

Effectiveness of Surgical Methods of Obesity Treatment in Gastric Resection

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Summary: Dumping syndrome can be considered as one of the main mechanisms of changes in eating behavior after bariatric surgery. Combined surgeries are effective in patients with morbid obesity. In patients with a BMI of more than 50 kg/m², the choice of surgery option is determined individually.

Keywords: gastric bypass, longitudinal resection of the stomach in combination with small intestinal bypass.

Relevance. In recent years, there has been increased interest in surgical methods for the treatment of severe forms of obesity and associated diseases, including type II diabetes mellitus. It has been proven that long-term results of pathological obesity treatment are influenced by surgical methods [9, 11]. Indications for surgery correspond to very specific criteria: the presence of a BMI > 40 kg/m² (regardless of the presence of concomitant pathology), or a BMI > 35 kg/m² in the presence of one or more diseases that can be influenced by weight loss [1,2,3,4,5,6,7,8]. The prevalence of obesity has currently reached epidemic proportions. According to data published in 2009 by the World Health Organization (WHO, International Obesity Task Force), about 2.1 billion people in the world were overweight or obese. In Russia (WHO, 2010), 51.7% of women and 46.5% of men were overweight or obese, including morbid obesity [1,2,9,10,11,12,13,14]. According to analysts' forecasts, by 2025 the number of obese people in the world will almost double; 40% of men and 50% of women will suffer from this disease.

Along with obesity, the incidence of closely associated type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD) has increased [1,15,16,17,18,19], which are the result of the progression of metabolic disorders, including insulin resistance (IR), which is inextricably linked with the accumulation of visceral fat and plays a key role in the pathogenesis of obesity-related diseases.

Currently, according to WHO, there are about 387 million patients with diabetes mellitus in the world; in Russia (according to the State Register of Patients with Diabetes Mellitus) as of January 2015, 4.04 million patients were registered by visits, of which about 90% were patients with T2DM, while the actual number of patients with diabetes exceeds 10 million [1, 20,21,22,23,24]. It is predicted that by 2035, 592 million people will suffer from diabetes.

Lifestyle changes in combination with pharmacotherapy are the basis for the treatment of obesity and type 2 diabetes. However, according to the US National Institutes of Health, up to 60% of obese patients cannot maintain their body weight (BW) reduced by diet and exercise for a year, and after 5 years, the reduced BW returns to the original in almost all of them. In morbid obesity (MO), the effectiveness of conservative therapy does not exceed 5-10% [1, 2, 3,25,26,27,28,29].

In this regard, surgeons suggest using only mini-gastrosurgery and gastric bypass with Roux-en-Y anastomosis in patients with metabolic syndrome, and in more severe cases of metabolic syndrome, biliopancreatic bypass.

The aim of the study: To improve the results of bariatric surgery in patients with metabolic syndrome through clinical and metabolic substantiation of the choice of surgical intervention method.

Materials and methods. The present work is based on the analysis of the results of examination and treatment of 59 patients with morbid obesity, operated on using combined techniques, who were examined and hospitalized in the 1st surgical department of the Bukhara Regional Multidisciplinary Medical Center and the thoracoabdominal surgery department of the multidisciplinary clinic of the Tashkent Medical Academy for the period from 2021 to 2023. The patients' age ranged from 31 to 59 years. Among them, 18 were men, 41 were women. The body mass index of all exceeded 40 kg / m². The maximum observation period is 3.5 years (39 patients). The results were evaluated in 18 patients (observation period of 1.5 years). In two cases, the postoperative period was less than 1 year. Distal gastric bypass was performed in 38 patients, longitudinal (sleeve) gastrectomy with distal small intestinal bypass was performed in 21 patients. The gastric bypass operation was first proposed in 1966 by E. Mason [7]. The technique was further modified in the works of W. Griffen, M. Fobi, J. Capella and R. Capella, J. Torres and C. Oca, R. Brolin, and others. Distal gastric bypass implies the presence of an aggressive bypass component, when the interintestinal anastomosis is located at a distance of 50-100 cm from the ileocecal angle. In the study, it was performed on 8 patients. Immediately below the level of the first branch of the left gastric artery, on the side of the lesser curvature, a "window" was formed in the peritoneum. Through it, using devices (either Echelon Flex™, or Endo Gia Universal, or Ethicon EndoSurgery Linear Cutter), the stomach was transected. A small ventricle with a volume of about 30 ml was formed. Most of the stomach, remaining in the abdominal cavity, was additionally peritonized. In order to maximally shorten the length of the small intestine segment switched off by Roux Y, it was transected 30 cm from the Treitz ligament. The diverting segment of the intestine was passed through a pre-formed opening in the mesocolon and a gastroenteroanastomosis of up to 1.2 cm in diameter was applied according to the retrocolica posterior type. Then, an end-to-side jejunoileoanastomosis was formed between the proximal jejunum (30 cm) and the ileum, at a distance of 70 cm from the ileocecal angle. In 5 patients, the operation of longitudinal (sleeve) gastrectomy was combined with distal small intestinal bypass. In fact, the creation of a narrow gastric tube while maintaining the physiological integrity of the stomach is a remarkable alternative for a large group of patients, mainly with a body mass index of less than 40 kg/m² [6]. When using the technique in patients with BMI > 40 kg/m², sleeve resection was supplemented with distal jejunoileoanastomosis, since it is the presence of a bypass component that allows for effective and stable normalization of lipid and carbohydrate metabolism disorders [2, 3]. The greater curvature of the stomach was mobilized along its entire length using the LigaSure™ system. Next, a longitudinal transection of the stomach was performed using a 40 Fr probe, 3 cm from the pylorus and directly to the angle of His. Ethicon Endo-Surgery Linear Cutter or Echelon Flex™ linear suturing devices were used. After removal of the severed portion of the stomach, the probe was changed to 32 Fr and peritonization was performed using a continuous wrapping suture. For this, Vicryl 3/0 or V-Lok 3/0 was used. A leak test was mandatory. Thus, the stomach was transformed into a narrow tube with a volume of 80-100 ml. After the formation of the gastric tube, the jejunum was transected 50 cm from the Treitz ligament and then a jejunoileal anastomosis was performed 70 cm from the ileocecal angle, depending on the BMI.

