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A Study on Laparoscopic Versus Open Ventral Hernia Repair

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ABSTRACT

Background: Ventral hernia is second most common type of abdominal hernia after groin hernia. Various surgical techniques varying from anatomical repair to meshplasty have been used to repair the hernias. With the advancement of laparoscopy, intraperitoneal mesh and fixation devices, ventral hernias are being repaired laparoscopically in increasing numbers. This study was planned to compare laparoscopic versus open meshplasty.
Methods: This is a retrospective study with 30 cases of ventral hernia divided equally for laparoscopic and open repair. In all cases, data was categorized according to post-operative complications, duration of operation and hospital stay. Statistical analysis of data was done and outcome was measured.
Results: Mean operative time as well as hospital stay was less in laparoscopic repair and overall complications were high in open meshplasty.
Conclusion: Laparoscopic meshplasty is better than open repair.

Keywords: Ventral hernia; Laparoscopic repair; Open repair

INTRODUCTION

Hernia is one of the common surgical problems which are encountered in day to day surgical practice. Ventral hernia is second most common type of abdominal hernia after groin hernia and accounts for about 10% of all hernia. [(1)]

Ventral hernias occur as a result of weakness in the musculofascial layer of the anterior abdominal wall. The most popular classification is congenital, acquired, incisional and traumatic type of ventral hernia. A patient may develop a ventral hernia either during development (omphalocele, gastroschisis, umbilical hernia) or later (paraumbilical, epigastric, incisional) due to factors imposing a strain on certain weak areas of the anterior abdominal wall. Of all the ventral hernia, incisional hernias are different as they are the only ones which have an iatrogenic origin. The recurrence rate of incisional hernia after primary suture repair is more than 50% [(2)] and has been reduced to 10–23% after the introduction of prosthetic materials (meshes) in hernia repair. [(3)]

AIM: The aim was to compare the effectiveness of ventral hernia repair by laparoscopic vs. open repair.

OBJECTIVES:
To compare the following factors between laparoscopic and open ventral hernia surgeries:
a. Duration of procedure
b. Hospital stay
c. Post-operative complications

MATERIALS AND METHODS

This study was done on 30 patients who underwent ventral hernia repair in various surgical wards of Shri Guru Gobind Singh Government Hospital, Jamnagar, between July 2017 to October 2019. Out of 30 patients, 15 had meshplasty by laparoscopic technique and 15 underwent meshplasty by open technique.

Study Design: Retrospective study

Source Of Data: Study subjects were selected from the Department of Surgery at Shri Guru Gobind Singh Government Hospital, Jamnagar from July 2017 to October 2019.

Selection Criteria: All the subjects fulfilling the inclusion criteria were included into the study.

Inclusion criteria:

a. Ventral hernia in patients with age more than 15 years
b. Non strangulated ventral hernia
c. Hernial defect less than 5 cm in largest diameter

Exclusion criteria:

a. Less than 15 years of age
b. Patient with large incisional hernia (defect >5 cm) with redundant skin
c. Patients with strangulated hernia
d. Ventral hernia in pregnancy
e. Recurrent ventral hernia

Sampling method:

Patients who fulfilled the inclusion criteria were divided into two groups –

GROUP A: Patients treated by laparoscopic repair & GROUP B: Patients treated by open repair.

OPERATIVE TECHNIQUE:

OPEN VENTRAL HERNIA REPAIR:

All open hernia repair were carried out by onlay meshplasty under general anaesthesia, spinal or epidural anaesthesia in supine position. Vertical elliptical incision was placed around defect and the sac was dissected, opened and contents were reduced after lysis of the adhesions. The excess sac was excised. The defect was then closed with polypropylene 1 size interrupted sutures. Subcutaneous flap of about 6 cm around the defect was created and prolene mesh was placed with proper centralization. It was fixed with polypropylene 2-0sutures.Suctiondrainswerelaidovertheprosthesis and Skin closed with monofilament2-0 vertical mattress sutures.

LAPAROSCOPIC VENTRAL HERNIA REPAIR:

The procedures were done under general anaesthesia in supine position.

A 10mm trocar for telescope was inserted at the palmer's point on left side at subcostal region in midclavicular line and the pneumoperitoneum was created. Once the pneumoperitoneum was created, two 5mm port were put under vision on both the side of telescope port according to the Baseball diamond concept. Then the contents of the hernia sac were reduced with bowel grasper.

