

Laparoscopic or Open Ventral Abdominal Hernia Repair: A Comparative Study in Tertiary Care Rural Hospital

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Abstract

Introduction: Ventral Hernia repair has been one of the most commonly performed surgeries. The most significant advances to impact Ventral Hernia repair have been addition of the prosthetic materials to conventional repair and the introduction of Laparoscopy to general surgical procedures. This clinical study was undertaken to compare the results of Open Ventral Hernia Repair (OVHR) with Laparoscopic Ventral Hernia Repair based on - Mean duration of surgery, Post operative hospital stay, Post operative pain, Mean duration of hospitalization, Complications of the surgery, incidence of recurrence after 6 months follow up. **Material and Methods:** The prospective study was conducted on 64 patients presenting with a ventral abdominal hernia to Great Eastern Medical School, Srikakulam, Andhra Pradesh, India between July 2016 and July 2017. **Results:** In the study, Laparoscopic hernia repair experienced less postoperative pain, reduced mean duration of hospital stay and postoperative hospital stay, early resume of work and normal activities, less complications and less incidence of recurrence after 6 months of follow up. However, the cost of surgery and mean duration of surgery was high in laparoscopic group compared to open group patients. **Conclusion:** Even though the initial expenses of the laparoscopic surgery is more, the overall cost benefit ratio is better in the laparoscopic technique than the open one for ventral hernias since there is less

postoperative stay, faster post op recovery and earlier return to work.

Keywords: Ventral Hernia; Open Ventral Hernia Repair; Laparoscopic Ventral Hernia Repair; Visual Analog Scale (VAS).

Introduction

A Hernia is defined as a "protrusion or projection of an organ or part of an organ through the wall of the cavity that normally contains it" [1]. Ventral Hernia is a protrusion of an abdominal viscus or part of a viscus through the defect in the anterior abdominal wall occurring at any site other than the groin. The term ventral is most commonly used to describe collectively that occurs outside the groin. It includes.

• Primary Ventral Hernias

1. Umbilical
2. Paraumbilical hernia
3. Spigelian hernia
4. Epigastric hernia

• Incisional Hernias

It is estimated that about 5% of people develop ventral hernia at some point in their life. Recurrence rates remain high in Ventral Hernia repairs in spite of improvements in the surgical techniques for ventral hernia repair and the use of the prosthetic mesh. Laparoscopic Ventral Hernia Repair (LVHR) was first described by Leblanc and Booth [2] in 1991. Since the introduction of Laparoscopic Ventral Hernia Repair,

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it has sparked a debate over the advantages of laparoscopic method with the open method. Ventral hernia repair surgeries are among the most commonly performed surgeries in our institution. The aim of the present study is to compare the results of Open Ventral Hernia Repair (OVHR) with Laparoscopic Ventral Hernia Repair based on-Mean duration of surgery, Post operative hospital stay, Post operative pain, Mean duration of hospitalization, Complications of the surgery, incidence of recurrence after 6 months follow up.

Materials and Methods

The study was conducted in Patients presenting with a ventral abdominal hernia to Great Eastern Medical School, Srikakulam, Andhra Pradesh, India between JULY 2016 and JULY 2017. It is a prospective study conducted on 64 patients, who met the predefined criteria and patient who are consented to get operated for a ventral hernia. This study was conducted in patients who got operated during November 2015 to November 2016. The study was conducted after obtaining ethical clearance from the College Ethical Committee.

Exclusion Criteria

- Patients who are not fit for surgery
- Patients who underwent emergency surgery for a ventral hernia for its complications like strangulation, obstruction, incarceration.
- Patients, who underwent additional procedures at the time of hernia repair like planned bowel resection are excluded from the study
- Repairs without Mesh are also excluded from the study

Inclusion Criteria

- Patients with Incisional Hernia fit for surgery
- Patients with Umbilical Hernia fit for surgery
- Patients with Para Umbilical Hernia fit for surgery
- Patients with Epigastric Hernia fit for surgery
- Patients with Spigelian Hernia fit for surgery

Preoperative Evaluation

All the patients were evaluated with routine blood investigations like Complete Blood Picture, Renal Profile, Echocardiogram, Chest X-ray and 2D ECHO in a patient who had previous Ischaemic Heart Disease. Ultrasonogram abdomen was done in all the patients to know the position of the defect, the size of the defect and to know the contents of the hernia sac.

Preoperative Preparation

All the patients received intravenous antibiotic prophylaxis at the time of skin incision and all the patients are kept nil per oral 6 hours before surgery.

Anaesthesia

For All the patients who undergone laparoscopic hernia repair, General Anaesthesia was used and patients who undergone open hernia repair, Spinal Anaesthesia was used.

