

Chapter 5

Obesity (Bariatric) Surgery

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Overview

Obesity is a major problem, which is increasing at an alarming rate in western societies arising principally from an overabundance of high carbohydrate and fat content food and sedentary lifestyles. Numerous studies have associated obesity with excess mortality and significant morbidities, such as cardiovascular disease, diabetes, and joint disease. However, significant social and psychiatric morbidity is also frequently reported to be associated with obesity. Weight loss is often a difficult process and obesity surgery offers a range of means by which weight control can be improved and alleviation of obesity can be achieved. Bariatric or weight loss surgery has been shown to be effective in significantly reducing morbidity and mortality associated with obesity. A recent (2007) study of over 15,000 obese people, of which 7,925 who had gastric bypass and 7,925 nonoperative matched controls, demonstrated an age-adjusted 40 % decrease in death rate in the operative group compared to controls, after a follow-up period of 7 years. Similarly, decreases of 56 % for coronary artery disease, 92 % for diabetes, and 60 % for cancer were observed in those after a gastric bypass compared with the controls. Accidents and suicides were, however, reported to be 58 % higher in the operative group, which was unexplained. This latter finding may suggest a higher incidence of presurgical mood disorders amongst those seeking surgery, or postsurgical psychological morbidity, although quality of life has been shown to improve after gastric bypass surgery.

Some 80 % of the bariatric surgery performed in the USA has been gastric bypass surgery; other western countries have tended to use gastric banding more frequently.

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Laparoscopic methods for performing gastric bypass surgery are being used more frequently; however, many surgeons still prefer open bypass techniques. The initial open gastric banding procedures have now largely been replaced by laparoscopic banding methods, most commonly adjustable gastric banding techniques. Open (vertical) gastric banding has therefore not been separately described in this chapter.

Acute complications are often related to the degree of obesity and the risks of surgery in obese patients, which include wound infection, bleeding, respiratory infection, and venous thromboembolism. Longer-term complications associated with obesity surgery are primarily infective or related to the pouch and limitation to food flow, for implantable laparoscopic adjustable gastric banding (LAGB), while gastric bypass complications are chiefly infective and nutritional in nature. However, a range of complications and consequences of surgery are reported.

The need for surgery and the relative risk of surgery must always be balanced against the risks associated with ongoing obesity in the longer term. Quality of life issues, together with full psychological and sometimes psychiatric assessment, are also essential to evaluate before and after surgery. Psychological support can improve compliance and outcomes in most situations. The cost, quality of life improvements, and survival benefits provide a strong argument for use of these procedures in managing severe obesity, especially when associated with diabetes and cardiovascular disease. Although the optimal strategy remains debated, relatively greater weight loss is associated with procedures with both a restrictive and absorptive component.

With these factors and facts in mind, the information given in these chapters must be appropriately and discernibly interpreted and used.

The *use of specialized units* with standardized preoperative assessment, multidisciplinary input, and high-quality postoperative care is essential to the success of complex obesity surgery overall and can significantly reduce risk of complications or aid early detection, prompt intervention, and cost.

Important Note

It should be emphasized that the risks and frequencies that are given here *represent derived figures*. These figures are best estimates of relative frequencies across most institutions, not merely the highest-performing ones, and as such are often representative of a number of studies, which include different patients with differing comorbidities and different surgeons. In addition, the risks of complications in lower or higher risk patients may lie outside these estimated ranges, and individual clinical judgement is required as to the expected risks communicated to the patient and staff or for other purposes. The range of risks is also derived from experience and the literature; while risks outside this range may exist, certain risks may be reduced or absent due to variations of procedures or surgical approaches. It is recognized that different patients, practitioners, institutions, regions, and countries may vary in their requirements and recommendations.

