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Review Article

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Comparative Analysis of the Effectiveness of Various Bariatric Surgeries

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ABSTRACT

Obesity in the twenty-first century is becoming an epidemic and is a major cause for serious concern in both developed and developing countries. Morbid obesity negatively affects several body systems at the same time, and together with its accompanying complications, leads to an overall decrease in the expected quality. Worldwide, there are about a billion people who are overweight. About half of the population in industrially developed countries, except for Japan and China, is overweight. In many countries of the world, over the past 10 years, the incidence of obesity has increased by an average of 2 times. There is a steady increase in obesity among children. In the countries of the Commonwealth of Independent States, the prevalence of obesity and overweight is currently about 50%. WHO experts believe that by 2050, the entire population of economically developed countries of the world will have some degree of obesity. That is why in 1997 the WHO recognized obesity as a global epidemic of the twenty-first century. This review article is devoted to the features of the effectiveness of bariatric surgery in obese patients.

Keywords: morbid obesity, type 2 diabetes mellitus, bariatric surgery

Obesity is accompanied by metabolic disorders and a whole range of different diseases and conditions: type 2 diabetes mellitus, atherosclerosis, hypertension, dyslipidemia, obstructive sleep apnea syndrome, hyperuricemia, gout, reproductive dysfunction, osteoarthritis, coronary heart disease, cholelithiasis, chronic varicose veins of the lower extremities are about 5 times more likely to develop against its background [1, 23, 29].

Excess weight increases neoplasms. Cardiovascular diseases against the background of excess body weight are more often complicated by the development of acute coronary syndrome and acute disorders of cerebral circulation, which in turn lead to heart attack and stroke. It has been proven that obesity shortens human life by an average of 5–15 years [2].

It is a well-known fact that obesity is a chronic, polyetiological, multifactorial heterogeneous disease that does not currently have an effective drug treatment (IFSO, 2021). Various diets, lifestyle modifications, therapeutic exercises, behavioral therapy, as well as adjuvant treatment with drugs such as sibutramine and orlistat have shown little effectiveness. Results have been obtained with a reliable evidence base that conservative treatment of obesity will undoubtedly lead to disappointment [3].

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In recent years, obesity surgery has proven its absolute superiority over conservative methods of combating excess weight. Bariatric surgery has clearly demonstrated that it provides sustainable weight loss and contributes to a clear improvement in long-term health. This, therefore, has led to the development of new surgical weight management strategies [4, 30].

In light of the above, it should be noted that surgical methods of weight correction are currently the only effective methods of combating morbid obesity and concomitant diseases, such as type 2 diabetes mellitus, hypertension, dyslipidemia, obstructive sleep apnea, when other methods of treatment [5].

However, it should be noted that although the benefits of bariatric surgery are obvious from many clinical trials and meta-analyses, such interventions require advanced technologies and can lead to undesirable results [31].

The volume of bariatric surgeries, according to the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO), has been growing exponentially over the past decade. However, all existing types of surgical interventions in metabolic surgery along with their variations are still evolving.

At the moment, there are several standard bariatric surgical interventions, such as longitudinal gastrectomy (Sleeve Gastrectomy), Roux-en-Y gastric bypass (RYGB), mini-gastric bypass (OAGB), as well as various modifications of biliopancreatic bypass grafting. All of them are performed with varying degrees of success and varying complication rates.

In 1993, American surgeons Witgrove and Clark performed the first laparoscopic RYGB. According to the Seventh IFSO Global Registry Report 2022, the RYGB is currently one of the most commonly performed bariatric surgeries worldwide. RYGB accounts for about 26% of all bariatric interventions [32].

This intervention has established itself as the gold standard in the treatment of metabolic disorders in most international bariatric surgery centers and has been used continuously for the past 20 years [6].

Throughout this time, RYGB has stood the test of time by achieving good long-term results in terms of weight loss. However, while some studies have shown a relatively higher rate of complications, both surgical and malabsorptic, after gastric bypass compared to other commonly performed bariatric procedures, other studies have shown no difference in the short and long term.

