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## Research Article

# An Overview of the Effects of Various types of Bariatric Surgical Operations in the Azerbaijani Population

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## Abstract

**Setting:** A private Azerbaijan Medical University, Department of Surgical Diseases-I and Modern Hospital Azerbaijan.

**Objective:** To investigate the results of various types of bariatric surgical operations in patients with overweight in the Azerbaijani population.

**Material and methods:** The study involved results of 214 severely obese patients [average age 40 ± 19; average body mass index (BMI) 59.95 ± 20.25 kg/m$^2$] who undergone bariatric surgery, 186 (86.9%) were females and 28 (13%) were males, compared post-operative complications by different technical modification, and observed fatty liver disease dynamics by examining BMI, diabetes, hypertension before operation and 1, 3, 6 and 12 months after operation.

**Results:** During the first 12 months, 195 (91.1%) patients who undergone laparoscopic sleeve gastrectomy (LSG) achieved average weight loss of 66.5+11.5 kg. In 10 (4.7% ) patients who undergone gastric bypass surgery [2 (0.9%) patients-Ru Y gastric bypass, 6 (2.8%) patients-mini gastric bypass, 1 (0.5%) patient-sleeve+Ru Y gastric bypass and 1 (0.5%) patient-sleeve+mini gastric bypass], 9 (4.2%) patients Re-sleeve gastrectomy, Sleeev gastrectomy group this indicator was 76 ± 14 kg, and during the second 6 months effective weight loss was observed as in previous months, which equalled to 33.5 ± 8.5 kg. The bupasse group this indicator was 79 ± 8 kg/Annual weight loss indicator was 71.5 ± 23.5 kg for all surgeries.

**Conclusion:** According to our study, it can be concluded that unlike other methods, satisfactory weight loss in severely obese patients and consequently, improvement in comorbidities observed after laparoscopic sleeve gastrectomy (LSG) make this method more reliable.

**Keywords:** Severe obesity; Sleeve gastrectomy; Gastric bypass; Azerbaijan

## 1. Introduction

Obesity is a chronic, multisystem disease which causes a number of problems in the human body. This pathology is one of the increasing serious health problems in developed countries. To begin with Type II diabetes and hypertension, as well as impaired venous circulation, hypercoagulopathies, non-alcoholic fatty liver disease, reproductive system disorders are the main complications of this pathology [1]. This list can be expanded with orthopaedic complications, arthritis, increase in colon, breast and liver cancer. It has been proved that after surgical correction of this pathology, insulin resistance decreases, and fatty liver disease, hypertension and respiratory pathologies are eliminated by 90% [2]. Surgical treatment of obesity came up with application and variety of several surgical procedures. Though initial historical information on such operations date back in 1950s, more efficient surgical procedures have begun to be formed since 1979 [3]. However, last breaking point of bariatric-metabolic surgery began in 1992 with adoption of concept on correction of such operations only in surgical way with permanent effects by World Health Organization. Since then, obesity was included in the book of surgical diseases throughout the world, and considered as a surgical pathology. However, it was proposed to use unique measuring unit, which we now call 'body mass index' (BMI). During the assessment, if BMI is more than 35, surgical treatment, if less, conservation treatment should be applied [4, 5].

Due to frequent failures, low permanent effects and patients' returning to their previous weight during the treatment of obesity with medicines and dietary methods, the surgical methods have been proven as more efficient procedures. Selection of the best operation type for patient depends on his/her assessed condition on admission and severity of comorbidities [6, 7]. Fundamental concept of bariatric or weight loss surgery, the most efficient treatment of obesity, is to reduce appetite or food absorption from gastrointestinal system, which is implemented by one or both of two key methods: reduce absorption from intestine (malabsorptive procedures) and stomach resection (restrictive procedures) [8, 9]. Obesity surgery is targeted at ideal weight loss of patients, along with helping in treatment of comorbidities. Comorbidities are successfully treated in majority of patients who have undergone surgical procedures against obesity. Our most preferred bariatric surgery method is sleeve gastrectomy. Laparoscopic sleeve gastrectomy (LSG) or stomach reduction is relatively new surgical method. Currently, LSG is the most common type of surgery [10].

## 2. Purpose

To investigate the results of various types of bariatric surgical operations in patients with overweight in the Azerbaijani population.

