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METHODS FOR PREDICTING THE DEVELOPMENT OF ANASTOMOSITIS AFTER MINIGASTRO-BUNCH OPERATIONS

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Abstract:

Methodology for predicting the development of anastomositis after minigastrobypass surgery , based on a combination of methods for assessing clinical signs of complications, the results of using visual (endoscopic) methods for assessing the gastric mucosa, and, without fail, indicators of immunological monitoring, in the form of the relationship of leukocytes with populations and subpopulations of lymphocytes (T -helpers and T- suppressors), as well as their ability to produce pro-inflammatory (TNF - α and IL -2) and anti-inflammatory (IL -10 and IFN -γ) cytokines in the postoperative period may reflect prognostic criteria for the development of both anastomositis and its complications forms of anastomositis . All of the above criteria served as the basis for constructing the corresponding prognostic and diagnostic program " PAMGB ".

Keywords: Mini-gastrobypass surgery, anastomositis, prognosis

RELEVANCE . Statistics confirm that obesity is on the rise in the 21st century. At current rates of development, by 2030 more than one billion adults will be obese. Naturally, obesity will be followed by an increase in the number of diseases associated with a single pathogenesis, including type 2 diabetes mellitus, dyslipidemia , non-alcoholic steatohepatitis and cardiovascular diseases. However, it has been difficult to determine the underlying molecular mechanisms contributing to cardiometabolic diseases, in part because type 2 diabetes mellitus has several subclasses.

Several pathways have been suggested to contribute to obesity and impaired glucose control, such as the immune system and gut microbiota. These include short-chain fatty acids, bile acids, amino acid-containing metabolites, nerve pathways, and lymphoid cells. Interestingly, they have also been shown to be involved in glucose metabolism and the development of non-alcoholic steatohepatitis , which illustrates the relationship between cardiometabolic diseases.

Bariatric surgery is the most effective intervention for reducing obesity - related morbidity and mortality. In this regard, one of the most common and well-studied bariatric procedures is laparoscopic Roux - en-Y gastric bypass and mini-gastrobypass. The increased insulin sensitivity found soon after such surgeries, even before significant weight loss is achieved, suggests immediate systemic changes in metabolism after surgery that are early, as even ten years after surgery, beneficial effects on glucose metabolism, lipids and blood pressure .

Despite the fact that this method of operation is already more than forty years old, the mechanisms underlying the development of such postoperative complications as anastomositis remain not fully understood. Changes during bariatric bypass surgery may include changes in bile flow, reduction in gastric size, anatomical rearrangement and altered nutrient flow, and modulation of intestinal hormones (2,6,8,11,19,20) . Although some studies have shown that the development of postoperative local inflammatory complications in the form of anastomositis , ulcer formation in the anastomotic area, bleeding, etc. develop as a result of changes after bariatric surgery, the passage of food from the stomach to the intestines.

It is promising to identify the connection between the development of this type of local inflammatory process and its connection with immunological changes, which would allow us to take a fresh look at the possibilities of predicting the course of postoperative complications. Moreover, there is no information in the literature regarding the pathogenetic relationship between the development of such complications as anastomositis and immunological changes, which have never been studied on a larger scale .

THE PURPOSE OF THE STUDY is to improve the results of predicting the development and early diagnosis of anastomositis by developing and justifying the effectiveness of clinical and immunological monitoring methods in obese patients after mini-gastrobypass surgery .

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MATERIAL AND METHODS. The results of diagnosis and treatment of 152 obese patients who underwent mini-gastrobypass surgery in the multidisciplinary clinic of the Tashkent Medical Academy and in private clinics in the city of Bukhara were analyzed . All patients, depending on the development of postoperative complications (anastomositis), were divided into 2 groups of 7–6 patients .

The first (main) group consisted of patients who, after minigastrobypass surgery, developed anastomositis and its complications in the form of bleeding or ulceration of the gastroenteroanastomosis , with an initial body mass index of 35 kg/m2 ^{or} more, aged from 18 to 75 years; availability of written informed consent from the patient to participate in the study.

The second (comparative) group consisted of patients in whom, after minigastrobypass surgery, the postoperative period proceeded without complications, but with the same other parameters that were reflected among the patients of the main group.

Mini-gastrobypass surgery was performed on all patients of the main and comparison groups using standard methods exclusively as a primary intervention. Postoperative management was according to the recommendations with the joint efforts of the surgeon, anesthesiologist-resuscitator, therapist and, if necessary, with the involvement of other specialists. Particular attention, along with the development of eating behavior, was carried out to control and correct glycemia (in patients with diabetes mellitus).