Laparoscopic Adjustable Gastric Banding

Description

General anesthesia is used. Laparoscopic adjustable gastric banding (LAGB) is used for treatment of morbid obesity. The aim is to provide a smaller gastric pouch for food in the stomach, thereby promoting early satiety, reduction of calorie intake, and weight loss. Using laparoscopic techniques, the procedure utilizes a silicone band to create a small proximal gastric pouch. Laparoscopic gastric banding typically places an inflatable cuff device around the upper stomach, connected to an implantable reservoir on the abdominal wall for in(de-)flation. Other methods of laparoscopic gastric banding are described but are very rarely used now. Patient selection and support by a multidisciplinary allied health-care team is especially important for the success of obesity surgery. The skin wounds are usually closed with absorbable suture, staples, or tape.

Anatomical Points

The anatomy is essentially fairly constant; however, the obese physique both inside and outside of the abdominal muscle wall can make accessibility problematic. Inadvertent injury during cannulation is possible unless laparoscopic entry under direct vision is practiced. Adhesions to the spleen can increase risk of splenic injury. The colon, small bowel, and omentum may overlie the stomach and make access more difficult. Although these organs are at risk, generally these can be readily displaced using reverse Trendelenburg positioning to enable the procedure to be performed. Commonly, the left lobe of the liver is large and bulky and can obscure vision. Fatty infiltration of the liver also makes the swollen liver friable and prone to injury during retraction. Previous surgery can alter anatomy and be problematic.

Perspective

See Table 5.1. Laparoscopic adjustable gastric banding is an elective procedure almost exclusively used for treating morbid obesity. The procedure is often technically straightforward, if somewhat challenging, and the complication rate is often determined by the degree of obesity and coexistence of other underlying risk factors such as smoking, diabetes, pulmonary disease, and cardiovascular disease. The success in reducing obesity is well established, with the majority of patients maintaining >60 % excess weight loss (EWL) for 5 years or longer. Both the success and the complication rates are closely related to patient selection. Major problems include wound infection of port sites or the implanted reservoir, atelectasis and pneumonia,

Table 5.1 Laparoscopic adjustable gastric banding complications, risks, and consequences

Complications, risks, and consequences	Estimated frequency
<i>Most significant/serious complications</i>	
Infection ^a	
Subcutaneous/wound	1–5 %
Intra-abdominal (including subphrenic abscess)	0.1–1 %
Intrathoracic (pneumonia, pleural, mediastinitis)	0.1–1 %
Systemic	0.1–1 %
Late – postsplenectomy sepsis (vaccination)	<0.1 %
Bleeding and hematoma formation ^a	1–5 %
Conversion to open operation	1–5 %
Diarrhea	1–5 %
Symmetrical pouch dilatation	
Adults	1–5 %
Adolescents	5–20 %
Band slippage	1–5 %
Port complications (leakage, migration, tube kink)	1–5 %
Bolus obstruction (serious, requiring removal)	1–5 %
Dysphagia or pseudo-achalasia	1–5 %
Reflux esophagitis/pharyngitis/pneumonitis	1–5 %
Failure of suture/staple line/band	1–5 %
Failure to control excessive weight	1–5 %
Delayed gastric (distal) emptying	1–5 %
Inability to vomit or belch	1–5 %
Gas bloat syndrome	1–5 %
Repeated vomiting	1–5 %
<i>Rare significant/serious problems</i>	
Pneumothorax	0.1–1 %
Myocardial ischemia/infarction	0.1–1 %
Gas embolus	0.1–1 %
Diaphragmatic injury/hernia	0.1–1 %
Ulceration stomal/esophageal/gastric/duodenal (early or late)	0.1–1 %
Gastric/esophageal/bowel injury or ischemia (devascularization)/perforation	0.1–1 %
Gastric erosion	0.1–1 %
Pancreatic/liver injury	0.1–1 %
Gastro-cutaneous fistula	0.1–1 %
Small bowel obstruction (early or late) ^a	0.1–1 %
[Adhesion formation]	
Deep venous thrombosis and pulmonary embolism	0.1–1 %
Splenic injury ^a	
Conservation (consequent limitation to activity, late rupture)	
Splenectomy	
Extrusion of band +/- ulceration	0.1–1 %
Nutritional deficiency – anemia, B12 malabsorption	0.1–1 %
Multisystem failure (renal, pulmonary, cardiac failure)	0.1–1 %
Death ^a	0.1–1 %

