

## Post-Operative Pain and Convalescence in Comparison of Laparoscopic Ventral Hernia Repair Vs Open Ventral Hernia Repair

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### ABSTRACT

**Background:** Ventral hernia is defined as a fascial defect located to the abdominal wall. The laparoscopic repair of Incisional and ventral hernia is fast becoming the standard of care.

**Objectives:** To compare and evaluate the post-operative pain and convalescence between two groups.

**Methods:** Study was conducted on 30 cases of ventral hernia admitted in Rajindra Hospital, Patiala. They were divided into two comparison groups (15 cases each). Group A: Open ventral hernia repair; Group B: Laparoscopic ventral hernia repair.

**Results and Conclusions:** Laparoscopic repair should be the preferred method of repair of ventral hernia as it is associated with a shorter hospital stay, decreased post-operative pain, better cosmetic results decreased complication rate like recurrence, and seroma formation, decreased mesh infection

rate, early ambulation period, better patient satisfaction and early return to activities.

**Keywords:** Post-Operative Pain, Convalescence, Hernia, Ambulation.

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### INTRODUCTION

A Ventral hernia is defined as a fascial defect located to the abdominal wall. Primary ventral hernias are classified as umbilical, epigastric, spigelian and lumbar hernias. Secondary ventral hernias are incisional hernias developed in former postoperative scars. Ventral hernia repair is a common surgical procedure. Most ventral hernias are paraumbilical, umbilical and epigastric hernias, but around 60% of the procedure are incisional hernia repairs and half of these are performed laparoscopically.

Hernia of anterior abdominal wall or ventral hernia, represents a defect in the parietal abdominal fascia and muscle through which intra-abdominal or pre peritoneal contents can protrude. Ventral hernia can be acquired or congenital. Acquired hernias may develop via slow architectural deterioration of muscular aponeurosis or they may develop from failed healing of the anterior abdominal wall incision (incisional hernia).

In recent times, due to progress made in chemical industries, numerous kinds of synthetic prostheses have rapidly appeared on

the market and now composite meshes have been introduced. Biological prosthesis have also been introduced but to a limited success. Laparoscopic repair was introduced in 1993 and introduction of various fixation devices then followed. Since then there has been a continuous debate on the technique of repair, placement of mesh, type of mesh, primary closure of defect, type of fixation to be used and mesh overlap.

Treatment of ventral hernias, wherever its site, is repair. Surgery is the preferred treatment with choice of two methods – open repair and laparoscopic repair. Basically repair of any kind of hernia requires only reduction of hernia contents, obliteration of sac and finally closure of hernia orifice.

The laparoscopic repair of Incisional and ventral hernia is fast becoming the standard of care. It has decreased the recurrence rates to less than 10% and in some series a recurrence of less than 2% with long term follow-up has been reported. Randomized trials, comparing open versus laparoscopic repair of incisional and

ventral hernias, have shown better results in favour of laparoscopic repair in terms of wound infection rates, overall complications, postoperative hospital stay, recurrence rates and shorter operating times.

### AIMS & OBJECTIVES

This prospective non-randomized study was conducted on 30 cases of ventral hernia repair admitted in Rajindra hospital, Patiala. They were divided into two comparison groups (15 cases each).

**Group A:** Open ventral hernia repair

**Group B:** Laparoscopic ventral hernia repair.

To compare and evaluate the post-operative pain and convalescence between two groups.

### MATERIALS AND METHODS

This prospective non-randomized study includes patients of ventral hernias admitted to the Department of Surgery at Rajindra Hospital, Government Medical College, Patiala. Patients were evaluated and complete biodata of the patient recorded and detailed history taken. Routine investigations were done.

#### Exclusion Criteria

- a) Infection involving abdominal incision site
- b) Densely scarred abdomen
- c) Acute abdomen with strangulated or infarcted bowel
- d) Incarcerated hernias
- e) Multiple operated scar
- f) Children less than 18yrs of age

#### Inclusion Criteria

- a) Epigastric hernia (fatty hernia of linea alba)
- b) Paraumbilical hernia
- c) Incisional hernia

#### Pre- Operative Screening

Patients were subjected to:

1. Detailed history and Clinical Examination
2. Routine blood investigations, urine investigations, ECG
3. Abdominal Ultrasonography to delineate hernia defect, satellite defect in myoaponeurotic layer of abdominal wall, to rule out ascites, intraabdominal malignancies and finally to diagnose concomitant pathologies like cholelithiasis, ovarian cysts etc.
4. Patient kept fasting overnight and 1 gm injection ceftriaxone was given intravenous pre-operatively.

