

## “A Comparative Study of Laparoscopic Versus Open Ventral Hernia Repair”

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**Abstract:** The aim is to compare the effectiveness of ventral hernia repair by laparoscopic vs. open repair in patients admitted from the Department of Surgery at Siddhartha Medical college and General Hospital, Vijayawada from December 2017 to October 2019. Materials and methods: This is a hospital based comparative study on patients with ventral hernias compared to study the efficacy of laparoscopic vs open ventral hernia repair on patients admitted in various surgical units in Siddhartha medical college, GGH, Vijayawada during November 2017 to June 2019. Results: Laparoscopic procedure in ventral hernia has shown promising results and is being widely accepted. Laparoscopic repair of hernia though requires increased operative time in the beginning but with experience over time and improved skills the time duration was significantly reduced, it results in shorter hospital stay, ICU stay and lower short-term complications (Pain) when compared to open repair. conclusion: the majority of studies across the globe have shown that Laparoscopic ventral hernia repair has promising results and a clear advantage over repair in regard to reduced post-operative pain, reduced the length of hospital stay, and less time for the return to normal activity and better cosmesis rates. Hence, laparoscopic ventral hernia repair is a safe and feasible alternative to open repair. The only drawback of the study can be its cost; however, as our hospital is a government hospital, it is not significant, however as it reduces the duration of hospital stay, earlier return to normal life can be considered for the same amount spent on open surgery. The drawback of the study is the time period for the assessment of recurrence rates is short.

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### I. Introduction

Ventral Hernias are protrusion of an abdominal viscus or a part of it through the anterior abdominal wall that occurs at any site other than the groin. E.g., incisional hernias, paraumbilical hernias, umbilical hernia, epigastric hernias, and Spigelian hernias respectively.

Incisional hernias are unique in a way that they are the only abdominal wall hernias, which are considered to be iatrogenic. Incisional hernia is still one of the most common complications of surgical procedures over the abdomen and is a significant source of morbidity and loss of time from productive employment.

Midline hernias usually occur through the linea alba abutting superiorly or inferiorly on the umbilicus called as PARAUMBILICAL HERNIA. They are usually an acquired lesion.

Epigastric hernia usually occurs by protruding through linea alba above the umbilicus. Approximately 5% of the populations have epigastric hernias.

Most of the Spigelian hernias are acquired and require surgery as the chances of complications are high. In this modern era of surgery, most of the emphasis is made on decreasing the hospital stay of the patient and also decreasing the postoperative morbidity and better cosmesis

### II. Materials And Methods

**STUDY DESIGN:** Comparative Prospective randomized study.

**SOURCE OF DATA:** Study subjects were recruited from the Department of Surgery at Siddhartha Medical college and General Hospital, Vijayawada from December 2017 to October 2019.

**SELECTION CRITERIA:** All the subjects fulfilling the inclusion criteria were included into the study

**INCLUSION CRITERIA:**

- a) Ventral hernia more than 2cm in size.
- b) Patients of age >18yrs & <70yrs
- c) Uncomplicated ventral hernias (reducible hernias only)

**EXCLUSION CRITERIA:**

- a) Multiple scars on the abdominal wall, which can make intra-peritoneal access difficult.
- b) Large defect where 3 to 5 inches meshes overlap is not possible intraabdominally.
- c) Irreducible ventral hernias
- d) Patient unfit for surgery (both laparoscopic and open repair)
- e) Emergency surgery, peritonitis, bowel obstruction, strangulation, perforation, Acute, and sub-acute intestinal obstruction.
- f) Recurrent hernia

**Sampling Method:**

Consecutive patients who fulfilled the inclusion criteria were randomized into two groups. Randomization plan obtained from and subjects were randomized as per the plan obtained until the desired sample. The aim is to compare the effectiveness of ventral hernia repair by laparoscopic vs. open repair. The size of 35 in each group was obtained during the study duration.

**AIM:**

The aim is to compare the effectiveness of ventral hernia repair by laparoscopic vs. open repair.

**OBJECTIVES:**

The two modalities of treatment are compared in the following aspects:

1. Post-operative morbidity (pain)
2. The integrity of anterior abdominal wall musculature (near normal)
3. Infection rate
4. Intraoperative and postoperative complications
5. Length of hospital stay
6. Time until the resumption of diet and intestinal movement
7. Recurrence after both Procedures

**III. Observation And Results:**

The present study is a hospital based comparative study, which included 35 cases in each group after randomisation, that were studied over a period of two years the Department of Surgery at Siddhartha Medical college and General Hospital, Vijayawada from December 2017 to October 2019.

**Table 1: Mean Age distribution of subjects in the study**

	Group			
	Laparoscopic		Open	
	Mean	SD	Mean	SD
Age	42.48	11.82	42.62	13.3

Mean age of subjects in the laparoscopic group was 42.48 ± 11.82 years and in open group was 42.62 ± 13.3 years. There was no significant difference in mean age between two groups.

**Table2: Location of Hernia on presentation**

Location	Group			
	Laparoscopic		Open	
	count	%	count	%
Epigastric	7	20	7	20
Infra umbilical	8	22.85	10	28.57
Supra umbilical	4	11.42	7	20
Umbilical	16	45.71	11	31.42

In the study 45.71% and 31.42% of hernia was umbilical and infra umbilical in laparoscopic group whereas 31.42% and 28.57% was umbilical and infra umbilical in Open group. 20% of cases were Epigastric in both the groups. 11.42% and 20% of cases were supra umbilical in Laparoscopic and open groups respectively. This difference was not statistically significant.