Table 5.1 (continued)

Complications, risks, and consequences	Estimated frequency
<i>Less serious complications</i>	
Pain/tenderness [rib pain (sternal retractor), wound pain]	
Acute (<4 weeks)	>80 %
Chronic (>12 weeks)	1–5 %
Paralytic ileus	0.1–1 %
Abdominal distention (acute or chronic)/excessive flatus	1–5 %
Intolerance of large meals (necessity for small meals) ^a	>80 %
Surgical emphysema	1–5 %
Seroma formation	0.1–1 %
Wound scarring (poor cosmesis/wound deformity)	0.1–1 %
Port site herniae	0.1–1 %

^aDependent on underlying pathology, anatomy, patient selection, surgical technique, and preferences

injury to other abdominal organs, conversion to open operation, venous thromboembolism, band erosion and slippage, stomal ulceration and bleeding, bolus obstruction or stomal stenosis, dysphagia, and inability to eat.

Major Complications/Consequences

The major complications occurring after laparoscopic gastric banding are symmetrical pouch dilatation (more commonly in adolescents than adults), band slippage, and port complications (leakage, migration, tube kinking). Gastric erosion from the band is rare. Wound infection of port sites or implanted reservoir, chest infection, or intra-abdominal infection are relatively rare but can be serious. Gastric or esophageal perforation and leakage is very unusual and is usually diagnosed on routine contrast radiography on the first postoperative day. Systemic infection and multisystem organ failure may then ensue and is the major cause of mortality when it occurs. Possible conversion to open operation is important to warn the patient about. Bleeding is rarely severe and usually controlled at surgery. Failure of “stomal” function can occur. Occasionally mechanical obstruction needs to be excluded from edema, malpositioning, kinking, or insufficient stoma opening size due to cuff overinflation or symmetrical pouch dilatation patient overeating. Usually, improved function of the proximal pouch occurs after a period of weeks following band deflation and can be shown on subsequent contrast swallow. If it persists, however, laparoscopic repositioning or replacement of the band into a more proximal position is required. Bolus obstruction is not uncommon, with or without stomal stenosis, but usually responds to band deflation, but rarely may require endoscopy for removal of the bolus material. Stomal ulceration may occasionally cause bleeding. Erosion of the band material through the stomach wall is reported but is rarely serious, and the eroded band can be removed endoscopically, if the buckle lies intragastrically, or otherwise dealt with laparoscopically. Reservoir displacement or malfunction, tube kinkage, or

leakage from the band or port may require revisional surgery. Splenectomy may be necessary from injury in <1 % of cases. Gas embolus or major vascular or bowel injury are additional serious, although very rare, complications of the laparoscopic approach. Venous thromboembolism is a serious and potentially lethal complication, which is related to obesity and surgery, but appears to be no more common in patients having laparoscopic band surgery than any other form of laparoscopic surgery.

Consent and Risk Reduction

Main Points to Explain

- Infection (including peritonitis)
- Bleeding
- Respiratory infection
- Laparoscopic complications
- Conversion to open surgery
- Long-term banding problems
- Band may require removal
- Further surgery
- Risks without surgery

Open Gastric Bypass

Description

General anesthesia is used. Open gastric bypass surgery is principally for elective reduction of weight in the morbidly obese patient. A midline incision is usually used. The aim of open gastric bypass surgery is to provide a smaller gastric pouch for food in the stomach, promoting early satiety, and to provide a bypass for food from the stomach directly to the more distal small bowel. The absorptive capacity for nutrients (predominantly fat malabsorption) causes steatorrhea which, in addition to weight loss, further discourages intake of fatty foods. The procedure utilizes a linear stapler to create a small proximal gastric pouch (or more recently a divided gastroplasty), to which a Roux-en-Y reconstruction is anastomosed, bypassing the distal stomach, duodenum, and upper small bowel, leaving biliary and pancreatic drainage unchanged. Open gastric bypass is gradually being replaced by laparoscopic methods (see below) in many centers. Patient selection and support is especially important for the success of obesity surgery. The abdominal wall is mass-closed, the subcutaneous tissues closed with absorbable interrupted sutures and the skin closed using continuous subcuticular sutures. Wound drain tubes are used according to surgical preference.

