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CORRECTIVE EFFECT OF LONGITUDINAL RESECTION OF THE STOMACH ON CONCOMIENTED DISEASES ASSOCIATED WITH MORBID OBESITY

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ABSTRACT

Studying of the corrective effect of longitudinal gastrectomy on concomitant diseases in patients with morbid obesity. This scientific work is based on the results of a comprehensive examination and treatment of 187 patients with MO who were treated in the our clinical bases from 2021 to 2023. The analysis of comorbidities in the compared groups showed that one or more comorbidities were detected in 52% of the control group, 57.5% of the main group. The main part of these patients was made up of patients with obesity of the III degree. In particular, if in the control and main groups, arterial hypertension was detected in 50 and 59.3% of patients before the surgical procedure, then 3 months after the surgical procedure, an increase in blood pressure was observed in 45.4 and 37% of the patients. After 6 months, this indicator was found in 27.3 and 14.8% of patients, after 12 months - in the control group, it was found in 9.1% of patients, while in the main group, no increase in blood pressure was observed. After surgery, the clinical signs of arterial hypertension and arthralgia in patients with morbid obesity gradually disappeared with the elimination of obesity. In conclusion, these clinical signs were caused by obesity, and its elimination led to the disappearance of these clinical signs.

Key words: obstructive sleep apnea; morbid obesity; bariatric surgery; laparoscopic longitudinal gastrectomy.

INTRODUCTION

Obesity is a chronic metabolic disease, manifested by excessive development of adipose tissue, progressing in its natural course, having a certain range of

complications and having a high probability of relapse after completion of treatment [1]. The disease depends on the interaction of several factors, such as genetic, endocrine, metabolic, environmental (social and cultural), behavioral and psychological components [13]. Recently, obesity has become one of the most important public health problems worldwide in all age groups [11]. Body mass index (BMI) in men and women increased by 0.4-0.5 kg/m^2 over the decade [12].

Obesity is a worldwide health problem that affects children, adolescents and adults and is accompanied by comorbidities such as hypertension, dyslipidemia, type 2 diabetes, cancer, osteoarthritis and sleep apnea [4]. Obesity, according to expert estimates, leads to a 4-fold increase in the risk of cardiovascular mortality and 2-fold increase in mortality due to cancer [7,8].

Long-term results of conservative treatment of obesity remain unsatisfactory, and today the most effective and reliable methods of treating morbid obesity are surgical, both in terms of the achieved reduction in body weight and in the improvement of metabolic parameters [3,2].

Bariatric surgery is the only effective treatment for morbid obesity, resulting in sustained weight loss and improvement in comorbidities [8]. An analysis of treatment methods for morbid obesity shows that bariatric surgery is currently the only effective option for achieving long-term stable weight loss for this group of patients [20].

Bariatric surgery is indicated for patients with a BMI >40 kg/m^2 without comorbidities and for whom bariatric surgery would not pose an undue risk if they are suitable for the bariatric procedure [9]. Patients with a BMI >35 kg/m^2 and 1 or more severe obesity-related comorbidities may also be offered a bariatric procedure [9,14].

Laparoscopic longitudinal gastrectomy is an important bariatric operation used in the treatment of patients with morbid obesity [19]. Clinical studies have shown that in addition to effectively reducing body weight in obese patients, LLG can also improve body fat distribution and reduce hyperuricemia [5].

Although a healthy lifestyle seems to be the ideal way to lose weight, surgical treatment continues to be the most effective and scientifically successful method for people with excess fat tissue (class II or III). Gastric bypass, sleeve gastrectomy, adjustable gastric banding and biliopancreatic diversion with duodenal switch are the most popular and common bariatric surgery procedures[17].

Purpose of the study: assessment and improvement of the corrective effect of longitudinal gastrectomy on concomitant diseases in patients with morbid obesity.

