



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**COMPARATIVE STUDY OF SHORT TERM OUTCOMES OF LAPROSCOPIC VERSUS OPEN VENTRAL ABDOMINAL WALL HERNIA MESH REPAIR EXCLUDING GROIN ( INGUINAL AND FEMORAL ) HERNIA IN TERTIARY CARE HOSPITAL.**

**KEY WORDS:** Ventral Hernia, Rives Stoppa, Sublay Repair

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**ABSTRACT**

**Aims and objectives:**

**Primary:** To compare perioperative complication of open repair with laproscopic repair of ventral hernia i.e

1. Tissue or organ damage ( bowel , bladder )
2. Surgical site infection
3. Wound seroma / hematoma
4. Wound dehiscence/ gap
5. Postoperative pain

**Secondary:** To analyze and compare the parameters of

1. Duration of surgery
2. Postoperative hospitalization stay
3. Mortality / morbidity
4. Age

**Methods:**

Patients admitted from MARCH 2021 to FEBRUARY 2022 with ventral abdominal hernia excluding groin ( inguinal and femoral ) hernia in department of general surgery , in a tertiary care hospital are included in study . by systemic random sampling those patient divided in two group

(A)Group :Patients who are considered for laproscopic ventral hernia repair

(B)Group :Another group of patients who are considered for open ventral hernia repair

**Result:** Postoperative pain and length of hospital stay is significantly less in laproscopic ventral hernia repair. Post operative complication like wound infection , seroma and hematoma were relatively less in laproscopic group.

**INTRODUCTION:**

Ventral Hernias is one of the most common surgical problems. A hernia is when a viscus or a portion of a viscus abnormally protrudes through a hole in the wall of the cavity it is supposed to be contained in. A ventral hernia is an opening in the abdominal wall through which bowel loops, fat, or omentum protrude(1). Due to weak spots in the abdominal wall where aponeurosis or muscle do not support it, ventral hernias develop. (2)The primary or congenital (umbilical, paraumbilical, epigastric, and spigelian) and secondary (incisional) hernias are distinguished by the European Hernia Society. Ventral hernia repair can be performed by open and laparoscopic approaches with multitude of options available for mesh placement. The planes of placing mesh in conventional ventral hernia repair are:

Onlay – The mesh lies superficial to the anterior rectus sheath or external oblique aponeurosis with an overlap

Inlay – The mesh is trimmed to the size of the sheath defect and is sutured to the edges

Sublay – The mesh is placed deep to the defect, either retro-rectus or inter-muscular, but always superficial to the peritoneum

Underlay – The mesh is placed intra-peritoneally

This study compared the short-term outcomes following laparoscopic versus open mesh repair of Ventral Hernia.

**AIMS AND OBJECTIVES:**

**Aim**

To compare short term outcomes of laparoscopic versus open ventral abdominal wall hernia mesh repair in tertiary care hospital.

**OBJECTIVES**

**Primary:** To compare perioperative complication of open repair with laparoscopic repair of ventral hernia i.e.

- Tissue or organ damage (bowel, bladder)
- Surgical site infection
- Wound seroma / hematoma
- Wound dehiscence/ gap
- Postoperative pain

**Secondary:** To analyse and compare the study for

- Duration of surgery
- Postoperative hospitalization stay
- Mortality / morbidity
- Age

**MATERIALS AND METHODS**

**Study Design:**

It is a prospective comparative study to be conducted on all consecutive patients meeting the inclusion criteria, until the required sample size is attained.

**Research site:**

Cases admitted to various surgical wards in a Tertiary Care Government Hospital.

**Sample size:**

$$N = [Z^2 (1-a) * P * Q] / [D^2]$$

$$Z^2 (1-a) = 1.96$$

$$P = \text{Percentage change} = 3\%$$

$$Q = 100 - P = 97\%$$

$$D = \text{Experimental error} = 5\%$$

Substituting the values in the formula, the minimum sample size is 46 patients. Total Sample size is divided in to 2 groups of surgeries as per the random sampling technique by using

computerized sampling.

a. Number of patients: 23 patients underwent open hernia mesh repair and 23 patients underwent laparoscopic hernia mesh repair. Type of mesh used was determined by the operating surgeon.

A Group: 23 patients who underwent laparoscopic ventral hernia repair

B Group: 23 patients who underwent open ventral hernia repair.

**b. Intervention:**

Patient admitted from MARCH 2021 to OCTOBER 2022 with ventral abdominal hernia in the Department of General Surgery, in a tertiary care hospital, have been included in the study. Patient underwent all routine investigations and by systemic random sampling those patients were divided in two group.

In both laparoscopic and open approach, mesh was placed in the retro rectus plane, i.e., between rectus muscle and posterior rectus sheath.

