

A PERCUTANEOUS TECHNIQUE OF LIVER RETRACTION IN LAPAROSCOPIC BARIATRIC SURGERY^{1*}Hamdy Abd EL Alim Mohammed Farag and ²Ahmed Abdel Mawgood EL Tokhy^{1,2}MD General Surgery Department Al Azhar University Hospitals.***Corresponding Author: Hamdy Abd EL Alim Mohammed Farag**

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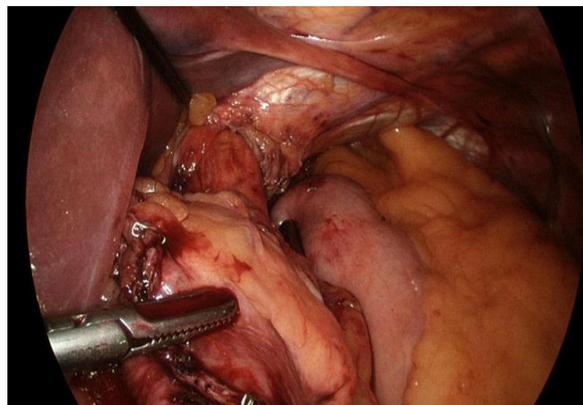
ABSTRACT

Background: Laparoscopic bariatric surgery requires retraction of the left lobe of the liver to provide adequate exposure of the hiatus and the stomach. The most common used approaches are use of retractors that require another incisions and prolonged operative time. **Objectives:** A prospective assessment of the efficacy and safety of a percutaneous stone forceps as liver retractor in patients undergoing laparoscopic bariatric surgery. **Methods:** A prospective review was performed on 120 patients undergoing bariatric surgery from January 2016 to January 2017 in Al azhar university hospitals. A percutaneous stone forceps was used to retract the left lobe of the liver in all cases. The retractor can be repositioned as necessary by releasing and regrasping the diaphragm at different sites. **Results:** This technique was used in 120 patients from January 2016 until January 2017. The average body mass index was 50 (range:35–65). In all patients, this method was found to be enough to complete the bariatric surgery. The majority of procedures included laparoscopic Roux-en-Y gastric bypass, sleeve gastrectomy. No intraoperative liver injuries occurred with use of this technique. **Conclusion:** Percutaneous retraction of the liver using the percutaneous stone forceps grasper was found to be safe and effective in those morbidly obese patients. The rate of complications involving this technique is very low. This novel method provides safe and effective retraction with less trauma and better cosmesis than conventional technique.

KEYWORDS: bariatric surgery, liver retraction, percutaneous technique.**INTRODUCTION**

Laparoscopic bariatric surgeries are challenging procedures to perform. A high body mass index (BMI) and an enlarged liver increase the surgery's difficulty. Preoperative weight loss can help to decrease the size of the liver. However, an enlarged liver can impede optimal visualization of the stomach during surgery. The challenge for many surgeons is how to retract the left lobe of the liver to obtain an adequate exposure 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 setup these retractors. 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.^[3,13] Therefore, the ideal technique for liver retraction during laparoscopic bariatric surgery would displace the liver to allow for optimal exposure of the

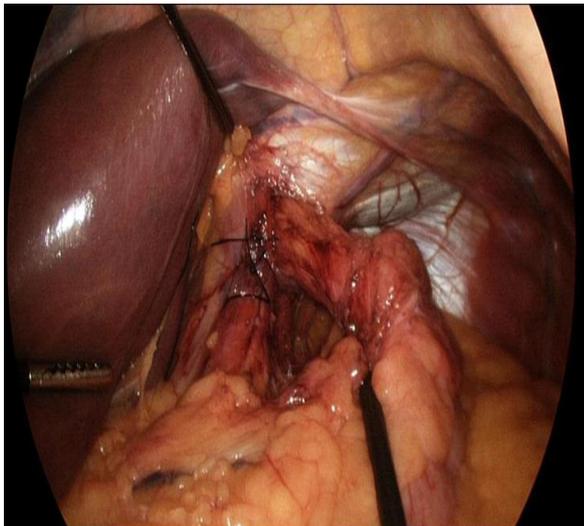
hiatus in a non-traumatic fashion and does not consume extra time. Additionally, if this can be achieved without incision or trocar, using a percutaneous retractor it would be preferable as regards cost as well as cosmetic view. (Fig. 1).

