



Editorial

Complications of bariatric surgery: Presentation and emergency management



A B S T R A C T

Keywords:

Emergencies
Complications
Obesity surgery
Vitamin D
Malnutrition

The epidemic in obesity has led to an increase in number of so called bariatric procedures. Doctors are less comfortable managing an obese patient after bariatric surgery. Peri-operative mortality is less than 1%. The specific feature in the obese patient is that the classical signs of peritoneal irritation are never present as there is no abdominal wall and therefore no guarding or rigidity. Simple post-operative tachycardia in obese patients should be taken seriously as it is a WARNING SIGNAL. The most common complication after surgery is peritonitis due to anastomotic fistula formation. This occurs typically as an early complication within the first 10 days post-operatively and has an incidence of 1–6% after gastric bypass and 3–7% after sleeve gastrectomy. Post-operative malnutrition is extremely rare after restrictive surgery (ring, sleeve gastrectomy) although may occur after malabsorptive surgery (bypass, biliary pancreatic shunt) and is due to the restriction and change in absorption. Prophylactic cholecystectomy is not routinely carried out during the same procedure as the bypass. Superior mesenteric vein thrombosis after bariatric surgery is a diagnosis which should be considered in the presence of any postoperative abdominal pain. Initially a first etiological assessment is performed (measurement of antithrombin III and of protein C and protein S, testing for activated protein C resistance). If the least doubt is present, a medical or surgical consultation should be requested with a specialist practitioner in the management of obese patients as death rates increase with delayed diagnosis.

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Obesity is an increasingly prevalent disease. Obesity surgery is no longer disputed in cases of severe obesity as this type of surgery in these patients not only achieves sustainable weight loss with an increase in life expectancy, but also a reduction in the comorbidities of obesity, particularly type 2 diabetes. For this reason the epidemic in obesity has led to an increase in number of so called bariatric procedures, surgery which is performed mostly laparoscopically (more than 30,000 procedures in France in 2011, increasing by 76% between 2009 and 2011). The result of this is an increase in consultation of patients who have undergone surgery to their general practitioner and to the emergency departments [1]. Doctors are already used to the emergency management of obesity related comorbidities such as decompensation of diabetes, flares of hypertension and respiratory failure, etc. On the other hand they are less comfortable managing an obese patient after bariatric surgery [2]. This management, however, is the same as in a non obese patient. This article is designed to make doctors aware of and familiar with these patients. There are currently two major types of surgical procedure validated by the H.A.S (French National Health Authority): restrictive procedures (an adjustable peri-gastric ring (sleeve gastrectomy), and malabsorptive procedures (gastric bypass), biliary pancreatic shunts). A choice of technique is based on patient preference, the patient's past history, eating behaviour and anatomy.

Average hospital obesity stays followings surgery are currently a week, approximately 9% of patients developing respiratory complications, 4% developing problems with an anastomotic fistulae and 6% requiring revision surgery. Peri-operative mortality is less than 1%.

1. Tachycardia

Simple post-operative tachycardia in obese patients should be taken seriously as it is a WARNING SIGNAL. The most common cause is dehydration, although pulmonary embolism or a surgical complication such as an anastomotic fistula should always be considered [3]. For this reason it is now conventional to say that “a tachycardia of over 120 beats per minute in an indication for surgical exploration unless proof to the contrary”. To recall, two cases of post-operative thyrotoxicosis causing tachycardia have been described [4].

2. Surgical complications

The most common complication after surgery is peritonitis due to anastomotic fistula formation. This occurs typically as an early complication within the first 10 days post-operatively and has an

incidence of 1–6% [5,6] after gastric bypass and 3–7% after sleeve gastrectomy. The specific feature in the obese patient is that the classical signs of peritoneal irritation are never present as there is no abdominal wall and therefore no guarding or rigidity. It is important to examine the non-specific signs which should nevertheless raise alert: a spike of fever, abdominal heaviness, hiccups, tachycardia and acute urinary retention. A surgical consultation is required if the least suspicion is present. Undiagnosed, fistula results in sepsis which itself can cause acute renal and respiratory failure.

- **Fistula**

Fistula after sleeve gastrectomy can develop even 3 months following surgery and in 90% of cases is located at the upper level of the stapling (cardia) [7]. Symptoms may involve DYSPHAGIA and left hypochondrial or shoulder pain and possibly hiccups [8]. ACT or digestive opacification may be falsely negative. If the least doubt is present, further surgical exploration should be carried out as quickly as possible.

