



E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

www.surgeryscience.com

2022; 6(4): 64-67

Received: 02-06-2022

Accepted: 05-07-2022

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Laparoscopic versus open ventral hernia repair: A comparative study

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DOI: <https://doi.org/10.33545/surgery.2022.v6.i4b.950>

Abstract

Background: A ventral hernia is when an abdominal viscus or a portion of it protrudes through the anterior abdominal wall anywhere other than the groin. The aim is to compare the effectiveness of ventral hernia repair by laparoscopic vs. open repair in patients admitted from the Department of Surgery.

Materials and Methods: This is a hospital-based comparative study on patients with ventral hernias compared to a study of the efficacy of laparoscopic vs open ventral hernia repair on patients admitted in various surgical units in SKIMS medical college.

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 conducted across the world have demonstrated that laparoscopic ventral hernia repair offers promising outcomes and a distinct benefit in terms of less post-operative discomfort, shorter hospital stays, quicker return to normal activities, and higher rates of cosmetic success. Laparoscopic ventral hernia repair is therefore a safe and practical substitute for open treatment. The study's cost may be its primary disadvantage, but since our hospital is a government facility, this is not a major issue. However, because it shortens hospital stays, an earlier return to normal life may be possible at the same cost as open surgery. The study's limitation is the little time frame used to evaluate recurrence rates.

Keywords: Laparoscopic, ventral hernia repair, abdominal viscus

Introduction

A ventral hernia is when an abdominal viscus or a portion of it protrudes through the anterior abdominal wall anywhere other than the groin^[1-3]. For instance, Spigelian hernias, epigastric hernias, umbilical hernias, para umbilical hernias, and incisional hernias all occur in different places. The only abdominal wall hernias that are thought to be iatrogenic are incisional hernias, which makes them special. One of the most frequent aftereffects of abdominal surgeries is still an incisional hernia, which is a major cause of morbidity and lost productivity at work^[3,4].

The linea alba that abuts either superiorly or inferiorly on the umbilicus, known as paraumbilical hernia, is where midline hernias typically form. Typically, they are acquired lesions. Typically, an epigastric hernia will protrude through the linea alba above the umbilicus. Epigastric hernias affect 5% of the population on average. Since there is a considerable risk of complications, surgery is usually necessary for Spigelian hernias. The main focus of surgery in the current period is on reducing the length of the patient's hospital stay, as well as postoperative morbidity and improving cosmesis^[5-7].

Materials and Methods

Study design: Comparative randomized study.

Source of data: Study subjects were recruited from the Department of Surgery at SKIMS Medical College.

Selection criteria: All the subjects fulfilling the inclusion criteria were included in the study

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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 intra-abdominally.
- 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

Patients who successively met the requirements for inclusion were divided into two groups by randomization. Up to the necessary sample, respondents were randomly assigned in accordance with a plan that had been obtained. The goal is to contrast the efficacy of laparoscopic and open ventral hernia repairs.

70 people in each group were reached over the course of the study.

Aim

The aim is to compare the effectiveness of ventral hernia repair by laparoscopic versus 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

Results

The present study is a hospital-based comparative study, which included 70 cases in each group after randomization, that were studied in the Department of Surgery at SKIMS Medical College.

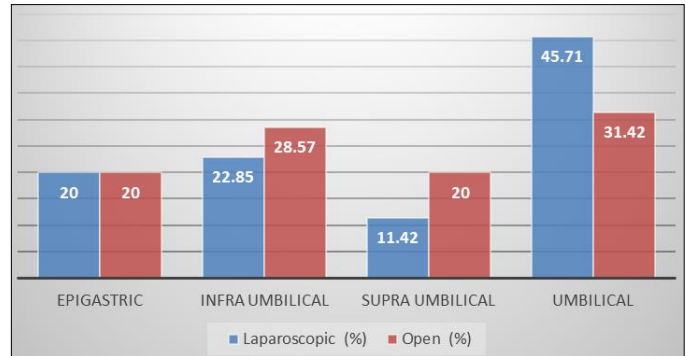
Table 1: Mean Age distribution of subjects in the study

	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.