Materials and methods: This scientific work is based on the results of examination and treatment of 187 patients with morbid obesity (MO), who were treated at the clinical bases of the Department of Surgical Diseases of Family Medicine of the Tashkent Medical Academy from 2021 to 2023. Depending on the treatment, the patients were conditionally divided into 2 groups: the 1st (control group) included 92 patients who underwent the traditional method of laparoscopic longitudinal gastrectomy ; in group 2 (main group) there were 95 patients who underwent our proposed modified laparoscopic longitudinal gastrectomy [10,18]. When the distribution of the patients of our research group by age was studied, it was found that the main group of patients are young and middle-aged women. The average age of patients was 36±0.92 years in the control group, 34±0.7 years in the main group. 81.8% of patients aged 18 to 44, 15.5% from 45 to 59 years, 2.7% from 60 to 74 years. The analysis shows that the patients who underwent surgery are mostly under 45 years old, which is considered to be the working age(Fig.1).

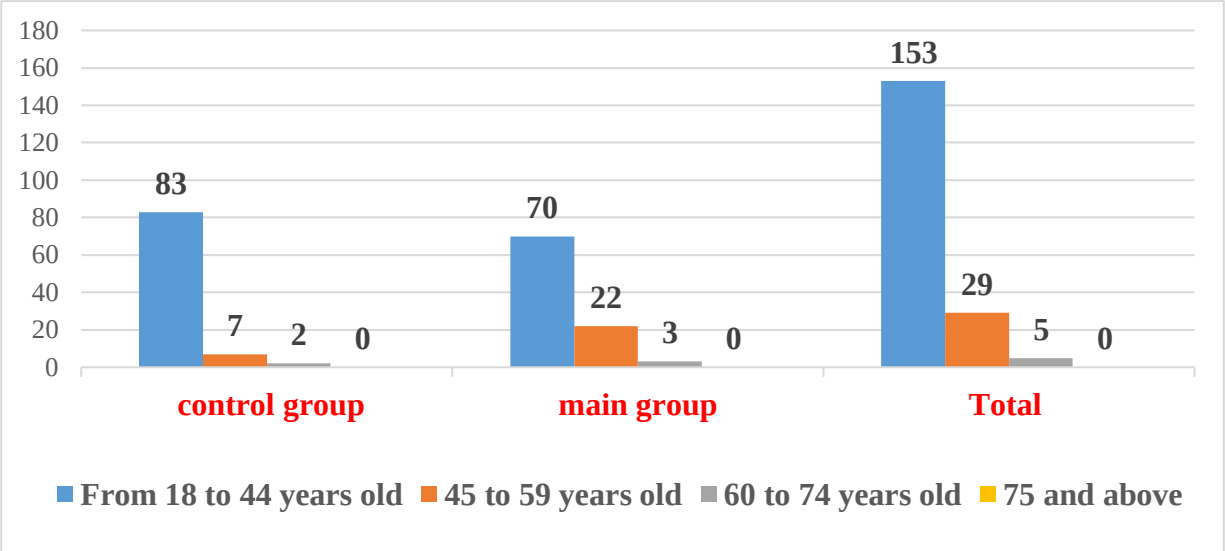

Fig.1. Distribution of patients by age.

When studying the distribution of patients by gender, there were 85 (92.4%) women in the control group, 7 (7.6%) men in the main group, 75 (79%) women and 20 (21%) men in the main group.

Analysis of the preoperative weight of morbidly obese patients showed that the minimum weight in the control group was 85 kg and the maximum weight was 186 kg, in the main group this indicator was 85 kg and 209 kg, and the average weight in the comparison groups was 115±1.0 kg, respectively.

The data analysis shows that in patients with morbid obesity, when their body mass index (BMI) was studied, it was noted that mainly III-degree (%) and II-degree (%) obesity applied for bariatric practice (Fig.2).