Research methods included a standard list (determining the patient's height and weight; calculating body mass index; general blood test; general urinalysis; biochemical blood tests; blood coagulation status . Standard studies were mandatory and were carried out in the preoperative period and 3, 6, 9, and 12 months after mini-gastrobypass surgery .

The second block of research methods included indicators of immunological monitoring and was carried out specifically to identify their role in the pathogenesis of the development of anastomositis and to develop methods for predicting the development of this type of postoperative complication in patients after mini-gastrobypass surgery .

RESULTS AND ITS DISCUSSION. The diagnosis of anastomositis in the main group of patients was made on the basis of patient complaints, clinical examination and endoscopic gastroscopy. Thus, 44 (57.9%) patients had complaints of pain in the epigastric region, nausea, vomiting, heartburn, a feeling of heaviness in the epigastrium , weakness, dizziness, diarrhea and a white coating on the tongue. Endoscopic gastroscopy revealed catarrhal anastomositis in 25 (32.9%) patients , and erosive anastomositis in the remaining 19 (25.0%) patients. In 22.4% of cases (17 patients), the above clinical signs were accompanied by the presence of diarrhea and tarry or "raspberry jelly"-type stools. Endoscopic gastroscopy revealed signs of erosive hemorrhagic anastomositis . In 19.7% of cases (15 patients), patients were bothered by more intense pain in the epigastric region, which endoscopic gastroscopy confirmed the presence of ulcer formation in the area of gastroenteroanastomosis .

Based on the above, for a differentiated approach to assessing the degree of development of postoperative anastomositis in patients after mini-gastrobypass surgery , we divided all patients of the main group into 2 subgroups. The first subgroup included 44 (57.9%) patients in whom anastomositis occurred in an uncomplicated form in a catarrhal or catarrhal-erosive process. The second subgroup included 32 (43.1%) patients with postoperative Anastomositis was detected in a complicated form in the form of bleeding or ulcer formation.

When assessing the incidence of this postoperative complication of mini-gastrobypass surgery, out of a total of 344 patients operated on in our clinic, a total of anastomositis developed in 22.1% of cases. This postoperative complication of minigastrobypass in 7.3% of cases occurred in the form of catarrhal unlimited anastomositis , in 5.5% of cases - in the form of erosive anastomositis , in 4.9% of cases - in the form of erosive-hemorrhagic anastomositis , and in 4.4% of cases - with the development of gastroenteroanastomotic ulcers .

The dynamics of the development of various forms of anastomositis in patients after minigastrobypass surgery was characterized by the prevalence of the frequency of this type of complication in the period from 4 to 7 days after surgery with predominant lesions of the catarrhal (39.3%) and erosive (28.6%) forms.

Thus, the most dangerous days turned out to be 4-7 days of the postoperative period, when 56 cases of anastomositis development were registered . At the same time, catarrhal forms of anastomositis were diagnosed in 39.3% of cases , erosive forms in 28.6%, and erosive-hemorrhagic forms of anastomositis in 25.0% . In subsequent periods, cases with the formation of ulcers in the area of gastroenteroanastomosis prevailed over other forms of anastomositis .

Comparative dynamics of changes in the number of leukocytes in the blood in patients with various forms of anastomositis after minigastrobypass showed that with an uncomplicated form of anastomositis, leukocytosis was observed in the dynamics of the postoperative period (13.51±0.81 x10 ^{9}/l) only on the 3rd day of observation (p <0 .05), while in patients with complicated forms of anastomositis, relatively high values of leukocytes in the blood were

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noted by us both in the preoperative period (10.03 ± 0.81 x10 ^{9}/ l) and in the postoperative period (15.37 ± 0 .91 x10 ^{9}/l; p <0.05).

In patients of both subgroups, the overall dynamics of changes in the number of lymphocytes changed identically. Minimum values were noted among patients with both uncomplicated (1.68±0.08 x10 ^{9}/l) and complicated (1.91±0.14 x10 ^{9} /l) forms of anastomositis on the 3rd day after surgery (p < 0.05). At the same time, we noted the minimum value of the number of T-lymphocytes among all patients with anastomositis also on the 3rd day of the postoperative period.

