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Original article

Prospective evaluation of routine early computed tomography scanning in laparoscopic sleeve gastrectomy

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Abstract

Background: Prompt management of laparoscopic sleeve gastrectomy (LSG) complications is essential in avoiding prolonged hospital stay and associated mortality. The value of routine computed tomography (CT) scan examination in early diagnosis of postoperative complications after LSG has not been studied.

Objectives: To prospectively assess the impact of postoperative day (POD) 2 CT scan after LSG.

Setting: Department of Minimally Invasive Digestive Surgery, Antoine-Beclere Hospital, AP-HP, Paris-Saclay University, France.

Methods: Data were prospectively gathered for 1000 patients undergoing single-incision LSG and POD 2 CT scan. Complications were identified and treatment modalities decided according to the severity of complications. Sensitivity, specificity, and positive and negative predictive values were calculated for the diagnosis of surgical complications on POD 2 CT scan.

Results: Mean age was 40.1 years and median BMI 42.6 kg/m². Early postoperative surgical complications occurred in 66 patients (6.6%). Intraabdominal bleeding/hematoma occurred in 38 patients, with 3 requiring emergent reoperation on POD 1. POD 2 CT scan detected this complication in 32 patients (sensitivity: 91.4%). Twenty-four (63.1%) patients were treated with relaparoscopy and drainage while 14 (36.9%) received conservative management. Postoperative transfusion was required in 7 patients. Twenty-eight patients suffered a gastric staple line leak, 13 (sensitivity: 46.4%) detected on POD 2 CT scan. Three patients (10.7%) received pure surgical treatment, 16 (57.1%) combined relaparoscopy and endoscopic treatment, and 9 (32.2%) had pure endoscopic treatment.

Conclusion: POD 2 abdominal CT scan is an efficient diagnostic tool for detecting active bleeding/hematoma, but shows less impressive results with gastric staple line leak detection. A combination of clinical surveillance and early imaging allowed prompt management of complicated cases, avoiding further morbidity. (Surg Obes Relat Dis 2016;■:00–00.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Q4 Obesity; Bariatric surgery; Sleeve gastrectomy; SILS; CT scan; Hematoma; Staple line leak; Fistula

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Obesity is a disease that has reached epidemic proportions around the world and carries an important health and financial burden for society. In the past 2 decades, bariatric surgery has become an increasingly popular form of

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treatment for morbid obesity [1–6]. Sleeve gastrectomy has been established as a widely accepted stand-alone bariatric operation [7–10]. It is currently considered faster, simpler, and less invasive than gastric bypass, since it does not require a gastrointestinal anastomosis. Reports in the literature on success with and excellent weight loss after laparoscopic sleeve gastrectomy (LSG) have been accumulating for the past few years [10–13]. However, LSG can be associated with postoperative complications such as active bleeding, hematoma, gastric staple line leak, or stenosis. An analysis of postoperative complications with LSG by the Fourth International Consensus Summit on Sleeve Gastrectomy found that 1.1% were related to high staple line leaks (range: 0–18%), 1.8% to hemorrhage (range: 0–21%) and .9% to stenosis (range: 0–8%) [12]. Early management of these complications is essential to avoid prolonged hospital stay and associated mortality.

The role of imaging in the early diagnosis of postoperative complications after LSG is still under discussion. Some groups assert that postoperative observation alone of the clinical state of the patient (i.e., tachycardia, pain, fever) is the best way to detect postoperative complications, without the use of imaging [14]. The routine use of upper gastrointestinal swallow studies has been advocated in the past for postoperative gastric staple line leak detection, but recent studies suggest that they are unnecessary after LSG [15–17]. Finally, computed tomography (CT) scanning is frequently used when a postoperative complication is suspected [17–19], but systematic use after LSG has not been reported.

To our knowledge, the value of routine CT scanner examination in the postoperative course of LSG has not been studied. The aim of this study was to prospectively assess the impact of postoperative day (POD) 2 CT scanning after LSG. We also present our therapeutic strategy for the prompt management of early complications after LSG.

Methods

This was a prospective, nonrandomized study of 1000 patients undergoing LSG in our department from August 2010 to July 2015. All patients had numerous preoperative examinations and had been followed for at least 6 months before surgery by a multidisciplinary team consisting of a bariatric surgeon, endocrinologist, gastroenterologist, radiologist, psychiatrist, nutritionist, and anesthesiologist. Systematic investigations carried out during preoperative assessments included 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/m² or higher, or a BMI between 35 and 40 kg/m² with significant co-morbidities, such as type 2 diabetes, hypertension, obstructive sleep apnea

syndrome, or significant osteoarticular alterations, after failure of serious nonsurgical management during at least 6 months. Decisions to proceed with LSG were made after evaluation in a multidisciplinary meeting by the aforementioned specialists.

Operative technique

All procedures were performed by single-incision laparoscopy, previously described in detail [20]. In brief, patients were placed in a seated position, at an angle of 55° to the table. The first step of the procedure was the introduction of a 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, but we mainly used only 3 of the ports to avoid conflict and clashing of the instruments. When available, a 10-mm flexible tip laparoscope (Endoeye Flex HD, Olympus America Inc., Center Valley, Pennsylvania) was preferred. As an alternative, a standard 10-mm rigid 30° laparoscope was used. A double-curved grasper and a thermofusion device (LigaSure, Medtronic, Minneapolis, Minnesota) were used for dissection of the gastrocolic ligament and gastroepiploic vessels. Liver exposure was assured by the curvature of the grasping forceps. After introduction of a 36-French orogastric tube along the lesser curvature, transection of the stomach was done using a 60-mm endoscopic stapler (Endo GIA Radial Reload, Medtronic, Minneapolis, Minnesota or Echelon Flex Gold Cartridges, 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. Drainage was not used routinely and was carried out in cases of particularly difficult gastric dissection, as in some patients with previous abdominal surgeries. Patients were discharged from the operating room without drainage, nasogastric tube, or urinary catheter.

Postoperative management and follow-up

Postoperative care followed a standardized protocol for all patients. A blood sample was taken on POD 1 to rule out anemia. Body temperature, cardiac frequency, and blood pressure were constantly monitored during hospitalization. An abdominal CT scan was performed 2 days after surgery to rule out gastric staple line leak, bleeding or hematoma, intestinal or gastric occlusion, or lesions in other intra-abdominal organs. A gastric staple line leak was suspected when CT scan showed air within a perigastric fluid

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