

Closure versus Non-closure of hernial defect in laparoscopic ventral hernia mesh repair – An observational study

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ABSTRACT

Introduction: Ventral hernias are the second most common type of abdominal hernias and account for approximately 10% of all hernias. Recurrence rates after open suture repair have been reported to be as high as 31% to 49%. Laparoscopic ventral hernia repair (LVHR) has been reported to have reduced recurrence rates as compared to open mesh repair, reduced infection rate, shorter recovery time and hospital stay. During LVHR, closure of the hernial defect is a contentious issue. We describe our observations with the closure of hernial defect in LVHR in comparison to non-closure of defects in relation to seroma, pain, ileus and recurrence.

Materials and methods: An observational study of closure versus non-closure of hernial defect in laparoscopic ventral hernia mesh repair was conducted in 81 patients from March 2015 to March 2016. Ventral hernia repair with mesh was done without closure of defect in 32 cases whereas in 49 cases closure of defect was done.

Results: Seroma, pain, ileus and recurrence incidence are less in closure of defect in comparison to non closure of defect in our study.

Conclusion: With increasing experience, different theories and techniques have been described by different surgeons to overcome the intraoperative and postoperative problems. During LVHR, closure of the hernial defect is a contentious issue. Closure of defect in our experience decreases rate of seroma formation. Closure of defect induce more post operative pain, but may be superior with regard to other important surgical outcomes. Duration of follow up is inadequate to conclude about incidence of recurrence in our study.

Keywords: Closure, non closure, hernia defect, mesh repair

INTRODUCTION

Indications to repair a ventral hernia are symptom relief, cosmesis, and prevention of future problems related to the hernia such as pain, acute incarceration, enlargement, and skin problems¹. For all hernia repairs it is important to define and

align patient and surgeon goals for the operation preoperatively.

Diagnosis of a ventral hernia is typically made during the history and physical examination.

Imaging studies including ultrasound, computed tomography (CT) with and/or without Valsalva, and magnetic resonance imaging (MRI) can also be used for diagnosis. Imaging studies may be helpful to assess the anatomic details of a ventral hernia, augmenting the physical examination, especially when a hernia cannot be reduced, and therefore the defect cannot be palpated and measured. These situations commonly arise with small defects, obese patients, or incarceration (either acute or chronic). CT has been found to be useful in diagnosing occult hernias, multiple defects, abscess, and hematoma, as well as in differentiating incarcerated hernias from abdominal wall neoplasms².

MATERIALS AND METHODS

An observational study on closure versus non-closure of hernial defect in laparoscopic ventral hernia mesh repair was conducted in 81 patients from March 2015 to March 2016 in our college. Inclusion and exclusion criteria for closure of the defect was defined [Table 1]. Thorough history and clinical examination of the patients was done with ventral hernia. All patients were asked for ultrasound of abdomen to know the site and size, number of defects, and content of ventral hernia. All were also thoroughly investigated and pre operative medical and anaesthetist fitness was taken keeping in mind all patients required general anaesthesia for surgery. Standard operative protocols as suggested by SAGES guidelines for laparoscopic ventral hernia were followed in all patients. All cases were operated under general anaesthesia and antibiotic prophylaxis was given. Pneumoperitoneum was created by closed method-Veress needle at Palmar's point in all cases [Figure 1].

In all cases 10mm 300 telescope was used. Two port technique was used in 66 patients and in remaining 15 patients three port technique was utilised [Figure 2]. Telescope was inserted through the 10mm trocar at the palmar's point.

Diagnostic laparoscopy was done and the ventral hernial site, content and size noted.

RESULTS

In the present study male patients were 26 and 55 were female patients. Median age of patients in our study was 42 years. Different types of ventral hernias in our study were umbilical-29, paraumbilical-25, incisional-18, epigastric-9. In our study 49 patients had hernia defect size 2-6 cm and remaining 32 patients had defect > 6cm. Omentum in 65 patients and bowel in 16 patients was seen as hernia content [Figure 3]. All adhesions were released by combination of blunt, sharp dissection and bipolar coagulation. In all case dual sided mesh was used of size 15 x 15 cm in 56 cases and 10 x 15 cm in 25 cases [Figure 4]. Mesh was fixed by Transfascial sutures in 69 cases and with tackers in 16 cases [Figure 5]. Operative time for hernia repair with closure of defect was 80 to 100 min and without closure of defect was 50 to 70 min [Figure 6]. All cases were discharged on 3-4 post operative day except for 1 patient with ileus who was discharged at 5th day. Patients in both the groups were followed for 1 year.

Seroma, pain, ileus and recurrence incidence are less in closure of defect in comparison to non closure of defect in our study [Table 2].