Relatively recently, gastric bypass with one anastomosis or mini-gastric bypass (OAGB) has been introduced into world practice. This method has been proposed as a fairly simple, quick and effective way to treat morbid obesity. This intervention was developed by Robert Rutledge in the late twentieth century, primarily as an alternative to RYGB. Despite the promising results, there are concerns about the safety of OAGB and associated complications, especially when compared to RYGB. Severe biliary reflux is one of the main controversial points of this method [7, 24].

As of 2022, OAGB accounts for approximately 4.6% of all metabolic operations in the world. According to Robert Rutledge, OAGB has certain technical advantages: shorter operative time and a lower incidence of postoperative complications. OAGB quickly gained worldwide popularity, confirming results similar to RYGB in terms of weight loss and comorbidity resolution. It has been proven by many published studies that OAGB contributes to the achievement of excellent metabolic results. However, the comparative results of the effectiveness of OAGB and RYGB generate intense debate and are still unclear due to the small amount of evidence in favor of one method over the other.

A team of authors from the Royal Hospital Bariatric Centre in Sunderland (UK) conducted a retrospective comparative study between 2014 and 2016 that evaluated the efficacy and complication rates of OAGB and RYGB, respectively. The criteria for exclusion from the study were any prior bariatric surgery, as well as the inability to be followed up for the duration of the study. All subjects underwent endoscopic fibrogastroduodenoscopy before surgery to assess the presence of hiatal hernias, esophagitis, and gastric and duodenal ulcers. The presence of smoking was also determined before surgery, and only those who quit the addiction were offered to take part in the study. Any postoperative complications were recorded during the entire follow-up period [8].

A total of 1115 patients took part in the study. Of the 1115 patients (957 RYGB, 198 OAGB), 968 patients (83.8%) were female and 187 (16.2%) were male. The mean age at surgery was 45.3 years (18–72) for the RYGB group and 44.4 (16–78) years for the OAGB group. All procedures were performed using video endoscopic technologies. At 2 years of follow-up, the mean overweight loss (EWL) was 41.2 (15.8) kg in the RYGB group and 49.3 (19.2) kg in the OAGB group ($P < 0.001$). The estimated mean total weight loss (TWL) % and mean EWL% were 31.1% (9.7%) and 70.1% (23.2%), respectively, for RYGB patients, and 35.1% (9%) and 74.5% (19.3%) for OAGB, respectively. Postoperative symptoms of gastroesophageal reflux were reported in 2.7% (26/957) of the RYGB group and 8.5% (17/198) of

the OAGB group. Reflux symptoms in the OAGB group were significantly higher (P<0.001). Unfortunately, there is a very pronounced shortage of published randomized controlled trials evaluating the comparative efficacy of OAGB and RYGB [33].

Researchers led by Marko Kraljević from Zurich, Switzerland, decided to remedy this situation and initiate a single-center, randomized, blinded controlled trial. The main objective of the study was to assess the effectiveness of OAGB compared to RYGB in EWL units (%) one year after surgery (primary endpoint), as well as the duration of surgery; duration of hospitalization; mortality; remission of obesity-related comorbidities; improving the quality of life; subjective perception of hunger and satiety; the frequency of postoperative dumping syndrome; levels of insulin, glycated hemoglobin (HbA1c), ghrelin, peptide YY, bile acids, and lipid profile at 3 years (secondary endpoint). A total of 80 patients aged 18 years and older with a body mass index of 35 to 50 kg/m2 were recruited, with 40 patients each in the OAGB and RYGB groups, respectively. The exclusion criteria were the presence of malignant neoplasms, inflammatory bowel diseases, pregnancy and a body mass index of more than 50 kg/m2. Before the operation, all patients were examined by a nutritionist, endocrinologist, psychiatrist and general surgeon. The patients also underwent a standard preoperative status, including endocrine status, lung function, cardiovascular function, and psychological evaluation. All underwent esophagogastroduodenoscopy with a test for Helicobacter pylori and an ultrasound examination of the abdominal organs. All subjects were operated on by the same surgeon with more than 1,000 bariatric surgeries performed. As a result, the authors concluded that the main drawback of OAGB is biliary reflux into the small ventricle and even into the esophagus. As we can see, the data obtained as a result of various studies by different authors are similar in some ways, and differ in others. As for biliary reflux, the two experiments described above have a diametrically opposite result. On the other hand, neither weight loss, nor overall weight loss, nor the degree of remission of obesity-related comorbidities, nor glycemia levels, nor lipid profile status have statistically significant differences between the groups of patients with OAGB and RYGB [9, 25].

