



A COMPARATIVE STUDY OF OUTCOME VENTRAL HERNIA REPAIR BY OPEN VERSUS LAPAROSCOPIC SURGERY WITH MESH

General Surgery

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ABSTRACT

Background : Ventral hernias are the second most frequent type of hernia in the globe. There are several proposed types of ventral hernia repairs, but the mesh repair has gained the most popularity. In the current surgical period, priority is placed on cosmesis while the majority of focus is placed on reducing the patient's hospital stay and post-operative morbidity. Due to its minimally invasive procedure, shorter hospital stay, and improved cosmesis, laparoscopic surgery has become of utmost importance. Despite the fact that laparoscopic treatment has grown in popularity, there is still some controversy regarding its superiority in ventral hernia repair, therefore further research is conducted to determine advantages of laparoscopic surgery. **Material And Method:** The Prospective Comparative study was conducted on patients who consented to get operated for ventral hernia at AVMC&H during period of December 2020 to September 2022. Appropriate IRC & IEC clearance was obtained from the institution. Patients admitted to AVMC&H with ventral hernias between were studied using pertinent history, clinical examinations, and the required investigations. 70 individuals in total underwent surgery with informed consent. Of those, 35 received laparoscopic mesh repair and 35 underwent open mesh repair. In order to create the graphs, tables, and other output, Microsoft Word and Excel were utilised along with the statistical tools SAS 9.3, SPSS 15.0. **Results:** In present study total of 70 patients fulfilling inclusion criteria were included, majority of the participants were females belonging to upper lower class, and majority presented with Incisional hernia. Chi square test showed statistically significant difference in post operative pain scores on day 0, day 7, 14, 21 and 30, after 3 months of the procedures. Chi square test showed statistically significant difference in wound infection on days 7, 14, 21, 30, after 3 months of the procedures. There was also significant difference in wound dehiscence on days 0,7,14,21,30, after 3 months. **Conclusion:** The short-term outcomes are favourable, and laparoscopic ventral hernia repair has promise as an alternative to the innovative technique. Compared to open repair, the method is a little more complex and requires experience. In comparison to open repair, it demonstrated a definite advantage in reducing post-operative discomfort, duration of hospital stay, post-operative problems, and superior cosmesis rates. The laparoscopic ventral hernia surgery safe and practical alternative to open repair.

KEYWORDS

Ventral hernia, laparoscopic mesh repair, Open mesh repair

INTRODUCTION

Hernia is defined as abnormal protrusion of a viscus or a part of a viscus lined by a sac through a normal or abnormal opening in the abdominal wall.¹ It is unquestionably true that the ability of humans to walk upright has resulted in instances of vulnerability between the abdominal muscle wall (ability for expansion) and the rigid pelvic bones.

They are classified into 2 types based on their visibility, External hernias are those which are visible from outside like epigastric hernia, inguinal hernia etc and Internal hernias are those which are present between two adjacent body cavities like diaphragmatic hernia.

Ventral Hernia is a protrusion through the anterior abdominal wall fascia. These defects can be categorized as spontaneous or acquired or by their location on the abdominal wall. It includes incisional hernias, paraumbilical hernias, umbilical hernia, epigastric hernias and spigelian hernias respectively.² Ventral hernias are the second most common type of abdominal hernias after inguinal hernias and account for approximately 10% of all hernias.³

The xiphoid process to the umbilicus is where epigastric hernias occur, the umbilicus is where umbilical hernias occur, and the rare spontaneous hernias known as hypogastric hernias occur below the umbilicus in the midline. Acquired hernias typically occur after surgical incisions and are therefore termed Incisional hernias.² It is still one of the most frequent side effects of abdominal surgery, and it causes a lot of morbidity and takes a lot of time away from working.²

Incisional hernia repair had a long history of having a significant recurrence rate. The development of synthetic prosthetic materials in more recent years has made it possible to do tension-free repairs, which has decreased the rate of recurrence. Epigastric hernias affect 5% of the population on average. When an epigastric hernia is diagnosed, there is no reason to put off having it repaired because the likelihood of

imprisonment is significant and surgery is still the only effective treatment.³

Because strangling is the primary risk associated with all hernia types, surgical intervention is required. This presents a difficulty for general surgeons due to the unacceptably high recurrence rate. The key distinctions between primary versus mesh repair and open versus laparoscopic repair when discussing surgical care of ventral hernias are these. For most ventral hernias, mesh treatment has become the gold standard in elective management.²

In the current surgical period, priority is placed on cosmesis while the majority of focus is placed on reducing the patient's hospital stay and post-operative morbidity. Hence due to its minimally invasive procedure, shorter hospital stay, and improved cosmesis, laparoscopic surgery has become of utmost importance. The popularity of minimally invasive surgery (MAS) has led general surgeons to review all procedures in favour of laparoscopic methods.

MATERIAL AND METHODS

This Prospective Comparative study was conducted in General Surgery department, AVMCH after getting institutional ethical clearance from December 2020 to September 2022. Patients were studied in two groups of 35 patients each. Patients between age 18-65 years, give informed written consent, Ventral hernias (epigastric, incisional, umbilical and paraumbilical), undergoing elective surgery for ventral hernia are included in the study. General Examination and detailed clinical examination were done. Routine investigations and USG abdomen and if required CT abdomen were carried out.

Cases who will undergo Laparoscopic ventral hernia repair and those underwent open ventral hernia repair were grouped separately. Both groups were assessed for post-operative pain using visual analogue scale, length of hospital stay, in-hospital complications and rate of routine discharge and quality of life with respect to return to routine

work. In the present study post-operative complications were grouped into early postoperative complications and delayed post-operative complications. Early postoperative complications included wound infection and seroma. Delayed postoperative complications including chronic pain, mesh bulge and recurrence were assessed

The patients were followed up daily till discharge and then at 3rd week, 6th week and after 3 months and 1 year as outpatients.

