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EVALUATION OF THE EFFECTIVENESS OF SURGICAL CORRECTION IN PATIENTS WITH TYPE II DIABETES MELLITUS

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ABSTRACT

Diabetes mellitus is now so common in the population that it is beginning to displace malnutrition and infectious diseases as the most significant factor in poor quality of life. Despite the availability of various methods for treating diabetes mellitus, it is not always possible to achieve glycemic stabilization, which worsens the prognosis of the disease. The modern approach to treating diabetes mellitus in the absence of effect from drug therapy includes surgical methods such as bariatric surgery. This direction has become especially relevant in many foreign countries due to its effectiveness. In our republic, we are also involved in the fight against diabetes using various types of bariatric surgery. These operations are carried out in many clinics in our Republic.

INTRODUCTION

Diabetes mellitus type II (DMII) is a chronic disease that is characterized by multiple organ lesions and the formation of complications such as diabetic neuropathy, retinopathy, nephropathy, etc. The incidence of type II diabetes throughout the world has become an epidemic. A significant increase in mortality, directly or indirectly associated with diabetes or its complications, dictates the relevance of this problem. The main causes of mortality in type II diabetes are cardiovascular diseases, acute cerebrovascular accident, myocardial infarction and gangrene of the lower extremities, the incidence of which is currently 42.3%

As the results of studies conducted by Forgacs I. show, damage to the digestive tract in type II diabetes is very severe, ranging from the oral cavity and esophagus to the large intestine and anorectal region. Along with this, many scientists believe that intestinal microbiota and its active metabolites are actively involved in the synthesis of hormones by enteroendocrine cells of the intestine. Violation of the secretion of these hormones is one of the key links in the pathogenesis of the development of endocrine diseases such as diabetes and obesity. It should be noted that there is also another hormone (PYY - hormone) produced by L cells in the ileum and colon. The main functions of PYY include slowing down gastric emptying and reducing the secretion of gastric and intestinal juices. In addition, PYY activates the satiety center and inhibits the hunger center in the hypothalamus. The effect of this hormone manifests itself in the form of a decrease in hunger, confirming its anorexigenic property. Along with this, PYY also inhibits insulin secretion by acting on a specific receptor on the beta cells of the pancreas - the Y1 receptor. There is evidence that PYY reduces tissue insulin resistance. This situation explains the urgent need for a new paradigm of glycemic control, the meaning of which should be early glycemic control and reducing the progression of risk factors and the development of complications, respectively.

Thus, it should be noted that the study of the nature of clinical and morphological changes in the gastrointestinal tract in type II diabetes mellitus has been little studied. Based on this, the studies we are planning will create conditions for study and will allow morphological substantiation of changes in the gastrointestinal tract in the development of a differentiated approach to mini-gastrobypass surgery.

Materials and methods.

The study was conducted in the city of Tashkent No. 1 clinical city hospital and private clinic Invivo, from 2021 to 2024. The study included 96 patients with varying degrees of obesity, of which 57

(58%) were patients with type 2 diabetes, 25 (24%) with impaired glucose tolerance and 19 (18%) with normoglycemia. Of these, 70 (67%) were women, 26 (33%) were men. There were 2 times more women who sought surgical treatment than men (Table 1.1).

Table 1.1

Proportion of patients depending on gender, abs. (%)

Total number of patients	96
Women	70 (67)
Men	26 (33)

The average age of the patients was 45.23±0.71 years, the average body weight was 95.2±2.62 kg, the average BMI was 41.7±0.78 kg/m^2 (Table 1.2).

Table 1.2

Indicators of age, body weight and BMI of those examined

average age	body weight	BMI
45,23±0,71	95,2±2,62	41,7±0,78

When analyzing requests for surgical treatment depending on age, it was revealed that among women, the largest number of patients were in the age range of 40-44.9 years, men more often applied at the age of 45-49.9 years. Request for surgical intervention in patients aged 18-39.9 years was associated with high BMI, the vast majority of them were female (Table 1.3).

