

MIXED TECHNIQUES IN BARIATRIC SURGERY

A. POPENȚIU¹, D. MOGA², A. SABĂU³, A. DUMITRA⁴, I. BARB⁵, D. SABĂU⁶^{1,2}Phd Candidate "Lucian Blaga" University of Sibiu, ^{3,4,6}Clinical Emergency Hospital of Sibiu, ⁵Military Emergency Hospital "Ștefan Augustin" from Sibiu**Keywords:** bypass technique, obesity, surgery**Abstract:** Over the time, many methods and concepts were used in the treatment of surgical treatment of obesity. The late results, uncontrollable adverse effects or complication rates are the factors that selected the interventions that proved to be closed to the ideal. Mixed interventions that bring together a restrictive component and a malabsorptive one are among the most useful, as shown by the large scale of their use worldwide. Our paper presents the concept of mixed – mechanism intervention, and demonstrates the method by presenting the most used variant of it: the Roux-en-Y gastric bypass.**Cuvinte cheie:** tehnică, bypass, obezitate, chirurgie**Rezumat:** De-a lungul timpului, o serie de metode și concepte diferite au fost folosite în tratamentul chirurgical al obezității. Rezultatele tardive, efectele adverse incontroabile sau rata complicațiilor sunt factorii care au selectat intervențiile cele mai apropiate de metoda ideală. Intervențiile de tip mixt, care asociază o componentă restrictivă și una malabsorbivă s-au dovedit a fi cele mai utile, dovada fiind procentul mare în care sunt folosite pe plan mondial. Lucrarea prezintă conceptul de intervenție chirurgicală cu mecanism mixt, ilustrând metoda prin tehnica cel mai des întâlnită, bypass-ul gastric pe ansă în Y la la Roux.

SCIENTIFIC ARTICLE OF THEORETICALLY PREDOMINANCE

Obesity surgery is a very active branch of surgery, with rapid developments related to the new devices and instruments that can be used.

Part of the initial interventions was abandoned due to uncontrollable adverse effects or lack of long-term results, while new procedures were developed, especially in the area mini invasive surgery. The emergence and upgrading of mechanical suturing devices, adapting them for use in laparoscopic surgery have enabled the development of new techniques or simplification and reduction of the execution time of classical techniques.

The purpose of the paper is to conduct a review of mixed interventions in bariatric surgery

Mixed interventions in Bariatric Surgery

The bariatric interventions prototype with mixed mechanism is the gastric bypass. Gastric by-pass use both components, restriction and malabsorption. The storage capacity of the stomach is reduced by creating a mini-reservoir, usually the proximal portion, and that is anastomosed in various versions at digestive segments at variable distances from duodeno-jejunal angle, which provides the component of malabsorption.

Initially, most of the stomach was attached to a jejunal loop, to induce early satiety and weight loss. Currently, the stomach is divided into a small reservoir proximally, and the distal segment and the duodenum are "abandoned" and taken out of the digestive system. Gastric reservoir is connected to the small intestine through a loop mounted in different variants, whose length and provision may vary depending on the surgical center and team conduct. Its long-term results are excellent and most of the co-morbidities associated with obesity are

remitted.

Physiology of gastric bypass

The restrictive component procedures reduce the stomach volume remaining in the digestive circuit at 15-30 ml. Such storage capacity falls by more than 90%, drastically limiting the amount of food that can be ingested, primarily by mechanical mechanisms, but also by neuro-endocrine mechanisms, one of the most important being the exclusion of the gastric fundus - producer of ghrelin.

This new mini-reservoir may remain attached to the stomach, or it could be detached.

Initial interventions placed only one line of staples, but the theoretical possibility of developing a gastro-gastric fistula and development of endoGIA type devices (which uses two lines of staples and make a section among them) led to the current versions of detachment from the stomach of the newly created reservoir.

Although subcardial portion is less prone to expansion in the postoperative period, this phenomenon may occur. What remains constant is the diameter of gastro-enteric anastomosis, which limits the discharge capacity, and hence the amount that can be stored.

Although functional gastric volume increases over time, the excess weight loss is achieved already, and relatively fixed diameter of the mouth of the anastomosis helps maintain the optimal weight. The dilation of the new reservoir tank is an event that occurs in all interventions and is responsible for most cases of partial restoration of overweight (note the mechanism of dilatation of the stomach wall after longitudinal gastrectomy).

Roux-en-Y gastric bypass

It is a variant of attaching the gastric mini-reservoir with the small bowel using a Roux-en-Y loop. Cesar Roux (1857-1934), Swiss surgeon, was the first who proposed and

¹ Corresponding Author: Adrian Popentiu, Military Emergency Hospital "Ștefan Augustin" Sibiu, 44-46, B-dul Victoriei street, Sibiu, Romania; e-mail: adipopentiu@yahoo.com; tel +40-0742074094

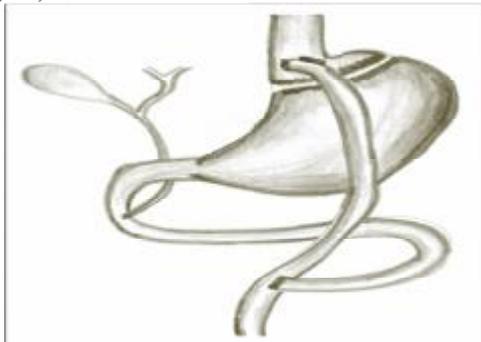
Article received on 01.03.2011 and accepted for publication on 21.07.2011
ACTA MEDICA TRANSILVANICA September 2011; 2(3)367-368

CLINICAL ASPECTS

popularized this variation of the anastomosis, in order to short-circuit the digestive segment, the first cases involving injuries or duodenal or gastric ulcer (1). The name comes from the similarity to a capital Y on schematic representation (Figure 1).

