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The article was received
2019.10.25



UDC 616.329-002-008-089.168.-06-037

<https://doi.org/10.26641/2307-0404.2020.1.200412>

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POST-OPERATIVE REFLUX ESOPHAGITIS AS A PREDICTOR OF CHOICE OF RESTRICTIVE OPERATION IN PATIENTS WITH METABOLIC SYNDROME

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Цитування: *Медичні перспективи*. 2020. Т. 25, № 1. С. 127-133

Cited: *Medicni perspektivi*. 2020;25(1):127-133

Key words: *obesity, metabolic syndrome, sleeve gastrectomy, gastroplication, fundoplication, laparoscopy, gastroesophageal reflux disease, reflux esophagitis*

Ключові слова: *ожиріння, метаболічний синдром, рукавна резекція, гастроплікація, фундоплікація, лапароскопія, гастроєзофагальна рефлюксна хвороба, рефлюкс-езофагіт*

Ключевые слова: *ожирение, метаболіческий синдром, рукавная резекция, гастропликация, фундопликация, лапароскопия, гастроэзофагальная рефлюксная болезнь, рефлюкс-эзофагит*

Abstract. Post-operative reflux esophagitis as a predictor of choice of restrictive operation in patients with metabolic syndrome. Savoliuk S.I., Lysenko V.M., Krestianov M.Y., Zavertylenko D.S., Krugliak Y.K. *The purpose of this study was to conduct a comparative analysis of the retrospective results of laparoscopic sleeve gastrectomy (LSG), laparoscopic gastroplication (LGP) and laparoscopic fundogastroplication (LFGP) (simultaneous performance of fundoplication by Nissen and gastroplication) obtained at the follow-up period of 1 year, to evaluate and compare the effectiveness of prevention of short-term postoperative complications, which are manifested in the form of GERD, by performing preventive antireflux procedure in combination with restrictive bariatric surgery. Evaluation of the effectiveness and long-term effects of the presented restrictive operations was carried out on the basis of retrospective data obtained during the supervision of 46 patients with obesity and metabolic syndrome (men / women – 16/30, average age – 41.19±6.07, body weight – 128.26±7.37 kg, abdominal circumference – 133.4±4.71 cm, body mass index (BMI) – 42.66±2.41 kg/m², I-III ASA). In the preoperative and postoperative periods, during consultations, in all patients measurements of anthropometric indicators were performed, laboratory data and results of instrumental research were considered. All metabolic procedures presented were performed at the basis of the Department of Surgery and Vascular Surgery of NMAPE named after P.L. Shupik in the period from 2016 to 2019. 13 patients underwent LSG, 20 – LGP and 13 – LFGP. In order to control the results, repeated consultations were carried out at 1, 3, 6 and 12 months of the postoperative period. The average duration of the operation was: LSG – 88.5±6.49 min, LGP – 120±5.42 min, LFGP – 135.38±7.48 min. The average period of hospitalization was: LSG – 3.2±0.63 days, LGP – 3.53±0.62 days, and LFGP – 3.5±0.67 days. After a year, the body mass index (BMI) was: LSG – 31.17±0.31 kg/m², LGP – 32.48±0.23 kg/m², LFGP – 32.43±0.21 kg/m². According to the results of a repeated questioning of patients one year after the operation, 3 (23.07%) of the LSG group and 5 (25.0%) of the LGP group had symptoms of GERD, which failed to be eliminated with the help of conservative therapy, life quality of patients became significantly worse. In the group of patients who underwent LFGP, this complication was absent. After the control gastroscopy, 1 year after, de novo signs of reflux esophagitis were detected (according to the Los Angeles classification): in the LSG group – 3 (23.07%) patients (2 – grade A and 1 – grade B), in the LGP group – 5 (25.0%) patients (3 – grade A and 2 – grade B). Among patients who underwent LFGP, there were no signs of reflux esophagitis. Considering the possible development of GERD and reflux esophagitis in one year after the restrictive surgery, the use of preventive measures consisting in the simultaneous performance of antireflux and metabolic operations is relevant, this is demonstrated by the example of LFGP. We recommend to give preference to simultaneous operations for the achievement of not only high rates of weight loss, but also for improvement of the quality of patients' life in the future.*