Subpopulations of lymphocytes, in particular T-helpers, in patients of the main group were characterized by progressive growth throughout the dynamics of the study - from 0.61±0.02 x10 ^{9}/l to 0.93±0.03 x10 ^{9}/l in patients with uncomplicated and from 0.32±0.02 x10 ^{9}/l to 0.82±0.02 x10 ^{9}/l in patients with a complicated form of anastomositis . At the same time, the difference in the number of T-helper cells between patients with uncomplicated and complicated forms of anastomositis was significantly pronounced (1.9 times; p <0.05).

T- suppressors differed from other subpopulations of T-lymphocytes by low values in the early stages after mini-gastrobypass surgery among patients of the main group. A pronounced difference between the subgroups of patients with anastomositis was noted by us primarily on the 14th day after surgery (0.3±0.04 x10 ^{9}/l in patients with uncomplicated and 0.79±0.08 x10 ^{9}/l in patients with complicated forms of anastomositis). However, a less pronounced difference was noted in the preoperative period (0.37±0.04 x10 ^{9} /l in patients with uncomplicated and 0.54±0.07 x10 ^{9}/l in patients with complicated forms of anastomositis). In general, the dynamics of changes in the number of T- suppressors in the peripheral blood had minimal values in patients with uncomplicated forms of anastomositis on the 7th day after surgery (0.29±0.02 x10 ^{9} /l) and in patients with complicated forms of anastomositis already on the 3rd day after surgery (0.22±0.01 x10 ^{9}/l).

In patients with a complicated form of anastomositis, wave-like changes in the amount of B-lymphocytes in the peripheral blood changed, reaching their maximum peak on the 14th day of the postoperative period (0.36±0.02 x10 ^{9}/l).

We noted high differentiated values between patients with uncomplicated and complicated forms of anastomositis on days 3 (0.22±0.05 x10 ^{9} /l and 0.17±0.01 x10 ^{9} /l, respectively) and on days 14 (0. 29±0.01 x10 ^{9}/l and 0.36±0.01 x10 ^{9}/l, respectively) in the postoperative period. In general, the average value of B-lymphocytes among patients with uncomplicated and complicated forms of anastomositis was lower than the initial data (0.28±0.03 x10 ^{9}/l and 0.26±0.02 x10 ^{9} /l, respectively).

Thus, a study of the nature and analysis of changes in the content of leukocytes, lymphocytes, T- and B-cells in the blood in patients with various forms of anastomositis after mini-gastrobypass showed that with an uncomplicated, catarrhal form of damage to the anastomotic zone, the increase in the number of lymphocytes in the blood does not manifest itself as pronounced changes in terms of cellular immunity, while in complicated forms of this postoperative pathological process there is an increase in the number of T- suppressors (2.2 times) and T-helpers (1.5 times) against the background of relative stability in the number of B-lymphocytes.

Among patients with postoperative anastomositis , a progressive increase in the production of the proinflammatory cytokine TNF - α was noted . In the postoperative period, the minimum value of the ability to produce the pro-inflammatory cytokine TNF - α was noted among patients with an uncomplicated form of anastomositis 3 days after mini-gastrobypass , and the maximum value was observed among patients with a complicated form of anastomositis 14 days after surgery.

In a separate analysis of the main group of patients between subgroups according to the severity of the development of anastomositis , it can be noted that the minimum average value of the pro-inflammatory cytokine IL -2 was noted among patients with an uncomplicated form of anastomositis on the 3rd day after mini-gastrobypass surgery (2.07±0.22 pg /ml), whereas the maximum average level of the pro-inflammatory cytokine IL -2 was recorded among patients with a complicated form of anastomositis also on the 3rd day of the postoperative period (6.14±0.33 pg /ml).

In patients with an uncomplicated form of anastomositis, the dynamics of the postoperative period had a wave-like character. The minimum value of the productivity of the anti-inflammatory cytokine IL -10 was noted 3 days after surgery (0.53 ± 0.08 pg / ml), and the maximum value was already 7 days after surgery (1.28 ± 0.11 pg / ml). Subsequently, a decline was noted again for a period of 14 days to 1.19±0.08 pg /ml after surgery.

We noted the maximum decrease in the productivity of anti-inflammatory cytokines IL -10 among patients with a complicated form of anastomositis . The dynamics of changes were characteristic of the previous subgroup of patients. Already 3 days after mini-gastrobypass surgery, the productivity of anti-inflammatory cytokines IL -10 in patients with a complicated form of anastomositis was critically low (0.14±0.08 pg /ml). However, starting from the 7th day after surgery, we noted an increase in

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the productivity of the anti-inflammatory cytokine IL -10 to 0.73±0.09 pg /ml already on the 14th day after surgery.

of anastomositis in the postoperative period, the production of the anti-inflammatory cytokine IFN -γ decreases, which was apparently due to the suppression of the functional activity of T and B cells. The productivity of the anti-inflammatory cytokine was relatively high in patients with an uncomplicated form of anastomositis (2.52±0.96 pg /ml), while it was minimal in patients with a complicated form of anastomositis (2.09±0.53 pg /ml). In general, in the preoperative period the ratio of the productivity of this cytokine among patients with various forms of anastomositis was insignificant.

