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General Surgery

COMPARATIVE STUDY BETWEEN OPEN AND LAPAROSCOPIC VENTRAL HERNIA REPAIR

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ABSTRACT **Introduction:** In today's era laparoscopy has gained quite popularity still there is debate on its use for ventral hernia. The main challenges in hernia management lie in deciding the surgical approach and type of repair procedure to perform, that is, laparoscopic or open surgery. **Material and methods:** A prospective observational comparative study was carried which included 90 patients out of which 45 patients underwent open mesh repair for ventral hernia and 45 patients underwent Laparoscopic mesh repair for ventral hernia were included in the study. Patients were follow up on post operative day 1, day 2, day 10, day 30 and day 60. **Results:** The average duration of surgery was slightly higher for the patients who underwent laparoscopic repair (95.11 vs 78.26 mins) with a P value of <0.0001 suggestive of statistically significant difference. The intraoperative blood loss was slightly lower lap repair group but the difference was not significant statistically (P=0.1347). The mean VAS post operative pain scores were higher for the patients who underwent open hernia repair. **Conclusion:** The study concluded that laparoscopic repair took more time than compared to the open group of patients. However, the laparoscopic group of patients had a much better post operative outcome in terms of reduced intra operative blood loss and post operative pain.

KEYWORDS : Open surgery, Laproscopic surgery, Ventral Hernia, mesh repair

INTRODUCTION:

Ventral hernias of the abdomen are non-inguinal, non-hiatal defects in the fascia of the abdominal wall. They are commonly seen in clinical practice. The ventral group includes anterior and lateral abdominal hernias. Anterior defects consist of umbilical, paraumbilical, epigastric and hypogastric hernias.[1]

An estimated one-quarter of all individuals are either born with or will develop a ventral hernia in their lifetimes.2 An estimated 348,000 ventral hernia repairs and over 300,000 ventral hernia repairs are performed annually in the United States and Europe, respectively.[3,4]

The laparoscopic approach affords the surgeon the ability to clearly and definitively define the margins of the hernia defect and to identify additional defects that may not have been clinically apparent preoperatively. Complete visualization of the fascia underlying the previous incision allows for identification of smaller 'swiss-cheese' defects that could be missed in an open approach.5 One of the key determinants to a high recurrence rate following conventional repairs is the phenomenon of occult hernias. These are the hernias liable to be missed during an open repair.

Laproscopic Surgery is gaining popularity because of its better cosmesis other than that lap surgeries are minimally invasive surgery which means less blood loss and wound healing is early the patients can easily resume their day to day activities. After lap surgeries there is less pain as compared to open surgeries. So patients are better satisfied. Laparoscopic surgeries for ventral hernia is less taken road which we further explored and hence bring the comparison with the traditional open surgeries.

STUDY DESIGN: Prospective observational comparative study.

SAMPLE SIZE and mode of collection : 90 patients who underwent surgery for Ventral Hernia in our institution between July 2021 to Jan 2023.

INCLUSION CRITERIA:

- Age above 20 yrs
- Patient giving consent and willing for follow up

EXCLUSION CRITERIA:

- Age less than 20 yrs
- Peritonitis
- Ascites
- Recurrent ventral hernia
- Patient with bleeding disorders
- Patient not willing for follow up
- Patient not giving consent
- Patient allergic to nylon
- Patient not fit for anaesthesia

Aims and Objectives:

To compare the outcome of open and laparoscopic ventral hernia repair in terms of -

- Duration of surgery.
- Intra-operative blood loss
- Post operative pain.

Methods:

Open mesh techniques

Open surgical technique was popularized by Rives, Stoppa and Wantz under general anesthesia. Foleys catheter was put for patients with lower abdominal ventral hernia repair and nasogastric tube for upper abdominal hernia repair with peri-operative single-dose antibiotic in the form of cefozolin 1 gm and dose repeated as and when duration exceeded more than two hours. Skin incision was made according to site and size of defect, a subcutaneous flap was raised up to 3 to 5 cm around the defect and after the hernia sac was found, the contents were reduced. Then plane created between posterior rectus sheath and muscle above the arcuate line and rectus muscle and peritoneum below the arcuate line. The posterior rectus sheath and peritoneum were closed primarily with 1:0 absorbable suture, then polypropylene mesh (trulene mesh, suture India) of suitable size with a minimum of 5 cm overlap beyond the margin of the defect and were placed between posterior rectus sheath/peritoneum and rectus muscle. The anterior rectus sheath was closed with a loop of polypropylene without tension after placing suction drain of 16 F. Then the skin was closed either with 2-0 ethilon or skin staplers.

Laparoscopic repair of ventral hernia

In laparoscopic repair of ventral hernia, evacuation of the urinary bladder in lower abdominal surgery and nasogastric tube in upper abdominal surgery was done, pneumoperitoneum created through Palmer's point, 2 to 3 cm below the left costal margin in the mid-clavicle line with veress needle. More often, a veress needle entry is possible without additional risk. Bowel was prepared to make more room in the abdominal cavity, the surgeon stands left of the patient with the camera man on his right. The monitor was placed opposite to the surgeon and the instrument trolley was towards the leg of the patient. Generally three trocars are adequate for small to moderate size hernias. 10 mm trocars at palmer point and other two 5 mm trocars at left lumbar and iliac fossa along the anterior axillary line. Adhesions of the abdominal contents to the hernial sac and the surrounding abdominal wall are lysed and the contents of the hernia are reduced as shown Figure 1. Hernia sac is excised as much as possible to avoid seroma formation. Tran facial sutures applied with poly propylene 1-0 suture with help of cobbler needle to obliterate the defect after reducing pneumoperitoneum partially. Size of the defect measured and appropriate size of dual mesh Laparoscopic repair of ventral hernia