Anatomical Points

The anatomy is essentially fairly constant; however, the obese physique both inside and outside of the abdominal muscle wall can make accessibility problematic. Occasionally, the presence of a shorter mesentery or adhesions may make it difficult for the Roux limb to reach the proximal gastric pouch. When the left lobe of the liver is large and bulky, it can obscure vision. Previous surgery can make further surgery difficult from adhesions or altered anatomy. Redoing open gastric bypass surgery can be challenging. The colon, small bowel, and omentum may overlie the stomach and make access more difficult. Splenic adhesions may restrict mobilization of the stomach and increase risk of splenic injury. Although these organs are at risk, generally these can be readily displaced to enable the procedure to be performed safely. The most dangerous stage of the procedure is creation of the posterior gastric window, as damage and leakage to the proximal stomach, cardia, or esophagus can be difficult to repair and possibly only dealt with by drainage.

Perspective

See Table 5.2. Gastric bypass is an elective procedure almost exclusively for treating morbid obesity. The procedure is often technically straightforward, if somewhat challenging, and the complication rate is usually determined by the degree of

Table 5.2 Open gastric bypass complications, risks, and consequences

Complications, risks, and consequences	Estimated frequency
<i>Most significant/serious complications</i>	
Infection ^a	
Subcutaneous/wound	5–20 %
Intra-abdominal (including subphrenic abscess)	1–5 %
Intrathoracic (pneumonia, pleural, mediastinitis)	5–20 %
Systemic	0.1–1 %
Late – postsplenectomy sepsis (vaccination)	<0.1 %
Bleeding and hematoma formation ^a	1–5 %
Diarrhea	20–50 %
Bolus obstruction (serious, requiring removal)	1–5 %
Dysphagia or pseudo-achalasia	1–5 %
Reflux esophagitis/pharyngitis/pneumonitis	1–5 %
Failure of suture/staple line/small bowel anastomotic leakage	1–5 %
Failure to control excessive weight	1–5 %
Delayed neo-gastric emptying	20–50 %
Inability to vomit or belch	5–20 %
Gas bloat syndrome	1–5 %
Repeated vomiting	1–5 %

(continued)

Table 5.2 (continued)

Complications, risks, and consequences	Estimated frequency
Nutritional deficiency – anemia, B12 malabsorption	1–5 %
Dumping syndrome	1–5 %
Early dumping (vasomotor)	
Late dumping (osmotic, insulin surge)	
Stomal stenosis	5–20 %
Stomal dilatation (widening)	5–20 %
Pouch gastritis	1–5 %
Pouch dilatation	1–5 %
<i>Rare significant/serious problems</i>	
Stomal ulceration	0.1–1 %
Pneumothorax	0.1–1 %
Myocardial ischemia/infarction	0.1–1 %
Diaphragmatic injury/hernia	0.1–1 %
Gastric/esophageal/bowel injury or ischemia (devascularization)/perforation	0.1–1 %
Pancreatic/liver injury	0.1–1 %
Gastro-cutaneous fistula	0.1–1 %
Small bowel obstruction (early or late) ^a	0.1–1 %
[Adhesion formation]	
Deep venous thrombosis and pulmonary embolism	0.1–1 %
Splenic injury ^a	0.1–1 %
Conservation (consequent limitation to activity, late rupture)	
Splenectomy	
Multisystem failure (renal, pulmonary, cardiac failure)	0.1–1 %
Death ^a	0.1–1 %
<i>Complications with extensive (massive diversion) bypass procedures</i>	
Electrolyte imbalance	1–5 %
Bypass enteritis	1–5 %
Nephrolithiasis	1–5 %
Abnormal liver function tests	5–20 %
Hepatic failure	0.1–1 %
Transient hair loss	50–80 %
Postural hypotension	20–50 %
Migratory polyarthritits	5–20 %
Bone disease	5–20 %
Cholelithiasis	20–50 %
Sensitivity to cold	5–20 %
Anemia	1–5 %
Mild malnutrition (vitamin, protein, calorie, fatty acid)	5–20 %
Severe malnutrition (including encephalopathy)	1–5 %
<i>Less serious complications</i>	
Pain/tenderness [rib pain (sternal retractor), wound pain]	
Acute (<4 weeks)	>80
Chronic (>12 weeks)	1–5 %
Paralytic ileus	20–50 %
Abdominal distention (acute or chronic)/excessive flatus	1–5 %