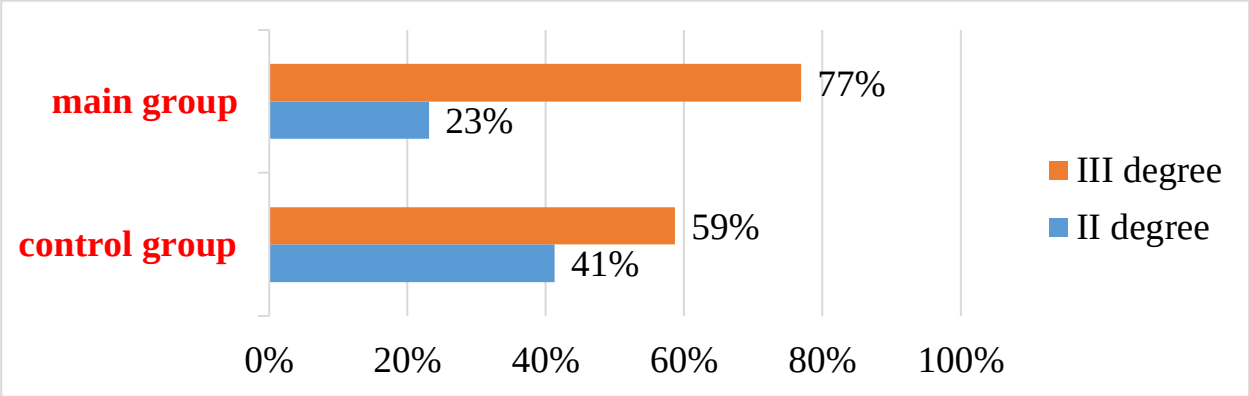

Fig.2. Distribution of patients with MO in comparison groups by level of obesity (WHO, 1997)

As we mentioned above, morbid obesity is accompanied by co-morbidities. They mainly include arterial hypertension, ischemic heart disease, osteoarthrosis (arthralgias) and reflux esophagitis. Of course, they can influence the course of morbid obesity, biochemical and hemostasiological indicators, and curative surgery. Therefore, our next task was to study the effect of comorbidities observed in morbid obesity. To do this, we divided the patients from the control and main groups into subgroups with comorbidities and those without.

Only 22 (24.1%) of the 92 patients in the control group did not have the above-mentioned comorbidities, and the remaining 70 (75.9%) patients had comorbidities (table1). 11 (32.3%) of patients in the group without accompanying diseases had 2nd degree obesity, 6 (10.3%) had 3rd degree obesity. 23 (67.7%) of the remaining 70 patients with comorbidities of the control group had the 2nd degree of obesity, and 52 (89.7%) had the 3rd degree of obesity.

Table 1.

Distribution of patients in the control and main groups according to the presence of comorbidities and degree of obesity

Groups	Total		Obesity Rate			
			2nd		3rd	
	n	%	n	%	n	%
control group, n=92						
Comorbidities-no	22	24,1	11	32,3	6	10,3
Comorbidities-yes	70	75,9	23	67,7	52	89,7
main group, n=95						
Comorbidities-no	29	31,5	11	28,2	7	12,5
Comorbidities-yes	66	69,5	28	71,8	49	87,5

Similar changes were also observed in the main group. In particular, 29 (31.5%) of those who did not have comorbidities, 66 (69.5%) of those who had

comorbidities. In the group of patients without accompanying diseases, 2nd degree obesity was detected in 11 (28.2%) patients, while 3rd degree obesity was observed in 7 (12.5%) patients. In the group with concomitant diseases, 2nd degree obesity was detected in 28 (71.8%) patients, and 3rd degree obesity was detected in the remaining 49 (87.5%) patients.

The cited data showed that patients with concomitant diseases are characterized by a high incidence of severe morbid obesity.

Analyzing the frequency of comorbidities, we can see that genetic predisposition, arterial hypertension, reflux esophagitis, gallstone disease and chronic bronchitis are of high importance in aggravating morbid obesity. If we consider the effect of each of them, having a genetic predisposition activates the center of "ochopathy" in the brain, causing the leptin receptor to malfunction due to the mutation of the main genes that control the metabolism. In the development of arterial hypertension, not only the activation of the sympathetic-adrenal system and cortisol production, but also the development of hypercholesterolemia, the development of endothelin 1 production, and the development of systemic atherosclerosis are observed due to lipid metabolism disorders.

At the same time, hypercortisolemia observed in patients causes increased appetite and overeating. At the same time, we observed that in patients with morbid obesity, impaired lung ventilation leads to the development of interstitial pneumonia, respiratory failure, and the development of chronic hypoxia, which leads to the deterioration of the patient's condition. According to the opinion of many scientists, the above-mentioned accompanying diseases are not only caused by obesity, but also cause the origin and acceleration of obesity, that is, a "dangerous cycle" is formed. In our opinion, the combination of genetic predisposition, arterial hypertension, reflux esophagitis, gallstone disease and chronic bronchitis in morbid obesity can lead to disease progression.