Statistical Analysis

The collected data was entered in MS Excel and data analysis was performed using SPSS ver.20. Categorical data was presented in the form of number and percentage. The chi-square test was used to find the association between two qualitative variables. Friedman test was used to assess association between different time period. P-value less than 0.05 was considered as statistical significance.

RESULTS

Table 1- Comparison Of Gender

Sex	Lap Repair	Open Repair	Total
Male	9(27.3%)	11(29.7%)	20(28.6%)
Female	24(72.7%)	26(70.3%)	50(71.4%)
Total	33	37	70

Majority of the participants were female. Among 50 female participants, 26 (70.3%) were open repair group and 24 (72.7%) were lap repair group.

Table 2- Post Operative Pain

Post Operative Pain	Lap repair (n=33) Median (IQR)	p-value	Open repair (n=37) Median (IQR)	P-value
Day 0	2 (2-3)	0.0001	5 (4-5)	0.001
Day 7	2 (2-2)		4 (4-5)	
Day 14	2 (1-2)		4 (4-4)	
Day 21	1 (1-1)		3 (3-4)	
Day 30	1 (1-1)		3 (2-3)	
after 3 months	0 (0)		2 (2-2)	

Friedman test shows that there was statistically significance at day 0, day 7, day 14, day, day 21, day 30 and after 3 months

Table 3- Wound Infection Post Treatment

Wound Infection	Score	Laparoscopic Repair(n=33)	Open Repair	P Value
Day 7	0	33	32	0.056
	1	0	5	
3rd Month	0	33	31	0.026
	1	0	6	

Chi-Square test shows that there was statistically significant difference in wound infection 7 days and 3 months after procedure. $P < 0.05$.

Table 4- Outcome Post Treatment

Recurrence	Lap Repair	Open Repair	Total	P Value
No	32(96.9%)	32(86.4%)	64(91.4%)	0.203
Yes	1(3.1%)	5(13.5%)	6(8.6%)	
Total	33	37	70	

There was no statistically significance difference between recurrence and the procedures ($P < 0.05$).

DISCUSSION

The present study is a prospective comparative study comparing the results of open versus laparoscopic ventral hernia repair in a short term. More than a dozen RCTs have compared the two types of repairs in the last 20 years, and the advantages of laparoscopic repair have been suggested to include avoiding large incisions and extensive dissections, a lower incidence of wound infections, a shorter hospital stay, and less need for analgesics.

The present study includes a total of 70 patients, 35 in the open group and 35 in the laparoscopy group. In one of the largest studies conducted by Ramshaw et al there were a total of 253 patients, 174 in open group and 79 in laparoscopy group.⁴ In one of the recent RCT conducted by Itani et al in 2010, a total of 146 patients are randomized such that 73 patients underwent conventional repair and 73 underwent laparoscopic repair.⁵ The mean age of the patients in the open group and the laparoscopic group in study by Misra et al from 2006 is 45.2

years and 45.96 years, respectively.⁶ The mean age in the laparoscopy group in study by Itani et al was 61.2 years, compared to 59.6 years in the open group.⁵

In present study, majority of participants were females. Among 50 female participants, 26 (52%) were open repair group and 24 (48%) were lap repair group. In the study conducted by Itani et al majority were men in both open (91.8%) and laparoscopy (91.8%) groups. In the study conducted by Misra et al about 80% were females in both the groups.⁶

The technique used to repair the mesh is another contentious phase. There are still a lot of unsolved questions in this area. A preliminary series of laparoscopic ventral hernia repairs found a connection between recurrence and the lack of transfascial sutures. However, many authors contend that the older series did not take into account a lot of other elements that could have been to blame for recurrences.

In a four-year, randomised trial, three mesh-fixation techniques—absorbable transfascial sutures, non-absorbable transfascial sutures, and the double-crown technique—were examined. The results showed that none of the techniques offered any advantage in terms of pain management over the others. In a study, Bansal VK et al. found that suture fixation was statistically less significant for post-operative discomfort than tacker fixation and was more cost-effective.⁹

In four RCTs (Asencio 2009, Barbaros 2006, Misra 2006, and Pring 2008),⁷ postoperative pain scores were recorded in both groups at nearly comparable rates. In the present study, the mean duration of post-operative pain – evaluated by VAS in open group is 6.5 days, while in laparoscopy group is 1.75 days, $P < 0.001$, which is statistically significant.

Reduced wound-related problems are one of the key benefits of laparoscopic repair. With the exception of Asencio 2009, almost all RCTs reported fewer wound-related problems after laparoscopic repair. The two most frequent side effects are seroma development and wound infection. According to research by Asencio et al, Misra et al, and Pring et al⁸, seroma rates were greater in the laparoscopy group while Itani et al observed reduced seroma rates in the laparoscopy group in 2010. In all the investigations, the open group had a greater rate of wound infection.

RESULT

In the present study, shows there was statistical significance difference in post operative pain score on day 0, 7, 14, 21, 30, after 3 months and the procedures.

Shows statistical significance difference in wound infection on day 7, 14, 21, 30, after 3 months and the procedures.

CONCLUSION

Laparoscopic ventral hernia repair has shown promising results and a clear advantage over open repair with regard to reduced post-operative pain, decreased post-operative complications, reduced length of hospital stay, and less time for return to normal activity and better cosmesis rates. Hence, laparoscopic ventral hernia repair is a safe and better alternative to open repair. The limitation of study is the shorter time period for the assessment of recurrence.

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