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BARIATRIC SURGERY IN ELDERLY PATIENTS

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ABSTRACT

BACKGROUND: *Bariatric surgery is indicated to patients with morbid obesity and aged 18–60 years. In older aged patients, such surgery can also be taken into consideration, however, the procedure of selecting the patients is not included into the clinical recommendations, which determines the topicality of the research.* ***AIM:*** *To establish a protocol for surgical treatment of morbid obesity in patients older than 60 years.* ***METHODS:*** *The research included 800 patients operated during the period of 2018–2023 at the Federal State Budgetary Institution "Federal Scientific and Clinical Center" of the Federal Medical-Biological Agency of Russia due to the presence of morbid obesity, of which 38 had an age of 61 and older. All the patients underwent only two types of surgery — laparoscopic longitudinal resection and laparoscopic Roux gastric bypass surgery. All the patients of the older age group underwent personalized selection for surgical treatment, screening procedures were arranged in order to detect the senile asthenia syndrome and, retrospectively, to stratify them using the GeriBari prognostic scale. During one year of follow-up, the remote results were assessed in all the patients along with the quality of life.* ***RESULTS:*** *There were no postoperative complications in the older age group, the 30-day mortality was 2.6% (1 patient has died from the complications of the coronaviral infection). The weight loss was found to be significantly less in the older age group (61 and older) comparing to the main group of patients (18–60 years): for laparoscopic longitudinal resection — 55.5% versus 73%, respectively (p=0.01), for laparoscopic Roux gastric bypass surgery — 58% versus 77.5% (p=0.0008). The remission of type 2 diabetes was achieved in 70.6% of the patients of the older age group. The quality of life among the patients of the older age group, even with the slight decrease of the excess body weight, was significantly better 12 months after surgery.* ***CONCLUSION:*** *Among the elderly patients with morbid obesity, it is possible to perform bariatry surgeries safely and effectively when following the proposed protocol.*

Keywords: *bariatric surgery; gastric bypass; longitudinal gastrectomy; obesity; old age; frailty.*

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BACKGROUND

Bariatric surgery, according to clinical recommendations issued by the Ministry of Health of the Russian Federation (ID:28), is indicated to patients aged 18–60 years with morbid obesity, in which conservative procedures had no effect. The comments specify that, in the other age groups, surgical treatment can also be taken into account, however, the procedure for selecting the patients was not established [1]. The number of the elderly population irreversibly grows world-wide. According to official data from the Federal State Statistics Service, in Russia as of the 1st of January 2023, there were a total of 29.38 million people aged older than 60, or approximately 20% of all the citizens[1]. With this, the maximal occurrence of obesity is reported specifically in the age group of 60–70 years and, according to some estimates, reaches 57.76% in men and 80.99% in women [2].

Physiological changes occurring with aging can affect the efficiency of metabolic and bariatric surgery, the rate of postoperative complications and the ability of elderly patients to restore after surgery [3–5]. Just a while ago, the majority of clinical recommendations worldwide concerning the treatment of obesity in the elderly age, have prioritized conservative procedures [6], however, in the last 10 years, a steady growth was reported in the number of trials on the efficiency and safety of bariatry surgeries in patients aged over 60–65 years. The treatment results were positive, while the risk of complications and lethal outcomes was more related with the presence of severe concomitant diseases, smoking, cognitive disorders and senile asthenia syndrome [7]. In 2022,

[1] Federal State Statistics Service [Internet]. Distribution of population by age groups. Access mode: https://rosstat.gov.ru/folder/12781.