The dynamics of changes in the productivity of the anti-inflammatory cytokine IFN -γ in the postoperative period after minigastrobypass in patients with an uncomplicated form of anastomositis only increased throughout the study, reaching a maximum peak 14 days after minigastrobypass (3.02±1.79 pg /ml). The difference in the productivity of the anti-inflammatory cytokine IFN -γ begins already 3 days after mini-gastrobypass surgery . The difference between patients with uncomplicated and complicated forms of anastomositis was 1.7 times (p <0.05).

Thus, complicated forms of anastomositis develop with an increase in the productivity of pro-inflammatory cytokines TNF-a (2.3 times) and IL-2 (2.4 times) against the background of a decrease in the productivity of anti-inflammatory cytokines. cytokines IL-10 (4.5 times) and IFN-γ (9.8 times), which may indicate the role of immunological imbalance in the pathogenesis of the development of anastomositis after mini-gastrobypass surgery .

The nature and analysis of changes in the production of pro-inflammatory and anti-inflammatory cytokines in patients with various forms of anastomositis after mini-gastrobypass surgery , that in the long-term period there is an increase in the ability of $CD4^+$ T cells to produce IL -2 and IFN -γ, which was comparable between subgroups of patients (p <0. 05). The ability of $CD8^+$ T cells to produce cytokines in patients with an uncomplicated form of anastomositis did not change, however, in patients with a complicated form of anastomositis, a significant increase in IFN -γ production was observed against the background of a relatively low proportion of IL-2 production. The ability to produce TNF - α , IL -2 and IFN -γ in patients with anastomositis was significantly significant (p <0.05), which indicates a more significant role and activity of $CD19^+$ B cells in the long-term period after mini-gastrobypass surgery .

The fourth chapter of the dissertation is devoted to the development and evaluation of the effectiveness of clinical and immunological methods for predicting the development of anastomositis after mini-gastrobypass surgery . This chapter provides a rationale for the clinical and immunological relationship between the development of anastomositis in patients after minigastrobypass , which ultimately made it possible to develop a clinical and immunological method for predicting the development of anastomositis after minigastrobypass and to conduct a comparative assessment of its effectiveness.

The differentiated values of the number of leukocyte growth in patients of the main and comparative groups in the first 3 days after surgery were not significant, although in subsequent periods the gap in these ratios increased by more than 1.5 times (p <0.05). The correlation value between indicators of the number of leukocytes in patients with complicated and uncomplicated forms of anastomositis was characterized by a direct and close level (R = 0.863).

Against this background, the lymphocyte count indicators (R = 0.547) were relatively low in the correlation between patients in the main and comparative groups , although the value indicated a direct dependence of the dynamics of changes in this indicator in patients in the postoperative period. At the same time, subpopulations of lymphocytes (T cells) had very significant differences between patients of the main and comparative groups both in the preoperative period (p <0.023), and during 7 (p <0.025) and 14 (p <0.017) days postoperative period. The dynamics of changes in the number of T-lymphocytes in the blood of patients after mini-gastrobypass surgery revealed a relatively low direct correlation between patients of the main and comparative groups (R = 0.595). In contrast, B-lymphocytes had higher values in the correlation between patients of the main and comparative groups (R = 0.877), which indicated a greater influence of mini-gastrobypass than the development of anastomositis on the nature of the changes we identified.

Subpopulations of T- suppressor and T-helper lymphocytes also had correlation values between patients of the main and comparative groups, characterizing direct relationships in the dynamics of the postoperative period, which also indicated the role of the surgical operation in changes in the immunological reaction of the body. However, in a relationship environment, changes in T- suppressors were more associated with the development of postoperative anastomositis , which in turn is confirmed by the correlation value data (R = 0.841).