Scientists from the Bariatric Center at the University of Helsinki (Finland) also decided to conduct a prospective randomized controlled trial to compare the efficacy and safety of OAGB and RYGB. Inclusion criteria: age over 18 years and body mass index ≥35 kg/m2. Exclusion criteria were: anaemia (haemoglobin <120 g/l), pregnancy or lactation, endoscopically confirmed hiatal hernia, reflux esophagitis or Barrett's esophagus; as well as any other condition that, in the opinion of the researchers, may pose a threat to the safety of participants, jeopardize the research procedure, or interfere with the interpretation of the results [34].

A total of 120 patients were assigned to the OAGB and RYGB groups. Follow-up should last 10 years and take into account the degree of weight change, the nature of the course of concomitant diseases, blood tests, determination of the cellular composition of the body using a bioimpedance analyzer, as well as questionnaires assessing the level of quality of life. Extensive metabolic analysis (energy expenditure intensity testing, muscle tissue and subcutaneous fat biopsy, urinalysis, saliva, and stool samples) will be performed at baseline, as well as at 6 and 12 months. Emphasis was also placed on the determination of biliary reflux for the OAGB group at 6 months by endoscopic fibrogastroduodenoscopy and scintigraphy. Bile reflux was measured using a special scintigraphic method, the scan lasted about 90 minutes to visualize the entire potential area of bile exposure to the stomach and esophagus. Objectives of the study: the primary result is the assessment of weight loss 2 years after surgery. Weight loss is measured as the percentage of overweight reduction (% EWL) and the percentage of total weight loss (% TWL). Secondary outcomes to be evaluated at 6, 12, 24 months, 5 and 10 years, respectively, are as follows: percentage reduction in excess body weight (% EWL) and percentage of total weight loss (% TWL), as well as any complications requiring any interventions or prolonged hospital stay, as well as additional outpatient visits [10].

During the first 3 months of follow-up, there was not a single fatal outcome, not a single relaparoscopy, and not a single case of indication for transfer to the intensive care unit. In both groups, one patient underwent additional endoscopic fibrogastroduodenoscopy due to eating difficulties (Clavien-Dindo class IIIa). One patient from the RYGB group stayed one additional night in the ward after surgery due to low hemoglobin levels, but there was no reason for blood transfusions and plasma substitutes or other interventions (Clavien – Dindo class I). One patient in the RYGB group was diagnosed with seroma (Clavien-Dindo class I). All other patients were discharged on days 1-2 after surgery [11, 26].

In a recent retrospective study with a five-year follow-up period based on prospectively validated data, a team of researchers from a large private bariatric surgery center in India set out to compare the extent of weight loss, assess metabolic syndrome outcomes, the presence

of complications, and the long-term outcomes of OAGB versus RYGB. There were 122 patients in the RYGB group and 90 in the OAGB group. Mean age was 44 and 46.4 years in the OAGB and RYGB groups, respectively. The OAGB group included more male patients (66.7%) compared to the RYGB group (53.2%).