Реферат. Послеоперационный рефлюкс-эзофагит как предиктор выбора вида рестриктивной операции у пациентов с метаболическим синдромом. Саволюк С.И., Лысенко В.Н., Крестьянов Н.Е., Завертыленко Д.С., Кругляк Е.К. *Цель данного исследования заключалась в проведении сравнительного анализа ретроспективных результатов лапароскопической рукавной резекции желудка (ЛРРЖ), лапароскопической гастропликации (ЛГП) и лапароскопической фундогастропликации (ЛФГП) (симультанное выполнение фундопликации по Nissen и гастропликации), полученных в срок наблюдения 1 год, с целью оценить и сравнить эффективность предупреждения краткосрочных послеоперационных осложнений, которые проявляются в виде ГЭРБ, путем выполнения превентивной антирефлюксной процедуры в сочетании с рестриктивной бариатрической операцией. Оценка эффективности и отдаленных последствий представленных рестриктивных операций проводилась на основе ретроспективных данных, полученных во время курации 46 больных ожирением и метаболическим синдромом (мужчины/женщины – 16/30, средний возраст – 41,19±6,07, масса тела – 128,26±7,37 кг, окружность живота – 133,4±4,71 см, индекс массы тела (ИМТ) – 42,66±2,41 кг/м², I-III ASA). В дооперационном и послеоперационном периодах во время консультаций всем пациентам в обязательном порядке проводились измерения антропометрических показателей, контроль лабораторных данных и результатов инструментальных методов исследования. Все представленные метаболические процедуры были выполнены на базах кафедры хирургии и сосудистой хирургии НМАПО им. П.Л. Шутика в период с 2016 г. по 2019 г. 13 пациентам была проведена ЛРРЖ, 20 – ЛГП и 13 – ЛФГП. Повторные консультации с целью контроля результатов проводились на 1, 3, 6 и 12 месяцах послеоперационного периода. Средний показатель продолжительности операции составил: ЛРРЖ – 88,5±6,49 мин., ЛГП – 120±5,42 мин., ЛФГП – 135,38±7,48 мин. Средний показатель срока госпитализации пациентов составил: ЛРРЖ – 3,2±0,63 д., ЛГП – 3,53±0,62 д. та ЛФГП – 3,5±0,67 д. Через год показатель индекса массы тела (ИМТ) составлял: ЛРРЖ – 31,17±0,31 кг/м², ЛГП – 32,48±0,23 кг/м², ЛФГП – 32,43±0,21 кг/м². По результатам повторного анкетирования пациентов через год после проведенной операции у 3 (23,07%) из группы ЛРРЖ и 5 (25,0%) из группы ЛГП имели место проявления симптомов ГЭРБ, которые не удавалось устранить с помощью консервативной терапии, что значительно ухудшило качество жизни пациентов. В группе пациентов, которым проводилась ЛФГП, данное осложнение отсутствовало. После проведения контрольной ФЭГДС через 1 год были обнаружены de novo признаки рефлюкс-эзофагита (согласно классификации Лос-Анджелес 1998 г.): в группе ЛРРЖ – 3 (23,07%) пациента (2 – степень А и 1 – степень В), в группе ЛГП – 5 (25,0%) пациентов (3 – степень А и 2 – степень В). Среди пациентов, которым была проведена ЛФГП, признаков рефлюкс-эзофагита не было обнаружено. Учитывая возможное развитие ГЭРБ и рефлюкс-*

эзофагита через год после проведенной рестриктивной операции, является актуальным применение превентивных мероприятий, заключающихся в одномоментном выполнении антирефлюксной и метаболической операций, что в данном исследовании демонстрируется на примере ЛФГП. Мы рекомендуем отдавать предпочтение проведению именно симультанных операций для достижения не только высоких показателей снижения веса, но и улучшения качества жизни пациентов в дальнейшем.