To assess weight loss, the formula for determining the percentage of excess weight loss (%EWL) was used: $\text{preoperative weight} - \text{current weight} \div \text{preoperative weight} - \text{ideal weight} \times 100$. The ideal weight indicator was determined using the Metropolitan table.

Results and discussion: In almost all cases, the formation of a small stomach and the imposition of a gastroenteroanastomosis were accompanied by technical difficulties due to excessive visceral fat and the depth of the surgical field. Sleeve resection is technically simpler than gastric bypass; does not require the imposition of a gastroenteroanastomosis, but required additional costs for cassettes for the stitching and cutting devices (6-7 60 mm cassettes for Endo Gia or Echelon Flex for longitudinal resection versus 2-3 for gastric bypass) and additional peritonization of the entire resection area. The "weak point" in this case is the possible failure of the gastric tube suture. The average operating time, regardless of the technique, was 3 hours. The effectiveness of combined operations is associated not only with weight loss, but also with the redirection of the movement of food masses, which bypass the

stomach and go directly to the distal parts of the small intestine, which prevents the interaction of bile and pancreatic enzymes with chyme.

An important role is played by incretins, including glucose-dependent insulintropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1), peptide YY, ghrelin, leptin, resistin [4, 10]. It is this complex endocrine influence that makes combined operations a powerful tool not only for long-term weight loss, but also for the successful treatment of conditions that determine metabolic syndrome. Early postoperative complications included failure of the gastric tube sutures and the formed "small" ventricle (2 cases - 15.4%). In the first observation, a patient with a BMI of 65.0 kg / m² developed failure of the gastric sutures and diffuse peritonitis. This required sealing the suture line and repeated sanitation of the abdominal cavity. Death occurred on the 21st day against the background of the development of multiple organ failure. In the second case (BMI 63.5 kg/m²), the limited nature of the failure did not require repeated intervention. Conservative treatment for 26 days led to closure of the fistula and recovery of the patient. In one case (7.6%), a patient with a BMI of 58.5 kg/m² developed acute postgastrectomy neuropathy [1], which required long-term drug correction, with a positive result. During a targeted survey of patients, manifestations of early dumping syndrome were revealed in 3 patients. Attacks occurred no more than 1-2 times a month, against the background of excessive consumption of sweet and dairy dishes. They were accompanied only by vasomotor symptoms in the form of general weakness and tachycardia. They lasted up to 15 minutes and stopped on their own. All this corresponded to a mild degree of dumping. When observing the same patients after 3 months or more, no recurrent attacks were noted, which is associated with the restriction of sweet and fatty foods in the diet.

Thus, this confirms the data that dumping syndrome can be considered one of the main mechanisms for changing eating behavior after bariatric surgery [5].

In the postoperative period, all patients experience rapid weight loss during the first postoperative year and slow weight loss over the next 18 months. Over 1.5 years of observation, the loss of excess body weight (%EWL) in the group averaged 70.6%. Over the same period, BMI decreased from 47.9 kg/m² to 32.9 kg/m². In 6 patients with initial impaired glucose tolerance and type 2 diabetes mellitus, a tendency toward normoglycemia (from 5.9±0.7 mmol/l to 4.9±0.7 mmol/l) and a decrease in blood pressure (from 160-180 mm Hg to 120-140 mm Hg) were noted. In all the observed patients, the decrease in the load on the spine and joints reduced pain in osteochondrosis and polyarthrititis. The manifestations of dyslipidemia decreased. Over a period of 1.5 years, normalization of total cholesterol and triglyceride levels was achieved. Thus, in the postoperative period, against the background of weight loss already during the first year, stable remission of diseases that form metabolic syndrome is achieved.

Conclusions:

1. Combined surgeries are effective in patients with morbid obesity.
2. In patients with a BMI of more than 50 kg/m², the choice of surgery option is determined individually.

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