The following results were obtained: the mean decrease in body mass index and incidence of type 2 diabetes mellitus were statistically significantly expressed in the OAGB group. The median surgery time for OAGB was 55 minutes, compared to 89.6 minutes for RYGB. The average length of stay in hospital was similar. In the perioperative period, one patient in each group developed intra-abdominal bleeding that was reversed by transfusion measures. In the OAGB group, there was a single episode of anastomosis failure that required surgery. Cases of nausea, vomiting, hair loss, constipation, and diarrhoea were observed in both groups but were not adequately documented. In the OAGB group, there were 4 cases of various complications in the long term. One patient in the OAGB group underwent relaparoscopy to reduce the biliary loop to 150 cm due to severe hypoproteinemia and excessive weight loss. Also, one patient from the RYGB group underwent a second operation to lengthen the biliary loop to accelerate weight loss.

Levels of hemoglobin, albumin, total protein, vitamin B12, vitamin D, and calcium were lower in the OAGB group compared to the RYGB group. The percentage of total weight loss and the percentage of overweight loss (% EWL) were significantly higher in the OAGB observation group. Notably, after 5 years, 18 (21.95%) patients after RYGB had 50% EWL compared to no such results in the OAGB group. Cure rates for type 2 diabetes (79%), hypertension (56%), obstructive sleep apnea (90%) and DLS (56%) were higher in the OAGB group. Contrary to what other studies have shown, the complication rate in this study was higher in the OAGB group (7.8%) compared to the RYGB group (1.6%), although this difference is not clinically significant as the number of patients was quite small. The complication rate in the OAGB group subsequently dropped dramatically over time to 2%. When analyzing the weight loss in this study, the authors noted a statistically significant difference in the mean % EWL in the OAGB group (84.64%) compared to the RYGB group (62.72%). Vitamin B12 and D deficiencies after RYGB gradually worsened over time in the postoperative period. Protein deficiency was quite rare after RYGB, in case of its development, it is necessary to give a balanced assessment of the diet and determine whether the patient has a meeting of the daily need for calories and proteins. This study, of course, has a number of drawbacks. The first disadvantage is that the sample is not large enough. Although all data were evaluated prospectively – the level of evidence provided is not as reliable as if it had come from a large prospective randomised trial. In addition, many data regarding minor complications were not properly preserved, and only the quality of life index score remained available for the RYGB group, and was lost for the OAGB group, which naturally prevented an adequate comparative assessment. The advantages of the study are its duration and the fact that the results of the experiment led to a technical modification of the OAGB, namely to the reduction of the biliary loop to 180 cm. Thus, the authors conclude: with intermediate and medium-term follow-up for 5 years, both RYGB with a biliary loop length of 80 cm and 120 cm, respectively, and OAGB with a superimposed anastomosis at a distance of 200 cm from the Treitz ligament, are fairly effective interventions that lead to good results in terms of weight loss and resolution of concomitant diseases such as type 2 diabetes mellitus and hypertension. However, OAGB with anastomosis applied at a distance of 200 cm from the Treitz ligament promotes better weight loss in addition to better resolution of comorbidities in the treatment of severe obesity than RYGB. The need for larger and longer-term comparative studies of these 2 methods is emphasized [12, 27, 35, 37].

In turn, the authors from the Netherlands decided to conduct a multicenter retrospective study, the main purpose of which was to compare the effectiveness of OAGB and RYGB after the initial failed bariatric surgery in terms of further additional weight loss. This study included 491 patients operated on between 2012 and 2017 for failed primary metabolic intervention (185 patients in the OAGB group and 306 people in the RYGB group). According to IFSO guidelines, all patients were between the ages of 18 and 65 when they underwent primary surgery. Preoperative evaluation of patients for eligibility included consultation with an endocrinologist, dietitian, and psychologist to rule out patients with an eating disorder. Exclusion criteria, in addition to the mentioned eating disorder, were any other psychiatric disorders, pregnancy, any other previous gastric surgery that was not a primary bariatric intervention [28].

Failure was defined as total weight loss of less than 25%, overweight loss of less than 50%, and/or residual body mass index of more than 40 kg/m2 at two years of follow-up.

One of the limitations of this study was the relative heterogeneity of the groups due to the retrospective nature of the data collection. The OAGB group was dominated by younger patients and more often male patients [13, 36].

