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# BARIATRIC SURGERY MORTALITY RISK SCORE

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**Summary.** Thus, the conducted analysis of the informativeness of these scales showed their low prognostic significance in relation to predicting the development of complications of bariatric surgeries. The low efficiency of the currently available scales for predicting the risks of complications in bariatric surgeries was the basis for developing an original integral scale that takes into account only prognostic reliable factors for each of the analyzed types of complications.

**Key words:** gastric bypass, longitudinal resection of the stomach in combination with small intestinal bypass.

**Relevance.** In recent decades, surgical methods for treating severe forms of obesity have become widely used worldwide, and there is an obvious trend both to an increase in the number of operations performed and to an expansion in the number of countries where bariatric surgery is becoming increasingly widespread. The main goal of surgical treatment of obesity is to influence the course of diseases associated with it by significantly reducing BW, since only achieving optimal glycemic control and target parameters of lipid metabolism can prevent the development and progression of complications of T2DM, including CVD [1,2.3,4,5,6,7,8].

The experience of using bariatric surgeries in patients with obesity combined with metabolic disorders and diseases has shown significant potential of surgery in achieving compensation of type 2 diabetes mellitus that developed against the background of obesity. In 1978, Buchwald H. and Varco R. formulated the concept of "metabolic" surgery [34]. Some of the first works in this area were the publications of Pories W. et al. [1, 2, 3], which discussed the possibility of stable compensation of type 2 diabetes mellitus in patients with obesity after gastric bypass surgery (GBS). Later, other authors, including Russian ones, also demonstrated an improvement in the course of type 2 diabetes mellitus after bariatric surgeries, the original purpose of which was to reduce BW [14, 17, 32]. These and other studies, as well as the accumulated international and Russian experience of using bariatric surgeries in patients with obesity and associated T2DM, as well as numerous publications [13, 17, 18, 32,33] on the positive impact of bariatric surgeries on the course of T2DM, determine the need for a thorough study of the mechanisms underlying the improvement of metabolic control in obese patients with various carbohydrate metabolism disorders, primarily with T2DM, after bariatric treatment. It turned out that in most patients with obesity and T2DM or another carbohydrate metabolism disorder, normalization of glycemia occurs relatively quickly after bariatric surgery - long before clinically significant loss of BW. After bypass operations (BS, biliopancreatic

diversion (BP)), normoglycemia, according to the literature, was restored in 84% - 98% of patients, and after restrictive ones - in 48% - 72% of patients [1,15,16,17,18,19].

A possible explanation for this is the phenomenon of the "incretin effect" discovered in the 60s of the last century [1,20,21,22,23,24,35] - a more pronounced stimulation of insulin secretion after oral administration of glucose compared to its intravenous infusion, leading to an identical increase in glycemia [1, 2].

Incretins belong to a family of hormones produced in the gastrointestinal tract (GIT) and stimulating insulin secretion in response to food intake. Up to 70% of postprandial insulin secretion in healthy individuals is due directly to the incretin effect, which is reduced in patients with T2DM and impaired glucose tolerance (IGT) [1, 2, 3,25,26,27,28,29].

Currently, the effectiveness of incretin-targeted therapy for T2DM has been confirmed in clinical practice. Of particular interest is the development in recent years of a new direction in the treatment of T2DM in obese patients, which is based on the use of the so-called "incretin effect" of bypass bariatric surgeries due to numerous clinical studies in the field of metabolic surgery [1,2,9,10,11,12,13,14,34]. However, the mechanisms of the positive effect of bariatric surgeries on the parameters of metabolic control in patients with obesity and T2DM have not yet been fully studied, and the potential of their incretin-targeted action has not been revealed. In addition, the effectiveness of bariatric surgeries in reducing MT and the duration of its maintenance, as well as the stability of positive metabolic effects in the long term, have not been tracked. All this indicates the relevance of studying the effect of bariatric surgeries on glucose, lipid metabolism and incretin production in patients with obesity and T2DM.

**The aim of the study**: Improving the results of surgical treatment of patients with morbid obesity.

**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 2024. The patients' age ranged from 31 to 59 years. Among them, 18 were men, 41 were women.