Regarding changes in the dynamics of the studied cytokines, one can note a low direct correlation for TNF-α (R = 0.208) and IL -10 (R = 0.320) , as well as a high inverse correlation for IL -2 (R = -0.881) and IFN-γ (R = -0.502). Such changes also came from the ability of T and B cells to produce cytokines. Thus, if the ability of T cells to produce IL-10 and IFN-γ was

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significantly reduced in patients with anastomositis , which was not affected by mini-gastrobypass surgery , then already three months after bariatric surgery, the composition of the lymphocyte subpopulation of patients with anastomositis was adjusted in accordance with the profile of the comparative groups of patients. We focus on this phenomenon , since similar results were obtained by other researchers [286, 289] under experimental conditions. In this case, as evidenced by sources of literary data, morbid obesity itself can lead to accelerated aging of the immune system [102, 209] and, accordingly, changes in the immune system create the prerequisites for the development of anastomositis in the postoperative period.

As evidence for our reasoning, we can point to the growth of B cells that we identified, which, apparently, occurred precisely due to the long course of chronic inflammation that occurs in patients with morbid obesity. Under such conditions, B cells are mobilized from the bone marrow into the peripheral blood [288]. Increased differentiation of T cells and the ability to produce cytokines have been described by other authors in morbid obesity [163]. To support their theory, the authors used bariatric surgery and found changes in cellular immunity after significant weight loss [228], suggesting a relationship between metabolic processes and the body's immune system. Our data indicate accelerated differentiation of $CD4^+$ and $CD8^+$ T cells in patients with anastomositis . Although this did not affect the ability of T cells to produce a number of cytokines , it was nevertheless reduced in patients with morbid obesity. With the development of anastomositis , the composition of subpopulations changes T and B cells were inverse to the comparison group, and the ability of CD4+ T cells to produce IL-2 and IFN-γ was not altered three months after minigastrointestinal bypass surgery . However, the cytokine capacity of $CD8^+$ T cells and B cells was not restored three months after minigastrointestinal bypass surgery .

Thus, the analysis of changes in immunological parameters revealed a close relationship between the development of anastomositis after mini-gastrobypass surgery and the level of T- and B-lymphocyte populations, pro-inflammatory and anti-inflammatory cytokines, not only in the early postoperative period, but also before surgery and in the long term after surgery. This allows us to conclude that indicators of the immunocompetent system play an important role both in the early diagnosis of the development of anastomositis , and in the prognosis and prevention of this complication of minigastrobypass surgery .

The graphical analysis carried out allowed us to identify the most significant and key indicators of the immune system, which can have a significant impact on the course of the postoperative period and influence the development of anastomositis . In this case, we believe that the presence of anastomositis indicates the presence of a local inflammatory process and, like any inflammatory process, the course of this pathological process passes through certain phases of both its development and outcome, which have clear clinical and morphological boundaries and determine the severity of the course and manifestations of the pathological process.

Analysis of the development and clinical manifestations of anastomositis in patients after mini-gastrobypass showed the presence of a high proportion of superficial and uncomplicated forms of damage to gastroenteroanastomoses . At the same time, in the structure of such complications as anastomotic reflux, gastric bleeding and the formation of gastroenteroanastomotic ulcers , a pathological process associated with the development of anastomositis is always at a preliminary stage . In other words, at the first stage, catarrhal forms of anastomositis develop , which, under unfavorable conditions and high aggression of the active factor, can lead to the development of erosions in the area of gastroenteroanastomosis . Subsequently, with deeper damage, the damage process involves the submucosa with pinpoint hemorrhages and deeper lesions down to the muscular lining of the stomach with the formation of ulcers.

In general, the development of various forms of anastomositis after mini-gastrobypass surgery may have stages of pathomorphological manifestations as phases of the inflammatory process. The first stage is catarrhal changes in the gastric mucosa and in the anastomosis area, the second stage is the formation of erosions, the third stage is the development of hemorrhagic complications and the fourth stage is the formation of gastroenteroanastomosis ulcers .

The correlation characteristics of the ratios of the studied indicators of immunological monitoring depending on the stages of development of various forms of anastomositis showed an ambiguous picture of transformations. In particular, at the initial stage (stage 0) in patients who developed anastomositis in the postoperative period , we noted high direct correlation values for the indicators of the lymphocyte series: T -lymphocytes, B -lymphocytes and T-helper cells ($R = 0.918 \pm 0.013$), while in relation to T- suppressors , we noted a high inverse correlation ($R = -0.811 \pm 0.052$). For other indicators, the correlation was below average and varied between direct and inverse values.