Table 1. Inclusion and exclusion criteria for defect closure

Inclusion criteria
Age >18yrs
Size of defect 2 to 6 cm
Exclusion criteria
All irreducible hernias
Size of defect >6cm
Patients not fit for general anaesthesia
Recurrent ventral hernia after laparoscopic repair.

Table 2: Showing complications

Complications	Non Closure (32 Cases)	Closure (49 Cases)
Seroma	6	1
Pain	1	5
Ileus	1	0
Recurrence	1	0



Figure 1: 10 mm telescope at palmar's point



Figure 2: Additional working ports

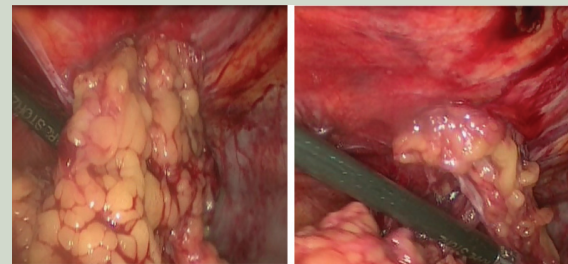


Figure 3: Omental Adhesions in hernial defect.

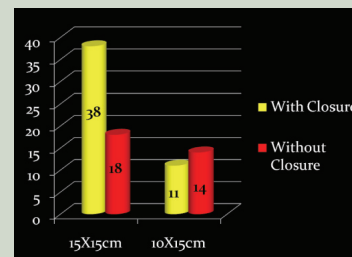


Figure 4: Size of the Dual mesh used.

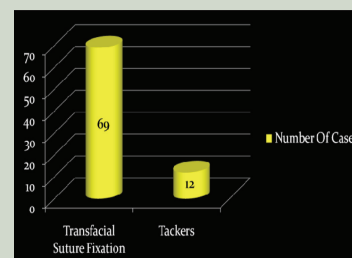


Figure 5: Mesh fixation

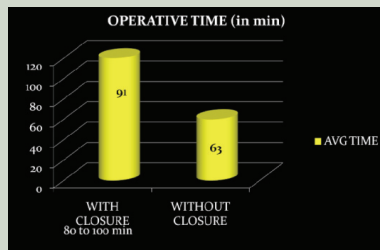


Figure 6: Diagram depicting operative duration

DISCUSSION

The principles of safe abdominal access for laparoscopic surgery apply to LVHR, and technical details about establishment of pneumoperitoneum can be found in the SAGES Fundamentals of Laparoscopic Surgery (FLS) program. There have been no comparative data regarding techniques for establishing pneumoperitoneum specifically for LVHR, although a variety of techniques have been described in the published literature, all with low rates of complications and successful establishment of pneumoperitoneum.

Current options most commonly used for initial peritoneal access for LVHR include direct trocar insertion with an optical trocar (with or without a pneumoperitoneum with the use of the Veress needle), or an open Hasson technique.

Multiple meta-analyses and randomized controlled trials with a variety of general surgical and gynecological laparoscopic procedures reveal no difference in major complication rates with direct trocar insertion without pneumoperitoneum compared to establishment of pneumoperitoneum with Veress needle prior to initial trocar insertion. Regardless of the technique, the surgeon should have adequate training and/or experience with it in similar clinical situations. Additionally, since many LVHRs are performed for midline hernias, it is recommended to access the abdomen off the midline, to avoid areas with potential adhesions of bowel. Regarding placement location, it is desirable to have the working ports as far lateral as possible to expose midline hernias and to be able to place a large piece of mesh without interference. The operation is usually accomplished using 3-5 ports. A larger port (10-12mm) is typically utilized for the insertion of the prosthetic mesh. This port is sometimes the initial port placed with an open technique, and placed just lateral to the rectus muscle for primary midline hernias, used mostly for mesh placement, and is eventually covered by the mesh used for the repair. There are usually 3 ports placed on one side of the abdominal wall and 1-2 ports placed on the other. Many authors report their entry techniques; however,

none directly compare the techniques. One of the largest retrospective series described placement of a Veress needle atleast 10 cm away from the prior scar, preferentially 2 cm below the left costal margin in the mid clavicular line (Palmer's point). The left upper quadrant (LUQ) is the most commonly reported initial entry site with all techniques³.

