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## A study on post-operative complications between open versus laparoscopic mesh repair of ventral hernias

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### Abstract

Any condition which tends to weaken the abdominal wall or tends to increase the intra-abdominal pressure may lead to development of hernia. Such as imperfect closure of peritoneum and anterior abdominal wall following laparotomy leading to incisional hernia. Post operatively all our patients, in both the groups received intravenous aqueous paracetamol and/ or Tramadol injections 8<sup>th</sup> hourly for 24 to 36 hours, unless contraindicated. Post-operative pain scoring was graded according to the Visual Analogue Scale (VAS) which ranges from 0 to 10, no pain to the worst possible pain. Then analgesics were changed patients to oral preparations, to be given on patient demand. In the study who underwent open repair it was observed that postoperative complications i.e, Wound infection, Seroma, Ileus, and hematoma were 13%, 20%, 10%, and 0% respectively. In Laparoscopic repair it was observed that postoperative complications that is, wound infection, Seroma, Ileus, and hematoma were 3.3%, 0%, 23.2%, and 0% respectively. This observation was statistically significant with p value of 0.018.

**Keywords:** Post-operative complications, laparoscopic mesh repair, ventral hernias

### Introduction

The proper understanding of the causes and basic pathologic mechanisms for the development of hernias is of great help to a surgeon in their management. A hernia develops due to several causes which are broadly classified into two categories, congenital or acquired <sup>[1]</sup>.

Developmental abnormalities which leave a weakness or communication might lead to the development of hernias. Such hernias might present early or sometimes late. These include a congenital sac, apertures in the linea alba and aponeurosis or in linea semilunaris, congenital muscle defects. An imperfectly developed umbilicus at birth sometimes permit the viscera to protrude through the umbilical cord <sup>[2]</sup>.

Any condition which tends to weaken the abdominal wall or tends to increase the intra-abdominal pressure may lead to development of hernia. Such as imperfect closure of peritoneum and anterior abdominal wall following laparotomy leading to incisional hernia. Also chronic strain on the abdominal musculature as in whooping cough in children, chronic Bronchitis, chronic constipation and urinary out flow obstruction in adults may precipitate development of hernias. Similarly conditions leading to stretching of abdominal musculature because of increase in size of contents e.g. Obesity, Pregnancy cause weakening of aponeurosis of anterior abdominal wall and favour the outcome of hernia. Previous surgeries on the abdomen leading to weakness leads to development of incisional hernia <sup>[3]</sup>.

The exact etiology of epigastric hernia is unknown, it is assumed to be the result of a structural congenital weakness in the line alba between xiphoid process and the umbilicus which in turn can be attributed to lack of fibers at the midline decussation, which allows pre peritoneal fat to be herniated between the gaps. Extra-peritoneal fat which when herniate through these defects is known as Fatty hernia of linea alba. Fibers originating from the diaphragm traverse the upper midline aponeurosis posteriorly and join the fibers of the posterior rectus sheath and middle tendinous intersection. They attach to the linea alba at a site midway between the xiphoid and umbilicus. Uncoordinated, vigorous, synchronous contraction of the diaphragm and upper abdomen may occur during straining and coughing. This force caused by upward traction on the diaphragm and lateral traction on the tendinous intersection is maximal at this point of attachment midway between the xiphoid and the umbilicus, which is the most common site of Epigastric Hernia <sup>[4]</sup>.

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Oscar Witzel, first described the use of biomaterials - silver mesh in 1900. In 1918, Handley developed silk mesh, but which could not be used for long term because they were not tolerated. In 1928 Goepel used stainless steel prosthesis, a fine, flexible, easily manipulated material. The main disadvantage of steel prosthesis was its tendency to become fragmented, injuring blood vessels, tissue. Later Mandl made an attempt to prepare celluloid based materials in 1933. Despite being resistant to tension, flexibility, use of these celluloid based materials was taken back because of higher chances of infection. In 1946, Vitalium described another metal material, but it was no longer used because of its rigidity. Amos Koontz adopted tantalum to treat event rations in 1948, and it was widely accepted. This was a resistant metal, with a low tendency to corrosion, appropriate to the synthesis of granulation tissue and very safe against infection, but it was fragile and of high cost, therefore it was no longer used.

## Methodology

**Study Design:** Prospective Study.

### Inclusion criteria

All adult patients above 18 years presenting with ventral hernias who are managed for ventral hernia in our hospital with mesh repair are included after taking a written consent.