In fact, we have proven its importance in the development of the main pathognomonic symptoms (nocturnal (sleep) apnea, decreased libido and depressive state) caused by obesity in patients with comorbidities. In particular, in patients with morbid obesity, if in the group without accompanying diseases, the incidence of apnea, decreased libido and depression is 11.5; It was observed in 7.7 and 11.5% of patients, 22.4 in the group with concomitant diseases; It was observed in 22.4 and 18.4% of cases, that is, it was 2-3 times higher. This leads to a decrease in the quality of life of patients, and the increase in depression causes the acceleration of bulimia.

In our study, arterial hypertension was detected in most (59.2%) patients with morbid obesity. According to the literature, the observation of arterial hypertension

in morbid obesity is associated with increased synthesis of the factor that activates the renin-angiotensin-aldosterone system in adipocytes [16, 15].

Arterial hypertension is characterized by "dangerous circulation" due to endothelial dysfunction and leads to various diseases in the vascular system (hemorrhagic and ischemic heart attacks and strokes). But arterial hypertension itself causes the development of atherosclerosis and obesity.

Our next task was to study the effect of co-occurrence of comorbidities on the results of surgery in morbid obesity. Re-examinations were carried out 1, 3, 6 and 12 months after surgery. Studies have shown that patients' TMI gradually decreases in all groups. As can be seen from the figure, primary TMI was slightly higher in the groups of patients with concomitant diseases in morbid obesity than in the control and main groups.

In the control group without comorbidities, after 6 months, TMI decreased from 36.63+1.24 to 27.91+0.77, and after 12 months, this indicator decreased to 26.22+0.66, i.e., it decreased 1.4 times. In the group with morbid obesity and concomitant diseases, TMI decreased from 42.87 + 1.04 to 31.73 + 0.82 by the 6th month, and to 28.43 + 0.59 after 1 year, that is, this decrease was 1.51 time. In the main group without comorbidities, after 6 months, TMI decreased from 41.71+1.49 to 30.86+1.08, and after 12 months, this indicator decreased to 27.91+0.72, i.e. 1.49 times. In the group with morbid obesity and concomitant diseases, TMI decreased from 43.56 + 0.99 to 31.53 + 0.63 by the 6th month, and to 28.34 + 0.48 after 1 year, that is, this decrease was 1.54 times .

Similar to these indicators, the degree of obesity after surgery also gradually decreased (table 2). For example, in the control group patients without comorbidities, 59% of patients had 3rd degree of obesity before surgery, and the remaining 41% of patients had 2nd degree of obesity. 3 months after surgery, obesity of the 3rd degree was not observed, obesity of the 2nd degree was detected in 28.6% of patients, obesity of the 1st degree was detected in 57.1%, and overweight in 1.4% of patients. After 1 year, overweight was found in 71.4% of patients in this group, and normal weight in 28.6% of patients. 31.8% of patients with morbid obesity had 3rd degree obesity and 2nd degree obesity was observed in the remaining 68.2% of patients. Three months after surgery, the number of patients with 3rd degree obesity remained unchanged (31.8%), 63.6% had 2nd degree obesity, and 4.5% had 1st degree obesity. In this group, 3rd degree obesity was not detected by 1 year, 2nd degree obesity - 9.1%, 1st degree obesity - 22.7%, overweight - 63.6%, and normal weight - 4.5% of patients. The obtained results indicate that the co-occurrence of concomitant diseases in morbid obesity reduces the effectiveness of surgery and slows down weight loss.

Table 2.

Dynamic changes in the degree of obesity after surgery in the control and main groups, n (%)