One of the most pressing problems of modern society in all countries of the world is the increase in the incidence of obesity and metabolic syndrome, which is also a key factor in the development of comorbidities such as diabetes [15], cardiovascular diseases [5], some types of cancer [4], various types of musculoskeletal disorders [16], disorders of the psycho-emotional aspect of health [1], this, in combination, significantly reduce the ability to work, quality and life and increase the cost in health care for the treatment of patients with this pathology. According to recent data, from 1980 to 2015, the total number of overweight and obese patients increased by 2 times, making up 1/3 of the world's adult population [9]. In line with this negative trend, it is projected that in 2030 the level of overweight and obesity will be 57.8% of the world population [10]. Among all the possible treatments, bariatric surgery is a leading and safe way of combating obesity and associated diseases. Given the intense increase in the proportion of morbidity for this pathology, there is a direct proportional increase in the number of metabolic procedures, the proportion of which increases every year. According to the fourth IFSO Global Registry Report 2018, the total number of bariatric operations was 394,431, which is 2 times higher than last year. Restrictive operations make up the predominant number, and the most common metabolic procedure of this type is a sleeve gastrectomy, share of which is 45.9% of the total number [3]. However, according to various reports [2, 8, 11, 14] there is a problem of development of de novo or aggravation of symptoms of gastroesophageal reflux disease (GERD) and reflux esophagitis in patients after performed sleeve gastrectomy in short time period, which consequently worsened the quality of life of patients. This makes it relevant to further investigate and look for preventive methods and ways to eliminate such a remote complication.

The purpose of this study was to conduct a comparative analysis of retrospective efficacy results and long-term effects of laparoscopic sleeve gastrectomy (LSG), laparoscopic gastroplication (LGP), and laparoscopic fundogastroplication (simultaneous Nissen fundoplication, and gastroplasty) (LFGP), which aims to evaluate and compare the effectiveness of preventing short-term postoperative complications manifested as GERD by performing

preventive antireflux procedure in combination with restrictive bariatric surgery.

MATERIALS AND METHODS OF RESEARCH

A comparative evaluation of the efficacy and long-term effects of restrictive surgeries was based on retrospective data obtained during follow-up of 46 patients with obesity and metabolic syndrome (men/women – 16/30, mean age – 41.19±6.07 (p=0.999), body weight – 128.26±7.37 kg (p=0.999), abdomen – 133.4±4.71 cm (p=0.999), body mass index (BMI) – 42.66±2.41 kg/m², I-III ASA (p=0.999). In the preoperative period all patients were consulted, consultation was held during which preoperative recommendations were provided (each patient was provided with a list of recommendations for surgical treatment preparation, which patients were clearly adhered to – compliance was achieved), information on available variants of metabolic procedures and possible short-term and long-term results (expected weight loss; known maximum observation terms to achieve results; possible re-weight gain; negative effects that may have an impact on quality of life, such as the formation of additional skin folds, the need for medications taking, change in eating behavior, etc.) and the availability of alternative non-surgical treatment of obesity and its effectiveness compared with bariatric operations. Informed consent to surgical treatment was obtained [13]. During the preoperative and postoperative periods and during consultations, in all patients obligatory anthropometric parameters were measured, control of laboratory data was made (general blood test, general urine test, biochemical blood test, glycated hemoglobin, NOMA index, triglyceride level, lipoproteins of low and very low density) and instrumental methods of examination (ultrasound examination of the abdominal organs, FGDS, radiography with contrast of the upper gastrointestinal tract) to identify comorbidities and postoperative complications were used [7]. By the results of the research, the following concomitant diseases were identified: hypertension (28 patients), dyslipidemia (24 patients), type II diabetes mellitus (8 patients). Patients' quality of life according to the manifestations of GERD was assessed using the GERD Q questionnaire (Table 1). The criterion for the exclusion of patients from this study was the presence of symptoms of gastroesophageal reflux disease (GERD), gastroesophageal hernia (GEH) and reflux-

esophagitis – according to the results of the studies the above mentioned diseases were absent in all patients in the preoperative period. All presented metabolic procedures were performed at the bases of the department of surgery and vascular surgery of P.L. Shupyk NMAPE in the period from 2016 to

2019. Of which 13 patients underwent LSG, 20 – LGP and 13 – LFGP. The observation period of patients after surgical treatment was 1 year. Repeated consultations in order to control the results were held at 1, 3, 6, and 12 months postoperatively.