Consequently, there is bias in both the selection and the analysis of the results. Despite this, the authors recommend that large randomized controlled trials be conducted in order to extrapolate the results of this particular study to the general population. Another drawback of the experiment was a significant difference in primary bariatric interventions: in the group, longitudinal resection of the stomach prevailed as a previous metabolic operation, while in the RYGB group, gastric banding was more common.

The following results were obtained: the percentage of TWL was significantly higher in the OAGB group at 12 months after surgery (mean value 24.1±9.8 vs. 21.9±9.7, p=0.023) and at 24 months (mean value 23.9±11.7 vs. 20.5±11.2, p=0.023) than in the RYGB group, respectively. Intra-abdominal complications such as leakage, intra-abdominal haemorrhage, intra-abdominal abscess and perforation were less common in the OAGB group (1.1% vs 4.9%, p=0.025). Surgery for the development of biliary reflux (5.4% vs. 0.3%, p<0.001) was naturally more common in the OAGB group. The Dutch scientists conclude that this study shows that OAGB is superior to RYGB in terms of weight loss and further weight maintenance after failed primary bariatric surgery, and is also accompanied by a lower rate of early complications. The findings demonstrate superior weight loss in the OAGB group after 12 and 24 months of follow-up, respectively, compared to the RYGB group. However, in order to substantiate and conclusively confirm these conclusions, it is necessary to conduct as many prospective randomized controlled trials as possible, with a standardized, thorough differential diagnostic search for concomitant pathology [14].

A group of authors from Venezuela conducted a control comparative study of 200 patients, the main goal of which was to compare the efficacy of OAGB and RYGB. Patients were divided into 2 groups. 100 patients underwent OAGB, 100 patients underwent RYGB. The criteria for inclusion in the experiment were a body mass index of more than 35 kg/m2 and age from 18 to 65 years. They were divided into groups 1:1 depending on age and initial body mass index ±5 years and ±1 kg/m2, respectively. Data were collected prospectively and the results of the surgeries were compared with the degree of weight loss, resolution of comorbidities, complication rates, and mortality. The exclusion criteria for the OAGB group were patients with endoscopically confirmed biliary reflux. Complications were evaluated according to the Clavien-Dindo classification. Patients had the following preoperative variables: age 40.46±12.4 versus 39.43±10.33 years in the OAGB and RYGB groups, respectively; gender – 64 women and 36 men in the OAGB group, 54 women and 46 men in the RYGB group; body mass index of 44.8±12.06 kg/m2 and 45.29±8.82 kg/m2 in the OAGB and RYGB groups, respectively; 50 patients with comorbidities in the OAGB group and 54 patients with comorbidities in the RYGB group. The mean age was 39.43±10.33 and 40.46±12.4 years for RYGB and OAGB, respectively. The median operative time for OAGB patients was 69.01±4.62 min and for RYGB 88.89±3.44 min (P=0.002). The hospital stay in both groups was 48 hours. Complications were observed in 9% of patients in the OAGB group and in 11% of patients in the RYGB group (P=0.03). There were no fatal outcomes in any of the groups.

The baseline weights of patients undergoing RYGB were 127.7±32.19 kg and 125.08±46 kg in patients in the OAGB group; the average weight in both groups at 6 months was 93 kg; the percentage of EWL at 6 months was 59.6% in the RYGB group and 56.1% in the OAGB group, and at 12 months 85.9 and 89.4% (P>0.05), respectively. The mean body mass index in the RYGB group at 6 months was 33 kg/m2 and 33.7 kg/m2 in the OAGB group; after 12 months - 29±4.5 kg/m2 and 27.7±7.85 kg/m2, respectively [15].

At 12-month follow-up, remission of hypertension and type 2 diabetes mellitus in patients in the RYGB group was 80% and 88.8%, respectively. The resolution of comorbidities after OAGB was 80.7% for hypertension and 89.5% for type 2 diabetes mellitus.