After mini-gastrobypass surgery (stage II) in patients with catarrhal Anastomosites, a high direct correlation was recorded for the indicators leukocytes, TNF - α , IL -2 and T-helper cells ($R = 0.975 \pm 0.011$). These indicators had an inverse correlation with anti-inflammatory cytokines IL -10, IFN -γ, T- and B-lymphocytes, and T- suppressors ($R = -0.926 \pm 0.018$).

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The identified correlation changes ultimately lead to the development of erosive anastomositis (stage III), which is characterized by a direct correlation (R = 0.816 ± 0.017) of such indicators as T- and B-lymphocytes, T-helpers, T- suppressors , studied pro - inflammatory cytokines (TNF - α and IL -2) and the anti-inflammatory cytokine IL -10 and an inverse correlation with the anti-inflammatory cytokine IFN -γ (R = -0.724±0.025).

The formation of ulcers in the area of gastroenteroanastomosis (stage IV) is characterized by a high direct correlation (R = 0.863 ± 0.033) of the indicators of pro-inflammatory cytokines TNF - α , and IL -2, as well as populations and subpopulations of lymphocytes (T-helpers and T- suppressors , T-lymphocytes and B-lymphocytes). We noted inverse correlation values for the anti-inflammatory cytokines IL -10 and IFN -γ (R = -0.724±0.012).

The catarrhal form of anastomositis after minigastrobypass surgery can develop in the presence of suppression of T-lymphocytes, B-lymphocytes and T-helpers, as well as the expression of T- suppressors . An erosive form of anastomositis after minigastrobypass can develop with a decrease in the production of IL-10, IFN -γ and suppression of T- suppressors , as well as an increase in the production of TNF-α, IL-2 and the expression of T-helper cells. An erosive hemorrhagic form of anastomositis after minigastrobypass surgery can develop with a decrease in the production of IFN - γ and the expression of T-lymphocytes, B-lymphocytes, T-helpers, T- suppressors against the background of increased productivity of TNF-α, IL-2 and IL-10. The ulcerative form of anastomositis after mini-gastrobypass surgery can develop when decreased productivity of TNF-α and IL-2, suppression of T-helpers, T- suppressors , T-lymphocytes and B-lymphocytes, as well as decreased production of IL-10 and IFN -γ

Thanks to the careful selection of these parameters, we have developed a program consisting of a database of significant data called " PAMGB " (Prediction of anastomositis after mini-gastrobypass surgery). This software product makes it possible to predict with high probability the conditions for the development of anastomositis and its complicated forms in patients after mini-gastrobypass surgery .

Thus, we have developed a method for predicting the development of anastomositis after minigastrobypass surgery , based on a combination of methods for assessing clinical signs of complications, the results of using visual (endoscopic) methods for assessing the gastric mucosa, and, without fail, indicators of immunological monitoring, in the form of the relationship of leukocytes with populations and subpopulations of lymphocytes (T-helpers and T-suppressors), as well as their ability to produce pro-inflammatory (TNF - α and IL -2) and anti-inflammatory (IL -10 and IFN -γ) cytokines in the postoperative period may reflect prognostic criteria for the development of anastomositis , and its complicated form of anastomositis . All of the above criteria served as the basis for constructing the corresponding prognostic and diagnostic program " PAMGB ".

A comparative assessment of the effectiveness of using the prognostic program " PAMGB " developed by us in patients with anastomositis after minigastrobypass showed that we achieved an increase in true positive results in erosive forms of anastomositis by 5.5 times, in erosive-hemorrhagic forms of anastomositis by 1.9 times, and the reliability of predicting the formation of gastroenteroanastomotic ulcers was increased 5 times. There was a significant reduction in cases with true negative prediction results for catarrhal (1.5 times) and catarrhal-erosive forms of anastomositis (1.7 times) and completely avoided false negative prediction results for all forms of anastomositis after minigastrobypass surgery . All this indicates a significant increase in the reliability of predicting the development of anastomositis in patients after mini-gastrobypass surgery as a result of the use of the immunological monitoring method we developed.