БАРИАТРИЧЕСКАЯ ХИРУРГИЯ У ПАЦИЕНТОВ ПОЖИЛОГО ВОЗРАСТА

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АННОТАЦИЯ

Обоснование. *Бариатрическая операция показана больным морбидным ожирением в возрасте 18–60 лет. В более старшем возрасте такая операция также может рассматриваться, однако порядок отбора пациентов в клинических рекомендациях не оговорён, что и обусловливает актуальность исследования.* ***Цель исследования*** *— разработать протокол хирургического лечения морбидного ожирения у пациентов старше 60 лет.* ***Методы.*** *В исследование включено 800 пациентов, прооперированных в период 2018–2023 годов в ФГБУ ФНКЦ ФМБА России по поводу морбидного ожирения, из них 38 были в возрасте 61 года и старше. Всем пациентам выполнялось только два вида операций — лапароскопическая продольная резекция и лапароскопическое гастрошунтирование по Ру. Все пациенты старшей возрастной группы прошли персонифицированный отбор на хирургическое лечение, проводились скрининг на синдром старческой астении и ретроспективно стратификация по прогностической шкале GeriBari. В течение года наблюдения у всех пациентов оценивали отдалённый результат и качество жизни.* ***Результаты.*** *Послеоперационных осложнений в старшей возрастной группе не было, 30-дневная летальность составила 2,6% (погиб 1 пациент от осложнений коронавирусной инфекции). Потеря веса оказалась значимо меньше в старшей возрастной группе (61 год и старше) в сравнении с основной группой пациентов (18–60 лет): при лапароскопической продольной резекции — 55,5% против 73% соответственно (p=0,01), при лапароскопическом гастрошунтировании по Ру — 58% против 77,5% (p=0,0008). Ремиссия сахарного диабета 2-го типа достигнута у 70,6% пациентов старшей возрастной группы. Качество жизни пациентов старшей возрастной группы даже при небольшой потере избытка массы тела статистически значимо улучшилось в течение 12 месяцев после операции.* ***Заключение.*** *У пожилых больных морбидным ожирением возможно безопасное и эффективное выполнение бариатрических операций при соблюдении предлагаемого протокола.*

Ключевые слова: *бариатрическая операция; гастрошунтирование; продольная резекция желудка; ожирение; пожилой возраст; старческая астения.*

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the recommendations from the American Society for Metabolic & Bariatric Surgery (ASMBS) and from the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) have stated that the age itself cannot be the contraindication for undergoing surgery, however, thorough selection is recommended among the aged patients, including the tests for senile asthenia syndrome [8]. Senile asthenia is the central geriatric syndrome, including the age-associated decrease of the physiological reserves and of the functions in the organism, which makes it more vulnerable for the effects from the internal and external factors, which determined the high risk of unfavorable events [9]. For the purpose of screening evaluation of senile asthenia, multiple scales were proposed, however, in Russia, only the “Age is not a drawback” questionnaire was validated, approved by the clinical recommendations on “Senile asthenia” (approved by the Ministry of Health of the Russian Federation, ID: 613) [10].

journal of clinical practice 2024 Vol 15 №4

In the accessible national literature, we could not find any research works with the assessment of senile asthenia among the bariatric surgery patients. Thus, the conduct of national research aimed at developing the protocol for selecting patients from the older age group for bariatric surgery, is still topical.

Research aim — to develop a protocol for surgical treatment of morbid obesity in patients older than 60 years.

METHODS

Research design

A retrospective comparative single-center research was arranged with the evaluation of the direct and remote results of surgical treatment of morbid obesity in two groups of patients — 18–60 years inclusive (the main group) and aged 61 and older (the elderly group). The medical aid for the patients with morbid obesity was provided in accordance with the "Obesity" clinical recommendations from the Ministry of Health of the Russian Federation (ID: 28).

Conformity Criteria

Inclusion criteria: body mass index over 40 kg/m^2; body mass index ranging from 35 to 40 kg/m^2 with the presence of diseases associated with obesity and requiring constant therapy (type 2 diabetes, hypertensive disease, chronic cardiac insufficiency, sleep apnea syndrome).

Non-inclusion criteria: presence of oncological diseases with currently under treatment or follow-up; acute myocardial infarction; acute disorders of cerebral circulation; thromboembolic complications of cardio-vascular diseases in the last 2 months; terminal stages of renal injury; decompensated state of the organs or systems; presence of depression or psychiatric disorders.

