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Surgery for Obesity and Related Diseases 12 (2016) 1270–1277

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Single-port laparoscopic sleeve gastrectomy as a routine procedure in 1000 patients

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Received October 22, 2015; accepted January 12, 2016

Abstract

Background: Single-port laparoscopic sleeve gastrectomy (SPSG) is performed routinely in our department as an alternative to a conventional laparoscopic approach.

Objectives: The aim of this study was to report our surgical results and follow-up outcome after SPSG.

Setting: Department of Digestive Minimally Invasive Surgery, Antoine Béclère Hospital, Assistance Publique—Hôpitaux de Paris, Paris-Saclay University, France.

Methods: Data from consecutive patients who underwent SPSG in our institution between August 2010 and July 2015 were prospectively collected and retrospectively analyzed. Patients with more than 1-year follow-up were included in our analysis for weight loss and co-morbidity.

Results: A total of 1000 patients underwent SPSG during the study period. Median body mass index was 42.6 kg/m² (range: 33.8–84.6 kg/m²). Median operative time was 112 minutes (range: 50–360 min) and decreased over the years. Completion of the procedure required introduction of an extraport in 78 patients (7.8%). Postoperative mortality and morbidity rates were .1% and 8.1%, respectively. Relaparoscopy and/or endoscopic treatment were required to treat intra-abdominal bleeding in 24 patients (2.4%) and staple-line leakage in 28 patients (2.8%). Five hundred forty-six patients were considered for 1-year follow-up evaluation. Mean excess weight loss was 69% after 1 year and 62.2% after 2 years. Incisional hernia from the trocar site occurred in 20 (3.7%) patients.

Conclusion: Sleeve gastrectomy can be routinely performed using a single-incision laparoscopic technique with equivalent outcomes of surgical morbidity and weight loss compared with conventional laparoscopic surgery. Prospective comparative studies are necessary to assess the potential benefits of this minimally-invasive approach. (Surg Obes Relat Dis 2016;12:1270–1277.) © 2016 American Society for Metabolic and Bariatric Surgery. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Keywords: Obesity; Bariatric surgery; Sleeve gastrectomy; SILS; LESS

Sleeve gastrectomy (SG) has become an established primary bariatric surgical technique [1,2], gaining popularity [3] and acceptance among surgeons. In 2014, approximately 27,000 SG procedures were performed in France, corresponding to a fivefold increase since 2009. The conventional

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http://dx.doi.org/10.1016/j.soard.2016.01.011
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Fig. 1. Single-port device during procedure.

laparoscopic procedure is performed using 4 to 6 skin incisions for the placement of trocars. Nevertheless, the relatively low complexity of this surgery, performed in only one abdominal quadrant with limited range of movements, has made it a good candidate for single-incision laparoscopic surgery (SILS).

Since 2008, several series of single-incision laparoscopic SG have been published [4–12]. Apart from the cosmetic benefit, potential advantages of SILS over conventional laparoscopy are less postoperative pain, shorter hospital stay, and faster return to professional activity [13,14]. However, this approach has been often criticized for the complexity in achieving optimal triangulation, the difficulties in dissection and exposure related to abundant subcutaneous and visceral fat, and the need for liver retraction, which could lead to suboptimal sleeve construction and, consequently, worse outcomes. We developed a single-incision technique for laparoscopic SG [10], carefully standardized to be reproducible and suitable for routine practice. The purpose of this study is to report our experience of single-port sleeve gastrectomy (SPSG) in our series of consecutive patients.

Materials and Methods

Methods

Data from all consecutive patients who underwent SPSG in our institution between August 2010 and September 2014 were prospectively collected and retrospectively analyzed after institutional review board approval. Before surgery, all patients underwent meticulous evaluation by a multidisciplinary team consisting of an endocrinologist, a gastroenterologist, a psychiatrist, a nutritionist, an anesthesiologist, and a surgeon. Standard investigations were carried out during preoperative follow-up, including esophagogastroduodenoscopy, upper gastrointestinal series, abdominal ultrasonography, polysomnography, and endocrinologic and nutritional evaluations. Patients were eligible for surgery if they had a body mass index (BMI) of 40 kg/m^2 or higher, or a BMI between 35 and 40 kg/m² with significant co-morbidities, according to the French guidelines [15]. Adolescent candidates for bariatric surgery were referred by a tertiary care center for pediatric obesity, considering morbid obesity as a BMI leading to 40 kg/m² at adult age (or 35 kg/m² with the presence of a co-morbidity), that is, BMI $\geq$4 standard deviations for age and sex. Co-morbidities were regarded as significant when medication was used, or when continuous positive airway pressure (CPAP) was employed in patients with obstructive sleep apnea syndrome (OSAS). The indication for SG was validated during a multidisciplinary staff meeting 1 month before surgery.

Operative technique

Since the introduction of SPSG in our department, the technique used has been fairly consistent [10,16]. The first step of the procedure used here was the introduction of the multiport single-access device (QuadPort+, Olympus Medical, Nagano, Japan, or Octoport, Landanger, Chaumont, France) through a 2–4 cm transversal incision, starting 2 fingers left of the midline and 4 fingers below the costal margin. The single-port device allows the introduction of two 5-mm instruments, two 10-mm instruments, and one 12-mm instrument through its 5 channels. However, to avoid conflict between instruments, only 3 of the 5 ports were simultaneously used during the procedure (Fig. 1). When available, a 10-mm flexible tip laparoscope (Endoeye Flex HD, Olympus) was preferred. As an alternative, a standard 10-mm rigid 30° laparoscope was used. In this case, a coaxial cable transmitting light source is mandatory to reduce instrument conflict and clashing. A double-curved grasper and a thermofusion device (LigaSure, Covidien, Élancourt, France) were used for dissection of gastrocolic ligament and gastroepiploic vessels. There was generally no need for liver retraction, as the left lobe was elevated by the curvature of the grasping forceps to maintain exposition.

After introduction of a 36-Fr orogastric tube along the lesser curvature, transection of the stomach was done using 60-mm endoscopic stapler (Endo-GIA Tri-Staple with purple cartridge, Covidien or Echelon Flex Powered with gold cartridge, Ethicon, Issy-les-Moulineaux, France). Hemostasis of the mucosa on the staple line was performed using bipolar coagulation. Reinforcement of the staple line with sutures or glue and staple-line leakage tests were not performed routinely. The excised gastric specimen was easily removed through the single-port access, the trocar's protective skirt preventing parietal contamination. Drainage was not used routinely and was carried out in cases of particularly difficult gastric dissection, as in some patients with previous abdominal surgeries. The abdominal fascia was closed in 2 layers using running sutures, and subcuticular suturing was used for skin closure. Neither urinary catheter nor nasogastric tube was used.

Follow-up

Postoperative care was applied under appropriate clinical monitoring, and blood count was performed the day after surgery. Abdominal computed tomography (CT) scan with

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