Findings. In this comparative study of the efficacy of RYGB and OAGB, it was proved that the loss of excess weight over the year in both groups was very similar - more than 85%, with a very good resolution of the two evaluated comorbidities: hypertension and type 2 diabetes mellitus (the rate exceeded 80%). Both groups had similar complication rates of 11% and 9%, respectively, with no deaths. The results show high efficiency of both methods, but on the condition that OAGB is easier to perform and requires less operational time.

German researchers led by Karl P. Rheinwalt decided to conduct a prospective cohort study with a large sample (783 patients). 355 patients underwent RYGB, 428 patients underwent OAGB. The study lasted from 2006 to 2017. Those operated on before July 2010 were ex-

cluded from the evaluation due to differences in surgical technique (different types of anastomoses, different lengths of loops were used). Early complications were considered dumping syndrome, anastomosis ulcer, gastroesophageal reflux.

The total length of the alimentary and biliary loops was 240 cm in the RYGB group, and the length of the bypass anastomosis in the OAGB group was 254.81±35.48 cm (120–350 cm). The preoperative body mass index was significantly lower in the RYGB group (44.53±3.65 kg/m^2) than in the OAGB group (53.75±6.51 kg/m^2). Also, patients in the OAGB group had significantly higher rates of arterial hypertension, severe coronary heart disease and obstructive sleep apnea. Patients in the RYGB group were significantly more likely to suffer from osteoarthritis. Operational time, of course, was significantly shorter in the OAGB group compared to RYGB (80.28 min vs. 103.36 min; $p<0.0001$) [16].

Intraoperative complications were (4.63% in the OAGB group and 8.68% in the RYGB group), early revision relaparoscopy (0.62% and 0.69%, respectively), leakage (1.23% and 1.74%, respectively), anastomosis ulcers (3.23% and 5.59%, respectively), gastroesophageal reflux (3.55% and 0.70%, respectively), and insufficient weight loss over 3 years was (4.19% and 5.59%, respectively, for the OAGB and RYGB groups). TWL in the OAGB group was 36.18 ± 9.18%; in the RYGB group - 33.8 ± 8.75%. Remission of comorbidity after 3 years was comparable in both groups. Complications such as anastomosis stenosis (1.94% in the OAGB group vs. 14.69% in the RYGB group) and dumping syndrome (3.55% vs. 6.64%, respectively) were less common in the OAGB group.

Thus, the authors conclude that the mean incidence of intraoperative complications (conversion to laparotomy, resolution of failure after a positive methylene blue test, correction of twisted anastomosis, difficult hemostasis) and early postoperative complications such as relaparoscopy, wound infection, anastomosis failure, and postoperative bleeding differed slightly between the two groups. Mortality in the first 30 days after surgery was zero in both groups. The average length of hospital stay was 4 days, and was the same in both groups. The rates of anastomosis ulcer and gastroesophageal reflux did not differ significantly between the two groups [17].

An additional comparison between OAGB≤250 cm, OAGB>250 cm, RYGB with an 80 cm alimentary loop/160 cm biliary loop, and RYGB with a 160 cm alimentary loop/80 cm bilary loop indicated a statistically significant difference between the four subgroups, but only in an unadjusted analysis. These differences ceased to be statistically significant after accounting for additional potential risk factors.

This study is the second-largest single-center statistically correct comparison of RYGB and OAGB, in addition to the Lee et al. study.

The authors conclude that after more than 6 years of thorough study of both techniques, OAGB is considered by the authors to be a valuable and very important complementary component in bariatric surgery. This leads to the need for a personalized approach to bariatric patients in the future. OAGB turned out to be a comparatively effective primary metabolic surgical intervention, opening up additional prospects and opportunities. Researchers believe that large-scale and well-designed prospective randomized scientific trials are needed to more accurately and validly assess the efficacy of OAGB and RYGB [18].