**Study duration:**

Study period was from MARCH 2021 to OCTOBER 2022

**Patient selection:**

**Inclusion Criteria**

- Patients planning to undergo surgery for ventral hernia
- Willing and able to comply with study follow-up procedures.
- Willing to provide written informed consent
- Age 18-70 years

**Exclusion Criteria**

- Patient not willing for study
- Patient not fit for anaesthesia
- Patients with inguinal or femoral or any other hernia other than ventral hernia
- Pregnant females
- Obese patients
- Patients with recurrent, obstructed, and strangulated hernias

**Surgical technique:**

**Open Retro Rectus Mesh Repair**

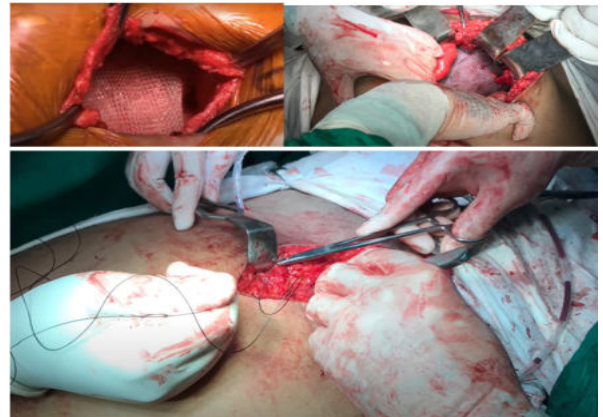
After making sure patient is adequately fit for anaesthesia, patient was taken to operation theatre and was induced and put under general anaesthesia. Foleys catheter was inserted in patients with lower abdominal ventral hernia and nasogastric tube for upper abdominal hernia repair with perioperative single dose third generation cephalosporin was administered intravenously. Under strict aseptic precautions parts painted and draped.

Midline skin incision was made, sac was identified and dissected all around. Linea alba was opened along its length. Hernia was reduced. Posterior rectus sheath was opened on both sides longitudinally. A space was created in the retro rectus plane, between rectus muscle and posterior rectus sheath for the deployment of mesh. Posterior rectus sheath of both sides was approximated together using Prolene 1. A 30cm x 30cm prolene mesh was placed in the space created. Subcutaneous tissue and skin were closed.

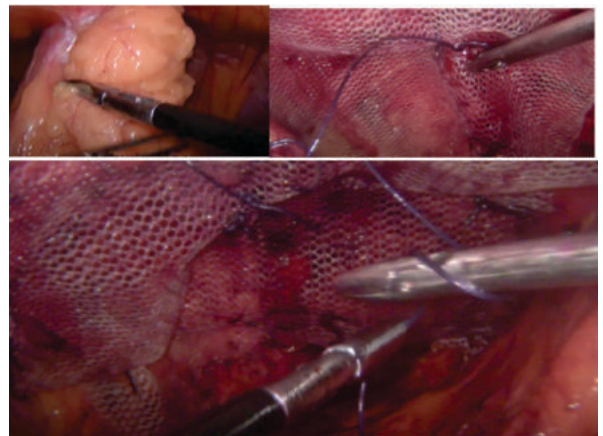
**Laparoscopic ventral hernia repair:**

Pneumoperitoneum was created using a Veress needle. A 10mm port and two or three 5mm working ports were placed based on the site of the hernia. After reduction of hernial contents, posterior rectus sheath open on bilateral site till linea semilunaris and below till pelvis, posterior defect closed with vicryl 2-0, a dual mesh was placed with a 5cm overlap beyond the margins of the defect. The mesh was secured to the anterior abdominal wall with metallic tacks. In

larger defects, the mesh was first secured using transfascial sutures, posterior rectus along with peritoneum close with prolene suture. The skin was closed by Polyamide sutures.



**Open hernia repair steps**



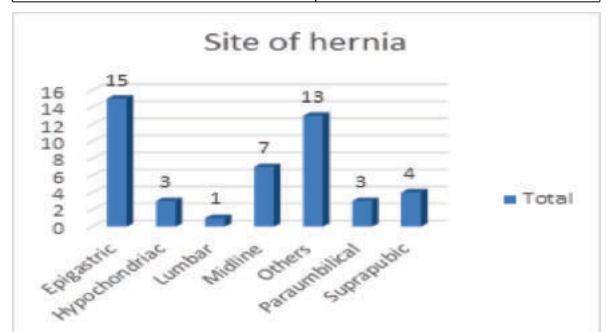
**Laparoscopic steps.**

**RESULTS AND DISCUSSION:**

**1. Site and Type of hernia**

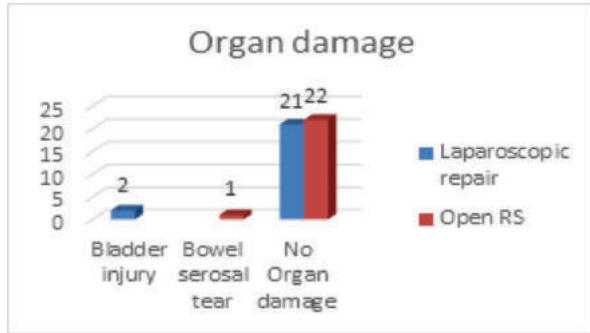
In a similar study done, Paraumbilical hernias were the most common in both groups, which accounted for 71.6% of all patients involved in our study. Incisional hernias were the second most common (21.7%) followed by epigastric hernias, which were the least common (6.7%). (4) This was similar to our findings, where 36% cases were primary and the rest were incisional hernia. Epigastric and paraumbilical were the most common sites.

