



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**OPEN AND LAPAROSCOPIC VENTRAL HERNIA REPAIR: A PROSPECTIVE STUDY**

**KEY WORDS:** Laparoscopic Ventral Hernia, Open Ventral Hernia, Spigelian Hernias Etc.

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**ABSTRACT**

**INTRODUCTION:** Ventral hernia occurs through the anterior abdominal wall at any site other than groin. They are classified into incisional, paraumbilical, umbilical, epigastric, and spigelian hernias. Incisional hernias are a complication of open abdominal surgery. Surgical repair is demanding with the goal of tension free repair. **AIM AND OBJECTIVE:** The aim of this study was to examine the potential of the laparoscopic ventral hernia repair method in detecting unexpected additional hernias. **MATERIALS AND METHODS:** A Prospective study conducted patients who consented to get operated for midline ventral hernia, with the help of relevant history, clinical examination, and appropriate investigations at Gauri Devi Hospital and Research institution, Durgapur from October 2019 to March 2020. **RESULTS:** The total number of patients was 55, of which 34 underwent open repair (group 1), among these 2 patients underwent abdominoplasty, and 21 patients underwent laparoscopic mesh repair (group 2) and 1 patient converted to open surgery due to dense adhesions. **CONCLUSION:** Laparoscopic ventral hernia repair has shown promising results and a clear advantage over open repair in regard with reduced postoperative pain, decreased postoperative complications, reduced length of hospital stay, less time for return to normal activity, better cosmesis, lower recurrence.

**INTRODUCTION**

One distinct advantage of laparoscopic inguinal hernia repair is the opportunity for clear visualization of the direct, indirect, femoral, obturator and other groin spaces.<sup>1</sup> Although ventral hernia repair is increasingly performed laparoscopically, complication rates with this procedure are not well characterized. For this reason, we performed a prospective study comparing early outcomes after laparoscopic and open ventral hernia repairs.<sup>2</sup> Ventral hernia occurs through the anterior abdominal wall at any site other than groin.<sup>3</sup> They are classified into incisional, paraumbilical, umbilical, epigastric, and spigelian hernias.<sup>4,5</sup> Incisional hernias are a complication of open abdominal surgery. Surgical repair is demanding with the goal of tension free repair. The use of prosthetic mesh has helped in reducing the recurrence rates. Paraumbilical hernias are usually acquired whereas umbilical hernias may be congenital. Epigastric hernia protrudes through linea alba above the umbilicus. Five percent of the population has epigastric hernias. There is a high chance of incarceration and surgery remains the only cure.<sup>6</sup> Most of the spigelian hernias are acquired and require surgery as the chances of intestinal obstruction are high. In this modern era of surgery, emphasis is on decreasing hospital stay and postoperative morbidity with importance given to cosmesis. Hence, laparoscopic surgery has gained paramount importance due to its minimally invasive technique, decreased hospital stay and better cosmesis. The trend toward minimal access surgery (MAS) has prompted general surgeons to scrutinize all operations towards laparoscopic techniques. Laparoscopic ventral hernia repair needs further evaluation of its long-term outcomes. In our study, we would like to share our experience with this procedure and compare it with traditional open repair.

The aim of this study was to examine the potential of the laparoscopic ventral hernia repair method in detecting unexpected additional hernias.

**MATERIALS AND METHODS**

A Prospective study conducted patients who consented to get operated for midline ventral hernia, with the help of relevant history, clinical examination, and appropriate investigations at Gauri Devi Hospital and Research institution, Durgapur from October 2019 to March 2020.

**Table no. 1 Criteria of the study**

Inclusion criteria	Exclusion criteria
Patients presenting with midline ventral hernias who were managed in our hospital with mesh repair were included after obtaining a written consent.	Non-midline hernias such as 1. Hernia after cesarean section, 2. Hernia after open appendectomy, 3. Spigelian hernia, 4. Lumbar hernia, 5. Obstructed hernia.

Duration of the study was 6 month all patients were evaluated by obtaining proper history and performing detailed physical examination and routine blood investigations. All patients received antibiotic prophylaxis half an hour before surgery.

