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Case Report / Приказ случаја

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Long-term results of laparoscopic gastric sleeve resection due to morbid obesity and metabolic syndrome

Дугорочни резултат лапароскопске ресекције желуца због екстремне гојазности и метаболичког синдрома

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SUMMARY

Introduction The aim of this paper was to presents long-term results of a laparoscopic gastric sleeve resection in a “super super” obese patient and a follow-up period of eight years.

Case Outline A patient with Body Mass Index (BMI) of 70 kg/m² and Stage 3 obesity according to “King’s Obesity Staging Criteria” (KOSC), with metabolic syndrome and cardiovascular risk of over 20%, and a pronounced severe obstructive sleep apnea, underwent a laparoscopic gastric sleeve resection (LGS). After two years, the patient reached BMI of 28.4 kg/m² and eight years after the surgery has BMI of 34.3 kg/m², and %EBMIL (% Excess BMI Loss) of 79.3%. According to the KOCs, he falls under Stage 0.

Conclusion LGS resection may be performed as a stand-alone procedure in “super super” obese patients, with excellent long-term results.

Keywords: morbid obesity; bariatric surgery; laparoscopy; sleeve gastrectomy; weight loss

САЖЕТАК

Увод Циљ овог рада је био да прикаже дугорочан резултат лапароскопске „рукавне“ ресекције желуца код „супер супер“ гојазног пацијента са периодом праћења од осам година.

Приказ случаја Болесника индексом телесне масе (ИТМ) 70 kg/m², са трећим стадијумом гојазности према „Kings Obesity Staging Criteria“ (KOSC), метаболичким синдромом, кардиоваскуларним ризиком више од 20% и израженим синдромом апнеја у сну. Изведена је лапароскопска „рукавна“ ресекција желуца 2008. године, прва оваква процедура у Србији. Две године после операције пацијент је достигао ИТМ 28,4 kg/m², а осам година након операције ИТМ 34,3 kg/m² и утврђени губитак индекса телесне масе од 79,3%. Према KOSC стадијум овог пацијента је најнижи.

Закључак Лапароскопска „рукавна“ ресекција желуца може се успешно извести код „супер супер“ гојазног пацијента као самостална процедура са одличним дугорочним резултатом.

Кључне речи: екстремна гојазност; хирургија гојазности; губитак тежине; лапароскопска рукавна ресекција желуца,

INTRODUCTION

Laparoscopic gastric sleeve resection (LGS) is a bariatric and metabolic procedure that has been performed extensively in the past decade throughout the world, either as a stand-alone procedure or as the first phase of the biliopancreatic diversion [1–4]. It gained popularity among not only surgeons but patients as well, due to its simplicity, small number of complications, good short-term results, positive effects on metabolic syndrome, and the fact that food does not change its path through the digestive tract [5, 6, 7]. However, certain papers speak of the disadvantages of LGS, the most significant being regaining weight a few years after the operation and newly-developed gastroesophageal reflux disease (GERD) [8, 9, 10]. In recent years, there have been papers on long-term results of LGS in the treatment of obesity and metabolic syndrome [11]. Our case study presents, according our knowledge, the first case of LGS in Serbia, which was performed in 2008 and has a follow-up period of eight years and we observed a long-term results in the treatment of patient with “super super” obesity.

CASE REPORT

The patient is a 36-year-old male who, prior to the procedure, weighted 214 kg, with 175cm in height and with a Body Mass Index (BMI) of 70 kg/m² (Figure 1.). Personal anamnesis revealed that

the patient had myocarditis in childhood, while family history revealed that both his father and uncle suffer from diabetes mellitus type II. The patient was showing signs of mild anxiety and social isolation, although he had a sedentary job. He had been smoking more than 20 cigarettes a day for 20 years. During his youth (at the age of 15), the patient was treated in hospital conditions with a dietary treatment supervised by an internist. On that and several other occasions after that one, he would lose 30-40 kg, but would always gain ever more weight after that. During the preoperative treatment, the patient was found to have an untreated hypertension (maximum blood pressure values were 180/100 mmHg), obstructive sleep apnea diagnosed during a sleep study as being “severe, predominantly obstructive sleep apnea (Apnea Hypopnea Index- AHI 86.7), with strong desaturations during

Table 1. Clinical and laboratory characteristics of patient’s metabolic syndrome.

	Preoperative		8 years after operation	
Weight (kg)	214		105	
Systolic blood pressure (mmHg)	180		100	
Diastolic blood pressure (mmHg)	100		70	
Fasting glucosae (mmol/l)	6,7	HOMA-IR: 11,8	4,7	HOMA-IR: 1,67
Fasting insulin (µIU/ml)	39,8		8,07	
HbA1c (%)	/		5,1	
Total cholesterol (mmol/l)	5,4		4,93	
HDL-cholesterol (mmol/l)	1,51		2,13	
LDL-cholesterol (mmol/l)	3,72		2,6	
Triglyceride (mmol/l)	1,06		0,53	
LDL/HDL	2,5		/	
Index atherosclerosis	/		1,2	
CRP mg/L	/		1,8	
Fibrinogen (g/l)	4,7			

HOMA-IR = [fasting insulin (µIU/ml) x fasting glucose (mmol/l)] /22,5

breathing crises and high oxygen desaturation index (ODI 82.6)”. The laboratory findings that reflect the existence of metabolic syndrome prior to the procedure in 2008 are presented in Table 1.

The procedure was performed on 31.10.2008, at the Clinic for Thoracic Surgery, Institute for Pulmonary Diseases of Vojvodina, Sremska Kamenica. Laparoscopic gastric sleeve resection was performed using five trocars, with Ethicon® Echelon Flex™ 60 mm stapler device through a 38 Fr bougie. Immediately after the surgery the patient was given fluids and recommended a month-long dietary regime of liquid and pureed foods.



