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ТИББИЁТДА ЯНГИ КУН НОВЫЙ ДЕНЬ В МЕДИЦИНЕ NEW DAY IN MEDICINE

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IMPROVED METHOD OF BARIATRIC SURGERY FOR PATIENTS WITH METABOLIC SYNDROME DUE TO GASTRO-ESOPHAGEAL REFLUX DISEASE

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✓ Resume

When performing laparoscopic longitudinal resection of the stomach in patients with metabolic syndrome on the background of gastroesophageal reflux disease, we recommend using a modified method, which differs from the traditional one in that after performing longitudinal resection of the stomach, anterior and posterior crurography is performed, the free part of the large omentum on the vascular pedicle of sufficient length is mobilized to transfer to the diaphragmatic surface of the abdominal cavity, due to the mobilized part of the large gland of the cuff around the abdominal part of the esophagus and with its tight stitching on the calibration probe 36 Fr.

Keywords: metabolic syndrome, gastroesophageal reflux disease, bariatrics

УСОВЕРШЕНСТВОВАННЫЙ МЕТОД БАРИАТРИЧЕСКОЙ ОПЕРАЦИИ У БОЛЬНЫХ С МЕТАБОЛИЧЕСКИМ СИНДРОМОМ НА ФОНЕ ГАСТРО-ЭЗОФАГЕАЛЬНОЙ РЕФЛЮКСНОЙ БОЛЕЗНИ

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✓ Резюме

При выполнении лапароскопической продольной резекции желудка у больных с метаболическим синдромом на фоне гастроэзофагеальной рефлюксной болезни рекомендуем применять модифицированный нами способ, отличающийся от традиционной тем, что после выполнения продольной резекции желудка проводят переднюю и заднюю крурографию, осуществляют мобилизацию свободной части большого сальника на сосудистой ножке достаточной длины для переноса к диафрагмальной поверхности брюшной полости, формировали за счет мобилизированной части большого сальника манжеты вокруг абдоминальной части пищевода и с плотным его прошиванием на калибровочном зонде 36 Fr.

Ключевые слова: метаболический синдром, Гастроэзофагеальная рефлюксная болезнь, бариатрия

GASTRO-EZOFAGEAL REFLUX KASALLIGI FONIDA METABOLIK SINDROMLI BEMORLARDA BARIATRIK OPERATSIYANING TAKOMILLASHTIRILGAN USULI

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✓ **Rezyume**

Gastroezofageal reflyuks kasalligi fonida metabolik sindromli bemorlarda oshqozonni laparoskopik uzunlamasina rezeksiya qilishda biz tomonimizdan modifikatsiya qilingan usulni qo'llashni tavsiya etamiz, u oshqozon uzunlamasiga rezeksiyasi bajarilgandan so'ng oldingi va orqa krurografiya o'tkazilishi bilan an'anaviy usuldan farqlanadi va qorin bo'shlig'ining diafragmal yuzasiga o'tkazish uchun yetarli bo'lgan uzunlikdagi katta charvini mobilizatsiya qilinadi hamda uning hisobiga qizilo'ngachning abdominal qismi atrofida manjeta hosil qilinib uni 36 Fr kalibrli zond yordamida zich tikiladi.

Kalit so'zlar: metabolik sindrom, gastroezofageal refluks kasalligi, bariatriya

Relevance

Worldwide, there is a progression of gastroesophageal reflux disease (GERD) and complications associated with the progression of this disease. It is developing with an exponentially growing obesity problem [1,3,5].

The previous understanding of the mechanisms of GERD development was considered to prolong the chronology of the process characterizing gastrointestinal reflux. This mechanism is one of the dominant ones and has become evidence for the etiology of the multifactorial cause of GERD [2,4,6]. At the same time, today there has been a transformation of vision regarding the factors that determine the risk of developing GERD and such as an increase in body mass index (BMI), the presence of obesity and metabolic syndrome (MS) [7,9,11].

Obesity, associated precisely with its abdominal form, which is the main component of MS, leads to the development of GPA primarily due to the presence of both intraabdominal and intragastric hypertension [8,10,12,13,14].

A kind of vicious circle is created, associated on the one hand with the presence of a hernia of the esophageal orifice of the diaphragm (GPA) and growing abdominal pressure on the other [1]. In the future, there is an increase already at the level of esophageal-gastric pressure, thereby the relaxation of the lower esophageal sphincter is disrupted [2,3,5].

Bariatric surgery is currently one of the progressive methods of treating obesity and MS [12]. In this regard, laparoscopic longitudinal gastric resection (LVL) is an important assessment of the effectiveness of widely used methods of surgical treatment of MS [3,12].