Research facilities

The research was carried out within the premises of the Federal State Budgetary Institution "Federal Scientific and Clinical Centre for Specialized Types of Medical Care and Medical Technologies of the Federal Medical-Biological Agency" (FSBI Federal Scientific and Clinical Center of the Federal Medical-Biological Agency of Russia), where during the time period from 2018 until 2023, a total of 800 bariatry surgeries were conducted in morbid obesity patients.

Medical Procedure Description

All the patients were treated with strict following the protocol of perioperative management and performing the bariatric manipulations, which was previously described by the authors of the present article [11]. Additionally, patients aged from 61 and older had a screening assessment for the presence of senile asthenia syndrome using the "Age is not a drawback" questionnaire (table 1). With the result of 0–4 points, no additional procedures were conducted, while when having 5 points and higher, the patient was referred to the geriatrician and the further tactics was defined together during the consilium. Special attention was paid to the consultation by the Psychiatrist, with the presence of depression or psychiatric disorders being considered a contraindication for surgical treatment.

Table 1

The "Age is not a drawback" questionnaire

Did you lose 5 kg and more during the last 6 months?*	Yes/No
Do you experience any restrictions in everyday life due to decreased vision or hearing?	Yes/No
During the last year, did you have any injuries caused by falling, or episodes of falling without traumas?	Yes/No
Did you feel depressed, sad or anxious within the last weeks?	Yes/No
Do you have problems related to memory, orientation or planning abilities?	Yes/No
Do you suffer from urine incontinence?	Yes/No
Do you have difficulties moving around the house or outdoors (walking up to 100 m or climbing a single staircase)?	Yes/No
For each positive answer, 1 point is scored. Legend (interpretation): ≤2 points — no senile asthenia, 3–4 points — probable pre-asthenia, 5–7 points — probable senile asthenia.	

Note. * Meaning unintentional weight loss. If the patient was losing weight voluntarily (by following the special diet or regular physical activity), the point is not scored.

The first surgery in the patient aged older than 60 years was carried out after accumulating the experience of 100 bariatric interventions in other age categories. The surgeries in patients older than 61 were carried out by a single surgeon with the assistants being the physicians having an experience of not less than 100 episodes of assisting during the bariatric surgeries (no trainees were allowed to participate in the surgical team). Anesthesiological aid was performed by the anesthesiologists trained on the specific features of anesthetic support in bariatry patients and having an employment experience of not less than 5 years in the same occupation.

Two types of bariatry surgeries were used — the laparoscopic gastric bypass (GB) and the laparoscopic longitudinal gastric resection (LGR). The surgery technique in all the patients was the standard one with its description provided in earlier publications from the authors [11].

Methods for registration of outcomes

Retrospective assessment was used to evaluate the risk of bariatric surgery based on the GeriBari prognostic scale (table 2), developed based on the analysis of the data bases of The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program in the USA (40,199 operated geriatric patients) [12]. Partially dependent functional status was reported in case of the necessity of the aid of another person during the everyday activities.

During the postoperative period, the rates of postoperative complications (classification by Clavien-Dindo, 2004), of repeated hospitalizations and of the mortality within the nearest 90 days from the surgery were evaluated.

After 12 months, the evaluated parameters included the percentage of excess weight loss, the rates of type 2 diabetes remission, as well as the cases of developing thromboembolic complications, acute myocardial infarction or acute disorders of the cerebral circulation along with the mortality.

The percentage of excess body mass index loss (%EBL) was calculated as the ratio of weight loss to the baseline excessive body weight. In order to calculate the excessive body weight, the ideal body weight was subtracted from the body weight value before surgery (body length in centimeters – 100). For example, if the person having a body height of 170 cm had a body weight of 120 kg before surgery, and after 1 year his weight has decreased to 80 kg, the %EBL equals 80%: 100×(120–80)/(120–(170–100))=100×40/50.

The remission of diabetes type 2 was defined as the level of glycosylated hemoglobin (HbA1c) being less than 6.5% for not less than 3 months in the absence of sugar-reducing therapy.