Table 1.3

Obese patients depending on age and BMI

Index	Average age		
	18-39,9	40-44,9	45-49,9
Men/ Women	2/9	8/35	12/27
BMI, kg/m^2	44,7±3,82*	40,76±0,62	35,54±0,75*

Note: a statistically significant difference is determined (p=0.015), no differences were found in the other groups.

We dynamically monitored BMI before and 1 year after various types of bariatric surgery. Thus, in the group of patients who underwent mini-gastric bypass, the average body weight initially was 112.02±3.42 kg, after 1 year there was a significant decrease in indicators to 64.31±1.05 kg (p<0.01), then there is a decrease in body weight by 42%.

In the group of patients who underwent sleeve resection, the initial body weight was 108.09±1.89 kg; 1 year after surgery, this figure significantly decreased by 38% to 80.21±1.09 (p<0. 01) (Table 1.4).

Table 1.4

BMI indicators at baseline and 1 year after surgery, (kg)

Observation period of	mini-gastric bypass, n=57	sleeve resections, n=39
Originally	112.02±3.42	108.09±1.89
After 1 year	64.31±1.05*	80.21±1.09 *
% reduction	42	38

Note: within groups there is a statistical difference between the indicators at baseline and after 1 year, p<0.01.

Results and discussion.

With various methods of treating diabetes mellitus, a significant decrease in body weight, as well as BMI, was observed both after sleeve resection and after mini-gastric bypass. Thus, before mini-gastric bypass, the average BMI was 38.60±0.63; after 1 year, this indicator significantly decreased by 38% to 25.32±0.14 (p<0.001). In the sleeve resection group, BMI before surgery averaged 41.74±1.21, after 1 year it significantly decreased by 39%, amounting to 25.12±0.42 (p<0.001) (Table 1.5).

Table 1.5

BMI at baseline and 1 year after surgery, (kg/m2)

Observation period of	mini-gastric bypass, n=57	sleeve resections, n=39
Originally	38,60±0,63	41.74±1.21
After 1 year	25.32±0.14*	25.12±0.42 *
% reduction	38	39

Note: within groups there is a statistical difference between the indicators at baseline and after 1 year, p<0.001.

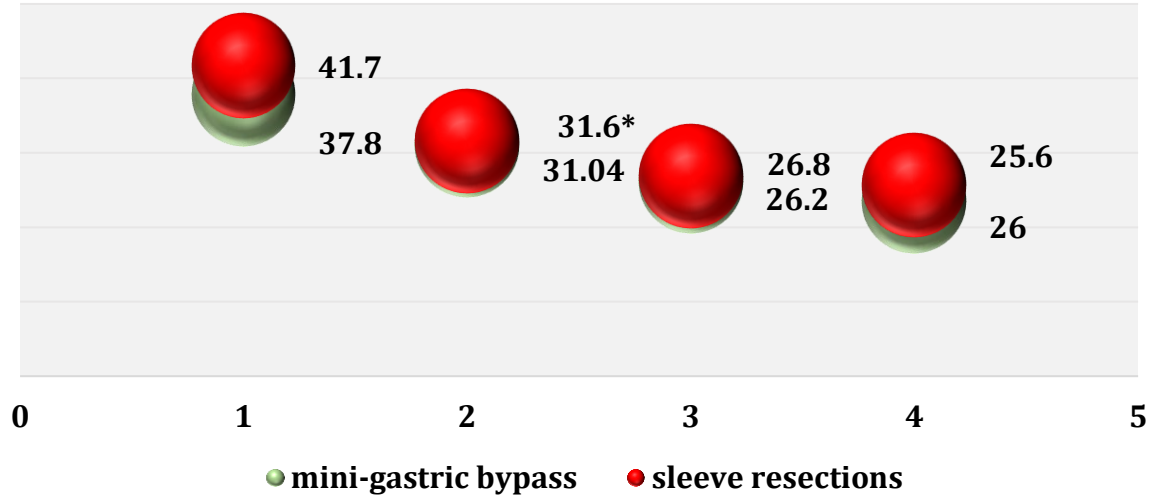
An assessment of body weight loss during various types of surgical interventions (sleeve-resection, gastric bypass) after 3-6-12 months (Table 1.6) showed that with gastric bypass the best results can be achieved in the first 6 months after surgical treatment, by the end of the first year the effect of this surgical intervention is sharply reduced. With gastric bypass, the rate of weight loss is not so significant, but the trend continues 1 year after surgery.