Table 1

Indices of body weight loss during 1 year (M±m)

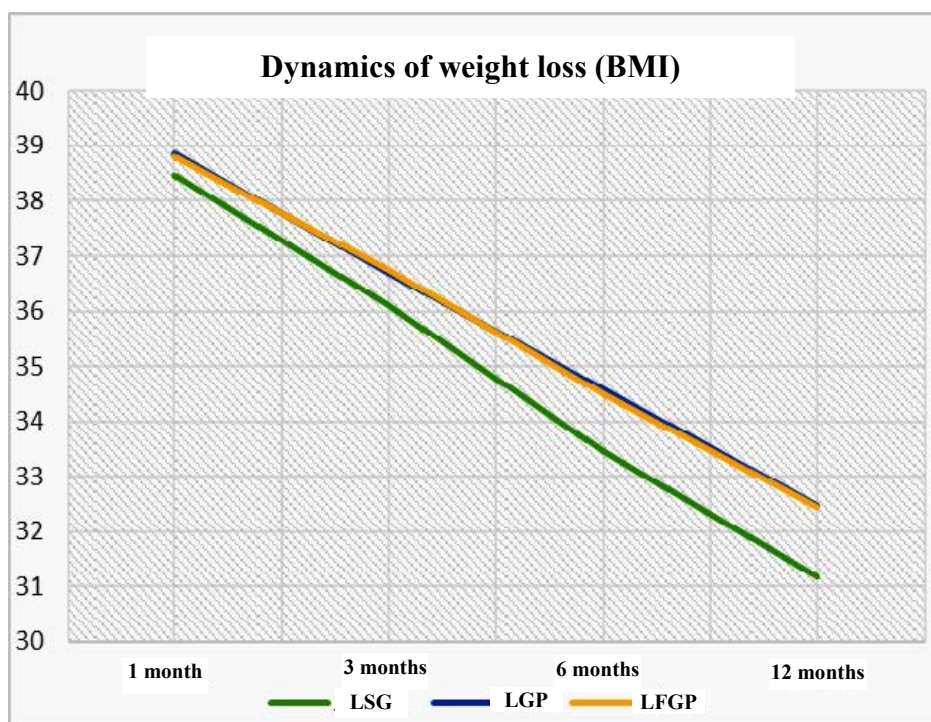
Groups of patients	1 month	3 months	6 months	12 months
LSG	38.46±0.45	36.10±0.36	33.45±0.41	31.17±0.31
LGP	38.86±0.36	36.69±0.29	34.57±0.24	32.48±0.23
LFGP	38.81±0.29	36.76±0.18	34.49±0.29	32.43±0.21

RESULTS AND DISCUSSION

The average duration of the operation was: LSG – 88.5±6.49 minutes, LGP – 120±5.42 minutes, LFGP – 135.38±7.48 minutes (p=0.999) [11]. In the early postoperative period, transient vomiting was observed in 3 (23.07%) of LSG and 4 (20.0%) patients of LGP group, its manifestations disappeared against the background of conservative therapy overnight. For patients of LFGP group, no similar complications were noted.

The mean hospital stay for patients was: LSG – 3.2±0.63 days, LGP – 3.53±0.62 days, and LFGP – 3.5±0.67 (p=0.999) days (p=0.999) [11].

One year after the surgical treatment of patients with obesity and with metabolic syndrome, the following results were achieved: BMI in patients after LSG was 31.17±0.31 kg/m², LGP – 32.48±0.23 kg/m², LFGP – 32.43±0.21 kg/m² (p=0.999) (Fig.) [12].