## 3. Material and Methods

The study involved results of 214 severely obese patients [average age 40 ± 19; average body mass index (BMI) 59.95 ± 20.25 kg/m$^2$] 186 (86.9%) were females and 28 (13%) were males who undergone open and laparoscopic bariatric surgery during 2013-2017 years.

Surgical instructions are based on 2006 Bariatric Surgery instructions criteria of IFSO (International Federation for the Surgery of Obesity and Metabolic Disorders). Pre-operative weights, BMI and comorbidities of patients were recorded. During the preoperative period, all patients were assessed by gastroscopy for examining upper gastrointestinal system, and by ultrasonography for examining liver, biliary tract pathology. As part of preparation for surgery, all patients passed consultations of pulmonologist, cardiologist, dietician, psychologist and endocrinologist, and anaesthetic risk assessment. Before and after operation heparin fractions were applied, varicose veins socks were dressed up before operation, and dynamical foot masseurs were used. Broad spectrum antibiotic of cephalosporin group was appointed as single dose before operation for prevention, and two doses after operation.

Operations were classified in three groups by their technical modifications. Upon taking standard measures before operation, 195 (91.1%) patients undergone sleeve gastrectomy, 9 (4.2%) patients Re-sleeve gastrectomy, 2 (0.9%) patients-Ru Y gastric bypass, 6 (2.8%) patients-mini gastric bypass, 1 (0.5%) patien-post-sleeve gastrectomy+Ru Y gastric bypass and 1 (0.5%) patient-post-sleeve gastrectomy+mini gastric bypass. Operation techniques in all groups complied with international standards. Ru Y gastric bypass and mini gastric bypass were conducted by standard technical methods knows to us. However, sleeve gastrectomy was conducted slightly different. Though during our review of world literature we observed that 32-42 Fr calibrating tube has no effect on 6-month weight loss, it is advisable to use 32 Fr due to satisfactory long-term results. Moreover, world literature advises to resect at the distance of 4-5 cm from pyloric sphincter. During the operations, we complete resection by 32 Fr calibrating tube and 60 mm lined staple towards fundus in parallel with minor curve after 2 cm distance from pyloric sphincter in antrum. We create smaller stomach as a result of these two methods, and achieve more noticeable and long-term weight loss. In the next stage, methylene blue is injected into stomach, and staple line is controlled. In order to minimize perioperative bleeding and anastomosis leak risk, staple line is sutured (sometimes with omentopexy). In this case, omentopexy is conducted for controlling further gastric torsion, the inner diameter of which is 1 cm, and possible leaks from staple line. Drainage is applied to all patients for preventive control of possible staple line leaks. The operation ends with the removal of resected stomach from trocar hole of 15 mm.

This study was conducted with the appropriate sequence of PROCESS criteria. Postoperative complications were comparatively investigated in terms of different technical modification, and fatty liver disease dynamics was observed by examining BMI, hypertension before operation and 1, 3, 6 and 12 months after operation.

## 4. Results

Out of 214 severely obese patients [average age 40 ± 19; average body mass index (BMI) 59.95 ± 20.25 kg/m$^2$] included in the study, 186 (86.9%) were females and 28 (13%) were males. Type II diabetes was identified in 43

(20.1%) patients, hypertension in 133 (62.1%) patients, sleep apnoea in 19 (8.9%) patients, polycystic ovarian syndrome-related hormonal dysfunction in 17 (7.9%) female patients, lack of sexual activity in 5 (2.3%) male patients, degenerative osteoarthritis in 14 (6.5%) patients, chronic obstructive lung disease in 1 (0.5%) patient, post-coronary stenting condition related to ischemic heart disease in 2 (0.9%) patients, and Grade 4 fatty liver in almost all patients (98%). Surgical operations were open in two (0.9%) patients, and laparoscopic in remaining (99.1%) patients. Average operation period was 2.5 ± 0.5 hours, and average hospital stay was 2.5 ± 0.5 days. No death was observed. One (1.1%) patient undergone re-operation due to anastomosis leak four days after operation, one (0.5%) patient experiences hypotension the next day after operation and treated with fluid transfer and cardiological medicines. Symptoms of dysphagia were observed three days after operation in one (0.5%) patient, and one month after operation in one (0.5%) patient, and both patients were treated with conservative therapy, and no mechanical tightness was observed during endoscopy. These disorders were normalized after three months without any treatment. Eleven (5.1%) patients undergone abdominoplasty 14 months after operation in order to restore normal appearance.