Post Operative Management

During postoperative period all the patients were encouraged to start orally after 6 hours of surgery (after bowel sounds were heard on auscultation or after patient passing flatus). In patients with persistent ileus, they were kept NPO and whenever required a nasogastric tube was passed only to be removed once the resolution of the ileus For all the patients only one dose of preoperative antibiotic prophylaxis was given and no postoperative antibiotics was given except in patients who developed seroma collection, collection was drained and antibiotics were given All the patients have given analgesics intravenous paracetamol 1 gram infusion every 8th hourly for 1st 24 hours and after patients received oral analgesics. All the patients were mobilized after 6 hours after surgery with abdominal binder All the patient's surgical wounds were inspected on post operative day 2 and seroma if any found was drained Postoperatively patients were discharged after patients tolerating orally adequately and mobilizing normally.

Postoperative Assessment of Pain

For all the patients, postoperatively pain was graded according to Visual Analog Scale (VAS) ranging from no pain to worst possible pain ranging from 0-10 at intervals - 6 hours after surgery, on postoperative day 2, on postoperative day 6 and on postoperative day 14.

Postoperative follow-up evaluation

Postoperatively patients were followed up on Postoperative day 6 (If patients discharged early), on postoperative day 14, at 3 months and at 6 months. During the initial follow up pain score was evaluated and complications like a seroma, hematoma and day of resume of work were evaluated and during long term follow up chronic pain, recurrence was evaluated. A proforma was used to collect the relevant information and master chart was prepared with the collected data and analyzed.

Observation and Results

The results obtained by comparing laparoscopic with open ventral abdominal hernia repair conducted in 64 patients in Great Eastern Medical School are as follows-

Duration of Surgery

Type of Surgery	N	Mean
Open Group	32	68.13
Laparoscopic Group	32	99.69

Duration of surgery is calculated in minutes The mean operative time was more in the laparoscopic group (99.69 min) when compared to open group (68.13). p value is significant.

Mean duration of Hospital Stay

Group	N	Mean
Open Group	32	8.13
Laparoscopic Group	32	4.22

Out of the 32 patients who underwent laparoscopic ventral hernia repair, mean duration of hospital stay is 4.22 days. Out of the 32 patients who underwent open ventral hernia repair, mean duration of hospital stay is 8.13 days.

Post Operative Pain

The pain experienced by the patients who underwent laparoscopic or open ventral hernia repair is assessed by well-accepted pain scoring system, the Visual Analogue Scale (VAS). Postoperative pain of the patients is assessed at regular periods - at 6hrs after surgery, at 2nd postoperative day, at 6th postoperative day and at 14th postoperative day.

After 6 Hours of Surgery

Group	N	Mean
Open Group	32	7.16
Laparoscopic Group	32	5.97

Pain at 2 days after surgery

Group	N	Mean
Open Group	32	4.06
Laparoscopic Group	32	3.19

Pain at 6 days after surgery

Group	N	Mean
Open Group	32	2.94
Laparoscopic Group	32	1.56

Pain at 14 days after Surgery

Group	N	Mean
Open Group	32	1.31
Laparoscopic Group	32	1.03

Postoperative Hospital Stay

Mean duration of postoperative hospital stay in open group is 7.13 days and in laparoscopic study group was 3.22 days.

Group	N	Mean
Open Group	32	7.13
Laparoscopic Group	32	3.22

Complications of the Surgery

Out of the 32 patients who underwent Open hernia repair, 3 patients have postoperative Complications (seroma Collection) and out of 32 patients who underwent laparoscopic Repair, 2 patients have Postoperative Complications.

Complication	Group		Total
	Open	Lap	
No (Count % with group)	29 (90.6%)	30 (93.7 %)	59 (92.2%)
Yes (Count % with group)	3 (9.4%)	2 (6.3%)	5 (7.8%)

Incidence of Recurrence

Out of the 32 patients who underwent Laparoscopic repair, no patients had a recurrence and out of 32 patients who underwent open repair, 1 patient had a recurrence at the end of 6 months.

Recurrence	Group		Total
	Open	Lap	
No (Count % within group)	31 (96.9%)	32 (100 %)	59 (92.2%)
Yes (Count % within group)	1 (3.1%)	0 (0%)	5 (7.8%)

Discussion

As the numbers of major surgical procedures are increasing over time in obese patients, there has been an increase in the incidence of the incisional hernias and primary ventral hernias which is major encountered problem to general surgeons. Surgeon's opinions vary regarding surgical treatment. There are many controversies regarding laparoscopic hernia repair, but it continues to evolve and there is more data available comparing both laparoscopic and open ventral hernia repair showing laparoscopic repair is superior to open ventral hernia repair. With the use of Laparoscopic repair, large incisions and

postoperative drains can be avoided, leading to a significant reduction in postoperative wound related problems [3,4]. In spite of use of laparoscopic repair for more than 25 years, there is no fully accepted view on this hernia repair and only 12% of all repair procedures are done laparoscopically [5]. The present study is a prospective study done in Great Eastern Medical School comparing the results of laparoscopic ventral hernia repair to open ventral hernia repair. As the number of studies showed laparoscopic hernia repair is superior to open hernia repair, it has been worldwide accepted as the alternative to open hernia repair. There are numerous studies comparing laparoscopic to open ventral abdominal hernia repair.

