

Evaluation of simultaneous surgical operations in obesity patients

Dmitriy Galimov^{1}, Oleg Galimov¹, Vladislav Khanov¹, Rinat Sufiyarov¹, Tel'man Ibragimov¹, and Gul'naz Vagizova¹*

¹ Bashkir State Medical University, 450008 Ufa, Russia

Abstract. Aim is to study the quality of life in patients with obesity who underwent hernia repair, in comparison with patients who underwent a weight-correcting intervention. **Materials and methods.** On the basis of the University Clinic was performed a prospective study of 107 patients with incisional hernia, who underwent a prosthetic hernioplasty and whose BMI exceeded 35 kg/m². All operated patients were divided into compared groups. The first group consisted of 36 (33.6%) patients who, in addition to hernia correction, underwent one of bariatric procedure. The second group consisted of 71 (66.4%) patients who underwent only prosthetic hernioplasty. In this groups was assessed the quality of life by SF-36 questionnaire before and 1 year after the operation. **Results and discussion.** It was found a correlation between the weight-correction surgery with the physical component of health, indicating a decrease in the role of physical problems in limiting the patient's life. Significant differences were revealed on the scales of physical functioning, health assessment, and the physical component of quality of life. **Conclusion.** Performing a simultaneous bariatric surgery with hernia repair improves the quality of life in these patients.

1 Introduction

As a result of the increasing number and scope of surgical interventions on abdominal organs, the treatment of postoperative ventral hernia (POVH) remains one of the current problems [1, 2]. Despite the development of laparoscopic surgical techniques, the surgical treatment of POVH does not go away and requires further development, as evidenced by the high incidence of both postoperative complications and recurrence, especially in patients with morbid obesity (MO) for well-known objective reasons [3, 4].

According to world statistics, in 7-24% of cases, surgical intervention with laparotomy access is accompanied by the development of postoperative ventral hernia. In presence of risk factors, the incidence of postoperative ventral hernia development is even higher, e.g. in morbid obesity - up to 28% and more, and during peritonitis surgery - up to 54.3%. In the context of an emergency laparotomy, the incidence of hernias increases to 40%. Also, according to statistics, hernias occur more frequently in elderly and senile patients with

* Corresponding author: dimon.gal77@mail.ru

anatomical and functional insufficiency of the anterior abdominal wall and decreased ability to regenerate [5, 6, 7].

Currently, the methods applied for POVH plasty are based on the use of additional plastic materials to provide a reliable cover of the hernia defect, reduce the incidence of hernia recurrence, and the absence of discomfort in the plasty area [8, 9]. However, at the present stage, no less important is given to such criteria as aesthetic satisfaction of the patient after the plasty, preservation of physical activity, including sports, and the restoration of work capacity and return to everyday life. This means that the study of "quality of life" at different times after operation is of relevance [10, 11, 12].

The quality of life assessment provides a more accurate assessment of expected and final outcomes on parameters that are at the interface between the scientific approach of specialists and the subjective point of view of the patient [13, 14].

2 Materials and methods

The study included 107 patients with POVH who underwent prosthetic, non-tensioned hernioplasty and whose BMI exceeded 35 kg/m² at the Clinic of the Federal State Budgetary Educational Institution "BSMU" of the Russian Ministry of Health.

All operated patients were divided into 2 groups according to the volume of surgery. The first group was represented by 36 (33.6%) patients who underwent additional bariatric intervention in addition to hernia correction. Preference was given to "sleeve" gastric resection in 31 (28.9%) patients and SADI in 5 (4.7%) cases. The second group consisted of 71 (66.4%) patients, in whom only non-tension prosthetic hernioplasty was performed.

It should be noted that the inclusion criteria for the bariatric group were as follows: patients' age from 30 to 60 years; absence of acute pathology and exacerbation of chronic diseases at the time of surgery; patient's awareness of the increased operation and motivation to lose weight; planned type of intervention; nonrecurrent POVH; midline hernia localization; uncomplicated herniotomy course; hernia size medium to large (classification according to K.D. Toskin and V.V. Zhebrovsky (1990)). An important feature of our study was that we used an original instrument developed by us to determine the true dimensions of anatomical structures [15].

The groups of patients were comparable in age and gender characteristics. In the first group, the mean age was 43±1.81 years, women were 25 (69.4%) and men 11 (30.6%), in the second group women were 64.8% (46) and men 35.2% (25) and the mean age in the group was 44±2.31 years ($p<0.05$).

We used Medical Outcomes Study (MOS) short form (SF) 36 questionnaire as a tool to assess LS. This questionnaire is easy to use, allows versatile processing of clinical material, has high sensitivity, and is short in length, which makes it easy to use for the researcher [16].