In the United Kingdom, between 2012 and 2015, a group of authors conducted a retrospective study of the efficacy of OAGB and RYGB in super-obese patients, based on data from the surgical center's own registry of bariatric patients. The aim of the study was to compare the results of primary OAGB and RYGB in patients with a body mass index greater than 60 kg/m2. The criteria for the selection of patients were the presence of symptomatic gastroesophageal-reflux disease, hiatal hernia, reflux esophagitis, detected by preoperative endoscopic fibrogastroduodenoscopy. These criteria have been identified as relative contraindications for OAGB. Nevertheless, they did not become an absolute contraindication, and some technical aspects of performing surgical interventions also played a role. For example, some patients were initially scheduled to undergo RYGB, but after preoperative diagnosis and given possible technical difficulties in performing RYGB, these patients subsequently underwent OJGB. The authors formed two groups: OAGB – 19 people, and RYGB – 47 people. The two groups were comparable across all measures, except that OAGB patients had significantly higher baseline body mass index and weight scores. The average operational time in the RYGB group was 129.5 minutes, whereas in the OAGB group the average operational time was 92.9 minutes. The postoperative course in all patients in both groups was smooth. There was not a single fatal outcome, not a single case of anastomosis failure, or other serious postoperative complications. As for late complications, in the remote period, they were observed in 2 patients in the OAGB group, and in 6 patients in the

RYGB group. Two patients in the OAGB group underwent relaparoscopy for persistent symptoms of gastroesophageal-reflux disease, which resulted in conversion to RYGB [19].

One (2.1%) patient from the RYGB group developed an anastomosis ulcer, which was resolved conservatively. Three patients from the RYGB group needed to consult an endocrinologist for significant hypoglycemia, and one patient suffered from chronic abdominal pain for no apparent reason. This patient may need diagnostic laparoscopy in the near future. One patient in the RYGB group was taking high-dose proton pump inhibitors for symptoms of gastroesophageal reflux disease, but this patient had suffered from gastroesophageal reflux disease prior to surgery. Two patients from the OAGB group required postoperative endoscopic fibrogastroduodenoscopy and two more required computed tomography for undifferentiated short-term abdominal pain, 5 endoscopic fibrogastroduodenoscopy and 5 computed tomography scans were performed in the RYGB group [20].

In terms of weight loss, patients in the OAGB group achieved a significantly higher EWL of 70.4% after 2 years compared to 57.1% in the RYGB group. TWL at 2 years was 44.4% in the OAGB group and 33.4% in the RYGB group, respectively. In other time frames, the authors also noticed a trend towards superior weight loss in patients in the OAGB group.

The data on remission of comorbidities are as follows: there were 7 (36.8%) patients with type 2 diabetes mellitus in the OAGB group at baseline compared to 22 (46.8%) patients in the RYGB group. There were 8 patients with hypertension (42.1%) in the OAGB group, and 24 people (51.1%) in the RYGB group. No statistically significant difference in the prevalence of these comorbidities was found between the groups. After surgery, 3 (42.9%) patients with type 2 diabetes mellitus in the OAGB group achieved remission compared to 13 patients (59.1%) in the RYGB group. Remission of hypertension in the OAGB group was observed in 2 patients (25%) compared to 11 (45.8%) in the RYGB group. The authors also did not find a statistically significant difference in the rate of remission of type 2 diabetes mellitus and/or hypertension between the groups.

The researchers did not observe any serious nutritional problems in the postoperative period in patients in the OAGB group. This may be partly because they used a constant anastomosis length of 200 cm in all patients, even though some authors recommend applying an anastomosis at a distance of more than 200 cm from the Treitz ligament in severe patients [21].

The reasons for the excellent weight loss results in the OAGB group are currently unclear. This may be because OAGB creates a workaround that bypasses the entire small intestine; with RYGB, however, a shorter bypass loop is created. Although even with RYGB, even though the loop length is shorter than with OAGB, it still leads to excellent weight loss. The authors note that future studies need to explore these questions in more detail. There are several drawbacks to this study. Apart from a small sample and a retrospective data collection mechanism, this study does not assess patients' quality of life. The data on comorbidity resolution do not have a statistically significant difference in both groups and therefore do not make sense to evaluate them carefully. Despite some shortcomings, the study is one of the few in the world that directly compares the most common bariatric surgeries in the world for super-obese patients. OAGB showed superior weight loss at 24 months follow-up compared to RYGB in super-obese patients (body mass index 60 kg/m2). Of course, these results need to be confirmed by larger, randomized trials with larger sample sizes to better compare short-term and long-term outcomes in patients with OAGB and RYGB [22].

