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Original article

Complex hernias with loss of domain in morbidly obese patients: role of laparoscopic sleeve gastrectomy in a multi-step approach

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Abstract

Background: Morbid obesity and its associated co-morbidities are risk factors for the development of abdominal hernias, add complexity to their repair, and increase perioperative risk. Repair of hernias with loss of domain (LoD) is further complicated by risk of abdominal compartment syndrome. A staged concept with an initial weight loss procedure might enable a reposition of the herniated viscera, improve co-morbidities for, and prohibit abdominal compartment syndrome in the subsequent repair.

Objective: To evaluate a multistep treatment strategy that entails initial laparoscopic sleeve gastrectomy (LSG) followed by open repair in the treatment of complex hernias with LoD in morbidly obese patients

Setting: University hospital

Methods: Retrospective analysis of all patients ($n = 15$) with morbid obesity and hernias with LoD treated in a staged concept between April 2010 and December 2015

Results: Median initial body mass index was 45 kg/m^2 . All hernias were recurrent incisional hernias with ≥ 2 failed repairs. No major complications occurred during or after LSG. After a median of 185 days, the second stage at a median body mass index of 33.6 kg/m^2 was performed. No bowel resections were needed. The only major perioperative complication was pneumonia in 2 patients (13%). Within 24 months (6–68) after the second step, there were 3 reoperations (small recurrence [7%], infected seroma [7%], and infected mesh [7%]). One patient (7%) was lost to follow-up after 2 years.

Conclusion: A 2-step approach to treat massive hernias with LoD in morbidly obese patients is safe and effective. LSG as initial weight loss procedure addresses LoD successfully without a need for further preoperative measures to condition for hernia repair. (Surg Obes Relat Dis 2017;■:00–00.)

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Keywords:

Bariatric surgery; Morbid obesity; Sleeve gastrectomy; Adult; Hernia; Loss of domain; Complex hernia; Staged; Giant hernia; Preoperative progressive pneumoperitoneum; Abdominal wall; Prostheses and implants

Management of hernias in the context of morbid obesity presents unique challenges. Not only is obesity a risk factor for the development of abdominal hernias and further adds technical complexity to the repair, but also there is a risk

factor for recurrence, and its associated co-morbidity increases the perioperative risk. Repair of complex hernias with loss of domain (LoD) is further complicated by risk of abdominal compartment syndrome (ACS) and respiratory complications [1].

Several strategies are used to address LoD; all aim at restoring the integrity and the function of the abdominal wall, achieved by either expansion of its surface or by reduction of the intraabdominal volume [2,3]. Expansion

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Fig. 1. Patient with body mass index of 59.8 kg/m² on the operating room table just before laparoscopic sleeve gastrectomy, lying on her back. The hernia is on her right stabilized by an additional flap.

can be achieved with preoperative pneumoperitoneum (PPP) and implantation of tissue expansion devices before or using myocutaneous flaps, inlay meshes, and or tension-releasing measures like component separation during the hernia repair. Reduction of intra-abdominal volume so far mainly consists of resection of large bowel with omentectomy.

Bariatric surgery is the only effective and sustainable treatment of morbid obesity and its co-morbidities in the short and long term [4,5]. Laparoscopic sleeve gastrectomy (LSG) has become increasingly popular due to its decreased technical difficulty, short operative times, absence of anastomoses, and maintained anatomy [6,7].

A staged concept addressing morbid obesity before hernia repair not only ameliorates conditions for the subsequent repair but also recreates intra-abdominal space to reduce the hernia. Such an approach might avoid bowel resection and therefore lessen morbidity. The purpose of this study was to assess the safety and efficacy of a novel, multistep approach for hernias with LoD in morbidly obese patients (Fig. 1) using LSG as initial step.

Materials and methods

Data collection

Data of patients with a staged approach to hernias with LoD (extra-abdominal volume >20% [1,8,9]) in the context of morbid obesity (body mass index [BMI] ≥ 35 kg/m²) between April 2010 and December 2015 were identified in a prospectively recorded computer database and reviewed. All patients were selected and followed up according to the guidelines of the Swiss Study Group for Morbid Obesity: after 3, 6, 12, 18, and 24 months and yearly thereafter. This study was approved by the local ethics committee.

Preoperative evaluation

Preoperative assessment consisted in gastroscopy, upper gastrointestinal series, abdominal computed tomography,

cardiopulmonary, and endocrinologic and psychologic workup with respective optimization of therapy. Patients with newly diagnosed obstructive sleep apnea syndrome were habituated to continuous positive airway pressure therapy before surgery. A nutritionist counseled all patients multiple times. An interdisciplinary team evaluated all candidates.

Classification as complex hernias was done according to a consensus of expert surgeons [9].

Surgical technique

Preoperative single-shot antibiotic prophylaxis was administered; low-molecular-weight heparin and pneumatic stockings were used as thromboembolic prophylaxis.

Our technique for LSG has been described elsewhere [7]. However, the placement of trocars was modified to allow for a positioning outside of the hernia ring through the intact fascia (Fig. 2). In short, after establishing a pneumoperitoneum using a Veress needle, 5 trocars were inserted. The greater curvature was freed beginning 5 cm oral of the pylorus up to the angle of His. The stomach was resected alongside a 32 F bougie, and the staple line was oversewn. The specimen was extracted after a leak test with 100 mL methylene blue.

For hernia repair, the hernia sac was resected and a mesh was implanted intraperitoneally before fascial closure. Parietene meshes were tailored to overlap the hernia borders by at least 10 cm. All were fixed with a combination of single knots at the corners and several short, nonabsorbable running sutures at the borders and between the meshes. The fascia was closed using polydioxanone suture loops. Procedures were performed using a combination of general and epidural anesthesia.

In case of a concomitant conversion to Roux-en-Y gastric bypass (RYGB) in patients with symptomatic gastroesophageal reflux disease, a standardized technique was used as well [4]. In short, the gastric sleeve was stapled off to form a pouch of 30–50 mL volume. A pouch-jejunostomy was then constructed with a linear stapler and oversewn, as 45 cm biliopancreatic and 150 cm alimentary limbs were constructed. Jejunojejunostomies were fashioned with a linear stapler and oversewn.

All patients were observed in a recovery room overnight and benefited from continuous positive airway pressure if tolerated. Proton pump inhibitors and low-molecular-weight heparin were continued for 4 weeks, and lifelong vitamin supplementation was initiated.

ACS was defined as intra-abdominal pressure > 20 mm Hg (measured via urinary catheter) with organ failure [1].

Descriptive statistics were used for demographic variables. Data were reported as medians with ranges from minimum to maximum.

Results

A total of 15 patients met the inclusion criteria; all underwent both stages. Demographic data are shown in

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