Table 5.2 (continued)

Complications, risks, and consequences	Estimated frequency
Intolerance of large meals (necessity for small meals) ^a	>80
Seroma formation	0.1–1 %
Wound scarring (poor cosmesis/wound deformity)	1–5 %
Incisional hernia (delayed heavy lifting/straining for 8/52)	0.1–1 %
Nasogastric tube ^a	50–80 %
Wound drain tube(s) ^a	>80

^aDependent on underlying pathology, anatomy, patient selection, surgical technique, and preferences

obesity and any and coexistence of other underlying risk factors, such as smoking, diabetes, pulmonary disease, and cardiovascular disease. The success in reducing obesity is variable, and failure rates are well reported. Both the success and the complication rates are closely related to patient selection. The incidence of nutritionally related complications increases proportionally with the amount of the small bowel that is bypassed. For instance, hepatic dysfunction, renal and biliary calculi, and malnutrition are more common with more extensive small intestinal bypass. Major problems include wound infection and dehiscence, atelectasis and pneumonia, injury to other abdominal organs, anastomotic leakage and intra-abdominal infection, venous thromboembolism, stomal ulceration and bleeding, bolus obstruction or stomal stenosis, pouch or stomal dilatation, dysphagia, and inability to eat and rarely systemic infection, multisystem failure, and death.

Major Complications/Consequences

The major complications occurring after open gastric bypass are wound infection, chest infection, or intra-abdominal infection. These can be serious. Anastomotic leakage occurs in up to 5 % of cases but is usually recognized on the ubiquitous postoperative contrast follow-through – provided the radiologist examines both the gastrojejunostomy and the enteroenterostomy more distally. Leakage may be dealt with in many instances using the drains inserted at the time of initial surgery; however, re-laparotomy is required for unremitting sepsis. Small bowel obstruction occurs in about 1–5 % of cases. If this occurs early, it is generally at the enteroenterostomy; if late, it is generally a distal SBO. Bleeding is rarely severe and usually controlled at surgery. Failure of stomal function can occur. Occasionally mechanical obstruction needs to be excluded from edema, malpositioning, kinking, improper stapling, or insufficient stoma opening size. Usually, improved stomal function occurs after a period of days but can occasionally take weeks. Anastomotic stenosis can occur (early or late) and dilatation or refashioning may be required. Bolus obstruction is not uncommon, early or later, with or without stomal stenosis, and may require endoscopy or rarely further surgery for removal of the bolus material. Stomal ulceration may occasionally cause very significant bleeding. Stomal dilatation or pouch dilatation can occur and can reduce the effectiveness of the procedure. Depending on the method, erosion of any

Consent and Risk Reduction

Main Points to Explain

- Infection (including peritonitis)
- Bleeding
- Respiratory infection
- Anastomotic leakage
- Long-term bypass problems
- Further surgery
- Risks without surgery

permanent sutures or other foreign material can occur. Nutritional abnormalities may be significant due to the induced malabsorption, and longer-term monitoring for these is usually required. Splenectomy may be necessary from injury during retraction in somewhere <1 % of cases. Venous thromboembolism is a serious and potentially lethal complication, which is more common in obese patients having surgery.