Obesity Rate	Control group , n=92, Comorbidities		Main group, n=95, Comorbidities	
	no, n=22	yes, n=70	no, n=29	yes, n=66
Initial obesity rate				
3rd level	2 (28,6%)	7 (31,8%)	8 (42,1%)	18 (66,7%)
2nd level	5 (71,4%)	15 (68,2%)	11 (57,9%)	9 (33,3%)
Obesity level after 1 month				
3rd level	0 (0,0%)	7 (31,8%)	6 (31,6%)	12 (44,4%)
2nd level	2 (28,6%)	14 (63,6%)	13 (68,4%)	15 (55,6%)
1st degree	4 (57,1%)	1 (4,5%)	0 (0,0%)	0 (0,0%)
Excess weight	1 (1,4%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
Obesity level after 3 months				
3rd level	0 (0,0%)	7 (31,8%)	4 (21,1%)	3 (11,1%)
2nd level	2 (28,6%)	14 (63,6%)	3 (15,8%)	11 (40,7%)
1st degree	4 (57,1)	1 (4,5%)	6 (31,6%)	13 (48,1%)
Excess weight	1 (1,4%)	0 (0,0%)	6 (31,6%)	0 (0,0%)
Obesity rate after 6 months				
3rd level	0 (0,0%)	2 (9,1%)	1 (5,3%)	0 (0,0%)
2nd level	0 (0,0%)	3 (13,6%)	3 (15,8%)	5 (18,5%)
1st degree	2 (28,6%)	7 (31,8%)	5 (26,3%)	12 (44,4%)
Excess weight	5 (71,4%)	10 (45,5%)	11 (57,9%)	10 (37,1%)
Obesity rate after 12 months				
3rd level	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
2nd level	0 (0,0%)	2 (9,1%)	0 (0,0%)	0 (0,0%)
1st degree	0 (0,0%)	5 (22,7%)	4 (21,1%)	10 (37,1%)
Excess weight	5 (71,4%)	14 (63,6%)	15 (78,9%)	17 (62,9%)
Normal weight	2 (28,6%)	1 (4,5%)	0 (0,0%)	0 (0,0%)

Analyzing the results of patients in the main group, 42.1% of patients had 3rd degree of obesity before surgery, and 57.9% of patients had 2nd degree of obesity. 3 months after surgery, obesity of the 3rd degree was detected in 21.1% of patients, obesity of the 2nd degree was detected in 15.8% of patients, obesity of the 1st degree was detected in 31.6%, and overweight in 31.6% of patients. After 1 year,

in this group, 21.1% of patients had 1st degree obesity, 78.9% of patients were overweight. In our group of co-occurring diseases in morbid obesity, before surgery, 66.7% of patients had 3rd degree obesity, and the remaining 33.3% had 2nd degree obesity. 3 months after surgery, 11.1% of patients with 3rd degree obesity, 40.7% - 2nd degree, and 48.1% - 1st degree obesity. In this group, 3rd and 2nd degree obesity was not detected by 1 year, 1st degree obesity - 37.1%, overweight - 62.9% of patients. The results obtained in the main group also proved that the co-occurrence of concomitant diseases in morbid obesity reduces the effectiveness of surgery and slows down weight loss.

It should be noted that comorbidity of morbid obesity in the control and main groups led to a gradual decrease. In particular, if in the control and main groups, arterial hypertension was detected in 50 and 59.3% of patients before the surgical procedure, then 3 months after the surgical procedure, an increase in blood pressure was observed in 45.4 and 37% of the patients (figure 3). After 6 months, this indicator was found in 27.3 and 14.8% of patients, after 12 months - in the control group, it was found in 9.1% of patients, while in the main group, no increase in blood pressure was observed.