**10 ml trocar followed by stone forceps without port (figure 1)****METHODS**

This is a large case of consecutive bariatric operations by a multiple surgical groups. A total 120 patients

underwent bariatric surgery using the stone forceps grasper as a percutaneous liver retractor. The patients' medical records were reviewed for demographic information, co-morbidities, and 30-day complication rate. The patients were prepped and draped in the usual fashion. A Verus needle was inserted into Palmer's point and used to establish pneumoperitoneum.

A5-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 stone forceps retractor 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 retractor was removed under direct laparoscopic visualization.



After retraction hiatus is completely seen (figure 2)



Post port healing (figure 3)

RESULTS

A total of 120 bariatric surgery patients underwent liver retraction using this technique by multiple surgical group in Al azhar university hospitals.

Table 1: is a summary of the patients' characteristics.

Patient characteristics	Value
Age in years	
Mean	38
Range	22 _ 56
Gender (n %)	
Male	33
Female	87
BMI,	
Mean (SD)	42
Range	38 _ 46

BMI: body mass index; n: number of patients; SD: standard deviation; Yr: year.

The patients who underwent bariatric surgery were predominantly female and morbidly obese (mean BMI: 42 kg/m²; range: 38–46). Laparoscopic sleeve gastrectomies, 85 Roux-en-Y gastric bypasses 35 (Table 2).

Procedure	N(%)
Lap.gastric bypass	35 (29.1)
Lap. Sleeve gastrectomy	85(70.8)

Lap: laparoscopic; n: number of patients; RYGB: Roux-en-Y gastric bypass.

The estimated operative time for the placement of this liver retractor was 1 minute in all cases. There were 3 cases where an additional stone forceps retractor was used to retract a very large liver. No conversion to a conventional liver retractor was required for these cases. The postoperative course was uneventful in all cases. The wound site from the stone forceps retractor was barely noticeable at 2 weeks postoperatively. 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 consume operative time to assemble. Many approaches require additional materials and instruments and increase operative time.^[5,14] Many techniques for liver retraction have been described in the literature. One such procedure is known as the Istanbul technique, which is utilized during single incision laparoscopic surgery (SILS) and was first described by Hamzaoglu *et al.*^[7,15] In this technique, a Penrose drain is prepared with 2 silk sutures tied to each end of the drain. It is then inserted through a 10-mm trocar of the SILS port and placed below the lateral segment of the liver, where it serves as a "hammock" to suspend the liver. Another liver suspension technique was described by Woo *et al.*^[4,6] and requires the use of two 4 x 4 gauze pads, 2–0 polypropylene monofilament suture, and a 70-mm double

estraight taper needle. The gauze pads are folded and then threaded using the suture to create a makeshift traumatic support for the liver suspension. Where as there is successful a traumatic suspension of the liver, these techniques require additional operative time that must be spent on manually fashioning the “hammock” and gauze sutures. A technique of liver retraction that utilizes a silicone disc is known as the ϕ -shaped technique, first described by Saeki et al.^[8,9,12] This technique was primarily utilized during laparoscopic gastrectomies in patients with gastric cancer for lateral liver segment retraction.

In this technique, a leaf-shaped silicone is used along with a loop created using 2-0 monofilament polypropylene suture. After performing the necessary suturing, the silicone disc is introduced into the abdominal cavity and placed underneath the liver where traction is applied to the suture, allowing the disc to lift and suspend the lateral segment of the liver. Once critical time is needed to fashion the silicone disc before its use during the surgical procedure. Another technique that utilizes a percutaneous approach to liver retraction is described by Giannietal.^[10,16], which utilizes a 15-cm Verres needle. After percutaneous insertion into the subxiphoid area, the needle is covered by a 16 to 18 French nasogastric or drainage tube. An angle is created at the covered tip of the needle, allowing for easy liver retracting. This technique reduces the need for additional incisions, trocars and retractors, but may not provide adequate support for retraction and suspension of larger livers, which are frequently encountered in bariatric patients. A randomized controlled trial comparing 3 methods of liver retraction for bariatric surgery was reported in 2013 by Goel et al.^[3,11]

CONCLUSION

The goal of this paper is to describe our technique of percutaneous liver retraction and highlight the fact that this has been used by us as the only method of liver in bariatric cases. The stone forceps retractor can be used safely and efficiently to obtain adequate retraction of the left lobe of the liver during laparoscopic bariatric procedures over a wide range of BMIs. We have also found that the technique is associated with better cosmesis, shorter operative times and ease of maneuverability during repositioning if necessary.

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