Separate evaluations in patients of the older age group were performed to define the quality of life in accordance with non-specific SF-36 questionnaire (Short Form-36) before bariatric surgery and after 12 months.

Table 2

GeriBari Prognostic scale [12]

Parameter	Points
Roux gastric bypass (comparing to longitudinal gastric resection)	6
Partially dependent functional status	6
Intake of anticoagulants	5
Chronic kidney disease	5
Oxygen dependence	4
Myocardial infarction in the past	4
Chronic venous insufficiency	4
Venous thromboembolic complications	3
“Major” heart surgeries in the past	3
Chronic obstructive pulmonary disease	3
Gastroesophageal reflux disease	2
Surgery time	2 for each hour
Interpretation	
Low risk (less than 6% of serious complications)	≤14
High risk of (more than 6% of serious complications)	>14

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journal of clinical practice 2024 Vol 15 №4

Ethical review

All the research participants have signed the voluntary informed consent for treatment and surgery. The conduct of the research was approved by the local Ethics Committee of the Federal State Budgetary Institution "Federal Scientific and Clinical Center" of the Federal Medical-Biological Agency of Russia (protocol No. 11, dated November 11, 2019).

Statistical analysis

The sample size was not preliminarily calculated.

During the statistical analysis, the nonparametric methods were used. The data were presented as the median with defining the upper and lower quartiles (Me [Q1; Q3]). The differences between quantitative characteristics were calculated using the Mann-Whitney test. The comparison of qualitative characteristics was done using the $\chi 2$ (chi-square) method. The software used was IBM SPSS 27. The obtained differences were considered statistically significant in case when the *p* value was <0.05 (95% of confidence).

RESULTS

Research sample (participants)

During the research period, the in-patient examination procedures for the purpose of defining the indications for bariatric surgery at the Federal State Budgetary Institution Federal State Budgetary Institution "Federal Scientific and Clinical Center" of the Federal Medical-Biological Agency of Russia were arranged for 74 individuals older than 60 years (64 years [62.5; 65.5]). The bariatric surgery was approved for 38 (51.35%) individuals aged 64 years [62.5; 67] with maximum age of 74 years. There was no significant difference in the age of the patients between the operated ones and those assigned for conservative treatment tactics (p=0.08). In all the cases, the decision of excluding the patient from the bariatric surgery group was made individually during the multidisciplinary consilium and it was based on the evaluation of the surgery risk due to the somatic status, the presence of senile asthenia syndrome, as well as the subjective factors, such as the patient's compliance and the readiness of strict following the recommendations, as well as the need for social-household aid and care. The characteristics of the research participants are provided in table 3.

When analyzing the data in the group of operated patients, it was found that only in 2 (5.3%) cases, the results of using the "Age is not a drawback" screening questionnaire were 0 points, 1 point was scored by 3 (7.9%) patients, 2 points — by 16 (42.1%), 3 points — by 15 (39.5%) and 4 points — by 2 (5.3%). In 23 (60.5%) patients, senile asthenia syndrome was not found, while 15 (39.5%) were diagnosed with pre-asthenia. Thirty-six out of 38 (94.7%) operated patients had mobility difficulties, 16 (42.1%) have reported problems with memory, orientation and planning abilities, 15 (39.5%) cases were associated with restrictions caused by diminished hearing and vision, 13 (34.2%) patients felt depressed and sad, other 13 (34.2%) had episodes of falling within 1 year and 6 (15.7%) had urinary incontinence-related problems. Constant intake of 5 and more medicinal products was reported for 9 (23.7%) patients; 8 (21%) had chronic pain syndrome; 8 (21%) have informed about living alone.