Table 1.6

Dynamics of body weight loss depending on the type of surgical intervention, %

Observation period of month	mini-gastric bypass, n=57	sleeve resections, n=39
In 3	31	24
In 6	19	11
In 12	7	4

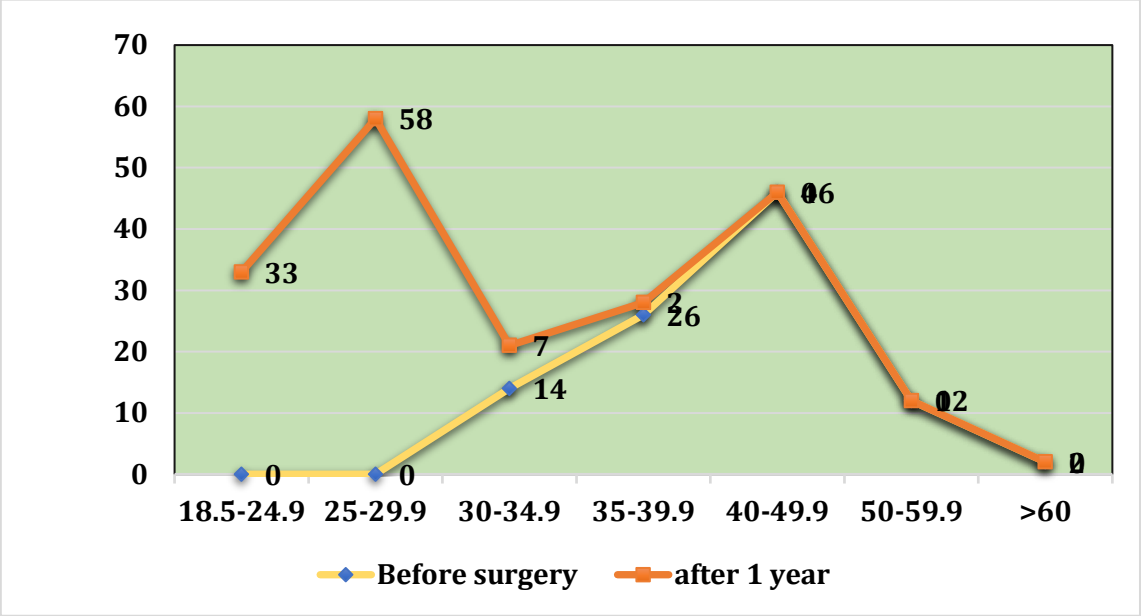
When studying, the dynamics of changes in BMI in the gastric bypass group in the first 3 months after surgery were more pronounced than in the sleeve resection group. Subsequently, the trend towards a decrease in BMI in the sleeve-resection group persisted until the first year of observation, which was not observed in the gastric bypass group (Fig. 1.1).



Note: within groups there is a statistical difference between the indicators at baseline and after 1 year, p<0.001.

Rice. 1.1. Dynamics of changes in BMI depending on the type of surgical intervention, (kg/m2)