The study was conducted in 2 stages. At the 1st stage, in the preoperative period, the patients filled in the questionnaire independently after consultation and familiarisation with the standardised Russified version of the SF-36 questionnaire (based on the MOS 36-Item Short-Form Health Survey (MOS SF-36) by one of the researchers. The 2nd stage, 1 year after surgery, when the questionnaire was administered remotely via modern electronic communication, by sending out the questionnaire form. At the second stage, 34 (94.4%) of the 36 patients from the 1st group and 66 (92.9%) of the 71 patients from the 2nd group participated in the study, which allows conclusions to be drawn for the whole group. In addition, at this stage the patients were additionally questioned about their underlying disease (presence of complications in the postoperative period, hernia recurrence, need for surgical consultation).

3 Results and discussion

Morbid obesity makes patients with postoperative ventral hernia a challenging category in surgical practice and is associated with a significant incidence of hernia recurrence. Reducing body weight is one of the key factors in preventing recurrence, which is achieved by performing bariatric surgery. It is still debatable whether there is an indication for combined interventions and increased surgical volume when an additional surgical step is more difficult than the main one.

No intraoperative complications were observed in all cases. Length of operation in the first group was 189 ± 28.31 min, in the second group - 91 ± 18.62 min. The number of wound complications in the postoperative period was comparable in the compared groups and did not differ statistically. In the first group, in the first year of follow-up, a stable reduction of excess body weight by an average of $52.3 \pm 7.27\%$ was achieved in all cases.

This study focuses on studying, in particular, LS of these patients in the postoperative period.

The analysis of the received questionnaire data has revealed a statistically significant correlation between the weight of the operative intervention and the physical component of the health, indicating a decreasing role of the physical problems in limiting the vital functions of the patient. Correspondingly, the preoperative and postoperative data revealed significant differences in the scales of physical functioning ($p = 0.0017$), health assessment ($p = 0.005$) and the physical component of quality of life ($p = 0.0091$). Group 1 patients also had higher levels of social activity - emotional and physical ability to communicate with members of the general population. Improvement was also noted in the general health (GH) section and in the ability to perform professional work. On the scales of the mental component, the difference in the compared groups was not significant (Table 1).

From the data of this study, it can be determined that the key to the impact of obesity on quality of life is the level of daily physical activity. Although herniation is a significant factor influencing daily physical activity, the persistence of obesity in group 2 patients did not allow them to reach satisfactory levels of daily physical activity and work capacity as was the case in group 1 patients. However, it is worth noting that comparable scores in the compared groups on the cultural and social factors of the questionnaire, lead to a lack of motivation to lose weight in most patients, forming a vicious circle and creating a high risk of hernial recurrence. These patients in group 2, 28 (43%) had better scores on the mental component factors of quality of life, which was explained by a higher social position in society and above-average income.

Table 1. Results of the SF-36 questionnaire for the comparison groups before surgery and 1 year after surgery

Questionnaire scales	Before surgery		1 year after surgery	
	1 st group	2 nd group	1 st group	2 nd group
Physical Functioning (PF)	56.3±6.11	59.1±4.34	78.3±3.29	60.3±2.51
Role (physical) Functioning (RP)	48.4±5.72	49.9±2.97	82.9±8.21	51.3±4.19
Pain (P)	66.2±4.27	69.5±4.44	74.3±3.11	71.1±5.21
General health (GH)	47.9±5.47	50.9±2.92	74.2±7.90	57.2±4.03
Viability (VT)	58.4±3.37	59.2±7.01	69.5±4.61	60.8±2.58
Social Functioning (SF)	69.8±8.80	66.3±11.04	78.1±8.05	77.2±9.04
Emotional Functioning (EF)	73.3±6.57	75.5±7.05	73.7±10.54	72.7±9.51
Mental health (MH)	71.4±4.18	74.6±6.70	75.6±5.62	78.2±7.60

A detailed analysis of the correlations of BMI, one year after surgery, for the individual scales of the questionnaire, revealed, as we have already mentioned, a significant correlation with the physical component of quality of life ($R = -0.33$ $p = 0.0062$), with the mental component no such correlation was detected. The abdominal nature of the fat distribution corresponded to a worse quality of life.

A significant difference was obtained in the patients' answers to 16 of 36 questions of the SF-36 questionnaire, most of which referred to physical functioning, as well as to the assessment of health, pain, physical and emotional functioning roles.

So, in particular, on the question related to limitation in performance of certain physical activities, in patients of the 2nd group one year after operation in 53 (81%) cases limitation in performance of heavy physical activities (running, lifting of weights), in 45 (69%) patients moderate (flat cleaning) was noted. In group 1 these figures were 13 (39%) and 9 (27%) respectively. There were no significant differences in the responses for light loads (lifting and carrying a bag of groceries), although in absolute numbers the rates were worse in Group 2. Twenty-five (74%) patients reported no limitations and no difficulty in bending and squatting when climbing a flight of stairs after weight correction ($p < 0.0001$). In the compared group, 39 (59%) had moderate limitations and 60 (91%) had difficulty in bending and squatting, of whom 26 (40%) had significant difficulty ($p = 0.02$). On the criterion of "general health" in the postoperative period the scores improved in both study groups, however, in 2 (6%) patients in group 1 and 19 (29%) in group 2 it was assessed as poor. In the first group, we attributed this score to a resurgent POVH recurrence. In Group 2, the "poor" outcome was attributed to both recurrence in 7 (11%) patients and the presence of age-related factors and obesity-related pathology in 12 (18%) cases. At the same time, it is worth noting that the preoperative values of the considered parameters were worse in both compared groups.