Table 3

Characteristics of the patients

Parameter	Older group *n*=38	Main group *n*=762	*p*
Males, *n* (%)	8 (21)	214 (28)	>0.05
Females, *n* (%)	30 (79)	548 (72)	>0.05
Age, years	64 [62; 66]	42 [35; 50]	-
Baseline body mass index, kg/m^2	45 [62.5; 67]	42 [35; 50]	>0.05
Type 2 diabetes, *n* (%)	17 (44.7)	318 (41.7)	>0.05
Laparoscopic Roux gastric bypass, *n* (%)	21 (55.3)	381 (50)	>0.05
Laparoscopic longitudinal gastric resection, *n* (%)	17 (44.7)	299 (39.2)	>0.05
Post-operative complications, Clavien-Dindo I–II, *n* (%)	0	6 (0.8)	>0.05
Post-operative complications, Clavien-Dindo III–IV, *n* (%)	0	20 (2.6)	>0.05
Mortality within 90 days from surgery, *n* (%)	1 (2.6)	1 (0.1)*	>0.05
%EBL in 12 months	56.5 [45; 69.5]	75 [66.5; 82.25]	<0.00001

Note. * Cause of death — traffic accident.

The assessment of elderly patients using the GeriBari prognostic scale has shown high surgery risk only for 5 (13.2%) patients (table 4).

Primary findings

None of the patients of the older age group had surgical complications in the perioperative period. The postoperative bed day count did not differ from that in the main group (3–4 days). During the next 90 days after surgery, there were 2 hospitalizations caused by heart rhythm disorder and by hypertensive crisis. One female patient (2.6%) aged 66 has died on day 14 after LGR with the cause being the multi-organ insufficiency and multisegmental pneumonia with a background of diagnosed coronaviral infection, with this background, there were no any signs of surgical complications found.

The remote results were accessible for evaluation in all the patients.

A man aged 65 has died 11 months after laparoscopic gastric shunting due to acute cardiovascular insufficiency.

The numbers of the loss of excess body weight after 12 months are provided in Fig. 1. Twelve months later, the %EBL after the LGR was 55.5% [39.15; 69.75], after GB — 58% [54.5; 69]. Three patients after LGR had the %EBL values not exceeding 1/3 (17%, 20% and 28%, respectively). The maximal %EBL value after LGR was 93%; the minimal %EBL after GB was 40% with the maximal being 102%, however, the statistical differences between two types of surgeries were insignificant (p=0.43). In the main group, the %EBL was significantly higher both for LGR (73% [61; 80], p=0.01) and for the GB (77.5% [67; 85], p=0.0008).

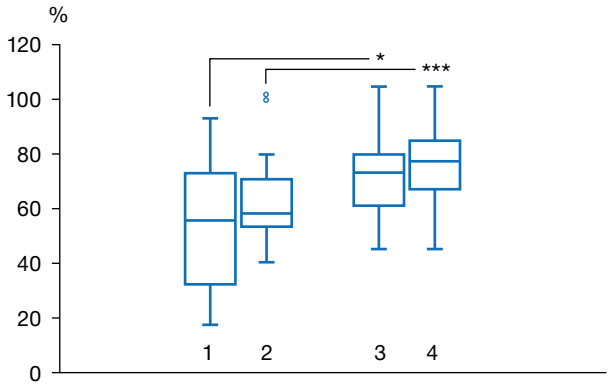

Fig. 1. Loss of excess body weight in 12 months after bariatric surgery: 1 — laparoscopic longitudinal gastric resection (older age group), 2 — laparoscopic gastric bypass surgery (older age group), 3 — laparoscopic longitudinal gastric resection (main group), 4 — laparoscopic gastric bypass surgery (main group). The differences were statistically significant: p <0.05 (*) and p <0.001 (***).

