJN 1996
- Open GBP vs. Total abdominal colectomy in IBD pts on chronic steroids
- 28% incisional hernia rate in obese
- 4% hernia rate in pts on steroids
- diabetes, wound infection, sleep apnea independent risks
- 20-30% recurrence rates after repair

Recommendations:
- weight loss BEFORE elective surgery
- broad-spectrum abx
- nonabsorbable suture +/- internal retentions
- binder
- use mesh for hernia repair

Wound Infections

Smith AnnSurg 2004
- Wound infections after colorectal surgery (176 pts)
- 26% infection rate!
- OR 2.5 for BMI 25-29, OR 3.0 for BMI >30
- OR 2.6 for intraop hypotension
- 20-30% recurrence rates after repair

Recommendations:
- weight loss BEFORE elective surgery
- broad-spectrum abx, consider sq drains
- multilayer closure
- good glucose control in diabetics
- supplemental oxygen
- laparoscopic approach when possible

Diet Therapy
- 48 RCT’s
- Avg weight loss 8-12% after 3-12 mos.
- Most weight regained within 2-5 yrs.

Physical Activity
- Minimal weight loss if primary treatment modality
- Useful as adjunctive therapy
Bariatric Procedures Performed Annually in the U.S.

Criteria for Surgery
- Body Mass Index of 40 kg/m² or greater
- BMI between 35 and 40 kg/m² with significant comorbidities
- Has failed other medically managed weight-loss programs

Preop evaluation:
- Cardiac, Pulmonary
- HCM
- r/o Endocrine causes of obesity
- Psychiatric and Nutritionist assessment
- Mandatory weight loss and attendance at group sessions

Types of Surgery
- Restrictive
  - Vertical Banded Gastroplasty (VGB)
  - Adjustable Gastric Banding
  - Sleeve (Vertical) Gastrectomy
- Malabsorptive
  - Jejunileal Bypass (JIB)
  - Biliopancreatic Diversion (BPD)
  - Duodenal Switch
  - Long Limb Gastric Bypass
- Restrictive with Malabsorptive Component
  - Roux-en-Y Gastric Bypass (RYGBP)

Restrictive Surgery
- Vertical Banded Gastroplasty (VGB)
  - Original restrictive procedure
  - 40-50% EBW loss
  - Staple disruptions
  - Band erosions
  - Uncommon today
Restrictive Surgery

Laparoscopic Adjustable Gastric Band (LAGB)

- FDA approved 2001
- Weight Loss Similar to VBG
- 30% Surgical Revision Rate
- Fewer serious complications
- Frequent post-op adjustments

Pro
- Relatively easy
- No protein-calorie malabsorption
- No vitamin or mineral deficiencies

Con
- Less weight loss
- More late failures due to dilation
- Less effective with sweet eaters
- Significant dietary non-compliance

Malabsorptive Surgery

- Greater sustained weight loss with less dietary compliance
- Increased risk of malnutrition and vitamin deficiency
- Constant follow-up to monitor increased risk
- Chronic diarrhea

Long Limb Gastric Bypass
Biliopancreatic Diversion with Duodenal Switch
Roux-en-Y Gastric Bypass

- Most commonly performed bariatric procedure
- Long-term sustained weight loss
- No protein-calorie malnutrition
- Few vitamin or mineral deficiencies
- Technically difficult

Laparoscopic vs. Open RYGBP Complications

Bariatric Surgical Outcomes

136 Studies – 22094 Patients

Mean % Excess Weight Loss

Resolution of Comorbidities

136 Studies – 22094 Patients
Hormonal Regulation of Body Weight and Glucose Metabolism

Appetite
- Insulin (pancreas)
- Ghrelin (stomach)
- Leptin (adipose tissue)
- CCK (duodenum)
- PYY (small bowel)
Central Peptides
- NPY, AgRP
- alpha-MSH, CART

Glucose Metabolism
- Insulin (pancreas)
- GLP-1 (distal small bowel)
- GIP (proximal small bowel)

Weight Loss after GBP
- Reduced caloric intake
- Delayed gastric emptying
- Malabsorption
- Dumping syndrome (?)
- Alterations in gut hormonal milieu
  - Ghrelin
  - Leptin
  - Incretins (GLP-1)
  - Other centrally-acting satiety peptides (PYY, PP, OXM)

Lap GBP in Patients with ESRD

Post-operative Weight Loss

Lee, C., et al. ASBS Mtg 2005
Conclusions

- Obesity greatly increases anesthetic and surgical risks
- Obesity prolongs postoperative recovery
- Non-surgical weight loss methods ineffective in morbidly obese patients
- Bariatric surgery best option; may be combined with other procedures