**Procedure for open surgery**

All patients are operated under spinal anesthesia. Foleys catheterization and nasogastric tube were occasionally used. In onlay repair, polypropylene mesh was sutured over the anterior rectus sheath, whereas in inlay technique, the mesh was placed in the preperitoneal space. The mesh was fixed with nonabsorbable sutures. Anterior rectus sheath was closed over the mesh by nonabsorbable sutures. Suction drain was placed in few cases based on the surgeon's choice.

**Procedure for laparoscopic surgery**

All the patients were operated under general anaesthesia. Nasogastric tube was placed for upper abdominal hernia and a Foleys catheter for lower abdominal hernias. Both were removed after the procedure on the operating table. The operating surgeon stands to the left of the patient with the camera man on his right or left depending on the location of the hernia. Pneumoperitoneum established by veres needle in palmers point. Adhesiolysis was done using sharp dissection or monopolar diathermy. Defect delineated and size was measured intracorporeally. The size of the mesh required was also assessed. The area to be covered by the mesh was marked after pneumoperitoneum was released and the sites for transfacial sutures were marked with the defect at its centre. The mesh was prepared, two nonabsorbable ethilon sutures were placed on either side at the upper end along with two polypropylene sutures at the opposite end. This was done

for easy identification based on the color difference. Mesh was anchored with the use of a spinal or cobbler needle. In some cases, we also used tackers in a double crown fashion. A compression dressing was done over the defect.

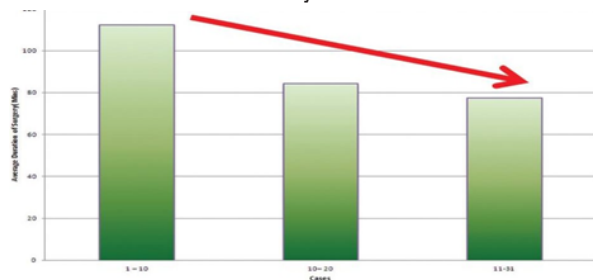
Mesh used: A. Open – Polypropylene mesh.  
 B. Laparoscopy – Composite or dual mesh.

**Statistical Analysis:** The statistical software namely SPSS 21.0 were used for data analysis. Descriptive and inferential statistical analysis was done. Variables on continuous measurements are presented on Mean ± SD and variables on categorical measurements are presented as number (%). Significance is assessed at 5% level of significance. Chi-square/Fisher exact test was used to determine the significance of study parameters on categorical scale between two or more groups. A P value of <0.05 was considered significance.

**RESULTS**

In this study, patients were grouped into two groups. Group 1: Patients undergoing open mesh repair. Group 2: Patients undergoing laparoscopic intraperitoneal mesh repair.

The total number of patients were 55, of which 34 underwent open repair (group 1), among these 2 patients underwent abdominoplasty, and 21 patients underwent laparoscopic mesh repair (group 2) and 1 patient converted to open surgery due to dense adhesions. The mean age and defect size were comparable in both the groups, M and F ratio was 1:3. The most common type of adhesions were omental followed by intestinal. One patient in the open group had transverse mesocolon adherent to the defect. In 2 patients of epigastric hernia, ligamentum teres was extending into the defect. In the open group, majority underwent inlay repair. The mean duration of surgery was comparable in both the groups [Figure 1]. Intraoperatively, in the open group, 2 patients had enterotomy, whereas there was an accidental injury to the inferior epigastric artery in 1 patient in the laparoscopy group. Primary closure was done for enterotomy, and because there was no spillage, a mesh was placed. The arterial bleed was controlled by a transfacial suture.



