The Surgical Management of Obesity

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• "Persons who are naturally fat are apt to die earlier than those who are slender"

Hippocrates
INTRODUCTION

• Since 1998, in the wake of a report by the (WHO), obesity has been considered a major public-health problem and has even been declared a global epidemic.

• The surgical treatment of obesity has evolved to focus more specifically on the treatment of medical comorbidities associated with obesity than simply obesity itself.

• Surgical therapy is the only effective and proven therapy for patients with severe obesity (body mass index >40 kg/m2).
• Bariatric operations prolong survival and resolve comorbid medical conditions associated with severe obesity.

• Bariatric operations involve either restriction of caloric intake or malabsorption of nutrients, or both.
THE DISEASE OF OBESITY

• Obesity is the second leading cause of preventable death in the United States, currently outdone only by smoking.
• Obesity is characterized by excess body fat and is generally defined by the body-mass index.
• The term obesity applies when the BMI is greater than or equal to 30kg/m2.
<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>PRINCIPAL CUT-OFF POINTS</th>
<th>CUT-OFF POINTS FOR ASIANS*</th>
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<tbody>
<tr>
<td>Normal range</td>
<td>18.5–24.9</td>
<td>18.5–22.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23.0–24.9</td>
</tr>
<tr>
<td>Pre-obese</td>
<td>25.0–29.9</td>
<td>25.0–27.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27.5–29.9</td>
</tr>
<tr>
<td>Obese class I</td>
<td>30.0–34.9</td>
<td>30.0–32.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32.5–34.9</td>
</tr>
<tr>
<td>Obese class II</td>
<td>35.0–39.9</td>
<td>35.0–37.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37.5–39.9</td>
</tr>
<tr>
<td>Obese class III</td>
<td>≥40.0</td>
<td>≥40.0</td>
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</tbody>
</table>

*For Asian populations, classifications remain the same as the international classification, but that public health action points for interventions are set at 23, 27.5, 32.5 and 37.5 kg/m².  
Source: Adapted from the World Health Organization (WHO) 2000.
Prevalence and Contributing Factors

- At Jordan ...28 % male, 53 % females
- 2013: obesity prevalence 35% in US
- Severe obesity is reaching epidemic proportions in the United States and dramatically increasing throughout the rest of the world.
- Genetic and environmental factors contribute to the development of obesity.
- Intermittent or consistent excessive caloric intake occurs.
- Lack of satiety...
• Obese individuals have excessive adipose cells, both in size and number, the number of such cells often is determined early in life; adult-onset obesity is largely a product of increase in adipose cell size.
• Weight gain results from increase in both adipose cell size and number.
• Males tend to have central visceral fat distribution, whereas females more often have a peripheral or gluteal fat distribution.
Co-morbidity Reduction After Bariatric Surgery

Migraines
57% resolved

Pseudotumor cerebri
96% resolved

Dyslipidemia, hypercholesterolemia
63% resolved

Non-alcoholic fatty liver disease
90% improved steatosis
37% resolution of inflammation
20% resolution of fibrosis

Metabolic syndrome
80% resolved

Type II diabetes mellitus
83% resolved

Polycystic ovarian syndrome
79% resolution of hirsutism
100% resolution of menstrual dysfunction

Venous stasis disease
95% resolved

Gout
72% resolved

Depression
55% resolved

Obstructive sleep apnea
74-98% resolved

Asthma
82% improved or resolved

Cardiovascular disease
82% risk reduction

Hypertension
52-92% resolved

GERD
72-98% resolved

Stress urinary incontinence
44-88% resolved

Degenerative joint disease
41-76% resolved

Quality of life improved in 95% of patients

Mortality
89% reduction in 5-year mortality

Courtesy Cleveland Clinic
Prognosis

• It is estimated that a severely obese male at age 21 will live 12 years less and a woman 9 years less than a nonobese individual.

• Obesity is found to be related to breast, ovarian, esophageal, colorectal, liver, pancreatic, gallbladder, stomach, endometrial, cervical, prostatic and renal cancers as well as non-Hodgkin’s lymphoma and multiple myeloma.
Medical Management

• Lifestyle changes
• Diet
• Exercise
• Behaviour modification
• Pharmacologic therapy: orlistat.
<table>
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<th>Types of commonly performed bariatric operations by mechanism of action</th>
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<tr>
<td><strong>Primarily Restrictive</strong></td>
</tr>
<tr>
<td>Laparoscopic adjustable gastric banding (LAGB)</td>
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<tr>
<td>Sleeve gastrectomy (SG)</td>
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<tr>
<td><strong>Primarily Malabsorptive</strong></td>
</tr>
<tr>
<td>Biliopancreatic diversion (BPD)</td>
</tr>
<tr>
<td>Duodenal switch (DS)</td>
</tr>
<tr>
<td><strong>Combination</strong></td>
</tr>
<tr>
<td>Roux-en-Y gastric bypass (RYGB)</td>
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Table 27-3

Indications for bariatric surgery

Patient must have:
1. Body mass index ≥40 kg/m² with or without comorbid medical conditions associated with obesity
2. Body mass index 35–40 kg/m² with comorbid medical conditions

In addition, it is expected that the patient:
3. Has failed attempt at medically supervised diet
4. Be psychiatrically stable
<table>
<thead>
<tr>
<th>Table 27-4</th>
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<tbody>
<tr>
<td><strong>Potential contraindications for bariatric surgery</strong></td>
</tr>
</tbody>
</table>

1. Severe medical disease making anesthesia or surgery prohibitively risky (American Society of Anesthesiologists class IV)
2. Mentally incompetent to understand procedure
3. Inability or unwillingness to change lifestyle postoperatively
4. Drug, alcohol, or other addiction
5. Active problem of bulimia or other eating disorder
6. Psychologically unstable
7. Nonambulatory status
8. Unsupportive home environment
Patient Selection

- Multidisciplinary team evaluation.