In laparoscopic repair of ventral hernia, evacuation of the urinary bladder in lower abdominal surgery and nasogastric tube in upper abdominal surgery was done, pneumoperitoneum created through Palmer's point, 2 to 3 cm below the left costal margin in the mid-clavicle line with veress needle. More often, a veress needle entry is possible without additional risk; however, in cases of severely scarred abdomen 'battlefield abdomen': an open entry is the method of choice. Bowel was prepared to make more room in the abdominal cavity, the surgeon stands left of the patient with the camera man on his right. The monitor was placed opposite to the surgeon and the instrument trolley was towards the leg of the patient. Generally three trocars are adequate for small to moderate size hernias. 10 mm trocars at palmer point and other two 5 mm trocars at left lumbar and iliac fossa along the anterior axillary line. Adhesions of the abdominal contents to the hernial sac and the surrounding abdominal wall are lysed and the contents of the hernia are reduced as shown Figure 1. Hernia sac is excised as much as possible to avoid seroma formation. Tran facial sutures applied with poly propylene 1-0 suture with help of cobbler needle to obliterate the defect after reducing pneumoperitoneum partially. Size of the defect measured and appropriate size of dual mesh Hemostasis was achieved before the removal of the trocars. All 10-mm trocar fascial defects were closed. Skin defects were closed with skin staplers. Catheter and ryles tube removed before extrubating the patient. Compressive dressing (bolster) prepared from guaze is placed over the hernia defect to prevent seroma formation for one week. Patients were followed one and two weeks after surgery and up to one year.

Figure 1 Contents after reduction in lap hernia repair

Results: Total of 90 patents were included in the study. 45 patients were allocated to each group. It was seen that the average age was similar for patients in both the groups (45.60 vs 42.93 years). The difference was not significant statistically.

Table 1. Age related parameters

Age related parameters	Lap repair	Open	Overall	P Value
Number of patients	45	45	90	0.3563
Mean age	45.6	42.93	44.27	
Std Dev	13.94	13.37	13.65	
Minimum	21	21	21	
Maximum	75	75	75	

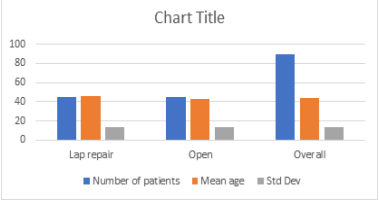


Figure2. Age related parameters

The average duration of surgery was slightly higher for the patients who underwent laparoscopic repair (95.11 vs 78.26 mins) with a P value of <0.0001 suggestive of statistically significant difference.

Table 2: Surgical parameters comparison

Surgical Parameters	Lap repair	Open	Overall	P Value
Duration of surgery (minutes)	95.11	78.26	85.58	<0.0001
Std Dev	11.24	9.94	10.93	
Intra-operative Blood Loss (ml)	84.18	87.27	87.69	0.1347
Std Dev	9.48	9.93	9.66	

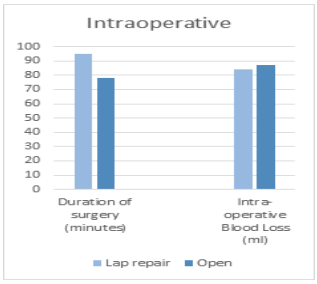
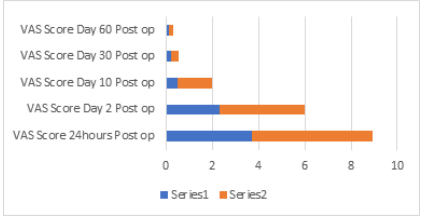


Figure3: Blood loss and duration of surgery comparison

Table 3 postoperative pain

VAS scores	Lap repair	Open	Overall	P Value
Number of patients	45	45	90	
VAS Score 24hours Post op	3.71	5.24	4.48	<0.0001
Std Dev	0.73	1.85	1.6	
VAS Score Day 2 Post op	2.31	3.71	3.01	<0.0001
Std Dev	0.73	1.6	1.43	
VAS Score Day 10 Post op	0.51	1.47	0.99	<0.0001
Std Dev	0.63	0.69	0.81	
VAS Score Day 30 Post op	0.22	0.31	0.27	0.5184
Std Dev	0.17	0.24	0.24	
VAS Score Day 60 Post op	0.15	0.19	0.17	0.1697
Std Dev	0.16	0.16	0.18	

Figure 4: Postoperative Pain relief



DISCUSSION

Laparoscopic ventral hernia repair was started by LE Blanc in 1993. After that, researches were done to make laparoscopic surgery feasible for ventral hernia repair. With the use of the laparoscopic approach, large incisions and drain placement can be avoided, which leads to a reduction in postoperative pain and scar size which are comparable to our study.[6,7]

The results of our prospective study revealed that, in comparison to open repair, laparoscopic repair is associated with shorter duration of surgery, reduced post-operative analgesic requirement and antibiotic requirement as infections are less.

Conclusion: Ventral hernia repair has been managed by laparoscopy and open ventral hernia repair techniques. In our study, 45 patients each were included for both the techniques and outcomes analysed. The study concluded that laparoscopic repair took more time intra-operatively compared to the open group. However, the laparoscopic group of patients had a much better post operative outcome in terms of reduced post operative pain and less intraoperative blood loss.

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