#### Materials Used

##### 1) Open Repair

Anatomical repair: No '1' prolene  
No "1" Ethilon

Mesh Repair : Poly propylene mesh

##### 2) Laparoscopic Repair

Anatomical repair: No "1" Prolene  
No "1" Ethilon

Mesh Repair : Polypropylene mesh  
Composite mesh [polypropylene/vicryl mesh]

#### Discharge

Patients were discharged on resumption of oral feeding, when post-operative pain was tolerable. Clear instructions regarding weight reduction (in obese patients), avoidance of activities leading increased intra-abdominal pressure (weight lifting, constipation multiparity) were explained to the patients.

### Types of umbilical Hernia Repair

#### Conventional Repairs

Mayo's Repair

#### Laposcopic repairs

Primary closure[Shoe lace technique]

#### Prosthetic mesh Repair

Onlay mesh Repairs

Underlay mesh Repairs(River's stoppa wahtz)

Inlay mesh repairs (Intraperitoneal river type repair)

#### Prosthetic mesh repairs

Intraperitoneal onlay mesh repair with defect closure

#### Follow Up

Patients were called for first visit to surgical OPD on 7<sup>th</sup>-9<sup>th</sup> post-operative day for removal of stitches, assessment of port site for any sign of infection, hematomas, sarcomas or any evidence of continuing pain and discomfort etc.

Patients were called for 2<sup>nd</sup> visit after 1 month, 3 month and then after 6 months.

A note was made of any recurrence of hernia, chronic pain, port site infection, port site herniation, seromas, hematomas etc. occurring during this period.

#### Statistical Analysis

Data was collected and managed using Microsoft Excel. Unpaired student's t- test was used to determine the significance of difference between two independent groups among continuous variables like age, defect size and operative time. For skewed data a corresponding non-parametric test, Mann - Whitney test was applied to see the difference between the two independent groups. For qualitative data Chi-square test was used to see the significant difference in proportion between the two groups. A p value of < 0.05 is considered as significant. All the statistical analysis was carried out using statistical package SPSS 14.

### RESULTS

A total of 30 patients of Ventral hernia/incisional hernia were included in the study to evaluate laparoscopic repair of ventral hernia with four corner trans fascial sutures and with open technique. The patients were divided into two study groups with 15 patients in each group. Patients in study group A, the repair of ventral hernia was done using open technique. In study group B the repair was done using four corners transfascial sutures only.

#### Demographic Profile

Out of 15 patients in Group A, maximum number of patients 7 (46.7%) were in age group of 41-50 years and minimum number of patients 2 (13.3%) were in age group of 51-60 years. Out of 15 patients in Group B, maximum number of patients 7(46.7%) were in age group of 41-50 years and minimum number of patients 2(13.3%) were in age group of 61-70 years. P value of 0.940, which was not significant.

Out of 15 patients in Group A, maximum number of patients 8 (53.3%) were male and minimum number of patients 7 (46.7%) were female. Out of 15 patients in Group B, maximum number of patients 10 (66.7%) were male and minimum number of patients 5 (33.3%) were female. P value of 0.456, which was not significant.

#### Operative Parameters

Out of 15 patients in Group A, maximum number of patients 4 (26.7%) were with defect size of 3 x 1-4 cm and minimum number of patients 1 (6.7%) were with defect size of 5 x 3 cm. Out of 15

patients in Group B, maximum number of patients 8 (53.3%) were with defect size of 3 x 1-4 cm and minimum number of patients 0 (0.0%) were with defect size of 1-2 x 1-2 and 5 x 3 cm. P value of 0.475, which was not significant.

#### Postoperative Pain

Postoperative pain was assessed using a visual analogue scale (VAS). Patients were explained that pain may be presented by a straight line of 10 cm length, the extremes of which corresponds to No Pain (0) at one cm and worst imaginable pain at the other end (10).

Patients were asked to rate their pain depending upon severity on the 1<sup>st</sup> post op day, second one at 1 week after the operation, third one month after the operation, fourth 3 months after the operation and fifth six months after the operation.

Out of 15 patients in Group A, number of patients experienced pain at 1<sup>st</sup> week postoperatively were 9 (60%) and 6 (40%) experienced no pain. At 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month none of the patients in this group experienced pain. Out of 15 patients in Group B, number of patients experienced pain at 1<sup>st</sup> week postoperatively were 3 (20%) and 12 (80%) experienced no pain. At 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month none of the patients in this group experienced pain. P value of 0.023, which was significant.

#### Seroma

Out of 15 patients in Group A, number of patients developed seroma at 1<sup>st</sup> week postoperatively were 1 (6.7%) and 14 (93.3%) no seroma formation. At 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month none of the patients in this group developed seroma. Out of 15 patients in Group B, number of patients developed seroma at 1<sup>st</sup> week, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month postoperatively were none of the patients. P value of 0.309, which was not significant.