Before surgery, type 2 diabetes, requiring sugar-reducing therapy, was diagnosed in 17 persons, with two of them receiving insulin therapy, while the other 15 were taking tableted medicines. In 12 months, 16 (94%) of patients had clinical improvement. Complete remission was achieved in 12 cases (70.6% of the

Table 4

Characteristics of the patients in accordance with the GeriBari scale

Parameter	Patients *n*=38 (%)
Roux gastric bypass (comparing to longitudinal gastric resection)	21 (55.3)
Partially dependent functional status	15 (39.5)
Intake of anticoagulants	4 (10.5)
Chronic kidney disease	2 (5.3)
Oxygen dependence	0
Myocardial infarction in the past	3 (7.9)
Chronic venous insufficiency	4(10.5)
Venous thromboembolic complications in the past	1 (2.6)
“Major” heart surgeries in the past	0
Chronic obstructive pulmonary disease	1 (2.6)
Gastroesophageal reflux disease	6 (15.8)
Surgery time, min	110 [70; 160]
Interpretation	
Low risk (≤14)	33 (86.8)
High risk of (>14)	5 (13.2)

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journal of clinical practice 2024 Vol 15 №4

total number of diabetes patients and 80% of the total number of patients taking only tableted drugs). Both patients receiving (before surgery) insulin therapy were switched to taking only tableted medicines. Two patients had achieved a decrease in the dosage of the tableted antihyperglycemic drugs. Only 1 (6%) patient aged 64 years after GB had his diabetes course characteristics at the same level.

The quality of life of the patients in the older age group has significantly increased (Fig. 2), with this, we did not note any relation between the parameters of the quality of life and the extent of losing excess body weight. Even in patients with insignificant weight loss (%EBL 17–28%), significant improvement was reported in the quality of life.

DISCUSSION

Over the past decades, the developed countries were showing an increase in the duration of life along with the simultaneous growth of the occurrence of obesity. The percentage of adipose tissue increases with age, while the muscle/bone mass decreases as a result of lower levels of basal metabolism, decreased production of anabolic hormones, as well as due to the decreased reactivity to thyroid hormones and leptin. If younger individuals have a muscle mass of approximately 40%, to the age of 75 it corresponds to about 25% of the whole body volume. Shortening of the volume of skeletal muscles results in a decrease in the rate of basic metabolism after the age of 20 years by 2–3% a year, and after the age of 50 — by 4% every year [13].

The advances in medical technologies have provided a possibility of performing bariatric interventions in elderly patients with a sufficient level of safety, which is why we can see a progressive growth in the number of publications in this issue. Some authors suppose that bariatric surgery gives comparable results in younger and elderly patients, while the other trials have proved a longer postoperative bed day count and lesser excess body weight loss among the patients older than 60 years [14, 15].

The recent systematic review and meta-analysis conducted by J. Kapała et al. [16] and including the operated patients older than 70 years (*n*=3923), has shown that, in one year after surgery, the mean loss of excessive body weight was 54.66%, the improvement of the diabetes course was reported in 50% of observations, arterial hypertension — in 36%, reflux-esophagitis — in 50%, sleep apnea — in 36% and hyperlipidemia — in 25%. The rate of postoperative complications was ~2% with the fatal outcomes showing 1%.

P. Gerber et al. [17], based on the analysis of the Swedish register involving 57,215 operated patients, inform that patients older than 60 years have strong