- Careful assessment of the patient’s eating habits, knowledge, self-awareness, and insight are important.

- Psychological assessment.
Preoperative Preparation

• Screening for “hidden” diseases such as coronary artery disease in those patients over age 50 is important.

• Underdiagnosed OSA.

• For patients with active GERD on medication, a preoperative screening upper endoscopy to rule out Barrett’s esophagus.

• anticoagulation.

• VTE prophylaxis

• Baselin TFT,LFT
laparoscopic Adjustable gastric Banding

- Involves placement of an inflatable silicone band around the proximal stomach.
- Creates an upper gastric pouch of 30-45 ml, this produces early satiety and limit food intake.
- EWL: 50-60% after 5-7 years
- Compared to LSG inferior weight loss and more complications.
- Least mortality but highest rate of reoperation.
- Less resolution of comorbidities
Common complications

• Band slippage and erosions.
• Band and port infection.
• Balloon failure.
• Port malposition
• Failure to loose weight
Laparoscopic Roux-en-Y Gastric Bypass

• Both restrictive and malabsorptive.

• Proximal gastric pouch of small size often 20-30 mL that is totally separated from the distal stomach.

• Roux limb of proximal jejunum is brought up and anastomosed to the pouch, the pathway of that limb can be anterior to the colon and stomach, posterior to both, or posterior to the colon and anterior to the stomach.

• The length of the biliopancreatic limb from the ligament of Treitz to the distal enteroenterostomy is 20 to 50 cm, and the length of the Roux limb is 75 to 150 cm.
Relative contraindications

• Previous gastric surgery.
• Previous antireflux surgery.
• Severe IDA.
• Distal gastric or duodenal lesion, require ongoing endoscopy.
• Barrett’s esophagus with severe dysplasia.
Outcome

• EWL 60-70 % after 1 year.
• Resolution of GERD 90 %, HTN 65%, Hyperlipidemia 70%
• Type II DM >80%
• Mortality less than 5%.
Complications

- Anastomotic leak 0.3%
- Stenosis 1-19%
- Marginal ulcer up to 15%
- Bowel obstruction 7%: internal hernia, top emergency!!
- Bleeding
- Nutritional deficiencies.
Internal hernia
Biliopancreatic Diversion and Duodenal Switch

• Resection of the distal half to two-thirds of the stomach and creation of an alimentary tract of the most distal 200 cm of ileum, which is anastomosed to the stomach.

• The biliopancreatic limb is anastomosed to the alimentary tract either 75 or 100 cm proximal to the ileocecval valve.
Biliopancreatic Diversion and Duodenal Switch

- The DS differs from BPD only in the proximal gut portion of the operation.
- Instead of a distal gastrectomy, sleeve gastrectomy.
- The end of the duodenum is then anastomosed to the distal 250 cm of ileum.
Biliopancreatic Diversion and Duodenal Switch

• Weight loss over 70% and very durable
• Complications:
  • anastomotic leak
  • obstruction
  • marginal ulcers
  • gastrogastric fistula
  • nutritional complications.

Patient must accept frequent, voluminous bowel movement
SADI-S

• Removing 85% of the stomach by sleeve gastrectomy.
• the duodenum is transected respecting the pylorus.
• A duodenum-intestinal anastomosis is carried out, 250 centimeters from the ileocecal valve.
Mini gastric bypass

• Long gastric pouch (12-15 cm) Just beyond Crow’s Feet 3 –4 cm proximal to pylorus.
• Length of Bilio-Pancreatic Limb
• BMI 30 –60 ...180 –200 cm
• BMI 60 –80...200 –250 cm
• Simple, superior wt loss.
laparoscopic Sleeve gastrectomy

• The most popular Bariatric procedure nowadays.
• Creation of small gastric tube over 36-40 Fr. bougie.
• Limits the food intake.
• Decreases ghrelin.
• EWL 66% over 3 years.
• Not effective on GERD
• Technically easier and more safe than RYGB
Sleeve Gastrectomy: Step by Step

Calibrated Gastrectomy

5 cm. from the pylorus

35Fr Foucher

5 cm. from the pylorus
Common complications

• Staple line leak
• Staple line bleeding
• Stenosis
• Kinking
Staple line leak

- Increased intraluminal pressure, if there is an obstruction or narrowing at the incisura this will be increased.
- Leaks of the proximal staple line are the most common, this related to increased pressure and stapling too close to the angle of His, and this may also present as late leak >6 weeks.
- Distal staple line leaks have earlier presentation, due to mechanical failure and thick distal gastric tissue, can be managed with early reoperation.
STRUCTURE
AT INCISURA ANGULARIS
WITH PROXIMAL DILATATION
AFTER SG

FIGURE 1. A UGI series from a patient Postoperative Day #3 following a sleeve gastrectomy. The upper arrow shows contrast extravasation from the proximal sleeve. The lower arrow demonstrates a narrowing of the sleeve at the incisura.
Gallbladder disease

- 35-40 % developed cholelithiasis – 40 % become symptomatic.
- If normal GB, or asymptomatic GBS no need to remove it at the time of surgery.
- Prophylactic .. UDA 600mg/day for 6 months.
Pregnancy and bariatric surgery

• Avoid pregnancy for 12-18 months
• Infants born – more likely premature and SGA