



COMPARISON OF OPEN AND LAPAROSCOPIC PROSTHETIC REPAIR OF LARGE VENTRAL HERNIAS

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Financial Support: None declared
Conflict of interest: None declared
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How to cite this article:

Vyas PH, Joshi AH, Odedra N, Shah KS. Comparison of Open and Laparoscopic Prosthetic Repair of Large Ventral Hernias. Ntl J Community Med 2016; 7(3):201-203.

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Date of Submission: 24-01-16

Date of Acceptance: 08-03-16

Date of Publication: 31-03-16

ABSTRACT

Introduction: Open ventral hernia repair is associated with significant morbidity and high recurrence rates. Recently, the laparoscopic approach has evolved as an attractive alternative. Our objective was to compare open with laparoscopic ventral hernia repairs.

Methods: 50 laparoscopic and 22 open ventral hernia repairs were included in the study. All patients underwent a tension-free repair with retromuscular placement of the prosthesis.

Results: No significant difference was found in the operative time between the 2 groups (laparoscopic 132.7 min vs open 152.7 min). Laparoscopic repair was associated with a significant reduction in the postoperative narcotic requirements ($P < 0.002$); the lengths of nothing by mouth (NPO) status ($P < 0.001$); and hospital stay ($P < 0.001$). The incidence of major complications ($P < 0.028$); the hernia recurrence ($P < 0.028$); and the time required for return to work ($P < 0.036$) were significantly reduced in laparoscopic group.

Conclusions: Laparoscopic ventral hernioplasty offers significant advantages and should be considered for repair of primary and incisional ventral hernias.

Keywords: Ventral hernia, Incisional hernia, Prosthetic inlay repair, Laparoscopy

INTRODUCTION

Incisional and primary ventral hernias represent a frequently encountered and at times frustrating problem for the general surgeon. Open repair of these hernias can be very challenging with significant associated morbidity (20% to 40%).¹⁻² They often (3% to 13%) complicate an otherwise uneventful abdominal operation,³ or present as an acute incarceration (6% to 15%) and strangulation (2%) mandating immediate surgical repair⁴. Additionally, a significant period of hospitalization is often required for recovery. Furthermore, depending upon whether a simple suture or prosthetic repair is used, open ventral hernia repair is associated with a 46% and 23% recurrence rate, respectively.⁵

Recently, laparoscopic repair of ventral hernias has infused the field with new interest and enthusiasm. A literature review shows that laparoscopic ventral

hernia repair has a short hospital stay (2.8 days) with acceptable complication (20%) and recurrence (4.7%) rates. Five previously published studies.^{7,8,9,10,11} compare the results of open and laparoscopic ventral hernia repair. These clearly demonstrate that the latter approach significantly decreases hospital stay. Unfortunately, many inconsistencies exist among these 5 studies with respect to the operative time, associated morbidity, and recurrence rate^{7,8,9,10,11}. Moreover, significant variability exists regarding the surgical techniques in some of these studies.

The present study represents a retrospective comparative analysis of laparoscopic and open ventral hernia repairs. The 2 groups were carefully selected to match for hernia characteristics, surgical technique, and associated comorbid factors. Differences in the operative time, hospital stay, and complication and recurrence rates were investigated.

ed. Lastly, the impact of the laparoscopic approach on postoperative recovery time was evaluated for the first time by comparing the length of nothing by mouth (NPO) status, pain control, and time required to resume regular activities, including the return to work.

MATERIALS AND METHODS

Patient Characteristics and Selection Criteria

This is a retrospective review of ventral and incisional hernioplasties that were performed by the senior authors between 2012 and 2015. 30 patients underwent a laparoscopic ventral hernia repair and 22 patients an open prosthetic repair. All patients had a tension-free repair with retromuscular (extra- or intraperitoneal) placement of the prosthesis with a 2- to 4-cm overlap (inlay), resembling the Stoppa technique.¹² To keep the groups as comparable as possible, all patients who underwent suture repair or prosthetic repair with the onlay, sandwich or edge-to-edge, patch-to-fascia technique were excluded from the study. Furthermore, the patients in the 2 groups were carefully selected to match, as closely as possible, for sex, age, body mass index, associated comorbid factors, and hernia characteristics. No significant difference between the 2 groups was noted regarding patient demographics and hernia characteristics, other than the fact that the open group consisted of a relatively older population (59.4 vs 47.82, $P < 0.003$).