In 133 patients out of 132 who experienced hypertension before operation, normotensive periods were extended, but in one patient no improvement was observed in hypertension. In 9 patients out of 12 (13.6%) suffering from hypertension, along with fatty liver disease and hyperlipidemia, these disorders were eliminated within first three months after operation. Despite fasting glucose, disarray in A1C and C-peptide levels during first three months in two patients out of 43 (20.1) with T2D, fasting blood sugar levels were normalized in the following periods. In one patient, oral dose, as well as combined antidiabetic drug was reduced to a single dose. In majority of male patients (13.6%), deficiency of free plasma testosterone levels and sex hormone-binding globulin levels was identified. These patients demonstrated improvement during six-month control, and by the end of the twelfth month normal ranges were obtained, excluding one patient. Anastomosis leak from fundal part was observed in one (0.5%) patient five days after LSG. Patient was immediately hospitalized and undergone intensive treatment, as well as drainage of percutaneous liver inferior and left diaphragm inferior. On the next day, fully covered bariatric stent was placed, and the patient was discharged after three days under ambulatory-dynamic control. Following the 5-week dynamic control, the stent was removed, and no complication was observed in subsequent period.

Gastroesophageal reflux was observed in 11 (5.1%) patients two months after operation, dumping syndrome in one (0,5%) patient, who undergone LSG, and diarrhea 5-6 times a day in one (0.5%) patient, who undergone mini gastric bypass. All patients were treated with proton pump inhibitor, acid neutralizers and dietary procedures during the first postoperative 90 days. During the first 6 years, the patients, who undergone standard LSG, achieved weight loss of 39.5 ± 11.5 kg. This figure was 44 ± 13 kg in patients for whom smaller stomach was formed. Weight loss indicator was 46 ± 14 kg in patients who undergone gastric bypass surgery, and during the second 6 months, effective weight loss was observed equaling to 33.5 ± 8.5 kg. However, in patients who undergone standard sleeve gastrectomy, weight loss index decreased in the second 6 months compared to the first 6 months, and equaled to 22.5 ± 4.5 kg. This figure was more efficient and equaled to 28.5 ± 6.5 kg in patients for whom smaller stomach was formed and

antrum resection was performed, compared to the standard group, Furthermore, both groups of patients, who were subject to sleeve gastrectomy, did not need any vitamin-mineral support after the first 3 months compared to gastric bypass surgery groups. Patients who had gastric bypass surgery were subject to blood tests once a month, and if needed, received parenteral vitamin-mineral treatment, and were given parenteral vitamin-mineral support under the control of blood tests once in 3 months during 12-month postoperative period. Annual weight loss indicator was 71.5 ± 23.5 kg for all surgeries.

Post-LSG gastroesophageal reflux is worth to be discussed. This issue is caused by loss of cardioesophageal junction during the operation and fast eating without following postoperative diet. We observed this pathology in 11 (5.1%) patients during our study. Some publications of world literature indicated this range as 3-21% [6, 7]. One of the issues reducing the success rate of treatment in obese patients is psychological disorder. Publications investigating the relation between the obesity and psychological disorders cover the symptoms of bipolar disorder in 80% of these patients [8]. Although the obesity is not considered as surgical problem, it will be difficult to achieve expected weight loss unless the patients change their old habits of being happy by eating, joy of secret eating and eating too much. Despite that concepts of successful and unsuccessful bariatric procedure have been recognized until recently, a number of researchers consider 15-50% weight loss resulting from this procedure as successful [9, 10]. 42.6% change ratio in excess weight of our patients at the end of twelfth month proves the efficiency of the method. When questioning one patient who lost relatively less weight, we identified regular intake of liquefied chocolate, beer and similar high-calorie drinks during the hunger crisis. This patient returned to normal state after special diet. Key reason of less weight loss after LSG is insufficient resection. In addition, fistula development, assessment of surgery type, stress and depression, preoperative BMI of more than 80 $kg/m^2$ are other factors, which make the treatment of comorbidities difficult.

## 5. Conclusion

Despite the promising results in short and medium term, long-term results are not sufficient for this method. Unlike other methods, few cases of vitamin deficiency and malabsorption, as well as efficient weight loss ratio after LSG enable wide application of this method. Consequently, LSG is believed to be a reliable method, which ensures sufficient weight loss in the treatment of obesity and super-obesity, as well as improvement in comorbidities.

## Conflict of Interest

The autors declare that they have no conflict of interest.

## Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

## Informed Consent Statement

Informed consent was obtained from all individual participants included in the study.

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