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The Past, the Present and the Future of the Obesity Surgery

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Editorial

Obesity can be described as accumulation of fat to some extent that has serious implications on psychological conditions of patients and poses enormous challenges for the physicians caring for them. It affects almost every system of obese patients; cardiovascular, endocrine, gastrointestinal, genitourinary and musculoskeletal system. The diagnosis of obesity is done by calculating body mass index (BMI; weight in kilograms divided by length in squared meters, kg/m²). A BMI >25 kg/m² represents overweight, >30 kg/m² obesity, and >40 kg/m² morbid obesity [1]. The prevalence of obesity is unfortunately increasing all over the world.

The main aims of therapy for obesity include loss and maintenance of weight and control of the diseases related to obesity.

Before Surgery

Lifestyle modifications generally lead to minimal (5-10%) weight loss in obese patients and also it is not continuous [2]. The addition of pharmacotherapy (phentermine, orlistat and sibutramine) slightly increases weight loss and unfortunately it is not affecting obesity continuously. Besides that, these drugs have some adverse neurologic side effects (suicide, severe depression) [3].

Bariatric Surgery

Bariatric surgery can be classified as restrictive (gastric plication, banded gastroplasty, adjustable gastric banding, sleeve gastrectomy), malabsorptive (biliopancreatic diversion, biliopancreatic diversion with duodenal switch) and combined (Roux-en-Y gastric bypass, mini gastric bypass). These techniques have been emerged in the history one-by-one after crop up of adverse side effects of the surgical method used by surgeons.

Operations for obesity firstly appeared in 1950s. Small bowel resections and later jejunio-ileal bypass was performed. It is recognized as a result of "short bowel syndrome" that causes weight reduction due to the malabsorption of nutrients. Dr. Arnold Kremen and Dr. Richard Varco, from the University of Minnesota, developed the intestinal bypass, a procedure that excludes the majority of the small intestine from contact with food [4]. However, malabsorption of some

vitamins and minerals caused significant adverse effects, like renal failure, acute hepatic failure, and some autoimmune diseases. Later Dr. Edward Mason, from the same university, developed gastric procedures (the gastric band and the gastric bypass) aiming to provide weight loss effectively and less side effects [5]. Scopinaro added biliopancreatic bypass to gastric bypass and Hess added duodenal switch to the bypass [6-7].

The biliopancreatic diversion was performed firstly by Italian surgeon Scopinaro in 1979. This method combines the benefits of restriction and malabsorption. It includes partial distal gastrectomy, transection of the small bowel approximately halfway between the ligament of Treitz and the ileocecal valve, roux-en-Y gastroenterostomy and an anastomosis of biliopancreatic limb with the alimentary limb 50 cm before the ileocecal valve forming a common channel [8]. This complex procedure can be performed laparoscopically in many centers. Although the results of the method are very impressive, complications were higher than restrictive methods.

Roux-en-Y gastric bypass (RYGBP) was developed from the idea that weight loss was observed in patients undergoing partial stomach resection for ulcers. Drs. Mason and Ito initially developed this technique in the 1960s [5]. The RYGBP is the most commonly performed bariatric operation in the United States. Initially it was performed as a loop bypass with a larger stomach. However, bile reflux from the loop configuration caused ulcers, so that the operation is now being performed as a "Roux-en-Y" technique. This prevents the bile reflux to the esophagus and stomach left after the surgery.

As we understand from the name mini gastric bypass surgery is a simplified form of RYGBP. The mini gastric bypass was firstly developed by Robert Rutledge in 1997 [9]. He firstly performed it as a modification of the Billroth II procedure. In this method, a long narrow tube of the stomach along the lesser curvature is created. A loop of the small intestine is brought up and hooked to this tube at about 180-200 cm from the Treitz ligament.

The first sleeve gastrectomy was performed in 1988 as a part of duodenal switch procedure by Doug Hess [7]. Ren et al. performed laparoscopic sleeve gastrectomy (LSG) as a component of biliopancreatic diversion with duodenal switch (BPD-DS) in 2000. They firstly used LSG as the initial stage of a two-staged operation for super-morbidly obese patients. Because obesity surgery, especially with anastomosis, has more complications than LSG in super-morbidly obese patients

[10]. Afterwards, the results of LSG encouraged surgeons to use it as a main one-step operation for the treatment of obesity. After pneumoperitoneum greater curvature of the stomach is mobilized by the division of gastrocolic omentum and about 2/3 of the stomach is resected by the staples.

Laparoscopic gastric plication was firstly done and improved by Iranian surgeon Talebpour [11]. Although some authors of the bariatric surgery do not accept this technique as bariatric surgery method, he claimed that the results of this technique is comparable to other restrictive methods. In this technique, gastrocolic omentum is divided, as in sleeve gastrectomy, and greater curvature of the stomach is imbricated on itself by two layered continuous non-absorbable sutures [12]. By this way the lumen of the stomach is reduced. The disadvantage of the operation is high recurrence rate, on the other hand it has less complications than other methods. It is not used as other methods worldwide. We abandoned this technique after our clinical experience in our clinic.

Recently, the endoscopy is commonly used for the treatment of obesity. The intragastric balloons (IGBs) were firstly used in 1985 with the Garren-Edwards Bubble in United States [13]. Some years later it was withdrawn due to the complications (gastric erosions, ulcers, intestinal obstruction, and laceration of the esophagus) [14-15]. In next years, bioenteric intragastric balloon (BIB) was first introduced. As its name implies it has less adverse effects than older intragastric balloons. After its insertion, BIB exerts a restrictive effect causing a sense of fullness, decreasing gastric emptying and thus producing early satiety. This causes weight loss for the short time period, however its long-term efficiency is not satisfactory [16-17].

The other recently used endoscopic method for the treatment of obesity is transoral gastric volume reduction (TRIM procedure). In this technique, endoscopic suturing system with multistitch is used to place sutures through the muscular wall of the stomach and approximate gastric wall. By this way, luminal space of the stomach is reduced. It is completely restrictive endoscopic method for the treatment of obesity [18].

Conclusion

The frequency of obesity has been increasing all over the world. There are many surgical methods used for the treatment of obesity. Pure malabsorptive procedures have been abandoned and restrictive methods, due to technical feasibility and having less complications, are used more commonly. The surgical techniques have been improved with the experience of older methods. Minimal invasive endoscopic methods also take their places in treatment of obesity with the advancement of endoscopic technology.

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