Operative Technique

Laparoscopic access to the abdominal cavity was gained with the Veress needle or the open Hasson technique. The camera port (11 mm) and 2 or 3 working ports (5 mm) were placed as far away as possible from the hernia defect. The 30° laparoscope was used in the majority of cases, although the 0° and 45° laparoscope was available and used when required. Adhesiolysis was performed with laparoscopic scissors, electrocautery, or the Harmonic scalpel. An appropriately sized mesh was placed at the subfascial plane either extraperitoneally or intraperitoneally, extending at least 2 to 4 cm beyond the edges of the defect. The DualMesh and the Composix mesh were secured with a minimum of 4 nonabsorbable sutures placed no more than 5 cm apart prior to intraperitoneal introduction. These sutures were then anchored transmurally with the aid of a percutaneous suture passer. Circumferential fixation of the mesh was completed with tacks placed approximately 1.5 cm apart. All port sites larger than 5 mm were closed with sutures under laparoscopic visualization.

Open ventral hernia repair was performed according to Stoppa's technique, as previously described.

Polypropylene mesh used in 60% and Vicryl mesh in 40%.

Data Collection and Follow-up

Data were collected from hospital and outpatient visits. Standardized data included patient demographics, postoperative pain control, complications, recurrence, and activities. No statistically significant difference in the length of follow-up existed between the laparoscopic and open groups (20.8 and 26 months, respectively). Ten patients (33%) in the laparoscopic group and 6 (27.7%) in the open group were lost to follow-up.

RESULTS

Three patients were excluded from the laparoscopic group because conversion to open repair was required due to adhesions (1 patient), inability to establish pneumoperitoneum (1 patient), and an ill-defined defect (1 patient).

No significant difference in the operative time between the 2 groups (laparoscopic 132.7 min vs open 152.7 min). Laparoscopic repair was associated with a reduction in the postoperative narcotic requirements (4 vs 9 dose of 50mg diclofenac, $P < 0.002$) and the lengths of nothing by mouth (NPO) status (10 vs 55.3 hrs, $P < 0.001$), and hospital stay (2.88 vs 8.23 days, $P < 0.001$). The incidence of major complications (1 vs 4, $P < 0.028$), the hernia recurrence (1 vs 4, $P < 0.028$), and the time required for return to work (15.95 vs 23.9, $P < 0.036$) were significantly reduced in the laparoscopic group.

Table 1: Complications occurred in the present Study

Complications	Lap.	Open
Ileus	01	03
Urinary Retention	-	-
Wound Seroma	01	04
Suture track infection	02	03
Recurrence	01	04
Bowel injury	-	02
Lap converted to Open	03	-

Postoperative Results

The incidence of major complications was significantly higher in the open group (4 vs 1, $P < 0.028$). One postoperative death occurred due to respiratory failure in the open repair group. Also occurring in this group were a postoperative small bowel obstruction that resolved with conservative management, a splenic abscess, and a case of pulmonary embolism that responded to heparin therapy. One laparoscopic hernioplasty was complicated by a postoperative complex hematoma that eventually required removal of the prosthesis.

On the contrary, no significant difference between the 2 groups was noted in the incidence of minor complications. It is of interest that the incidence of postoperative ileus was higher in the open group (13.6% vs 4%), even though it did not reach a significant difference. The likelihood of wound infection and seroma formation was similar in the 2 groups. All seromas resolved spontaneously without requiring percutaneous needle aspiration.

During follow-up, 4 (18.2%) patients in the open repair group developed a recurrence compared with only 1 (2%) patient in the laparoscopic group, which had recurred after removal of the prosthesis. Our results revealed a significant reduction in the recovery time for patients in the laparoscopic group. They returned to work earlier and resumed regular activities more rapidly.

DISCUSSION

Obviously, a concern exists about selection bias in our study, because of the retrospective nature of the data analysis. To maintain the validity of our results, certain inclusion criteria were used in patient selection. The technique used for inclusion for all ventral hernioplasties included (laparoscopic and open) resembled the tensionfree, inlay prosthetic repair.