Row Labels	Count of Site
Epigastric	15
Hypochondriac	3
Lumbar	1
Midline	7
Others	13
Paraumbilical	3
Suprapubic	4
Grand Total	46



**2. Organ damage**

There were two reported cases of bladder injury and 1 case of serosal tear in our study. Basukala et al showed a total incidence of 3.1% of intraoperative bowel and bladder injury which was higher than that of the previously conducted studies. A literature review by LeBlanc et al(5). reported the incidence of bowel injury among 1.78% patients of the 3925 patients undergoing LVHR. Incisional hernias are associated with greater risk of adhesions requiring adhesiolysis, making bowel and bladder susceptible to injury. Out of four patients who faced intraoperative bowel/bladder injury, none of them developed surgical site infection in the study by Basukala et al.



**3. Seroma**

Our study showed that there is more likelihood of seroma formation in Open RS group.

A study was conducted to determine seroma rates. Group A (n=28): ePTFE dual mesh patch secured intraperitoneally by full-thickness stitches and endoscopic tacks to cover the hernia defect and to overlap healthy margins. Group B (n=52): The same technique as in group A, but the hernia sac was cauterized by monopolar cautery (n=5) or Harmonic scalpel (n=47). It showed significantly fewer total seromas occurred in group B compared with group A (P=0.004). Cauterization of the hernia sac and a central full-thickness suture to reduce dead space seems to prevent seroma. This technique combined with a large patch to cover at least 4 cm of healthy margins and the surgeon's experience may be sufficient to prevent recurrences in laparoscopic ventral hernioplasty. (55,56)

**4. Wound dehiscence**

There was no difference seen in our study. However as per a study by Magdy et al, postoperative seroma following laparoscopic repair accounted for 30 versus 10% following open repair. Four patients developed wound infection, three of them in the open repair group (15%) and one of them in the laparoscopic repair group (5%). Recurrence rates were 10% in laparoscopic repair versus 5% in the open repair. Three (15%) cases in open group and one (5%) case in laparoscopic group had postoperative ileus and were managed conservatively. No vascular nor bowel injuries were reported in both groups of this study. (6)

**5. Mortality**

There was no difference in mortality. This is in line with other similar studies.

**6. Duration of surgery**

The mean duration of surgery was not significantly different between the 2 groups (P=0.15). This is contrary to our findings where open surgery was quicker. This is probably due to early learning curve. (7)

**7. Postoperative pain**

A study done by Rogmark et al showed that postoperative pain or recovery at 3 weeks after repair of midline incisional hernias does not differ between Laparoscopic Repair and Open Repair, but the Laparoscopic Repair results in better

physical function and less surgical site infections than the Open Repair does.

Our study showed better pain tolerance in the laparoscopic group. (8,9)

**8. Hospital stay**

A study by Navarra et al showed that Time to oral solid food intake was longer in the open group (P=0.002). The analgesic requirement was lower in the laparoscopic group (P=0.05). One patient after open surgery and 2 in the laparoscopic group suffered postoperative complications (P=0.71). Postoperative stay was shorter in the laparoscopic group (P=0.006). No readmission or recurrence was registered within 6 months from surgery in either group. Laparoscopic incisional hernia repair, based on the Rives-Stoppa technique, is a safe, feasible alternative to open techniques. However, larger studies and long-term follow-up are required to further evaluate the true effectiveness of this operation.

**9. Blood loss**

Studies have shown that there is no significant difference in blood loss between laparoscopic and open hernia repair. Both techniques can result in some degree of blood loss, but this is usually minimal and can be effectively managed through proper surgical techniques and the use of blood transfusions when necessary.

**CONCLUSION:**

Laparoscopic ventral hernia repair carries a significant advantage over open hernia repair, especially in terms of reduced postoperative pain, duration of hospital stay, and early resumption of normal activity.

Our study showed higher rate of complications like bladder injury in LVHR compared to open repair, whereas surgical site infection, seroma and hematoma were more common in open repair as compared with LVHR.

A low rate of conversion to laparotomy, minimal perioperative morbidity, and the absence of perioperative mortality in this series indicate the safety of LVHR in obese patients with complex hernias. In addition, a high success rate suggests improved efficacy of LVHR compared with the historical rates among control subjects undergoing open surgery. In experienced hands, LVHR may be the approach of choice for most patients.

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