Graph of dynamics of weight loss of patients

Over the period of study, compensation for type II diabetes mellitus was noted in 6 (75.0%) patients, arterial hypertension – in 22 (78.5%), and lipid profile normalization - in 19 (79.16%) of those ones.

During questioning of patients according to GERD Q questionnaire in preoperative period, GERD manifestations were absent in patients in all three groups (mean 3.8 points). According to the

results of repeated questioning of patients one year after surgery, 3 (23.07%) of the LSG group and 5 (25.0%) of the LGP group showed symptoms of GERD (mean for the LSG – 9.5, LGP – 9.4) (Table 2), which required the use of conservative therapy, which worsened patients' quality of life. This complication was absent in the group of patients undergoing LFGP.

Table 2

Results of questioning of patients one year after performed surgery

Group of patients	Total number of patients	Symptoms of GERD de novo one year after surgery	
LSG	13	3	23.07%
LGP	20	5	25.00%
LFGP	13	0	0.00%

After performed control FEGDS one year after, de novo signs of reflux esophagitis (according to the Los Angeles classification) were detected: in the LSG group – 3 (23.07%) patients (2 – grade A and 1 – grade B), in group LGP – 5 (25%) patients (3 – grade A and 2 – grade B). There were no signs of reflux esophagitis among patients who underwent LFGP.

One year after in 3 patients after LSG and in 5 patients after LGP, during control fluoroscopy with barium solution, episodes of gastro-esophageal reflux of the contrast and moderate enlargement of the proximal gastric regions were observed as compared to patients with LFGP.

Considering the significant increase in percentage of patients suffering from obesity and metabolic syndrome, there is an increase in the total number of bariatric surgeries, which represent the most effective method of treatment of this disease. The most effective among all presented bariatric procedures is a sleeve gastrectomy, which is a representative of metabolic procedures of restrictive type, that show their effectiveness in reducing weight and securing remission of concomitant diseases caused by obesity, which significantly improves the quality of life of patients. Gastroplication is a bariatric surgery of restrictive type that has a performance similar to that of after a sleeve gastrectomy without resection of a large gastric curvature, but this operation remains poorly understood. According to various sources, which report on the possible development of complications in the form of de novo manifestations of GERD symptoms and signs of reflux esophagitis in the short and long term [13], it is considered necessary to use conservative therapy,

which leads to a decrease in the quality of life of patients after performed metabolic procedure. In case of ineffectiveness of drug therapy in the future it is necessary to perform revision surgery to correct such a pathological condition. This problem makes relevant the use of what is being demonstrated in the present study as an example of single-stage laparoscopic gastroplication and Nissen fundoplication and the search for new preventive measures during the metabolic procedure, not only to treat obesity and metabolic syndrome, but also to prevent its long-term consequences. surgical treatment with further study of the results in the pre-term period when performing this type of simultaneous operations.

CONCLUSIONS

Considering the possible development of GERD and reflux esophagitis a year after the restrictive surgery, it is important to use preventive measures, i.e. to perform antireflux and metabolic surgeries in one study, as demonstrated by LFGP example in this study. This procedure is effective not only in reducing body weight, achieving remission and control of comorbidities, but also in preventing long-term complications after restrictive metabolic procedures, which in turn prevents the use of drug therapy that reduces the quality of life of patients, and allows to avoid possible recurrent surgery to treat GERD and reflux esophagitis caused by a metabolic procedure. However, this type of surgical treatment requires further retrospective study. Accordingly, we recommend to perform simultaneous surgery to achieve not only high rates of weight loss, but also improve patients' quality of life in the future.

The topic of the research initiative of the Department of Surgery and Vascular Surgery of P.L. Shupyk NMAPE: "Innovative technologies in surgical treatment of diseases of the abdominal cavity,

abdominal wall and vessels "Time for completion: 01.2017-10.2021, state registration number: 0117U002468

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The article was received
2019.09.18