Furthermore, particular attention was given to the patient profile and the hernia characteristics, which were relatively similar in both groups. Considering the importance of proper terminology in ventral hernias (primary, incisional, or recurrent incisional), as this reflects upon the outcome and associated morbidity of the repair,⁶ we discovered no difference in their incidence between the 2 groups. Lastly, a special effort was made to include only patients from a specific period (2012 to 2015) to achieve a similar length of follow-up for all patients.

Nevertheless, our study confirms previous reports demonstrating that laparoscopic ventral hernia repair significantly shortens hospital stay^{7,8,9,10,11}. On the other hand, we found that the laparoscopic approach does not prolong operative time, as previously suggested.⁸ Although, in our study the overall complication rate was not different between the 2 groups, interestingly we observed a significant decrease in the incidence of major postoperative complications. Our study is to produce statistically supporting evidence for an existing significant difference in the recurrence rate in favor of the laparoscopic group.

Clearly, laparoscopic ventral hernioplasty offers significant advantages over the open approach. It provides better visualization of the hernia defect, leading to a more adequate repair, which probably

explains the associated lower recurrence rate. Also, by significantly shortening the hospital stay and to a lesser extent the operative time, it decreases the overall health care costs counterbalancing and most likely offsetting the higher equipment costs. The faster recovery time, the markedly improved postoperative patient comfort and the reduced complication rate observed with the laparoscopic approach will entirely change the concept of the "frustrating problem" and the significant morbidity that surgeons often encounter with ventral hernia repair.

CONCLUSION

Based on these data, the laparoscopic approach is an attractive alternative and should be considered for the repair of primary and incisional ventral hernias.

REFERENCES:

1. Leber GE, Garb JL, Alexander AI, Reed WP. Long-term complications associated with prosthetic repair of incisional hernias. *Arch Surg.* 1998;133:378-382
2. Anthony T, Bergen PC, Lawrence TK, et al. Factors affecting recurrence following incisional herniorrhaphy. *World J Surg.* 2000;24:95-101
3. Costanza MJ, Heniford BT, Arca MJ, Gagner M. Laparoscopic repair of recurrent ventral hernias. *Am Surg.* 1998;64(12): 1121-1127
4. Read RC, Yoder G. Recent trends in the management of incisional herniation. *Arch Surg.* 1989;124:485-488
5. Luijendijk RW, Hop WCJ, Van Den Tol MP, et al. A comparison of suture repair with mesh repair for incisional hernia. *N Engl J Med.* 2000;343:392-398
6. Koehler RH, Voeller G. Recurrences in laparoscopic incisional hernia repairs: A personal series and review of the literature. *JSLs.* 1999;3:293-304 [PMC free article]
7. Frantzides CT, Carlson MA. Minimally invasive herniorrhaphy. *J LaparoendoscAdvSurg Tech.* 1997;7(2):117-120
8. Holzman MD, Purut CM, Reintgen K, Eubanks S, Pappas TN. Laparoscopic ventral and incisional hernioplasty. *SurgEndosc.* 1997;11:32-35
9. Park A, Birch DW, Lovrics P. Laparoscopic and open incisional hernia repair: A comparison study. *Surgery.* 1998;124(4): 816-822
10. Carbajo MA, delOlmo JCM, Blanco JJ, et al. Laparoscopic treatment vs open surgery in the solution of major incisional and abdominal wall hernias with mesh. *SurgEndosc.* 1999;13:250-252
11. Ramshaw BJ, Esartia P, Schwab J, et al. Comparison of laparoscopic and open ventral herniorrhaphy. *Am Surg.* 1999;65:827-832
12. DeMaria EJ, Moss JM, Sugeran HJ. Laparoscopic intraperitoneal polytetrafluoroethylene (PTFE) prosthetic patch repair of ventral hernia. *SurgEndosc.* 2000;14:326-329
13. Stoppa RE. The treatment of complicated groin and incisional hernias. *World J Surg.* 1989;13:545-554
14. Heniford T, Park A, Voeller G. Laparoscopic ventral hernia repair. *Surg Prospectus.* 1999;1:1-11