**Results and discussion.** In accordance with the study design, taking into account the inclusion criteria in the groups, the results of examination and surgical treatment of obesity in 59 patients who underwent bariatric surgery in the period from 2021 to 2024 were systematized and retrospectively analyzed. Complications in patients of the retrospective group occurred in 5 cases (8.4%). Intra-abdominal bleeding was noted in four cases (2.4%). Failure of the hardware line of gastric sutures occurred in one observation (1.7%). Thromboembolism of the pulmonary

artery branches was noted in two patients (1.2%), including one (0.6%) with a fatal outcome. For possible prediction of the described complications of bariatric surgeries in patients with morbid obesity, the task was to analyze the reliability of various scales for assessing the risk of negative consequences of surgical interventions used in clinical practice. Of the few similar tools available today that are applicable in this area of practical medicine are the “Bariatric Surgery Mortality Risk Assessment Scale”, the “Charlson Comorbidity Index”, the assessment of the functional status of patients in metabolic equivalents (MET), the “Joseph A. Caprini Venous Thromboembolic Complications Risk Assessment Scale”, and the “HAS-BLED Scale”. To assess the risk of surgical treatment of morbid obesity in patients of the retrospective group, a more specific "Bariatric Surgery Mortality Risk Score" (OS-MRS) was used.

Depending on the obtained sum of points on the "Bariatric Surgery Mortality Risk Score", patients of the retrospective study group were distributed as follows: 0-1 point - low risk - in 11 (22.4%) patients, 2-3 points - average risk in 36 (73.5%) patients, 4-5 points - high risk in 2 (4.1%) patients. The development of complications was observed in all three risk groups, the highest number of complications - 4 patients (11.2%) and one fatal outcome were in the group of average-risk patients with a sum of points of 2-3 on the "OS-MRS" scale.

Thus, the "Bariatric Surgery Mortality Risk Score" turned out to be was of little informative value (p=0.244, Mann-Whitney test) for predicting the outcome. Then, the Charlson Comorbidity Index was used to assess the risk of complications during bariatric surgery in patients of the retrospective group.

Based on the results of the calculation of the "Charlson Comorbidity Index", the prognosis of patient mortality is determined, which in the absence of polymorbidity is 12%, with 1-2 points - 26%, with 3-4 points - 52%, and with a sum of more than 5 points - 85%. When calculating this index, points for concomitant diseases and age were summed up, as a result, patients were distributed as follows: 0 points - 4 (2%) patients, 1-2 points - 24 (48%) patients, 3-4 points - 16 (32%) patients, 5 and more points - 5 (12%) patients. When analyzing the obtained results, it was revealed that a fatal outcome was observed only in 1 case (6.3%) in a patient with a score of 4, among patients with a score of 5 or more, there were no fatal outcomes. The development of such a complication as intra-abdominal bleeding was observed in 3 (12.5%) patients with a score of 1-2 and in 1 (20%) patient with a score of 5. PE in the early postoperative period developed in two patients with a score of 3 and 4, in one of these cases with the development of a fatal outcome. Failure of the stapler line of sutures of the gastric stump developed in 1 case (20%) in a patient with a score of 5. Thus, the Charlson Comorbidity Index has low prognostic significance (p = 0.202, Mann-Whitney criterion) for patients with morbid obesity, since this index is not specific and does not take into account the body mass index, the

level of physical activity of the patient, therefore it cannot be used as the only tool for predicting the outcome of bariatric surgery. Further stratification of the risk of developing postoperative complications and fatal outcome of bariatric surgeries was carried out based on the assessment of the functional status of patients in "metabolic equivalents" (MET). During the analysis of the treatment results of patients in the retrospective group, it turned out that with a low functional status, which corresponded to ≤4 MET, the incidence of complications was higher and amounted to 33.4%, compared with 6.8% with an average functional status. Among patients with a good functional status, there were no complications or fatal outcomes. Consequently, the functional status has a high prognostic value for assessing the risk of developing postoperative complications and fatal outcome of bariatric interventions, but assessing this factor alone is not enough due to the pronounced comorbidity of patients. Another important issue in the surgical treatment of morbid obesity is predicting the risk of venous thromboembolic complications. The Joseph A. Caprini Venous Thromboembolic Complications Risk Assessment Scale, which is widely used in clinical practice, was applied to the patients in the retrospective group of this study. Thus, the Joseph A. Caprini Venous Thromboembolic Complications Risk Assessment Scale has a high prognostic value, while the method takes into account the largest number of factors, including age, patient body mass index, concomitant pathologies, and patient physical activity. However, this scale can only predict venous thromboembolic complications, and therefore additional scales and indices are required to assess the risk of developing other complications of bariatric surgeries.

**Conclusions:** Thus, the conducted analysis of the informativeness of these scales showed their low prognostic significance in relation to predicting the development of complications of bariatric surgeries. The low efficiency of the currently available scales for predicting the risks of complications in bariatric surgeries was the basis for developing an original integral scale that takes into account only prognostic reliable factors for each of the analyzed types of complications.

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