**Table 3: Mean defect Size of Hernia between two groups**

Defect in cm	Group			
	Laparoscopic		Open	
	Mean	SD	Mean	SD
	3.49	0.57	3.93	0.89

Mean Size of Hernia in Laparoscopic group was  $3.49 \pm 0.57$  cm and in open group was  $3.93 \pm 0.89$  cm. This difference in mean size of hernia between two groups was statistically significant. i.e., Laparoscopic surgery was performed in Smaller hernia and Open surgery was performed for hernia with little larger size.

**Table 4: Defect Size of Hernia between two groups**

Defect		Group			
		Laparoscopic		Open	
		count	%	count	%
	3-3.5 cm	21	60	14	40
	3.6 - 4 cm	11	31.42	7	20
	>4 cm	3	8.57	14	40

In the study 91.42% and 60% of Hernia were <4cm in Laparoscopic and open group respectively. 8.57% and 20% of hernia was > 4 cm in Laparoscopic and open group respectively. This difference was statistically significant.

**Table 5: Duration of stay in hospital in Days between two groups**

Duration of stay in Hospital		Group			
		Laparoscopic		Open	
		count	%	count	%
	<3 Days	7	20	0	0
	4-5 Days	20	57.14	8	22.85
	>5 Days	8	22.85	27	77.14

In the laparoscopic group 20% of subjects stayed in hospital for <3 days, 57.14% stayed in hospital for 4 to 5 days, and 22.85% stayed in hospital for >5 days. Where as in open group 22.85% of subjects stayed in hospital for 4 to 5 days and 77.14% stayed in hospital for >5 days. This difference in hospital stay during post-operative period was better in Laparoscopic group significantly.

#### IV. Discussion

The present study is a prospective, randomized study comparing the results of open versus laparoscopic ventral hernia repair. In the present day, prosthetic mesh repair has become the gold standard for hernia surgery. This has played a pivotal role in reducing recurrence rates. The worldwide laparoscopic acceptance of laparoscopic surgery has paved the way for an alternative to open surgery.

The present study includes a total of 70 patients, 35 in the open group and 35 in the laparoscopy group. Subjects

were randomized into two groups to reduce bias. Single blinding technique was used in the study.

In the present study, the mean age is comparable between the two groups: 42.62 years in the open group and 42.48 years in the laparoscopy group. In the study conducted by Misra et al. in 2006 the mean age of the patients in the open group was 45.2 yrs, and the laparoscopy group is 45.96 yrs.<sup>7</sup> In the study conducted by Itani et al., the mean age in the laparoscopy group was 61.2 years, and in the open group was 59.6 yrs.<sup>6</sup>

In the present study of ventral hernia consisting of epigastric, umbilical, paraumbilical and incisional hernias, majority of the patients in open group had umbilical hernia (31.42%) while in laparoscopy group majority also had umbilical hernia (45.71%).

In the present study, most of the patients were male in open (60%) whereas in laparoscopy group males and females were almost equal (51.42% & 48.57%). In the study conducted by Itani et al. majority were men in both open (91.8%) and laparoscopy (91.8%) groups.<sup>6</sup> In the study conducted by Misra et al. about 80% were females in both the groups

In the present study, the majority of patients i.e., 21 (60%) had defect size less than 3 to 3.5cms in laparoscopy group whereas in open group 14 (40%) patients had defect size 3 to 3.5cms and 14 (40%) patients had a size of >4cms. In the study conducted by Misra et al., the mean defect size was 42.12 mm in the open

group and 65.66 mm in the laparoscopy group. However, in the current study, the majority of subjects operated in both groups were <4 cm. This can be due to the early detection of hernia.

Hence from the majority of studies across the globe have shown that Laparoscopic ventral hernia repair has promising results and a clear advantage over repair in regard to reduced post-operative pain, reduced the length of hospital stay, and less time for the return to normal activity and better cosmesis rates. Hence, laparoscopic ventral hernia repair is a safe and feasible alternative to open repair. The only drawback of the study can be its cost; however, as our hospital is a government hospital, it is not significant, however as it reduces the duration of hospital stay, earlier return to normal life can be considered for the same amount spent on open surgery. The drawback of the study is the time period for the assessment of recurrence rates is short.

## V. Summary

1. Mean age of subjects in the laparoscopic group was  $42.48 \pm 11.82$  years and in open group was  $42.62 \pm 13.3$  years. Age matching was achieved in the study. Hernia is common after 40 years.
2. Mean defect Size of Hernia in Laparoscopic group was  $3.49 \pm 0.57$ cms and in open group was  $3.93 \pm 0.89$ cms.
3. Mean duration of surgery was  $87.34 \pm 6.05$  in laparoscopic group and  $92 \pm 9.94$  min in Open group. There was no significant difference regarding the duration of surgery between two groups.
4. Mean time required for post-operative mobilization was lesser in Laparoscopic group compared to open group significantly.
5. 62.5% of subjects in Laparoscopic group had pain (which was pricking type at the port site) and 91.7% in open group had pain. Hence pain was more commonly seen in Open type of repair.
6. Mean duration for stay in hospital was significantly less in laparoscopic group compared to open group.

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