CONCLUSIONS:

1. Anastomositis after minigastrobypass develops in 22.1% of cases. This postoperative complication of minigastrobypass in 7.3% of cases occurs in the form of catarrhal unlimited anastomositis , in 5.5% of cases - in the form of erosive anastomositis , in 4.9% of cases - in the form of erosive-hemorrhagic anastomositis , and in 4.4% of cases - with the development of gastroenteroanastomotic ulcers .
2. In an uncomplicated (catarrhal, erosive) form of damage to the anastomotic zone, the increase in the number of lymphocytes in the blood does not manifest itself as pronounced changes in the indicators of cellular immunity, while in complicated forms (erosive-hemorrhagic and the formation of anastomotic ulcers) of this postoperative pathological process, an increase in the number of T- suppressors is noted (2.2 times) and T-helpers (1.5 times) against the background of relative stability in the number of B-lymphocytes.
3. Complicated forms of anastomositis develop with an increase in the productivity of pro-inflammatory cytokines TNF-a (2.3 times) and IL-2 (2.4 times) against the background of a decrease in the productivity of anti-inflammatory cytokines IL-10 (4.5 times) and IFN-γ (9.8 times), which may indicate the role of immunological imbalance in the pathogenesis of the development of anastomositis after mini-gastrobypass surgery .
4. In the long-term period after mini-gastrobypass surgery , there was an increase in the

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ability of CD4+ T cells to produce IL-2 and IFN-γ, which was comparable between subgroups of patients ($p<0.05$). The ability of CD8+ T cells to produce cytokines in patients with an uncomplicated form of anastomositis did not change, however, in patients with a complicated form of anastomositis, a significant increase in IFN-γ production was observed against the background of a relatively low proportion of IL-2 production. The ability to produce TNF-α, IL-2 and IFN-γ in patients with anastomositis was significantly significant ($p<0.05$), indicating a more significant role and activity of CD19+ B cells in the long-term period after mini-gastrobypass surgery .

5. Analysis of changes in immunological parameters revealed a close relationship between the development of anastomositis after mini-gastrobypass surgery and the level of T- and B-lymphocyte populations, pro-inflammatory and anti-inflammatory cytokines, not only in the early postoperative period, but also before surgery and in the long term after surgery. This allows us to conclude that indicators of the immunocompetent system play an important role both in the early diagnosis of the development of anastomositis , and in the prognosis and prevention of this complication of minigastrobypass surgery .

6. The developed method for predicting the development of anastomositis after minigastrobypass surgery , based on a combination of methods for assessing clinical signs of complications, the results of using visual (endoscopic) methods for assessing the gastric mucosa, and, without fail, indicators of immunological monitoring, in the form of the relationship of leukocytes with populations and subpopulations of lymphocytes (T -helpers and T-suppressors), as well as their ability to produce pro-inflammatory (TNF-α and IL-2) and anti-inflammatory (IL-10 and IFN-γ) cytokines in the postoperative period may reflect prognostic criteria for the development of both anastomositis and its complicated form of anastomositis .

7. A comparative assessment of the effectiveness of using the prognostic program "PAMGB" developed by us in patients with anastomositis after mini-gastrobypass surgery showed that, compared with the traditional method of predicting this type of postoperative complication, an increase in true positive results was achieved in erosive forms of anastomositis by 5.5 times, in erosive-hemorrhagic forms of anastomositis by 1.9 times, and the reliability of predicting the formation of gastroenteroanastomotic ulcers was increased by 5 times. There was a significant reduction in cases with true negative prediction results for catarrhal (1.5 times) and catarrhal-erosive forms of anastomositis (1.7 times) and completely avoided false negative prediction results for all forms of anastomositis after minigastrobypass surgery . All this indicates a significant increase in the reliability of predicting the development of anastomositis in patients after mini-gastrobypass surgery as a result of the use of the immunological monitoring method we developed.