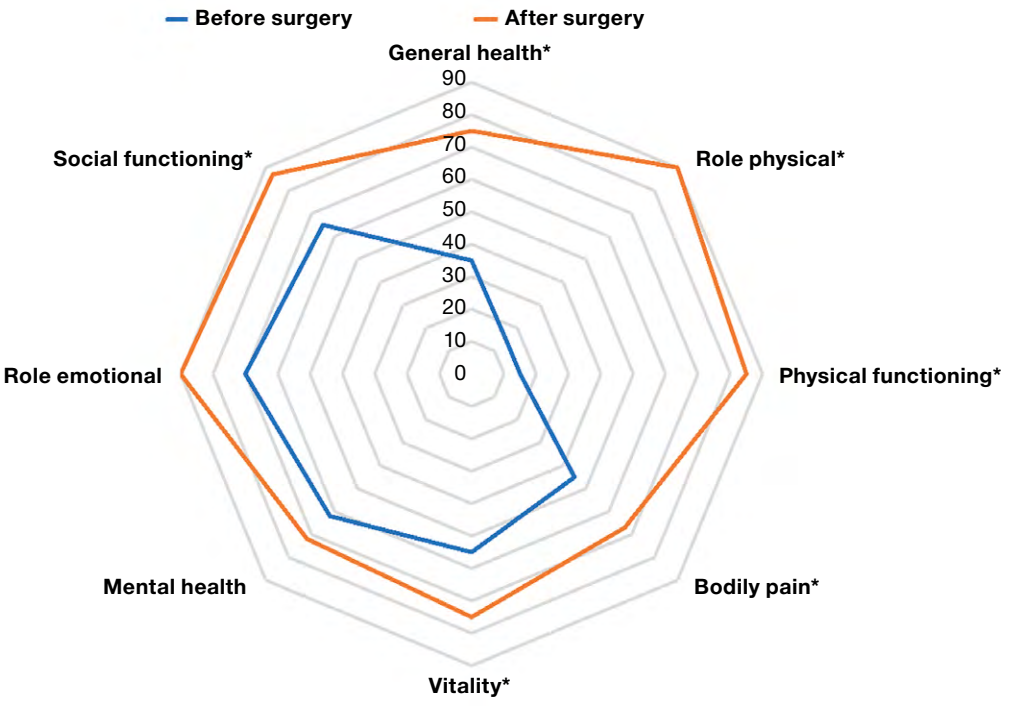

Fig. 2. Changes in the quality of life among the morbid obesity patients of the older age group after bariatric surgery (* marks the parameters with the statistically significant differences).

and stable improvements of the physical and obesity-related quality of life even 5 years after bariatric surgery. As for the metabolic results, the conducted trials confirm the efficiency of bariatric surgery in terms of treating diabetes. However, longer duration of diabetes causes irreversible loss of beta-cells, which is why the metabolic mechanism of GB and LGR is predictably less effective in the older age comparing to younger patients. A number of research works has shown the absence of differences in the efficiency of the LGR and GB in terms of diabetes in elderly patients, which is also confirmed by our results [18, 19].

Despite the already accumulated vast data on bariatric surgeries in elderly patients, there are controversial opinions on the postoperative complications. Thus, according to data from USA registries, the mortality after bariatry surgeries among the elderly is 0.27% (3 times higher than in younger cohort) [12]. Upon analyzing the Scandinavian obesity register, the similar mortality value was observed among the elderly — 0.27%, while the total mortality was at the level of 0.03% [20]. However, according to data from the national register of the Netherlands, the 30-days mortality after bariatric surgery did not differ in the younger and older cohorts, being 0.2% [21]. In a recent review by N.Ç. Başaran [22] it was reported that the mortality after bariatric surgery among the elderly in various trials is within the ranges of 0–0.34%, and this level is comparable to the mortality data for cholecystectomy (0.2–6%).

The investigators have no unified opinion on the best variant of bariatric surgery in elderly from the point of view of the risks and results, but only two options of standard surgical interventions were considered — the LGR and the Roux GB. LGR is the most commonly conducted bariatric surgery world-wide. A meta-analysis by S. Giordano et al. [23] involving 2259 patients after laparoscopic LGR from 11 research works, has shown comparable results from the point of view of safety and resolving the associated diseases among the elderly and the younger patients, even though in the patients of the older age group, lower weight loss was noted. A randomized multicenter research has shown that, in patients older than 65 years, GB comparing to LGR is associated with better loss of excess body weight (68% versus 60%, respectively; p=0.044) and higher rates of diabetes remission (85.7% versus 46.15%, respectively; p=0.27) [24]. According to data from M. Kermansaravi et al. [25], obtained as a result of the systematic review and "umbrella" meta-analysis (6 meta-analyses), the elderly persons undergoing LGR had lower (comparing to GB) mortality parameters, the same was shown for the early and late complications (by 55%, 55% and 41%, respectively), however, the noted findings also included lower efficiency in terms of the results related to weight loss and to the recurrences of obesity-related disease. The research by J.S. Frieder et al. [26] has analyzed the largest single-center experience of bariatric surgery among the elderly patients (LGR and GB were carried out in 2486 morbid obesity patients) and has shown that the number of complications was significantly higher in the GB group comparing to LGR (27.7% versus 9.4%; p <0.01). In general, the majority of research works note that LGR in elderly patients is a safer surgery comparing to the GB.