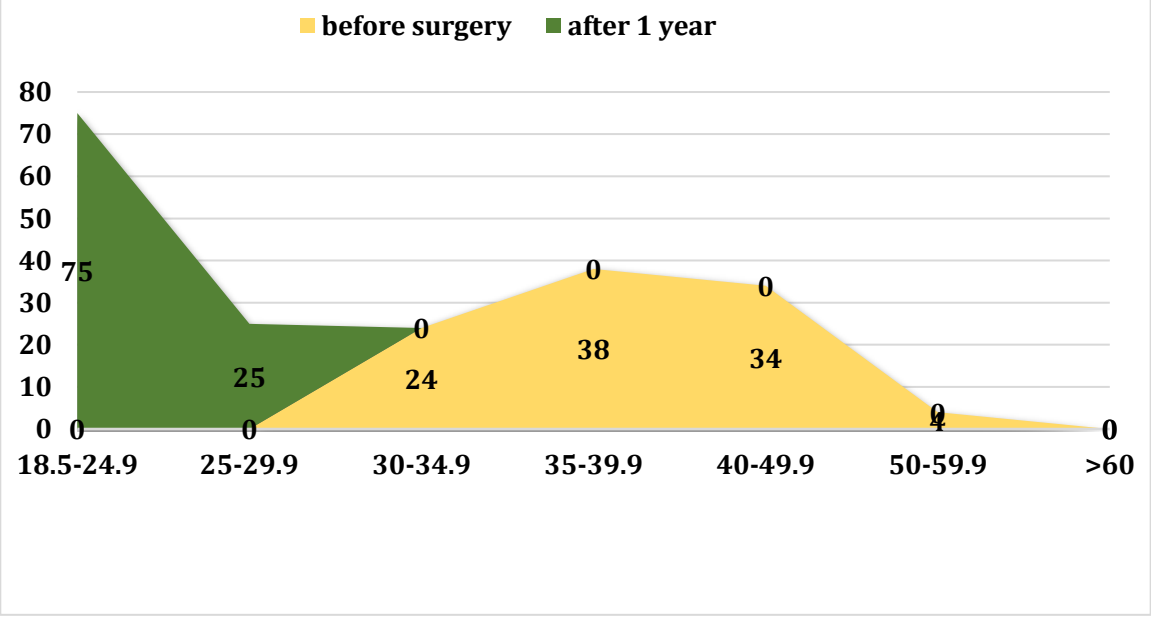
The outcome of mini-gastric bypass is presented in Figure 1.2, where, depending on the initial BMI indicators, the result is shown 1 year after this type of surgery. Before surgery, in the mini-gastric bypass group, 4 patients were with stage I obesity, 14 with stage II, 23 with a BMI of 40-49.9, 5 with a BMI of 50-59.9 and 1 with a BMI of more than 16 .



Rice. 1.2. Distribution of patients by BMI before and 1 year after sleeve resection, %

As can be seen from Figure 1.2, 68% of patients after mini-gastrobypass achieved overweight, 34% - normal body weight or normal BMI. Within 1 year, 3% of patients achieved BMI grade I, 8% achieved grade II obesity.

In the sleeve resection group, 18 people had class I obesity before surgery, 25 had class II obesity, 23 had a BMI of 40-49.9, and 3 had a BMI of 50-59.9. 1 year after gastric bypass, there were more people in the group with normal body weight, and there were no obese patients after this type of surgical intervention. (Fig. 1.3).



Rice. 1.3. Distribution of patients by BMI before and 1 year after gastric bypass surgery, %

In the gastric bypass group, the initial waist circumference in men was 102.78±1.04 cm, in women – 115.82±4.23 cm. 1 year after surgery, this figure significantly decreased to 65.41±0.91 and 89.12±1.86 cm ($p<0.05$). In the mini-gastrobypass group, waist size in women was initially 108.78±1.67 cm, in men 109.00±4.66 cm, 1 year after surgery there was a significant decrease in this indicator, respectively, to 72.15±0 .76 and 84.00±1.67 cm ($p<0.001$). After 1 year of observation after the mini-gastrobypass, the waist volume in women decreased by 31 cm, after sleeve resection - by 21 cm. The largest percentage reduction in waist volume was observed in women in the first three months after sleeve resection, then the dynamics of waist volume loss in two groups of both men and women were leveled out.

CONCLUSION

Thus, after sleeve resection and mini-gastric bypass in patients with type 2 diabetes and prediabetic condition, a significant decrease in BMI was observed. The best results in reducing BMI during sleeve resection can be achieved in the first 6 months after surgical treatment, with a subsequent absence of a trend after a year. With mini-gastric bypass, the trend towards a decrease in BMI persisted throughout the one-year follow-up.

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