However, to date, such aspects of bariatric surgery as the effectiveness of LVL both in the presence of metabolic syndrome and gastroesophageal reflux disease still remain unexplored [12,14].

The purpose of the study: improvement of the results of laparoscopic longitudinal gastric resection in patients with metabolic syndrome on the background of gastro-esophageal reflux disease.

Research materials and methods

The clinical material consisted of 120 patients with MS on the background of GERD who were treated and examined at the multidisciplinary clinic of the Tashkent Medical Academy in 2020 to 2023. All patients were divided into 2 cohort groups: the control group (60 patients) who were treated and examined from 2020 to 2021 and the main group (60 patients) who were treated and examined from 2022 to 2023.

The main difference between the patients of the control and main groups was that in patients of the control group, we used the traditional version of laparoscopic longitudinal gastric resection as a variant of bariatric surgery, and in patients of the main group – a modified laparoscopic longitudinal gastric resection developed by us, which provided for the creation of conditions allowing to eliminate the possibility of gastroesophageal reflux disease in patients with metabolic syndrome (FAP No. 2610 dated 10/17/2024).

The immediate results of treatment were evaluated according to our improved methodology "Scale for evaluating the immediate results of bariatric surgery in patients with metabolic syndrome against the background of gastroesophageal reflux disease" by gradating the indicators into "excellent", "good", "satisfactory" and "unsatisfactory".

The evaluation of long-term results of bariatric operations in patients with metabolic syndrome on the background of gastroesophageal reflux disease was carried out in a comprehensive program format according to the method developed by us "Scale for evaluating long-term results of bariatric operations in patients with metabolic syndrome on the background of gastroesophageal reflux disease".

The immediate results of treatment of patients with metabolic syndrome on the background of gastroesophageal reflux disease were evaluated in dynamics on 3, 7, 14 and 30 days after the surgical period, and the long-term results of treatment of patients were evaluated in dynamics 3, 6 and 12 months after the surgical period.

Results and their discussion

In our studies, an improvement in the glycemic profile of the blood was revealed in patients of the control group. The glucose concentration in the postoperative period gradually decreased from 6.51 ± 2.2 mmol/l on the 3rd day of the postoperative period to 5.43 ± 0.32 mmol/l on the 30th day of the postoperative period ($p < 0.05$).

Subsequently, in the long-term period after surgery, a statistically significant decrease in blood glucose levels was found in patients of the control group, but not as dynamically as in the early postoperative period. The same results were obtained in other studies, where there was a significant decrease in blood glucose and a decrease in insulin resistance according to HOMA-IR.

The improvement of the carbohydrate system after LVL is closely related to weight loss and adipose tissue. Recent studies show that changes in carbohydrate metabolism occur a few days after LPRH.

We have not found significant differences in the frequency of clinical signs of GERD. Subsequently, starting from the 14th day of the postoperative period, the clinical signs of GERD return to the initial statistical level of the preoperative period. All this may directly indicate the low effectiveness of traditional LVH in patients with MS on the background of GERD, even if the use of crurography techniques and antireflux position of the stomach.

In the postoperative period, 69 postoperative complications were noted, which accounted for an average of 1.15 pathologies per 1 patient. This was due to a combination of several complications in the same patient.

According to the medical history, 9 types of postoperative complications were detected in the control group of patients. At the same time, according to the Clavien-Dindo classification, 3 (33.4%) pathologies were in class I, 4 (44.4%) pathologies in class II and 2 (22.2%) pathologies in class III.

Paroxysmal atrial fibrillation (class II, 15 cases – 21.7%), exacerbation of chronic laryngitis (class II, 11 cases – 15.9%), postoperative wound hematoma (class I, 9 cases – 13%), saphenous vein thrombophlebitis (class II, 8 cases – 11.6%) were most often diagnosed, bronchopneumonia (class II, 7 cases – 10.1%), exudative pleurisy (class III-A, 7 cases – 10.1%), inflammatory infiltration of the wound (class I, 5 cases – 7.2%), seroma of the wound (class I, 5 cases – 7.2%) and acute urinary retention (III-A class, 2 cases – 2.9%).

Thus, an analysis of the dynamics of changes in the frequency of postoperative complications showed that in patients of the control group, after the use of traditional LVH, complications with a direct or indirect connection with GERD prevailed throughout the study (up to 30 days). It should be noted here that in this case, first of all, we are talking about extraesophageal forms of GERD. Cardiological and otorhinolaryngological forms of the lesion, which in the postoperative period were manifested by rhythm disturbances and exacerbation of chronic laryngitis. Subsequently, it was in these patients, due to the prevailing favorable conditions, against the background of lesions of the vagus nerve and larynx, bronchopneumonia developed, and in severe cases also exudative pleurisy.