Mean Duration of Surgery

In the present study, the mean duration of surgery in the laparoscopic group is 99.69 minutes and the mean duration of surgery in open group is 68.13 minutes. In the study conducted by Asencio et al. [6] and Barbaros et al. [7], there is a longer duration of surgery for laparoscopic group compared to open group, but some studies like Olmi et al. [6] go against this. The longer duration of surgery in the laparoscopic study is due to a difficulty in a case due to dense adhesions and reducing the contents, all through the laparoscopic approach.

Mean Duration of Hospitalization

In the present study, the Mean Duration of Hospitalization in the laparoscopic group is 4.22 days and the Mean Duration of Hospitalization in open group is 8.13 days. In the study conducted by Carbajo et al. [8], the Hospital Stay period for the laparoscopic group was 2.2 days and Open group was 9.1 days.

Postoperative Hospital Stay

In the present study, Postoperative Hospital stay in the laparoscopic group is 3.22 days and in open group is 7.13 days. In the study conducted by Olmi et al. [6], the postoperative hospital stay in the laparoscopic group is 2.7 days and in open group is 9.9 days. The main reason for long postoperative stay in open group is a use of a drain.

Postoperative Pain

In our study postoperative pain was assessed at regular intervals using VAS scoring system. At 6 hours of surgery pain score for the Laparoscopic group is 5.79 and in open group is 7.16. At postoperative day 2 pain score for the Laparoscopic group is 3.19 and in open group is 4.06. At postoperative day 6 pain score for the Laparoscopic group is 1.56 and

in open group is 2.94. At postoperative day 14 pain score for the Laparoscopic group is 1.03 and in open group is 1.31. Pain experienced by patients in a laparoscopic group is significantly low compared to the open group. A study by Asencio et al. [6] shown increased postoperative pain in laparoscopic group compared to open group, this might be caused by trans parietal suturing along with tackers which were used to fix the intraperitoneal mesh. Studies done by Barbaros et al. [8] and Misra et al. [9] showed a decrease in postoperative pain in laparoscopic group compared to open group.

Complications

In the present study, only 2 patients (6.3%) has postoperative complications (seroma collection) in laparoscopy group compared to 3 patients (9.4%) has postoperative complications (seroma collection) in open group. This high complication rates in open group are due to extensive soft tissue dissection, raising of flaps for mesh placement and drain insertion. In a study done by Carbajo et al. 62 13% patients in laparoscopic group and 67% in open group has seroma collection postoperatively and study done by Park et al. [10], 4% patients in laparoscopic group and 2 % patients in open group have complications. In a study done by Badiger S et al. [11] 3% patients in laparoscopic group and 8% patients in open group has postoperative seroma collection.

Incidence of Recurrence after 6 months of Follow up

In the present study, only 1 (3.1%) patient out of 32 patients had a recurrence after 6 months of follow up compared with no recurrence in the laparoscopic group. Some studies experienced high postoperative recurrence rates in laparoscopic group compared to open group perhaps, because of a high number of prior surgery attempts [12]. In a study done by Carbajo et al. 62 recurrence rates was 05 in laparoscopic group compared to 7% in open group. In a study done by Ramshaw et al. [13] recurrence rates was 3% in laparoscopic group compared to 21% in open group. A Study done by Navarra et al. [14] showed no recurrence seen in the open and laparoscopic group.

Conclusion

The present study is a comparative study of laparoscopic with open ventral abdominal hernia repair done in Great Eastern Medical School. This study is done to compare the results of laparoscopic and open hernia repair surgeries in term of preoperative risk factors, Mean duration of surgery, Postoperative hospital stay, Postoperative pain, Mean duration of hospitalization, Complications of the

surgery, incidence of recurrence after 6 months follow up. In the study, while comparing the laparoscopic and open ventral abdominal hernia repair, it was seen that patients who underwent Laparoscopic hernia repair experienced less postoperative pain, reduced mean duration of hospital stay and postoperative hospital stay, early resume of work and normal activities, less complications and less incidence of recurrence after 6 months of follow up compared to patients who underwent open ventral abdominal hernia repair. However, the mean duration of surgery was high in laparoscopic group compared to open group patients. The main drawback of the present study is assessment of time period for recurrence is short.

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