Laparoscopic Gastric Bypass

Description

Laparoscopic gastric bypass surgery is principally for elective reduction of weight in the morbidly obese patient. The patient is usually positioned supine and the number and sites of ports are placed according to surgical preference and accessibility. The aim of laparoscopic gastric bypass surgery is to provide a smaller gastric pouch for food in the stomach, thereby promoting early satiety, and to provide a bypass for food from the stomach directly to the more distal small bowel, reducing the capacity for absorption of nutrients, causing weight loss. The procedure utilizes a linear stapler to create a small pouch in (or divide) the upper stomach fundus, to which a small bowel loop or Roux-en-Y reconstruction tube is anastomosed, bypassing the distal stomach, duodenum, and upper small bowel, leaving biliary and pancreatic drainage unchanged. Patient selection and support is especially important for the success of obesity surgery. The port sites are closed using deep muscle sutures where required and skin sutures, staples, or tape.

Anatomical Points

The anatomy is essentially fairly constant; however, the obese physique both inside and outside of the abdominal muscle wall can make accessibility problematic.

The laparoscopic approach is perhaps less affected by limitations posed by obese tissues. Occasionally, the presence of a shorter mesentery or adhesions may make the raising of the small bowel more difficult. When the left lobe of the liver is large and bulky, it can obscure vision. Previous surgery can make further surgery difficult from adhesions or altered anatomy. Repeat laparoscopic gastric bypass surgery can be challenging. The colon, small bowel, and omentum may overlie the stomach and make access more difficult. Splenic adhesions may restrict mobilization of the stomach and increase risk of splenic injury. Although these organs are at risk, generally these can be readily displaced to enable the procedure to be performed safely.

Perspective

See Table 5.3. Laparoscopic surgery is being increasingly utilized to replace open surgery for primary gastric bypass surgery. Clearly, there are advantages

Table 5.3 Laparoscopic gastric bypass complications, risks, and consequences

Complications, risks, and consequences	Estimated frequency
<i>Most significant/serious complications</i>	
Infection ^a	
Subcutaneous/wound	5–20 %
Intra-abdominal (including subphrenic abscess)	1–5 %
Intrathoracic (pneumonia, pleural, mediastinitis)	5–20 %
Systemic	0.1–1 %
Late – postsplenectomy sepsis (vaccination)	<0.1 %
Bleeding and hematoma formation ^a	1–5 %
Conversion to open operation	1–5 %
Diarrhea	20–50 %
Bolus obstruction (serious, requiring removal)	1–5 %
Dysphagia or pseudo-achalasia	1–5 %
Reflux esophagitis/pharyngitis/pneumonitis	1–5 %
Failure of suture/staple line/small bowel anastomotic leakage	1–5 %
Failure to control excessive weight	1–5 %
Delayed neo-gastric emptying	20–50 %
Inability to vomit or belch	5–20 %
Gas bloat syndrome	1–5 %
Repeated vomiting	1–5 %
Nutritional deficiency – anemia, B12 malabsorption	1–5 %
Dumping syndrome	1–5 %
Early dumping (vasomotor)	
Late dumping (osmotic, insulin surge)	
Stomal stenosis	5–20 %
Stomal dilatation (widening)	5–20 %
Pouch gastritis	1–5 %
Pouch dilatation	1–5 %
Excessive flatus	1–5 %

(continued)

Table 5.3 (continued)

