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Surgeon-at-work

A percutaneous technique of liver retraction in laparoscopic bariatric & upper abdominal surgery

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Abstract

Background: Laparoscopic bariatric surgery requires retraction of the left lobe of the liver to provide adequate exposure of the hiatus and the stomach. Currently used approaches utilize retractors that require additional incisions and prolong operative time.

Objectives: A retrospective evaluation of the efficacy and safety of a percutaneous liver retractor in a large series of patients undergoing laparoscopic bariatric surgery.

Setting: Private practice, United States.

Methods: A retrospective chart review was performed on 2601 patients undergoing bariatric surgery from January 2011 to September 2015. A percutaneously introduced grasper (Teleflex MiniLap Percutaneous Surgical System, Morrisville, NC) was used to retract the left lobe of the liver in all cases. The retractor could be repositioned as necessary by releasing and regrasping the diaphragm at different locations.

Results: This technique was used in 2601 patients from January 2011 until September 2015. The average body mass index was 43.1 (range: 20.6–80.3). In all patients, this new method was found to be satisfactory to complete the bariatric procedure. The majority of procedures included laparoscopic Roux-en-Y gastric bypass, sleeve gastrectomy, and gastric band placement. No intraoperative liver injuries occurred with use of the Teleflex retractor.

Conclusion: Percutaneous retraction of the liver using the Teleflex MiniLap Percutaneous Surgical System was found to be safe and effective in this large series of morbidly obese patients. The rate of complications involving this technique is extremely low. This novel method provides safe and effective retraction with less trauma and better cosmesis than conventional technique. (Surg Obes Relat Dis 2016;▮:00–00.)

Keywords: Bariatric surgery; Liver retraction; Laparoscopic Roux-en-Y gastric bypass; Laparoscopic sleeve gastrectomy; Laparoscopic gastric band

Laparoscopic bariatric surgeries are intricate and challenging procedures to perform. A high body mass index (BMI) and an enlarged liver increase the surgery's complexity. Preoperative weight loss can help decrease the size of the liver. However, an enlarged liver can impede optimal visualization of the stomach during surgery. The challenge for many bariatric surgeons is how to retract the left lobe of the liver to obtain an adequate field of vision and maximum working space. Currently, the most common techniques (i.e., Nathanson & Snowden-Pencer retractors) require an additional subxiphoid incision, involve attachment to the operating room table, and increase risk of iatrogenic injury [1]. Furthermore, operative time is required to set up these retractors.

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Several more recently reported liver retraction techniques eliminate the subxiphoid incision. These methods require modified surgical drains, liver suspension tape, silicone disks, combinations of clamps and retractors, and suture-based techniques [2–12]. No single technique has proven to be ideal. However, it is widely accepted that these techniques involve the risk of iatrogenic liver injury, postoperative pain, and organ scarring [13].

Therefore, the ideal technique for liver retraction during laparoscopic bariatric surgery would displace the liver to allow for optimal exposure of the hiatus in a nontraumatic fashion and does not consume valuable operative time. Additionally, if this can be achieved without incision or trocar, using a percutaneous retractor would be preferable from a cost as well as cosmetic viewpoint. We report a novel technique for liver retraction using the Teleflex MiniLap Percutaneous Surgical System that we have found to safe and effective in $>$ 2000 cases. Fig. 1.

Methods

This is a large case series of consecutive bariatric operations by a single surgical group. A total of 2601 patients underwent bariatric surgery using the Teleflex MiniLap Percutaneous Surgical System as a percutaneous liver retractor.

Study patients

All patients undergoing bariatric surgery from January 2011 to September 2015 were included in the case series. The patients' medical records were reviewed for demographic information, co-morbidities, and 30-day complication rates. Patients who had undergone revisional bariatric surgery and lap band removal were also included in this series.

Surgical technique

Our technique is well demonstrated in the attached video (Video 1).

The patients were prepped and draped in the usual fashion. A Veress needle was inserted into Palmer's point and used to establish pneumoperitoneum. A 5-mm optical trocar was inserted into the left upper quadrant. After inspecting all 4 abdominal quadrants, additional trocars were inserted as needed for that particular bariatric surgery. Next, the Teleflex retractor (TR) was introduced inferior to the xiphoid process under direct laparoscopic visualization. The left lobe of the liver was retracted anteriorly to the abdominal wall by directing the instrument underneath the liver and attaching it to the peritoneum covering the apex of the diaphragmatic crura (Fig. 2 and 3). The liver retractor can be easily manipulated as needed to facilitate maximum exposure of the hiatus. At the end of the case, the TR was removed under direct laparoscopic visualization. The puncture site was covered with butterfly closures (e.g., Steri-Strips) and an adhesive bandage (e.g., Band-Aid).

Results

A total of 2601 bariatric surgery patients underwent liver retraction using this technique by a single surgical group at John T. Mather Memorial Hospital, Port Jefferson, New York. Table 1 is a summary of the patients' characteristics. The patients who underwent bariatric surgery were predominantly female (72%) and morbidly obese (mean BMI: 43 kg/m^2; range: 20.6–80.3). The main bariatric surgeries performed during this period were 1137 (43.7%) Laparoscopic sleeve gastrectomies, 485 (18.6%) Roux-en-Y gastric bypasses and 497 (19.1%) gastric bands (Table 2). The estimated operative time for the placement of this liver retractor was $<$ 1 minute in all cases.

There were 3 cases where an additional TR was used to retract a very large liver. No conversion to a conventional liver retractor was required for this case series. The postoperative course was uneventful in all cases. The wound site from the TR was barely noticeable at 2 weeks postoperatively (Fig. 3). There were no postoperative complications at 30 days.

Discussion

A critical requirement in bariatric surgery is exposure of the hiatus by retraction of the left lobe of the liver. Traditional liver retractors generally require an additional port site, increase the risk of infection, and utilize limited operative time to assemble. Numerous techniques for liver

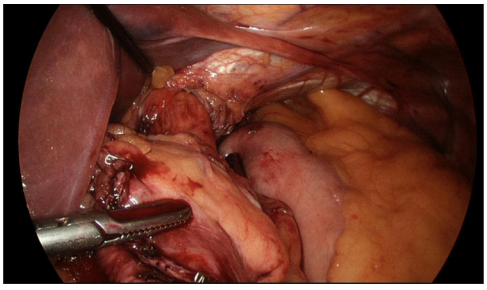

Fig 1. Use of the TR to create the gastric pouch during a Laparoscopic Roux-en-Y gastric bypass.

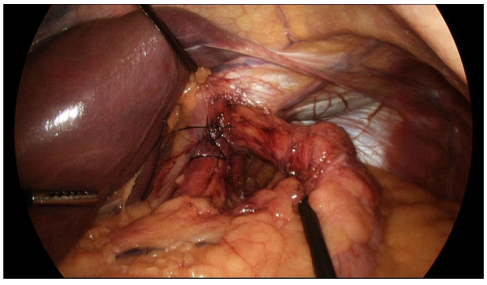

Fig 2. Use of the TR to repair a hiatal hernia during Laparoscopy sleeve gastrectomy.