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Complications of bariatric surgery: Dumping syndrome, reflux and vitamin deficiencies

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A B S T R A C T

Bariatric surgical procedure are increasingly and successfully applied in the treatment of morbid obesity. Nevertheless, these procedures are not devoid of potential long-term complications. Dumping syndrome may occur after procedures involving at least partial gastric resection or bypass, including Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy. Diagnosis is based on clinical alertness and glucose tolerance testing. Treatment may involve dietary measures, acarbose and somatostatin analogues, or surgical reintervention for refractory cases. Gastro-esophageal reflux disease (GERD) can be aggravated by vertical banded gastroplasty and sleeve gastrectomy procedures, but pre-existing GERD may improve after RYGB and with adjustable gastric banding. Nutrient deficiencies constitute the most important long-term complications of bariatric interventions, as they may lead to haematological, metabolic and especially neurological disorders which are not always reversible. Malabsorptive procedures, poor postoperative nutrient intake, recurrent vomiting and poor compliance with vitamin supplement intake and regular follow-up are important risk factors. Preoperative nutritional assessment and rigourous postoperative follow-up plan with administration of multi-vitamin supplements and assessment of serum levels is recommended in all patients.

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Introduction

Bariatric surgical procedure are currently the most effective treatment modality to induce weight loss and reduce complications of obesity. However, bariatric interventions also induce major changes in the anatomy and function of the gastrointestinal tract [1].

Several main types of bariatric surgery have been used over the last decades, and these include the biliopancreatic diversion, the Roux-en-Y gastric bypass, the vertical banded gastroplasty and the laparoscopic adjustable gastric band and the sleeve gastrectomy. The vertical banded gastroplasty, laparoscopic adjustable gastric band and sleeve gastrectomy are considered restrictive procedures, deriving their efficacy from interference with the volume capacity of the proximal stomach. The biliopancreatic diversion and the Roux-en-Y gastric bypass are considered malabsorptive procedures, as they interfere with normal digestive and absorptive processing of food, although the latter is considered mainly restrictive [1].

In this paper, potential adverse consequences of bariatric surgical procedures such as dumping syndrome, gastro-esophageal reflux and nutritional deficiencies, are summarized, with a focus on clinical management aspects.

Dumping syndrome after bariatric surgery

Dumping syndrome is characterized by vasomotor and gastrointestinal symptoms which can be attributed to rapid gastric emptying or rapid exposure of the small intestine to nutrients [2]. Dumping syndrome occurs readily after partial or complete gastrectomy, and hence is a potential complication of some bariatric surgical procedures involving partial gastrectomy. Furthermore, dumping syndrome can occur as a consequence of damage to the vagus nerve [2].

In dumping syndrome, symptoms are typically triggered by meal ingestion and are somewhat arbitrarily subdivided into ‘early’ and ‘late’ dumping symptoms (Table 1) [2,3]. Early dumping symptoms occur in response to the rapid passage of hyperosmolar nutrients into the small bowel, and they reflect the release of gastrointestinal hormones which may be accompanied by a shift of fluids from the intravascular compartment to the lumen. Several candidate peptides can be involved in this response, including enteroglucagon, Vasoactive Intestinal Peptide, Peptide YY, pancreatic polypeptide and neurotensin. Late dumping occurs between one and three hours after the meal and is characterized by symptoms of hypoglycaemia. Rapid gastric emptying leads to a high glucose concentration in the intestinal lumen, from which it is rapidly absorbed. This is a trigger for peak insulin secretion, but because of the long half-life of insulin and the transient character of the initial rise in glycaemia, hypoglycemia may occurs when all available glucose has been absorbed [2]. A recent paper provided evidence for a key role of glucagon-like-peptide-1 in the pathogenesis of late hypoglycemia after gastric bypass [4].

Most patients present with early dumping, or a combination of both early and late dumping. Isolated late dumping, i.e. patients in whom hypoglycemia is the only symptoms, is very rare. In severe cases, dumping syndrome is associated with significant impairment of quality-of-life [3] and may contribute to significant weight loss by avoidance of food intake.

After bariatric surgery, dumping syndrome has mainly been reported in patients who underwent Roux-en-Y gastric bypass and other interventions involving partial gastrectomy. After gastric bypass,

Table 1
Symptoms in dumping syndrome.

Early dumping
• Gastrointestinal symptoms
Abdominal pain, diarrhoea, borborygmi. bloating, nausea
• Vasomotor symptoms
Flushing, palpitations. perspiration, tachycardia, hypotension, syncope
Late dumping
• Hypoglycemia
Perspiration, palpitations, hunger, weakness, confusion, tremor, syncope