Table 2: Location of Hernia on presentation

Location		Group			
		Laparoscopic		Open	
		count	%	count	%
Location	Epigastric	14	20	14	20
	Infra umbilical	16	22.85	20	28.57
	Supra umbilical	8	11.42	14	20
	Umbilical	32	45.71	22	31.42



Graph 1: Location of Hernia

In the study, 45.71% and 31.42% of hernia were umbilical and infra umbilical in the laparoscopic group whereas 31.42% and 28.57% were umbilical and infra umbilical in the 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

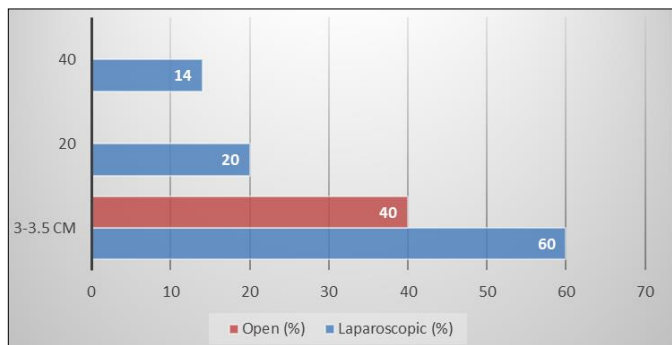
Defect in cm	Group			
	Laparoscopic		Open	
	Mean	SD	Mean	SD
	3.49	0.57	3.93	0.89

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

Table 4: Defect Size of Hernia between two groups

Defect		Group			
		Laparoscopic		Open	
		count	%	count	%
Defect	3-3.5 cm	42	60	28	40
	3.6 - 4 cm	22	31.42	14	20
	>4 cm	6	8.57	28	40

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

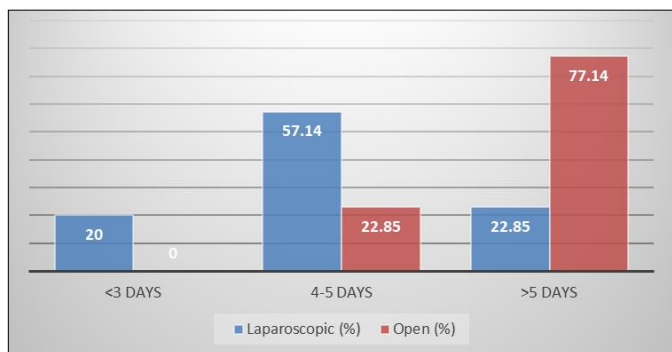


Graph 2: Defect Size of Hernia

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

		Group			
		Laparoscopic		Open	
		count	%	count	%
Duration of stay in Hospital	<3 Days	14	20	0	0
	4-5 Days	40	57.14	16	22.85
	>5 Days	16	22.85	54	77.14

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



Graph 3: Duration of stay in hospital

Discussion

The current study compares the outcomes of open versus ventral laparoscopic hernia repair in a randomized setting. The gold standard for hernia surgery at the moment is prosthetic mesh repair. This has been crucial in lowering recurrence rates. The adoption of laparoscopic surgery on a global scale has made it possible for an open surgery substitute [8]. A total of 140 patients are included in the current trial, including 70 in the open group and 70 in the laparoscopic group. To minimize bias, subjects were randomly divided into two groups. The study employed the single-blinding method. The mean age in the current research was 42.62 years for the open group and 42.48 years for the laparoscopic group, which is comparable. The mean age of the patients in the open group and the laparoscopy group in the research by Misra *et al.* from 2006 was 45.2 years and 45.96 years, respectively [4, 5]. In the research by Itani *et al.*, the mean age was 61.2 years for the laparoscopic group and 59.6 years for the open group [6]. The majority of patients in the open group (31.42%) and the majority of patients in the laparoscopic group (45.71%) in the

current research of ventral hernia, which included epigastric, umbilical, paraumbilical, and incisional hernias, had umbilical hernias.

In the current study, the majority of patients had open surgery (60%) and had more men than women (51.42% and 48.57%) under laparoscopy. The majority of patients in the Itani *et al.* study's open (91.8%) and laparoscopic (91.8%) groups were men [6]. In both groups of the study by Misra *et al.*, roughly 80% of the participants were women.

In the current study, the majority of patients, 42 (60%) in the laparoscopic group, had defects less than 3 to 3.5 cms, whereas in the open group, 28 (40%) patients had defects smaller than 3 to 3.5 cms and 28 (40%) patients had defects larger than 4 cms. The mean defect size was 42.12 mm in the open group and 65.66 mm in the laparoscopic group in the research by Misra *et al.* However, the majority of participants in the current research were operated in both groups were under 4 cm. This could be as a result of early identification of hernia

Therefore, the vast majority of studies conducted around the world have demonstrated that laparoscopic ventral hernia repair has positive outcomes and a distinct advantage over repair in terms of decreased post-operative pain, shorter hospital stays, quicker return to normal activity, and better cosmesis rates. Laparoscopic ventral hernia repair is therefore a safe and practical substitute for open treatment. The study's cost may be its primary disadvantage, but since our hospital is a government facility, this is not a major issue. However, because it shortens hospital stays, an earlier return to normal life may be possible at the same cost as open surgery. The study's limitation is the little timeframe used to evaluate recurrence rates.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article

Bhat SA, Peer JA, Gorski BA. Laparoscopic versus open ventral hernia repair: A comparative study. National Journal of Clinical Orthopaedics. 2022;6(4):64-67.

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