LITERATURE

1. Avlas S.D., Glinnik A.A., Stebunov S.S. Prediction of surgical complications of bariatric surgery. Surgery. Eastern Europe. (2021). T. 10. No. 1. P. 9-20.
2. Analysis of clinical manifestations of biliary reflux in the long term after laparoscopic surgery minigastrobypass surgery / A. A. Chaikin, D. A. Chaikin, A. N. Chaikin [et al.] // Moscow Surgical Journal. – 2023. – No. S. – P. 100.
3. Bariatric surgery: modern view (literature review) / V. A. Golub, O. A. Kosivtsov , A. E. Bublikov, V. A. Ievlev // Bulletin of the Volgograd State Medical University. – 2022. – T. 19, No. 3. – P. 14-19.
4. Dedov I.I., Shestakova M.V., Mayorov A.Yu. Algorithms for specialized medical care for patients with diabetes. 9th edition // Diabetes mellitus. (2019). - T. 22 - No. 1(S1) - P. 1-144.
5. Zhizhin F.S., Kapustin B.B. Clinical and endoscopic classification of acute anastomositis after gastric resection // Vestn . chir.-2002.-No. 6.-S. 49-52.
6. Kudba T.N. Clinical and immunological criteria for predicting anastamositis after gastrectomy // Dissertation . ... candidate of economic sciences // Astrakhan, 2006 – 94 p.
7. Minigastrobypass with Nissen fundoplication in the treatment of patients with obesity and gastroesophageal reflux disease / V.V. Anishchenko, D.A. Kim, A.V. Kozlov [et al.] // Surgical practice. (2023). – T. 8, No. 3. – P. 43-58.
8. Risk of major complications of laparoscopic minigastrobypass surgery / Yu.S. Vinnik, A.A. Chaykin, D.A. Chaikin [et al.] // Modern problems of science and education. (2023). – No. 6. – P. 162.
9. A cytokine network involving IL-36gamma, IL-23, and IL-22 promotes antimicrobial defense and recovery from intestinal barrier damage. / V. L. Ngo, H. Abo, E. Maxim, et al. //Proc. Natl. Acad. Sci. USA. (2018) 115:E5076–85.
10. Arterburn DE, Fisher DP The current state of the evidence for bariatric surgery. // JAMA. 2023 Sep 3 ;312 (9):898-9.
11. Augustin AK, Pesaner V.Ts., Kuraryn Sh.P. Features of postoperative administration of patients with anastomosites after minigastric

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-35, June 2024
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bypass surgery // Journal of Bariatric Surgery, (2019); 3(5):184-92.
12. Chronic interleukin-6 (IL-6) treatment increased IL-6 secretion and induced insulin resistance in adipocyte: prevention by rosiglitazone. / C. Lagathu , JP Bastard, M. Auclair , et al. // Biochem . Biophys . Res. Commun . (2023) 311:372–9.
13. Khamdamov B.Z. Comparative evaluation of methods of amputation related to tidiotarus witn severe forms of diadetic foot syndrome. European Science Review. Austria, Vienna 2014 Septemba-October No. 9-10. - C. 58-60.
14. Khamdamov B.Z. Changes in the quality of life of patients after upper amputations in diabetic heel syndrome. Samarkand. Problems of biology and medicine. No. 1, 2019., (107) - pp. 115-117 .
15. Khamdamov B.Z. Complex treatment of diabetic foot syndrome with critical ischemia of the lower extremities. Journal of Biomedicine and Practice. Tashkent 2020, Special issue. Part 5 – WITH. 801-814.
16. Khamdamov B.Z. Method of laser photodynamic therapy in the treatment of wound infection in diabetic foot syndrome. Biology va tibbiyot muammolari No. 1 (116) 2020. – P. 142-148
17. Khamdamov B.Z. Morphological changes when using photodynamic therapy in the treatment of wound infection in an experiment. Journal of Morphology. Saint Petersburg. 2020. Volume 157 (2-3). -WITH. 223-224.
18. Khamdamov B.Z. Optimization of methods for local treatment of purulent-necrotic lesions of the foot in diabetes mellitus. Magazine. Tibbiyotda yangi kun. 2018, No. 4 (24) - S. 112-115.
19. Khamdamov BZ, Akhmedov RM, Khamdamov AB The use of laser photodynamic therapy in the prevention of purulent-necrotic complications after high amputations of the lower limbs at the level of the lower legs in patients with diabetes mellitus. Scopus Preview. International journal of Pharmaceutical Research. Volume 11, Issue 3, July-September, 2019
20. Khamdamov BZ, Nuraliev NA Pathogenetic approach in complex treatment of diabetic foot syndrome with critical lower limb ischemia. American Journal of Medicine and Medical Sciences, 2020 10 (1) 17-24 DOI: 10.5923/j.20201001.05.
21. Khamdamov BZ Indicators of immunocitocine status in purulent-necrotic lesions of the lover extremities in patients with diabetes mellitus. American Journal of Medicine and Medical Sciences, 2020 10 (7): 473-478 DOI: 10.5923/j.20201001.08
22. Khamdamov, B., & Dekhkonov, A. (2022). Clinical and laboratory parameters of the wound process complicated by the systemic inflammatory response syndrome in patients with diabetes mellitus. Journal of education and scientific medicine, 2(3), 25-29. Retrieved from https://journals.tma.uz/index.php/jesm/article/view/349
23. Khamroev, U., & Khamdamov, B. (2022). Features of changes in endothelial system parameters in patients with diffuse toxic goiter. Journal of education and scientific medicine, 2(3), 62-67. Retrieved from https://journals.tma.uz/index.php/jesm/article/view/358