It is important to consider the size of the hernia defect when contemplating a laparoscopic approach, as larger defects generally increase the difficulty of the procedure⁴. A recently published guideline by an Italian Consensus Conference recommended caution for defects greater than 10 cm but did not consider such defects as absolute contraindication. On the other hand, the same group recommended that hernias with a defect size < 3cm should not be approached laparoscopically. This recommendation was based on expert opinion and a survey showing that less than 10% of surgeons used prosthetics in defects less than 3cm; it was, therefore, deemed "an indirect indication of a minimum size limit for laparoscopy. The present MEDLINE search of the literature did not reveal any evidence in support of this recommendation. Therefore, additional evidence is needed before a minimum size for laparoscopic repair can be defined. Reported conversion rates in the literature range between 1-14% in series with over 50 patients. Possible reasons for a higher conversion rate may include poor patient selection, severe adhesions, incarcerated hernia content impossible to reduce and/or inadequate training and expertise on the part of the surgeon⁵.

Given the variation of technical ability and institutional capability, along with the gradual acquisition of experience, surgeons must use their judgement when determining whether to perform a laparoscopic or open VHR. When considering a laparoscopic approach and selecting patients, the surgeon should consider his or her own experience. There is limited evidence to indicate how expertise with laparoscopic VHR is developed; however, it appears prudent to recommend that less experienced surgeons should start with less complex cases. A study analyzing 180 cases of a prospectively collected database found a number of clinical factors that significantly increased operative time (which was used as a surrogate for laparoscopic repair complexity) such as adhesiolysis and prior ventral hernia repair(s). Other factors reported in the literature that increase the complexity of LVHR include large defects (>10cm diameter), hernias in unusual locations (subxiphoid, suprapubic, flank, etc.), incarcerated hernia, hernias with small defect size but large hernia sac, obesity, bowel distention, pregnancy, and presence of ascites⁶.

The afore mentioned factors, which are known to increase the technical difficulty of the operation, should help

guide the surgeon in selecting the appropriate patients for LVHR. The decision of whether or not to perform a LVHR should weigh the surgeon's training and experience, as well as the institution's capability to provide the proper equipment and supplies. As training and experience is gained, gradually more complex laparoscopic VHRs may be appropriately undertaken.

Traditionally ventral hernias were repaired by opened technique with or without the use of mesh. Later with the advent of laparoscopy focus was shifted to laparoscopic closure of defect initially later to use of mesh and recently to incorporate both the techniques i.e, closure of the defect with mesh reinforcement. Laparoscopic ventral hernia repair, compared to open repair, has a lower rate of wound infections. Recurrence rates and postoperative pain are similar between the two techniques, during mid-term follow-up. The advantages offered by LVHR over open hernia repair in terms of decreased wound complication rates should be taken into consideration by surgeons and disclosed to patients during consultation and discussion of surgical options.

Reasons to close the defect during LVHR prior to mesh insertion include the possibility of reduced seroma rate, reduced recurrence rate, improved "abdominal wall function," and improved abdominal wall contour postoperatively⁷. Persistent pain following laparoscopic ventral hernia repair should be treated with analgesics, anti-inflammatory medications, steroids, trigger point injection or nerve block. Seroma formation following laparoscopic hernia repair should be considered an expected outcome, rather than a complication. Seromas that are persistent for prolonged period of time or those that are symptomatic may require treatment⁸. Techniques for prevention of seromas may be employed to minimize the likelihood of developing this persistent problem but results of these techniques are mixed. There are few studies showing that cauterization of the hernia sac may decrease seroma formation. The use of abdominal pressure dressings and abdominal binders may improve pain but may not reduce seroma occurrence. Laparoscopic defect closure at the time of laparoscopic ventral hernia repair have been suggested to help restore the contour of the abdominal wall, reduce abdominal bulging as well as reduce seroma formation. Reports of this technique have demonstrated a mixed benefit upon seroma formation with a low or absent incidence of clinically significant seromas, however abdominal wall contouring may be a benefit⁹. Patients developing a postoperative ileus should be initially treated non-operatively with fluid administration, bowel rest, and/or gastric decompression. There is no uniformly accepted definition of prolonged ileus following laparoscopic ventral hernia repair, but "ileus" or "prolonged

ileus" is reported to be between 0% and 20%, with the average incidence 4.0%. The cause of postoperative ileus after LVHR has been speculated to be due to suture site pain, adhesiolysis, duration of procedure, or bowel manipulation¹⁰.

CONCLUSION

This was an observational study which was conducted in our college with minimal resources. Lot of effort was put to ask patients for the follow - up. From this study it is clearly evident that closure of defect in laparoscopic ventral hernia has more advantages than non closure of the defect. Based on the above results, we conclude that during LVHR with closure of defect in our experience decreases rate of seroma formation, induce more postoperative pain, but may be superior with regard to other important surgical outcomes. Duration of follow up is inadequate to conclude about the incidence of recurrence in our study.

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