In general, the evaluation of the effectiveness of traditional laparoscopic longitudinal gastric resection in patients with MS on the background of GERD revealed the presence of low values of "excellent" and "good" treatment results both in the immediate (9.6% and 22.5%) and in the long-term (11.1% and 22.2%) postoperative periods of treatment due to high the frequency of postoperative complications (in the early period up to 1.15 units per 1 patient) and recurrence of GERD. All this required repeated hospitalizations of patients to the clinic (on average 3.2 ± 0.9 times) with an extension of the treatment period (up to 15.6 ± 0.3 bed days), which indicates a decrease in the patients' LVH against the background of the preservation of the components of MS.

The listed reasons for the unsatisfactory results of treatment of patients in the control group may indicate the need to use more effective solutions to the surgical problem associated with the technical side of performing LVL.

The modification of the LVL was based on the principle of creating an antireflux cuff, which, along with techniques for creating an antireflux position of the stomach, would block the flow of gastric contents into the esophagus cavity.

The LPRF modified by us was carried out as follows: At the first stage, access to the abdominal cavity was carried out by installing trocars. After the revision of the abdominal organs, access was carried out to the omentum sac, with the mobilization of the stomach along the large curvature and along the gastro-diaphragmatic ligament. Having installed an intragastric calibration probe 36 Fr, sleeve resection of the stomach was performed along it using a stitching device. After reaching the hemostasis of the stapler line, anterior and then posterior crorography was performed. Next, the mobilization of the free part of the large omentum on the vascular pedicle of sufficient length for transfer to the diaphragmatic surface of the abdominal cavity was carried out. A cuff was formed around the abdominal part of the esophagus due to the mobilized part of the large omentum. This cuff made of a large omentum was tightly sewn around the abdominal part of the esophagus on a calibration probe 36 Fr.

The subsequent stages of the operation were standard: drainage of the abdominal cavity, removal of the severed part of the stomach and suturing of trocar wounds.

In general, it can be noted that the best option for laparoscopic longitudinal gastric resection in patients with metabolic syndrome against the background of gastroesophageal reflux disease is a technically feasible option for creating an antireflux position of the stomach with the formation of an antireflux cuff around the abdominal part of the esophagus due to tight stitching of the mobilized part of the large omentum on the calibration probe 36 Fr. Already on the 3rd day of the postoperative period, positive treatment results were stated as "excellent" in 4 (6.7%) and "good" in 14 (23.3%) patients. After another 3 days, these indicators increased to 5 (8.3%) and 22 (36.7%), respectively. Evidence of the presence of positive postoperative dynamics should be considered a decrease in "unsatisfactory" treatment results from 19 (31.7%) cases on the 3rd day of the postoperative period to 1 (1.7%) cases on the 7th day, respectively.

On the next day of the postoperative period, the leaders were "excellent" (58.3% of cases on the 30th day of the postoperative period) and "good" (73.3% of cases on the 14th day of the postoperative period).

A total of 44 cases of postoperative complications were reported in the main group of patients. On average, 0.73 postoperative complications occurred per 1 patient of the main group, which was 1.6 times less than among patients of the control group ($p < 0.05$).

In a comparative aspect, a certain mechanism for the development of a number of postoperative complications was established, which were directly related to extraesophageal forms of GERD in patients of the control group. In particular, the incidence of acute laryngitis and, subsequently, bronchopneumonia and exudative pleurisy were on average 2.28 times higher among patients in the control group. This also includes the difference in the frequency of heart rhythm disorders (1.9 times more in patients of the control group) associated with irritation of the vagus nerve and manifestations of the consequences of the cardiogenic form of GERD and its continuation.

During the 30-day postoperative period, we revealed a tendency to normalize laboratory parameters of carbohydrate and lipid metabolism. There was a decrease in fasting glycemia from 6.95 ± 2.13 mmol/l on the 3rd day of the postoperative period to 5.85 ± 0.13 mmol/l on the 30th day ($p < 0.05$); total cholesterol in the blood from 6.13 ± 1.19 mmol/l to 3.92 ± 1.49 mmol/l ($p < 0.05$); triglycerides from 1.87 ± 0.44 mmol/l to 1.19 ± 0.18 mmol/l ($p < 0.05$) and LDL cholesterol from 3.12 ± 0.98 mmol/L to 2.16 ± 0.41 mmol/l ($p < 0.05$).