4 Conclusion

Consequently, performing a simultaneous bariatric procedure can be technically more difficult than the main procedure. This requires careful selection of the patient, both somatically and in terms of their own 'psychological maturity' in the need for weight loss. If the patient consents, UDE of lower extremity veins, ECHO, FGDS, ABDUS must be performed in addition to the necessary, "standard" set of preoperative hernia examinations, with prior consultation with an anaesthesiologist and resuscitator before hospitalisation. Successfully performed bariatric intervention, simultaneously with herniotomy, allows a statistically reliable improvement of patient quality of life one year after surgery, especially according to the physical components of the SF-36 questionnaire, which consequently positively influences self-esteem and increases an active role in society.

References

1. A.S. Marinochkin, S.V. Avakimyan, K.I. Popandopulo, V.A. Avakimyan, Russian Sklifosovsky Journal of Emergency Medical Care **11(1)**, 181–185 (2022) <https://doi.org/10.23934/2223-9022-2022-11-1-181-185>
2. M. Lodha, et al., Cureus **14(6)**, 26136 (2022) <https://doi.org/10.7759/cureus.26136>
3. V.I. Nikolsky, E.V. Titova, A.A. Samorodova, J.E. Feoktistov, Life Quality in Patients after Prosthetic Hernioplasty **24(1)**, 19-25 (2016) <https://doi.org/10.18484/2305-0047.2016.1.19>
4. V. Egiev, J. Majorova, M. Leont'yeva, A. Meleshko, Obesity and metabolism **11(2)**, 13-16 (2014) <https://doi.org/10.14341/omet2014213-16>

5. C. Rognoni, et.al., *Sci Rep.* **10(1)**, 10706 (2020) <https://doi.org/10.1038/s41598-020-67821-w>
6. A.T. Nissen, D. Henn, S. Moshrefi, D. Gupta, R. Nazerali, G.K. Lee, *Ann Plast Surg.* **82(5S Suppl 4)**, 332-338 (2019) <https://doi.org/10.1097/SAP.0000000000001768>
7. A.V. Fedoseev, S.U. Muraviev, V.N. Budarev, A.S. Inutin, M.I. Faber, *Khirurgicheskaya praktika* **4**, 10-14 (2016)
8. A.L. Charyshkin, A.A. Frolov, *Modern problems of science and education* **5** (2013)
9. A.S. Ermolov, V.T. Koroshvili, D.A. Blagovestnov, *Pirogov Russian Journal of Surgery Khirurgiya. Zurnal im. N.I. Pirogova* **10**, 81-86 (2018) <https://doi.org/10.17116/hirurgia201810181>
10. S.E. Gumenyuk, A.V. Gubish, A.Yu. Popov, A.N. Petrovsky, A.G. Grigoriev, A.Yu. Sidelnikov, R.A. Batchaeva, A.A. Ismelova, *Kuban scientific medical bulletin* **1(2)**, 61-65 (2017) <https://doi.org/10.25207/1608-6228-2017-2-61-65>
11. A. Mejaddam, E. Krantz, G. Höskuldsdóttir, L. Fändriks, K. Mossberg, B. Eliasson, et al., *PLoS ONE* **17(10)**, 0273553 (2022) <https://doi.org/10.1371/journal.pone.0273553>
12. J. Stephenson, C.M. Smith, B. Kearns, et al., *BMC Public Health* **21**, 1990 (2021) <https://doi.org/10.1186/s12889-021-12009-8>
13. R.L. Kolotkin, J.R. Andersen, *Clin Obes.* **7(5)**, 273–89 (2017) <https://doi.org/10.1111/cob.12203>
14. F.B. Pimenta, E. Bertrand, D.C. Mograbi, H. Shinohara, J. Landeira-Fernandez, *Front Psychol.* **6**, 966 (2015) <https://doi.org/10.3389/fpsyg.2015.00966>
15. O.V. Galimov, V.O. Khanov, *Operating access meter. Russian patent N 160117 10.03.16 Bull.73.* https://i.moscow/patents/ru160117u1_20160310
16. L. Lins, F.M. Carvalho, *SF-36 total score as a single measure of health-related quality of life: Scoping review. SAGE Open Med.* 2016 Oct 4 <https://doi.org/10.1177/2050312116671725>.