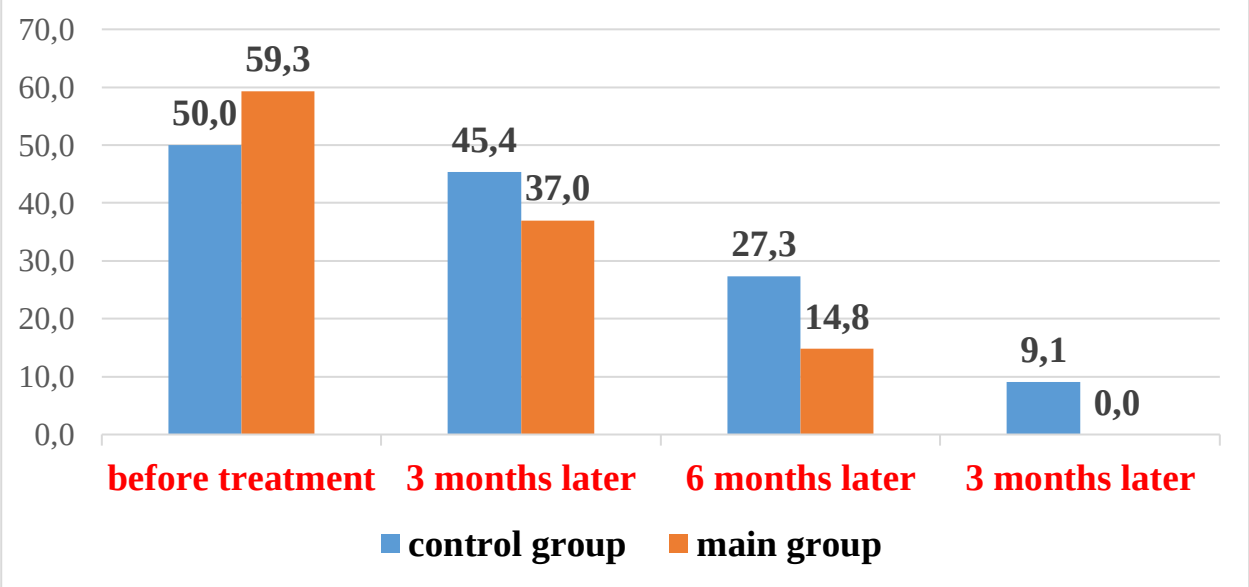

Figure 3. Dynamic changes in the incidence of concomitant arterial hypertension with morbid obesity in the control and main groups 3, 6 and 12 months after surgery.

Therefore, surgical procedures used in the treatment of morbid obesity lead to a decrease not only in morbid obesity, but also in arterial hypertension. In this case, the surgical procedure we offer has shown to be more effective than the traditional one.

At the same time, we also analyzed the occurrence of arthralgia, one of the concomitant diseases in morbid obesity (figure 4). In particular, in the control

group, arthralgia was detected in 17.5% of patients in the group without concomitant diseases, 13.2% after 3 months of surgery, 4.5% after 6 months, and not detected after 12 months. In the control group with morbid obesity, arthralgia was detected in 21% of patients, after 3 months in 14.9%, after 6 months in 5.9% of patients, and after 12 months, this complaint was not detected in patients.