- **Bleeding**

Bleeding may occur from the gastrointestinal tract staple lines or from the anastomoses (stomach, small bowel) in approximately 2% of patients undergoing surgery [9]. This complication usually occurs during the hospitalisation period and in most cases resolves spontaneously.

- **Herniation**

The clinical diagnosis of surgical herniation through a trocar opening may not be apparent in an obese subject. In these situations, CT is the best investigation to reveal these hernias. If the hernia becomes strangulated, patients develop signs of obstruction [10]. Internal herniation occurs in approximately 6% of patients after gastric bypass or biliary pancreatic shunting and develop in the mesenteric windows between the raised loops. These are promoted by the patient's massive weight loss [11]. This complication occurs late after the procedure (over 2 years). These hernias are very difficult to reveal on clinical enquiry and from radiological investigations. The patient may only present with a non-severe abdominal pain but which is repetitive resembling the Koenig's syndrome. Computed tomography may show indirect signs of internal herniation with disappearance of the diameter of the small bowel. If the least doubt is present, surgical investigation should be considered as the risk of this herniation is massive small bowel necrosis.

- **Anastomotic stenosis**

Anastomotic stenosis may develop in approximately 12% after bypass and typically develop a month or more after surgery with a peak occurring 50 days after gastric bypass. They usually involve the gastrojejunal anastomosis [12]. This stenosis presents with epigastric pain and post-prandial regurgitation. Treatment generally involves endoscopic dilatation and some patients require several dilatations.

- **Gastric erosion**

Gastric erosion due to the ring occurs in 0.3–7% of patients [13]. This complication develops gradually and usually asymptomatic. In some occasional cases it may present with infection of the ring casing but usually it involves patients regaining weight as the ring

becomes ineffective. The diagnosis is made by gastroscopy and a gastro-duodenal transit study.

- **Intestinal small bowel obstructions**

Intestinal small bowel obstructions may develop early or very late after surgery [14]. These occur in approximately 5% of cases after gastric bypass and are due either to adhesions or to internal herniation or to intussusception of the small bowel. Acute obstruction is diagnosed by computed tomography.

3. Pulmonary complications

- **Deep vein thrombosis and pulmonary embolism**

Deep vein thrombosis and pulmonary embolism are the second leading cause of post-operative death after gastric surgery with a calculated incidence of 2% and mortality rate of 20–30% [15,16]. They may develop a few days after surgery although the risk persists for several months post-operatively. The clinical diagnosis is not straightforward: an isolated tachycardia or tachypnea in an obese patient should suggest pulmonary embolism and urgent computed tomography should be performed. The management is the same as in non-obese patients. This risk is increased in patients with a past history of venous thrombosis.

- **Post-operative pneumonia**

Post-operative pneumonia is rare (<1%) as patients are mobilised early and laparoscopy causes less respiratory disturbance. Early post-operative pneumonia should suggest a surgical complication and be investigated by computed tomography [17].

4. Nutritional complications

Post-operative malnutrition is extremely rare after restrictive surgery (ring, sleeve gastrectomy) although may occur after malabsorptive surgery (bypass, biliary pancreatic shunt) [18] and is due to the restriction and change in absorption. The first post-operative dietary intake should be only in liquid form with approximately 600 calories per day becoming of solid consistency with approximately 800–1200 calories, including 60 g of protein. In addition, exclusion of the initial part of the small bowel causes malabsorption of minerals, trace elements, lipid and water soluble vitamins, calcium, magnesium, iron, intrinsic factor and vitamin B12. Iron and calcium are absorbed in the duodenum explaining the risk of post-operative anaemia following bypass or biliary-pancreatic shunting and occurs in 20–50% of cases. If the Y loop is long, vitamin D deficiency may occur [19]. The long term risk is that of osteoporosis and osteomalacia. Cases of secondary hyperparathyroidism after gastric bypass have also been described. Vitamin B12 folate (Vit B9) and Thiamine (vit B1) deficiency may occur in 26–66% of cases and for this reason most patients who have malabsorptive surgery are given multi-vitamin complexes, iron, calcium, vitamin D and vitamin B12 for life after post-operative malabsorptive surgery [20]. The risk of protein malnutrition is higher in bilio-pancreatic shunting and is characterised by regaining weight due to lower limb oedema. This is a medical emergency.

5. Hepato-biliary complications

Gallstones are more common in obese people and appear to be accentuated after bariatric surgery (3–30%). For this reason, ursodeoxycholic acid is often prescribed post-operatively (for 6 months)

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