The measurement of the defect was drawn on the external surface of the anterior abdominal wall and a mesh of adequate size that covers the whole defect overlapping upto 5 cm from the edge was selected. The defect was closed with prolene size 1 suture by intra corporeal suturing. Then the multilayered composite intraperitoneal mesh wasinserted through 10 mm port. The mesh was properly centered over the defect and fixed by absorbable tacker to the abdominal wall. Finally the omentum was laid over the underlying bowel loops to prevent its direct contact with the mesh. After completing the procedure the ports were withdrawn under vision and the telescope port was removed last.

STATISTICAL ANALYSIS

The data of both the groups in terms of age, sex, types of hernia, symptoms, duration of operation, duration of hospital stay, complications were compared and analysed with help of microsoft excel. The p-value was determined by unpaired "t" test. The p-value < 0.05 was considered as significant.

RESULTS

The following observations were made:

Table 1: Types of ventral hernia

Types of hernia	No. of patients	Percentage
Incisional	12	40%
Umbilical	9	30%
Para umbilical	6	20%
Epigastric	3	10%
Total	30	100%

Table 2: Age distribution

Age (year)	No. of patients	Percentage
20-30	3	10%
31-40	9	30%
41-50	12	40%
51-60	6	20%
Total	30	100%

Table 3: Sex distribution

Sex	Open	Laparoscopic	Percentage
Male	4	1	16.67%
Female	11	14	83.33%
Total	15	15	100%

Table 4: Presentation of ventral hernia

Symptoms	No. of patients	Percentage
Swelling	30	100%
Pain	25	83.33%
Vomiting	2	6.67%
Fever	1	3.33%

Table 5: Duration of operation (in minutes)

	Open	Laparoscopic
No. of patients	15	15
Mean	103.73	99.46
Standard Deviation	±9.49	±11.34
p-value	0.29	

Table 6:Duration of hospital stay (in days)

	Open	Laparoscopic
No. of patients	15	15
Mean Duration	8.33	3.27
Standard deviation	±1.13	±0.93
p-value	<0.001	

Table 7:Post-opComplications seen in subjects of the study

	Open (No. of patients)	Laparoscopic (No. of patients)
Bowel injury	0	0
Seroma	03(20%)	0
Wound infection	03(20%)	01(6.6%)
Flap necrosis	0	0
Total	06(40%)	01(6.6%)

DISCUSSION

In our study, 12 subjects (40%) had incisional hernia, 9 patients (30%) had umbilical hernia, 6 patients (20%) had paraumbilical hernia and 3 patients (10%) had epigastric hernia. So most common type of ventral hernia found was incisional hernia.

In different age groups, peak incidence of ventral hernia was in age group of 41-50years.

Ventral hernia was found to be more common in female when compared to male (83.33% and 16.67% respectively).

The mean duration of operation was less in laparoscopic repair (group A) when compared to open ventral hernia repair (group B) (99.46 minutes v/s 103.73 minutes). A study done by Carbajo et al [(4)] also correlated with our findings (87 minutes vs 112 minutes). However, our findings were not significant statistically, as p-value is > 0.05.

The mean hospital stay was less in laparoscopic repair (group A) when compared to open ventral hernia repair (group B) (3.27 days v/s 8.33 days), which is highly statistically significant as p-value is < 0.001. Study done by Rulaniya et al, [(5)] Carbajo et al [(4)] and Park et al [(6)] also correlated with our findings (3.75 days vs 8.7 days, 2.2 days vs 9.1 days, 3.4 days vs 6.5 days respectively).

In our study, overall complication rate was low in laparoscopic repair (group A) when compared to open repair (group B) (6.6% v/s 40%).

CONCLUSION

1. This retrospective study was done on 30 patients with ventral hernia, who underwent laparoscopic and open repair.
2. Most common ventral hernia is incisional hernia.
3. Most common age group of ventral hernia is 41-50 years of age.
4. Ventral hernia is commonly found in female.
5. In laparoscopic ventral hernia repair, operative time is less when compared to open repair, but the difference is not significant.
6. Hospital stay was less in laparoscopic ventral hernia repair as compared to open ventral hernia repair which is highly significant.
7. Following laparoscopic ventral hernia repair, patient had less post-operative complications as compared to open hernia repair.
8. We cannot evaluate the cost effectiveness between two procedure as various types of meshes and fixation devices are supplied free of cost in our institute.

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