Figure 1. Before the procedure.



Figure 2. Eight years after the procedure.

The postoperative period went without complications; the patient was on proton pump inhibitors for two weeks and subcutaneous injections of low-molecular-weight heparin for 30 days after the procedure.

Maximum weight loss was achieved two years after the procedure, when the patient weighed 87 kg and had BMI of 28.4 kg/m².

Table 2. Results two and eight years after operation.

	2 years after operation	8 years after operation
BMI (kg/m ²)	28,4	34,3
%EWL	87,5	75
%TWL	59,3	51
%EBMIL	92,4	79,3

%EWL (Percentage of excess weight loss) calculated as: (initial weight – current weight)/(initial weight – ideal weight) x 100

%TWL (Percentage of total weight loss) calculated as: (initial weight - current weight) / initial weight x 100

%EBMIL (Percentage of excess body mass index loss) calculated as: (initial BMI - current BMI)/(initial BMI-25) x100

Eight years after the procedure, the patient weights 105 kg and has BMI of 34.3 kg/m² (Figure 2).

Laboratory results eight years after the procedure are presented in Table 1.

The main weight-loss parameters two and eight years after the procedure are presented in Table 2.

DISCUSSION

Laparoscopic gastric sleeve resection has been performed extensively in the past decade throughout the world as a stand-alone procedure due to its technical simplicity and good short-term and medium-term results [1, 6]. However, there are not many studies, especially large-scale ones, that assess the success of LGS in a period longer than six years [2,11].

We present the patient who was, according to our knowledge, the first to undergo LGS in Serbia, with an eight-year follow-up period, which falls under long-term results. The indication for the procedure was established based on morbid obesity (BMI=70 kg/m²), and significant co-morbidities that also define the existence of metabolic syndrome: arterial hypertension, prediabetes, dyslipidaemia, sleep apnea, and abdominal obesity. His initial BMI classified him among “super super” obese patients. According to a new criteria for the severity of obesity, “King’s Obesity Staging Criteria” (KOSC), the patient was suffering from the most severe stage (three) with cardiovascular risk of over 20% [12].

The procedure was performed by calibrating the stomach with a 38 Fr bougie. Some authors received better results with thinner bougies, but larger (wider) bougies are also used in LGS [2, 13]. We drew from our experience in surgical procedures of the oesophagus and the procedures with Swedish adjustable gastric band, which is why we used a 38 Fr bougie. The size of the bougie through which LGS is to be performed has not been standardized, although the fourth consensus conference (2012) on LGS revealed that approximately one third of surgeons use a 36 Fr bougie [13]. Recent studies have found that bougie size is not crucial for the long-term success of the procedure [14, 15]. The surgical technique for complete removal of the gastric fundus after complete immobilization is more important than bougie size. The percentage of stomach stenosis after LGS is approx. 1% and is

higher in patients with whom thinner bougie was used [13, 16]. Double-contrast barium enema study of our patient's oesophagus and stomach 8 years after LGS indicated no neo-fundus or stenosis, which are the most frequent late-stage complications of LGS, therefore, a 38 Fr bougie may be considered adequate.

Initial BMI is an important success factor of LGS, since it was determined that patients with lower initial BMI (under 40 kg/m²) have a higher success rate in short-term and medium-term results, whereas "super super" obese patients (BMI > 60kg/m²) experience less success due to subsequent weight gain [2, 16]. For such patients, LGS is the operation of choice, since other procedures are coupled with increased intraoperative and postoperative risk of complications [17]. According to Biron's twenty-year analysis of biliopancreatic diversion, the criteria for a successful bariatric procedure based on the initial BMI have been adopted [18]. Since our patient belonged to the "super super" obese group, the success of the procedure is considered long-term if the BMI is under 40 kg/m². The result after eight years indicates that BMI is now 34.3 kg/m² and, according to this criterion, LGS is a successful procedure. As regards the EWL percentage, an ideal procedure should achieve a 100% loss of excess weight [2, 19]. In practice, however, that occurs only in a negligible number of patients, and that is certainly not the case with "super super" obese patients. However, the two-year and eight-year %EWL that amounted to 89.7 % and 77 %, respectively, indicates that LGS was successful in patient, in both medium-term and long-term period. Along with %EWL, BMI is the second parameter and is considered borderline if it equals 35 kg/m², which our patient maintains even after eight years from LGS [20]. Some authors recommend the so-called %EBMIL as a success parameter for the performed bariatric procedure, and the starting point for its calculation is the achieved BMI of 25 kg/m² [11, 21, 22]. This is much easier to occur in patients whose initial BMI was under 50 kg/m², and much harder in patients whose BMI was over 50 kg/m², as was the case with our patient. Also recognized is the significance that a three-month %EBMIL (over 20%) has on the long-term result, which should be over 50 %. Eight years after the procedure, our patient's %EBMIL is 79.3%, which classifies LGS as a very successful procedure for this "super super" obese patient. Other studies have also confirmed LGS as a successful bariatric procedure.

In relation to the KOSC, eight years after LGS, our patient no longer takes any medication for any of the co-morbidities he suffered from before the procedure. He has normal blood pressure, his cardiovascular risk is under 10%, and glycosylated hemoglobin (H_gA_{1c}) is 5.1% (Stage 0 of the KOSC).

Laparoscopic gastric sleeve resection may be successfully performed as a stand-alone procedure in selected "super super" obese patient, with excellent long-term results in terms of both anthropological measures and KOSC.

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