Complications, risks, and consequences	Estimated frequency
<i>Rare significant/serious problems</i>	
Stomal ulceration	0.1–1 %
Pneumothorax	0.1–1 %
Myocardial ischemia/infarction	0.1–1 %
Gas embolus	0.1–1 %
Diaphragmatic injury/hernia	0.1–1 %
Gastric/esophageal/bowel injury or ischemia (devascularization)/perforation	0.1–1 %
Pancreatic/liver injury	0.1–1 %
Gastro-cutaneous fistula	0.1–1 %
Small bowel obstruction (early or late) ^a	0.1–1 %
[Adhesion formation]	
Deep venous thrombosis and pulmonary embolism	0.1–1 %
Splenic injury ^a	0.1–1 %
Conservation (consequent limitation to activity, late rupture)	
Splenectomy	
Multisystem failure (renal, pulmonary, cardiac failure)	0.1–1 %
Death ^a	0.1–1 %
Complications with extensive (massive diversion) bypass procedures	
Electrolyte imbalance	1–5 %
Bypass enteritis	1–5 %
Nephrolithiasis	1–5 %
Abnormal liver function tests	5–20 %
Hepatic failure	0.1–1 %
Transient hair loss	50–80 %
Postural hypotension	20–50 %
Migratory polyarthritis	5–20 %
Bone disease	5–20 %
Cholelithiasis	20–50 %
Sensitivity to cold	5–20 %
Anemia	1–5 %
Mild malnutrition (vitamin, protein, calorie, fatty acid)	5–20 %
Severe malnutrition (including encephalopathy)	1–5 %
<i>Less serious complications</i>	
Pain/tenderness (rib pain (sternal retractor), wound pain)	
Acute (<4 weeks)	>80 %
Chronic (>12 weeks)	1–5 %
Paralytic ileus	20–50 %
Surgical emphysema	1–5 %
Abdominal distention (acute or chronic)/excessive flatus	1–5 %
Intolerance of large meals (necessity for small meals) ^a	>80 %
Seroma formation	0.1–1 %
Wound scarring (poor cosmesis/wound deformity)	1–5 %
Port site herniae	0.1–1 %
Nasogastric tube ^a	50–80 %
Wound drain tube(s) ^a	>80 %

^aDependent on underlying pathology, anatomy, patient selection, surgical technique, and preferences

in the laparoscopic over the open approach but also the specific risks of laparoscopy. Laparoscopic gastric bypass is an elective procedure almost exclusively for treating morbid obesity. The procedure is often technically straightforward, if somewhat challenging, and the complication rate is usually determined by the degree of obesity and any and coexistence of other underlying risk factors such as smoking, diabetes, pulmonary disease, and cardiovascular disease. The success in reducing obesity is variable, and failure rates are well reported. Both the success and the complication rates are closely related to patient selection. The incidence of nutritionally related complications increases proportionally with the amount of the small bowel that is bypassed. For instance, hepatic dysfunction, renal and biliary calculi, and malnutrition are more common with more extensive small intestinal bypass. Major problems include wound infection of port sites or the implanted reservoir, atelectasis and pneumonia, injury to other abdominal organs, conversion to open operation, anastomotic leakage and intra-abdominal infection, venous thromboembolism, stomal ulceration and bleeding, bolus obstruction or stomal stenosis, pouch or stomal dilatation, dysphagia, and inability to eat and rarely systemic infection, multisystem failure, and death.

Major Complications/Consequences

The major complications occurring after laparoscopic gastric bypass are wound infection of port sites, chest infection, or intra-abdominal infection. These can be serious. Anastomotic leakage is unusual but can be catastrophic if it is considerable and/or undetected. Possible conversion to open operation is important to warn the patient about. Systemic infection and multisystem failure may then ensue and is the major cause of mortality when it occurs. Bleeding is rarely severe and usually controlled at surgery. Failure of stomal function can occur. Occasionally mechanical obstruction needs to be excluded from edema, malpositioning, kinking, improper stapling, or insufficient stoma opening size. Usually, improved stomal function occurs after a period of days but can occasionally take weeks. Anastomotic stenosis can occur (early or late) and dilatation or refashioning may be required. Bolus obstruction is not uncommon, early or later, with or without stomal stenosis, and may require endoscopy or rarely further surgery for removal of the bolus material. Stomal ulceration may occasionally cause very significant bleeding. Stomal dilatation or pouch dilatation can occur and can reduce the effectiveness of the procedure. Depending on the method, erosion any permanent sutures or other foreign material can occur. Splenectomy may be necessary from injury during retraction in somewhere <1 % of cases. Gas embolus and major vascular or bowel injury are additional serious, although very rare, complications of the laparoscopic approach. Venous thromboembolism is a serious and potentially lethal complication, which is more common in obese patients having surgery.

Consent and Risk Reduction

Main Points to Explain

- Infection (including peritonitis)
- Bleeding
- Respiratory infection
- Laparoscopic complications
- Conversion to open surgery
- Anastomotic leakage
- Long-term bypass problems
- Further surgery, laparotomy
- Risks without surgery

Further Reading, References, and Resources

Laparoscopic Gastric Banding

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