### Exclusion criteria

- Children less than 18 years.
- Complicated (Obstructed/strangulated/incarcerated) ventral hernias.
- Pregnancy with ventral hernia.
- Ventral hernia repairs combined with other procedures.
- Laparoscopic repairs converted to open repair.
- Patients Unfit for Surgery.

The study was carried out with ethical clearance by the institutional ethics committee and in conformity with the guidelines for medical research laid out by ICMR and Helsinki declaration.

30 consecutive adult patients with age above 18 years who underwent laparoscopic and 30 consecutive adult patients with age above 18 years who underwent open mesh repair of ventral hernias in Department of Surgery.

### Preoperative Evaluation

All patients who participated in this study were evaluated pre operatively with detailed history, clinical examination and relevant investigations including biochemical, serological and imaging modalities (as necessary).

### Post-operative management

Post operatively all our patients, in both the groups received intravenous aqueous paracetamol and/ or Tramadol injections 8<sup>th</sup> hourly for 24 to 36 hours, unless contraindicated. Post-operative pain scoring was graded according to the Visual Analogue Scale (VAS) which ranges from 0 to 10, no pain to the worst possible pain. Then analgesics were changed patients to oral preparations, to be given on patient demand. All the patients are ambulated within 12 hours of surgery and are encouraged to take oral feeds. Feeding is started with sips of liquids initially, shifted to normal diet after the resolution of post-operative ileus which is indicated by passing of flatus and normal bowel sounds on auscultation and return of appetite. Patients with persistent ileus were kept NPO and a nasogastric tube is inserted when

necessary. In open cases where drains were used, were removed when the collection was less than 20 ml for 2 consecutive days. The wounds were inspected for development of any post-operative complications like, seroma, hematoma or infection. Patients were discharged in a healthy general condition after complete ambulation.

## Results

**Table 1:** Association between Post-operative Complications and Surgery

Post-operative Complications	Open (n=30)	Laparoscopic (n=30)	P Value
Wound Infection	4 (13.3)	1 (3.3)	<b>0.018</b>
Seroma	6 (20.0)	0 (0.0)	
Ileus	3 (10.0)	7 (23.3)	
Hematoma	0(0.0)	0(0.0)	
Others	0(0.0)	1 (3.3)	

In the study who underwent open repair it was observed that postoperative complications i.e, Wound infection, Seroma, Ileus, and hematoma were 13%, 20%, 10%, and 0% respectively. In Laparoscopic repair it was observed that postoperative complications that is, wound infection, Seroma, Ileus, and hematoma were 3.3%, 0%, 23.2%, and 0% respectively. This observation was statistically significant with p value of 0.018.

**Table 2:** Comparison of Mean VAS on Post-Operative Day 1 between Open and Laparoscopic Surgery groups.

Variables	Open (n=30) Mean (SD)	Laparoscopic (n=30) Mean (SD)	P Value
VAS on Post-Operative Day 1	8.1 (1.0)	7.6 (1.2)	0.073

Our study showed that mean VAS score on postoperative day 1 in open group was 8.1 +/- 1 and in laparoscopic group was 7.6 +/- 1.2. Though mean VAS on POD 1 in laparoscopic group was less compared to open group, it was statistically not significant (P value – 0.073).

**Table 3:** Comparison of Mean VAS on Day of Discharge between Open and Laparoscopic Surgery

Variables	Open (n=30) Mean (SD)	Laparoscopic (n=30) Mean (SD)	P Value
VAS on Day of Discharge	3.3 (1.3)	2.2 (1.0)	0.001

In our study we observed that mean VAS on the DOD in open group was 3.3 +/- 1.3 and 2.2 +/- in laparoscopic group. This was statistically significant with P value 0.001.

## Discussion

In our study we observed that, overall 5(8.3%), 4(13.3%) in open and 1(3.3%) in lap had wound infection. No patients in laparoscopic group had seroma compared to 6(20%) in open group. According to our study incidence of postoperative ileus was more in laparoscopic group 7(23.3%) compared to 3(10%) in open group. None of the subjects in both groups had post-operative hematoma, and one patient developed pneumonia post operatively in laparoscopic group. McGreevy *et al.* [5] study showed overall 8% and 21% complication rates in lap and open groups respectively, of which 8% comprised wound infections and 4% of subjects had ileus. Lomanto *et al.* [6] showed an overall incidence of 24 and 30% complications in laparoscopic

and open groups respectively. According to Itani *et al.* [7] overall complication rates were less in lap group (31%) compared open group (48%), of which wound infection 24 and 5%, and seroma were 24 and 8.2% in open and lap groups respectively.