**Figure 1: Decrease in the average duration of surgery in laparoscopy group.**

Drain was placed and removed on postoperative day 2. Almost all the patients were pain free by 5 days in laparoscopy group, whereas 31 (62.7%) had pain in the open group. Among the postoperative complications, seroma was the most common. In the 2 patients in the laparoscopy group, seroma reduced with conservative management in less than 2 weeks. In the open group, 16 patients were managed conservatively, whereas aspiration was done in 5 cases. Postoperative ileus was present in 4 patients in both the groups. In the open group, there was persistent ileus in 2 patients who recovered by conservative management. In the laparoscopy group, all the patients recovered in 3 days, nasogastric tube was placed in 1 patient and was removed in 1 day. None of the patients in both the groups had mesh infection. Deep vein thrombosis was seen in 1 (1.96%) patient in the open group and was managed conservatively. Chronic pain lasting for 6 months was present in 3 (9.7%) patients in the open group, whereas it was present

in 1 (3.2%) patient in the laparoscopy group, which was managed by oral analgesics. The length of hospital stay, mean duration to return to normal activity, and cosmesis score based on patients' satisfactory score significantly favoured laparoscopic repair. No recurrences were reported in this study.

**DISCUSSION**

Prosthetic mesh repair is the gold standard for hernia surgery and plays a pivotal role in reducing the recurrence rates. The worldwide acceptance of laparoscopic surgery has paved the way for an alternative. Ever since the first laparoscopic ventral hernia surgery by Le Blanc<sup>7</sup> in 1993, the procedure has faced many challenges and underwent many modifications. There are more than a dozen randomized controlled trials (RCTs) reported in the last 20 years, comparing both the repairs. The suggested advantages of laparoscopic repair are avoidance of large incisions and extensive dissections, low incidence of wound infections, reduced analgesic requirements, and hospital stay. The main disadvantages of transfascial sutures are longer surgery time, more incisions, poor cosmetic rates, greater infection rates, pain during early postoperative period, and chronic pain. With the advent of tacking devices and double-crowning technique,<sup>8</sup> the concept of transfascial sutures came under scrutiny. In a randomized study, three methods of mesh fixation were studied for 4 years – absorbable transfascial sutures, nonabsorbable transfascial sutures, and double crown technique of tacker fixation; none of the technique has pain reduction advantage over others. Bansal et al.,<sup>9</sup> concluded that suture fixation is cost effective and has statistically less significant postoperative pain. In recent times, studies are emerging with double crown technique using tacking devices resulting in similar if not less recurrence rates.<sup>8</sup>

The main reason for this is better understanding on the conditions responsible for recurrence such as area of coverage and type of mesh. Some surgeons believe that tacking devices are equally effective, reduce operating time, and less postoperative discomfort. In our study, we employed transfascial sutures in all the patients and sutures with tackers in 24 patients. The operating time is the detrimental factors in assessing the effectiveness of the procedure. In our study, mean operating time was comparable in both groups. Studies by Ramshaw<sup>8</sup> and Asencio<sup>10</sup> reported lesser operating times in laparoscopy group, whereas those by Mishra<sup>11</sup> and Pring<sup>12</sup> did not show any significant difference between the two procedures. Studies by Olmi et al.<sup>13</sup> and Carbajo et al.<sup>14</sup> showed significant reduced time in laparoscopic surgery. In our study, two enterotomies were reported in the open group when compared to none in laparoscopy. Carbajo et al.<sup>14</sup> in 1999 in his RCT reported similar results. Asencio et al.<sup>10</sup> 2009 and Barbaro et al.<sup>15</sup> 2006 reported one event of enterotomy each in the laparoscopy group when compared to none in the open group.

**CONCLUSION**

Laparoscopic ventral hernia repair has shown promising results and a clear advantage over open repair in regard with reduced postoperative pain, decreased postoperative complications, reduced length of hospital stay, less time for return to normal activity, better cosmesis, lower recurrence. laparoscopic ventral hernia repair is a safe and feasible alternative to open repair. The laparoscopic inguinal hernia repair approach allows viewing of the entire myopectineal orifice, facilitating repair of any unexpected hernias and thereby reducing the chance of recurrence.

**Recommendation**

The findings demonstrate that laparoscopic ventral hernia repair in our experience was safe and resulted in shorter operative time, fewer complications, shorter hospital stays, and less recurrence. Hence, it should be considered as the procedure of choice for ventral hernia repair.

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