The principles of selecting older patients for bariatric surgery are still not clearly developed, while in practice they often involve individualized decisions by the consilium of physicians. The IFSO recommendations (2022) state that one of the objective criteria for patient assessment could be the presence of senile asthenia syndrome [8]. This recommendation is based on the research by A.B. Gondal et al. [7], involving 21,426 patients aged from 60 years and older, in which it was shown that the weakness evaluation scale could be used as a method for stratifying the risks for patients before bariatric surgery. In the research performed by the group headed by R. Sebastian [27], based on the analysis of the treatment results from 650,882 patients (72% LGR, 28% GB), the authors came to the conclusion that the presence of senile asthenia syndrome is associated with higher surgery risks, which is related to the "cumulative deficit" (when the cumulative effect from the number of pre-existing concomitant diseases is higher than in cases of their separate assessment).

J.T. Dang et al. [12], based on the analysis of the data on the results of GB and LGR in 40,199 geriatric patients, have developed the GeriBari prognostic scale, showing a sensitivity of 46.0% and the specificity of 100%, which was used in our retrospective research. The fact that high risk was detected only in 13% of our patients, indirectly confirms the efficiency of the scale. The benefit of the scale is its controllability: in case of the patients having significant diseases and conditions, refusing to perform GB in favor of LGR allows leaving the patient in the low risk group. However, this scale does not take into account the presence of senile asthenia syndrome, and in our research, none of the participants had senile asthenia. During the present trial, for selecting the patients for bariatric surgery, we have used the only screening questionnaire validated in our country on the

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presence of senile asthenia syndrome "The Age is not a drawback". This questionnaire is generally similar to the ones used by the authors of the abovementioned trials. According to our opinion, the combined use of the "Age is not a drawback" screening questionnaire and the GeriBari scale can allow for determining the category of patients older than 60 years, in which performing bariatric surgery is safe.

We have obtained the data similar to the global ones, indicating the safety of bariatry surgeries among the elderly patients with the condition of following a number of principles:

1) individual selection of patients, including the use of screening questionnaire for the purpose of ruling out senile asthenia;
2) strict following the perioperative protocol of following the patients;
3) performing the surgery by means of an experienced surgical team;
4) justified type of surgical intervention.

CONCLUSION

Currently, the possibility of performing bariatry surgeries in patients older than 60 years in the Russian Federation is, in fact, considered being the "grey zone", for it is not clearly regulated by the clinical recommendations. The current research, according to out data, is the first in Russia.

As a result of analyzing the obtained data, the following conclusions can be drawn. In particular, bariatric surgeries in patients older than 60 years are plausible and safe, just as in younger patient, but with following a number of conditions. The efficiency of bariatric surgery in terms of decreasing the excess body weight after 60 years is significantly lower, however, the metabolic effects are at the high level, which determines higher quality of life in the patient after surgery. Patients older than 60 years, having conventional indications for bariatric surgery, should undergo additional selection procedures: it is necessary to rule out senile asthenia syndrome in them (based on using the screening questionnaire and on the conclusion by the geriatrician), to take into account the presence of surgery risk factors, as well as a number of subjective factors, such as the compliance level, the readiness to strictly follow the recommendations, the need for social-household aid and care. Currently, for the older age group, only two types of bariatry surgeries were justified — the Roux laparoscopic gastric bypass surgery and the laparoscopic longitudinal gastric resection. The protocol of perioperative managing the patient from the older age group should be strictly followed, while the surgery itself shall be performed solely by an experienced surgical team (with an experience of more than 100 bariatry surgeries).

ADDITIONAL INFORMATION

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