In this present study, though the mean pain score (VAS) on POD1 was less in laparoscopic group 7.6+/-1.2 compared to open group 8.1+/-1.0, it was not statistically significant. Whereas the mean pain score (VAS) on the day of discharge was statistically significant in our study. Mean VAS, DOD 3.3+/-1.3 for open and 2.2+/-1.0 for lap group. Lomanto *et al.* [6] showed similar results with post-operative pain, significantly less pain in lap group, mean VAS 2.9 on POD1 and 4.17 on POD3. Misra *et al.* [8]. showed similar results with less pain scores in laparoscopic group.

Mean duration of hospital stay for open was 1.47 and 3.43 days for laparoscopic groups according to Misra *et al.* [8] and it was 2.7 days in lap and 4.7 in open group according to Lomanto *et al.* [6] In our study we observed that mean duration of hospital stay was 3.5 and 5.3 days for lap and open groups respectively, with a statistical significance. McGreevy *et al.* [5] didn't show any significant difference between the groups with respect to duration of stay in hospital, 1.1 and 1.5 days for lap and open groups.

Our study showed that the average time taken for subjects to their routine work after surgery was significantly less in laparoscopic (LVHR) group. Return to work, 11.2 +/- 3.5 days in lap group and 24.8 +/-6.5 days for open group, p value <0.001.

The present study didn't show any recurrence in either of the groups during the short follow-up period of 6 months. Lomanto *et al.* [6] study showed recurrence in 2% of the subjects in laparoscopic group and 10% in open group. Study conducted by Itani *et al.* [7] showed 12.5% and 8% recurrence rate among laparoscopic and open groups respectively. Misra *et al.* [8] observed 6.2 and 3.3% recurrence in lap and open groups.

### Conclusion

- In this study we observed that overall incidence of surgery related post-operative complications was less in laparoscopy group (13.3%) compared to open (21.6%), which was statistically significant. Wound infection, Seroma, Ileus, and hematoma were 13%, 20%, 10%, and 0% respectively in open group, and in laparoscopic group they were 3.3%, 0%, 23.2%, and 0% respectively. 1 patient in laparoscopic group developed pneumonia postoperatively.
- Pain score (mean VAS) was almost similar in both the groups on POD1, 8.1 for open and 7.6 for lap group, not statistically significant. But mean VAS score on the day of discharge in open and laparoscopic groups were 3.3 and 2.2 respectively. Statistically this observation was strongly significant.

### References

1. Ponten JEH, Somers KYA, Nienhuijs SW. Pathogenesis of the epigastric hernia. *Hernia* 2012, 627-33.
2. Lang B, Lau H, Lee F. Epigastric hernia and its etiology. *Hernia* 2002;6(3):148-50.
3. Steenholdt C, Hernandez J. Risk factors for umbilical hernia in Holstein heifers during the first two months after birth. *J Am Vet Med Assoc* 2004;224(9):1487-90.
4. Yahchouchy-Chouillard E, Aura T, Picone O, Etienne JC, Fingerhut A. Incisional hernias: I. Related risk factors. *Digestive Surgery* 2003, 3-9.
5. McGreevy JM, Goodney PP, Birkmeyer CM, Finlayson SR,

Laycock WS, Birkmeyer JD. A prospective study comparing the complication rates between laparoscopic and open ventral hernia repairs. *Surg Endosc* 2003;17:1778-1780.

6. Lomanto D, Iyer SG, Shabbir A, Cheah WK. Laparoscopic versus open ventral hernia mesh repair: a prospective study. *Surg Endosc* 2006;20:1030-1035.
7. Itani KM, Hur K, Kim LT, Anthony T, Berger DH, Reda D, *et al.* for the Veterans Affairs Ventral Incisional Hernia Investigators. Comparison of laparoscopic and open repair with mesh for the treatment of ventral incisional hernia: a randomized trial. *Archives of Surgery* 2010;145(4):322-8.
8. Misra MC, Bansal VK, Kulkarni MP, Pawar DK. Comparison of laparoscopic and open repair of incisional and primary ventral hernia: results of a prospective randomized study.