Signs of GERD in the postoperative period were noted in 97 cases and on average there were 0.4 signs of the disease per 1 patient, which was 3.2 times less than among patients of the control group.

A decrease in the clinical signs of MS against the background of GERD in patients of the main group led to a reduction in bed days of inpatient treatment after modified LVH to an average of 7.2 ± 2.2 bed days, which was 2.3 times less than in patients of the control group.

Thus, a comparative assessment of the immediate results of treatment showed that due to the use of laparoscopic longitudinal gastric resection modified by us in patients with metabolic syndrome on the background of gastroesophageal reflux disease, it allowed to increase the frequency of "excellent" results from an average of 9.6% to 24.2% of cases, that is, 2.5 times, "good" results – from 22.5 to 42.9%, that is, by 1.9 times and reduce the frequency of "unsatisfactory" treatment results for this disease from 17.9% to 8.3%, that is, by 2.2 times. The use of modified LVL made it possible in the early postoperative period, due to the improvement of the condition of patients, to reduce the number of inpatient bed days from 16.6 ± 3.5 to 7.2 ± 2.2 bed days, that is, 2.3 times.

A comparative assessment of the effectiveness of modified LVH in terms of body weight dynamics revealed a more intensive weight loss process among patients of the main group, which led to a decrease in the number of patients with obesity and, accordingly, with MS.

For the entire long-term period after modified LVL, we did not notice a deterioration in the course of MS and GERD among patients of the main group. Clinical signs of GERD and laboratory signs of MS persisted in 6.7% of patients in the main group only after 3 months of the postoperative period, which was 3.7 times less than among patients in the control group ($p < 0.05$).

In the remaining periods of the study after modified LVL, we no longer noted such cases among patients of the main group, whereas among patients of the control group they were registered 6 (18.3%) and even 12 (6.7%) months after LVL.

Thus, the analysis shows that the use of the modified LVL developed by us against the background of achieving positive results with respect to both MS and GERD.

The use of the BAROS-3 questionnaire, which in its average value showed a significant increase in all parameters of the quality of life of patients after the use of modified LVL compared with patients with traditional methods of surgery.

In the main group of patients, repeated hospitalization of patients to the clinic, due to the deterioration of the condition of patients, was in isolated cases (0.8 ± 0.2 times), and was associated to a greater extent with the consequences of GERD (nausea, frequent vomiting, the need for infusion therapy) with an average inpatient treatment of 5.2 ± 0.2 bed days, whereas On average, patients of the control group were hospitalized to the clinic repeatedly 3.1 ± 0.9 times, which led to an increase in the average value of inpatient treatment to 15.6 ± 0.3 bed days with an extension of the period of disability and the level of quality of life.

Thus, a comparative assessment of long-term treatment results showed that due to the use of our modified LVL in patients with metabolic syndrome on the background of GERD, it allowed to increase the frequency of "excellent" results from an average of 11.1% to 23.3% of cases (2.1 times), "good" results - from 22.2% to 50% (in 2.25 times), completely avoid cases with "unsatisfactory" results of treatment of this disease, as well as reduce the frequency of repeated hospitalizations to the clinic by 3.9 times, and the number of beds-days - by 3 times, which indicates an improvement in the results of treatment of patients, an increase in the quality of life and a reduction in the time of disability.

Conclusions

1. The reasons for the unsatisfactory results of treatment of patients after the use of traditional laparoscopic longitudinal gastric resection, characterized by low values of "excellent" and "good" treatment results, both in the immediate (9.6% and 22.5%, respectively) and in the long-term (11.1% and 22.2%) periods, are the development of a high frequency of postoperative complications (up to 1.15 units per 1 patient) and recurrence of gastroesophageal reflux disease. All this required repeated hospitalizations of patients to the clinic (on average 3.2 ± 0.9 times) with an extension of the treatment period (on average up to 15.6 ± 0.3 bed days), which in turn caused a decrease in the quality of life of patients against the background of the preservation of the components of the metabolic syndrome.
2. The use of modified laparoscopic longitudinal gastric resection in patients with metabolic syndrome on the background of gastroesophageal reflux disease has improved the results of long-term treatment results in the form of an increase in the frequency of "excellent" results from an average of 11.1% to 23.3% of cases, that is, 2.1 times, "good" results - from 22.2% to 50%, that is by 2.25 times, completely avoid cases with "unsatisfactory" results of treatment of this disease, as well as reduce the frequency of repeated hospitalizations to the clinic by 3.9 times, and the number of beds-days - by 3 times, which indicates an improvement in the results of treatment of patients, an improvement in the quality of life and a reduction in the time of disability.

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