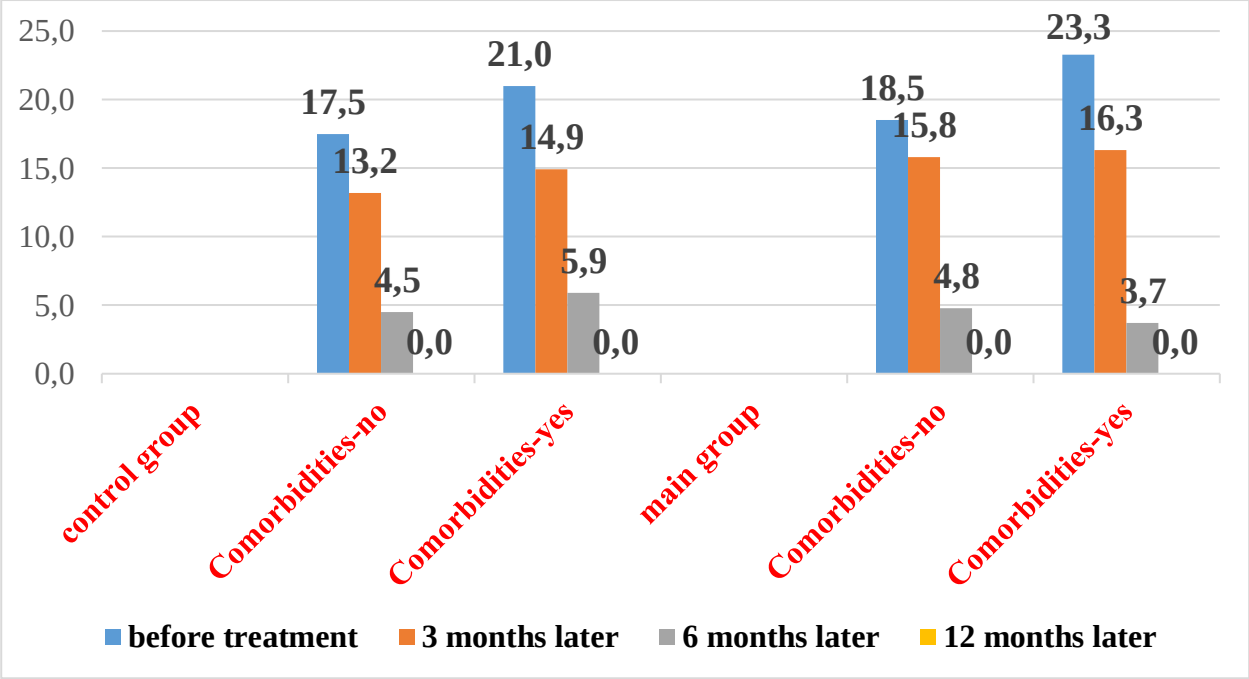

Figure 4. Dynamic changes in the incidence of arthralgia associated with morbid obesity in control and main groups 3, 6, and 12 months after surgery.

In the main group, arthralgia was not observed with accompanying diseases, and 18.5 and 23.3% of the patients of the combined groups had arthralgia, which decreased after 6 months and 4.8 and 3.7% were observed after 12 months, and this clinical sign was not detected after 12 months.

So, after surgery, the clinical signs of arterial hypertension and arthralgia in patients with morbid obesity gradually disappeared with the elimination of obesity. In conclusion, these clinical signs were caused by obesity, and its elimination led to the disappearance of these clinical signs.

As we noted above, the main pathognomic complications caused by obesity are high and lead to a decrease in the quality of life of patients. Indeed, in the control group without concomitant diseases, decreased libido, depression was not observed, apnea was observed in 9.3%, reflux esophagitis was observed in 28.6% of patients (table 3). Reflux esophagitis did not change after conventional surgery and remained in 28.6% of patients. Decreased libido, depression, apnea, and reflux

esophagitis in the control group with accompanying diseases in morbid obesity 22.7; 18.2; It was found in 22.7% and 27.3% of patients, 2.49 after surgery; 3.95; 2.49 and decreased by 2 times to 9.1; 4.6; 9.1 and 13.6% of patients were preserved.

Table 3.

The effect of surgery on the main pathognomonic symptoms caused by obesity (%)

Comorbidities	**libido**	**depression**	**apnea**	**Reflux esophagitis**
control group, n=92				
no, n=22	0,0 0,0	0,0 0,0	9,3 3,1	28,6 28,6
yes, n=70	22,7 9,1	18,2 4,6	22,7 9,1	27,3 13,6
main group, n=95				
no, n=29	10,5 0,0	15,8 0,0	15,8 5,3	31,6 0,0
yes, n=66	22,2 7,4	18,5 3,7	22,2 3,7	25,9 7,4

Note: the figure shows the results before the treatment, the denominator shows the results after the treatment.

Decreased libido, depression, apnea and reflux esophagitis in the main group without comorbidities 10.5; 15.8; observed in 15.8 and 31.6% of patients. The proposed surgery resulted in complete resolution of her libido, depression, and reflux esophagitis symptoms. Apnea decreased 3 times and remained in 5.3% of patients. In morbid obesity, concomitant diseases include decreased libido, depression, apnea, and reflux esophagitis 22.2; 18.5; It was found in 22.2% and 25.9% of patients, after surgery 3; 5; 6 and 3.5 times decreased to 7.4; 3.7; 3.7 and 7.4% of patients were preserved. The proposed surgical procedure effectively eliminated the pathognomonic symptoms of obesity compared to the indicators of the control group.

Conclusions:

1.In morbid obesity, the combination of concomitant diseases (arterial hypertension, reflux esophagitis, gallstone disease and chronic bronchitis) leads to a high incidence of severe obesity, a 2-3 times increase in the development of pathognomic symptoms, and the formation of a "dangerous circulation".

2. In the control and main groups, arterial hypertension was detected in 50 and 59.3% of patients before the surgical procedure, then 3 months after the surgical procedure, an increase in blood pressure was observed in 45.4 and 37% of

the patients. After 6 months, this indicator was found in 27.3 and 14.8% of patients, after 12 months - in the control group, it was found in 9.1% of patients, while in the main group, no increase in blood pressure was observed.

3. In case of morbid obesity, the co-occurrence of accompanying diseases leads to further deepening of cholesterol metabolism disorders, increased changes in blood vessels, development of pathognomic symptoms.

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