#### Mesh Infection

Out of 15 patients in Group A, number of patients developed mesh infection at 1<sup>st</sup> week, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month were none of the patients. Out of 15 patients in Group B, number of patients developed wound infection at 1<sup>st</sup> week, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month postoperatively were none of the patients. P value was not significant.

#### Recurrence

Out of 15 patients in Group A, none of the patients developed recurrence at 1<sup>st</sup> week, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month postoperatively. Out of 15 patients in Group B, none of the patients developed recurrence at 1<sup>st</sup> week, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month postoperatively. P value was not significant.

#### Other Complications

None of the patients in study group A and group B developed any complications on long term follow up like urinary retention, sub-acute intestinal obstruction, chest complications or wound infection, mesh infection, bowel incarceration, intraabdominal collections and recurrence.

#### Number of Days Stayed Post Operatively

In Group A, number of days patients stayed postoperatively with mean value of 5.80 and standard deviation of 1.61. In Group B, number of days patients stayed postoperatively with mean value of 2.73 and standard deviation of 0.45. P value of <0.001, which was highly significant.

#### Cost Analysis

The mean cost per patient for group A was Rs 3666, i.e., 1.7 times the mean cost per patient calculated for group B (Rs 6166). The difference was statistically highly significant with  $p < 0.001$ .

Considering the minimum costs required for the procedure, the cost for laparoscopic mesh repair of incisional/ ventral hernia for medium sized defect with transfacial sutures is 1.7 times higher than suture fixation in open surgery, which is due to high cost of large sized mesh and physiomes used in laparoscopic repair.

#### Patient Satisfaction

Patient satisfaction score was measured on a verbal scale at three months post-surgery. Patients in Group B had higher satisfaction scores as opposed to those in Group A, but the difference was statistically insignificant ( $p = 0.283$ ). Also when enquired whether they would suggest the same surgery to another person with similar disease, 14 patients were in favor of surgery, only 1 (6.66%) respond negatively in group B whereas in Group A, 3 (20%) patients respond negatively to surgery.

#### Return to Activity

A questionnaire was administered to patients at 3 months or thereafter post-operatively to assess the time required for returning to normal activity. The mean time interval after which patients started walking independently was 11.3 hrs in the post-operative period.

The patients started moving about freely in their house after a mean period of 2.8 days. For a mean of 2 days they required help for dressing up. The patients resumed their usual activities at an average interval of 11.9 days, with climbing stairs at 12.6 days and lifting objects at 61.3 days. There was statistical high significant ( $p \text{ value} < 0.001$ ) difference between two groups observed except lifting objects.

## DISCUSSION AND CONCLUSIONS

The laparoscopic approach for incisional and primary ventral hernia has gained popularity because of its low recurrence rate, short hospital stay, good cosmetic outcome and low complication rate as compared to open repairs.<sup>1-5</sup>

The laparoscopic approach also provides the surgeon the ability to clearly define the margins of the hernia defect and to identify additional smaller "swiss-cheese" defects which may not be clinically apparent preoperatively and can be missed in an open approach.

Randall et al<sup>6</sup>, done a Pooled analysis of LVHR compared with open ventral hernia repair (OVHR) encompassing 5340 patients in a 14-year period revealed that LVHR was associated with significantly fewer wound complications (3.8% vs 16.8%;  $p < 0.0001$ ), fewer total complications (22.7% vs 41.7%;  $p < 0.0001$ ), fewer hernia recurrences (4.3% vs 12.1%;  $p < 0.0001$ ), and a shorter length of stay (2.4 vs 4.3 days;  $p = 0.0004$ ). Itani et al<sup>7</sup> reported time to resume work activities was shorter for the laparoscopic group than for the open repair group (median, 23.0 days vs 28.5 days). In 2011 Beldi et al<sup>8</sup>, compared laparoscopic and open techniques and reported that for laparoscopic repair, the direct operative costs were higher (2,314 versus 2,853 euros;  $p = 0.03$ ), and the overall hospital costs were lower (9,787 versus 7,654 euros;  $p = 0.02$ ).

Although laparoscopic incisional and ventral hernia repair has gained popularity, there are many technical issues which need to be resolved. The issues of access to the abdominal cavity mesh overlap and mesh size have more or less been resolved. Further, issues like the ideal mesh to be used, the fixation technique and the necessity for closure of the defect before mesh fixation are areas of ongoing debate.

To summarize: thus it is concluded that laparoscopic repair should be the preferred method of repair of ventral hernia as it is associated with a shorter hospital stay, decreased post-operative pain, better cosmetic results decreased complication rate like recurrence, and seroma formation, decreased mesh infection rate, early ambulation period, better patient satisfaction and early return to activities.

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