The use in of bariatric surgery has been adopted in order to avoid adverse effects of a gastric reservoir anastomosis with the omega-type loop by Griffen (2). Positive results led to the wide adoption, especially in the U.S., where it is the intervention of bariatric surgery most often used today.

Figure no. 1. Structure from gastric bypass (graphics by A. Popențiu)



This intervention can be done entirely by laparoscopy and it was made for the first time in 1993 and Clark Wittgrove. Adapting mini invasive techniques has increased the popularity of the method, which is currently bariatric surgery most commonly used worldwide (3).

Before the development of minimally invasive techniques, the Roux-en-Y gastric bypass was performed in many centers by classical approach, with good results on weight loss and acceptable peri- and postoperative complication rates.

Results related to anastomotic dehiscence rate and other intra-abdominal complications are relatively comparable with data from the groups where the intervention was performed by laparoscopy, but reduced parietal complications and length of stay - shorter recovery, and reduced pulmonary complications percentage is favoring the laparoscopy. At present, issues related to costs involved are well studied, but although on short-term the laparoscopic interventions themselves are significantly more expensive, the benefits related to shortened hospital stay and faster socio-professional reintegration compensate for this relative disadvantage.

Communicated results in literature

In a retrospective study on a sample of 10,000 patients who underwent a gastric bypass, Griffen et al (4) obtained the following results: over 85% have lost at least 50% of excess body weight, and from 5000 patients followed by a period of 10 years, 80% maintained this results.

Another study followed 608 patients who were monitored for up to 14 years (5), and had a mean weight loss of 75% at one year, but decreased to 50% by the eighth year.

Positive metabolic effects are most representative image of improvement in comorbidities in patients from the studied groups:

- Dyslipidemia is improved by over 70% of patients;
- Essential hypertension is resolved over 70% of patients and for the rest the amount of needed drugs to control it is much lower;
- Type 2 diabetes is cured in up to 90% of patients, blood sugar values returned to normal very quickly,
- Obstructive sleep apnea may disappear completely or be improved;
- Gastro-esophageal reflux disease may disappear in most

patients;

- Articular disease (lumbar diseases, arthroses) improves spectacularly;
- Circulatory phenomena of venous insufficiency (edema) - partially remitted.

Improving co-morbidities (diabetes, dyslipidemia, hypertension, etc.) finally results in increased life expectancy, increased quality of life and a decrease in expenses related to health and social care. A study in Sweden on a group of obese diabetic patients showed a 80% reduction of annual mortality in patients who underwent bariatric surgery interventions, compared to a control group (6). Obese patients with diabetes in the group treated with surgery had a mortality of 9% at 9 years, compared with the control group, where mortality was 28%, with most deaths related to cardiovascular disease.

MacDonald et al presented a study that patients with diabetes treated with oral hypoglycemic agents has a mortality rate of 4.5% for a period of 9 years of follow up, compared with only 1% for diabetic patients who underwent gastric bypass intervention (7).

CONCLUSIONS

Obesity currently reaches a global pandemic size, which raises serious medical, social and financial issues, including our country. Obesity and overweight induce an increased risk of developing chronic diseases such as type 2 diabetes, cardiovascular disease, hypertension, cardiovascular disease and some cancers. Mixed surgical methods with restrictive and malabsorptive components, are most commonly used with good results in terms of weight loss and low rate of complications

BIBLIOGRAPHY

1. C.Roux: De la gastroenterostomie. *Revue de chirurgie*, 1893, 13: 402-403;
2. Griffen W O, Bivins BA, Bell R M et al, Gastric bypass for morbid obesity, *World J Surg*, 1981; 5:817-22;
3. Torres JC, Oca CF, Garrison RN. Gastric bypass: Roux-en-Y gastrojejunostomy from the lesser curvature. *South Med J*;76:1217-21,1983;
4. Griffen WO. Gastric bypass. In: Griffen WO, Printen KJ eds. *Surgical management of morbid obesity*. New York, NY. Marcel Dekker, Inc, 1987:27-45;
5. Pories WJ, Swanson MS, MacDonald Kg et al. Who would have thought it? An operation proves to be the most effective therapy for adult onset diabetes mellitus. *Ann Surg* 1995; 222:339-52;
6. Sjostrom C D, Lisnsner L, Wedel L H, Sjostrom L, Reduction in incidence of diabetes, hypertension and lipid disturbances after intentional weight loss induced by bariatric surgery. *SOS Intervention Study*, *Obes Res* 1999,7, 477-484;
7. MacDonald K G, Long S D, Swanson M S et al; The gastric bypass operation reduces the progression and mortality on non-insulin-dependent diabetes mellitus; *J Gastrointest Surg*, 1997;1:213-220.