CONCLUSION

Thus, summarizing the results of the comparative studies of the efficacy and safety of RYGB and OAGB described above, we can generalize that both methods demonstrate comparative effectiveness in the treatment of excess weight and the correction of concomitant diseases. Early postoperative complications also had comparable rates. However, as for the study of late complications, such as nutritional deficiency, malabsorption, the development of reflux-associated complications, as well as ulcers of the gastroenteroanastomosis, there is no unequivocal opinion in the world literature on this matter.

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Turli bariatrik operatsiyalar samaradorligining solishtirma tahlili

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ABSTRAKT

Yigirma birinchi asrda semizlik epidemiyaga aylanib bormoqda va rivojlangan va rivojlanayotgan mamlakatlarda ham jiddiy xavotirga sabab bo'lmoqda. Morbid semizlik bir vaqtning o'zida bir nechta tana tizimlariga salbiy ta'sir ko'rsatadi va uning qo'shilgan asoratlari bilan birgalikda kutilgan sifatning umumiy pasayishiga olib keladi. Dunyo bo'ylab bir milliardga yaqin odam ortiqcha vaznga ega. Yaponiya va Xitoydan tashqari sanoat rivojlangan mamlakatlarda aholining qariyb yarmi ortiqcha vaznga ega. Dunyoning ko'pgina mamlakatlarida so'nggi 10 yil ichida semizlik bilan kasallanish o'rtacha 2 baravar oshdi. Bolalar o‘rtasida semizlik barqaror o‘sib bormoqda. Mustaqil Davlatlar Hamdo'stligi mamlakatlarida semizlik va ortiqcha vaznning tarqalishi hozirda qariyb 50% ni tashkil etadi. JSST ekspertlarining fikriga ko'ra, 2050 yilga kelib dunyoning iqtisodiy jihatdan rivojlangan mamlakatlarining butun aholisi ma'lum darajada semizlikka ega bo'ladi. Shuning uchun 1997 yilda JSST semizlikni yigirma birinchi asrning global epidemiyasi deb tan oldi. Ushbu ko'rib chiqish maqolasi semiz bemorlarda bariatrik operatsiyaning samaradorligi xususiyatlariga bag'ishlangan.

Kalit so'zlar: morbid semizlik, 2-tip qandli diabet, bariatrik operatsiya

Сравнительный анализ эффективности различных бариатрических операций

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АБСТРАКТ

Проблема ожирения в XXI веке принимает масштабы эпидемии и является весомой причиной для того, чтобы вызывать серьезную озабоченность как в развитых, так и в развивающихся странах. Морбидное ожирение одновременно негативно влияет на несколько систем организма, и вместе с сопутствующими ему осложнениями приводит к общему снижению ожидаемого качества. Во всем мире насчитывается около миллиарда человек, страдающих избыточным весом. Избыточную массу тела в индустриально развитых государствах, кроме Японии и Китая, имеет около половины населения. Во многих странах мира за последние 10 лет заболеваемость ожирением увеличилась в среднем в 2 раза. Отмечается неуклонный рост ожирения среди детей. В странах Союза Независимых Государств на данный момент распространенность ожирения и избыточной массы тела составляет порядка 50%. Эксперты ВОЗ полагают, что к 2050 г. – все население экономически развитых стран мира будет иметь ту или иную степень ожирения. Именно поэтому в 1997 году ВОЗ признала ожирение глобальной эпидемией XXI века. Данная обзорная статья посвящена особенностям эффективности бариатрических операций у больных с ожирением.

Ключевые слова: морбидное ожирение, сахарный диабет 2 типа, бариатрическая хирургия