

Original research article

A Comparative Study of Minimally Invasive Surgery Versus Open Surgery for Abdominal and Groin Hernias

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Abstract

Objectives: To compare open versus laparoscopic repair for abdominal and groin hernias with regard to the following factors: duration of surgery, post-operative pain and analgesia, resumption of oral diet, length of hospital stay, cost and return to normal activity.

Materials and methods: The study is obtained from patients who consented to get operated for inguinal and ventral hernias at ANMMCH, Gaya. Study duration of Two Years. Relevant history, clinical examination and appropriate investigations were done. A total of 81 patients were operated after written consent. 60 patients with inguinal hernias and 60 patients with ventral hernias were used in the study. A proforma was used to collect the relevant information. Data was analyzed using the Students 't' test, Fisher's Exact test and the chi-square test, a P value of <0.001 was considered significant.

Results: On comparing the ventral hernia group, it was seen that patient undergoing laparoscopic hernia repair experienced less post-operative pain, early resumption of oral diet, shorter duration of hospital stay and resumed normal activity quicker. Operative time was longer and cost of operation was more in the laparoscopic group. On comparing inguinal hernias, patients in laparoscopic group experienced less post-operative pain, required shorter duration of analgesia, shorter hospital stay and resumed normal activity quicker. Operative time was longer in the laparoscopic group.

Conclusion: Laparoscopic hernia repair holds a promising alternative to the novel repair and the short term results are encouraging. In both cases of ventral and inguinal hernia, laparoscopic repair showed a clear advantage in decreasing the post operative pain, length of hospital stay, reduced duration of analgesia and earlier return to normal activity when compared to open repair. Hence, laparoscopic hernia repair can be considered as a feasible alternative to open repair.

Keywords: ventral hernia repair, inguinal hernia repair, TEPP, incisional hernia.

Introduction

Hernia is defined as an 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⁾ Ventral Hernia is a protrusion of an abdominal viscus or part of a viscus through the anterior abdominal wall occurring at any site other than the groin. It includes incisional hernias, paraumbilical hernias, umbilical hernia, epigastric hernias and spigelian hernias. An inguinal hernia is a protrusion of abdominal contents into the inguinal canal through an abdominal wall defect. The introduction of laparoscopic technique has sparked a debate over the superiority of this method versus open repair. Though a variety of procedures are performed, none can be termed as an ideal procedure as each one is accompanied by varied early and late complications, the most significant being

recurrence. In our institution, abdominal and groin hernia repairs are among the most common surgeries performed daily. This study aims to evaluate if there is significant advantage of minimally invasive surgery over open surgery for abdominal and groin hernia repair based on duration of operation, resumption of oral diet, post-operative pain and analgesia, length of hospital stay, cost and return to normal activity.

Objectives

The aim of the present study was to compare open versus laparoscopic repair for abdominal and groin hernias with regard to the following factors:

- *Duration of surgery
- *Post-operative pain and analgesia
- *Resumption of oral diet
- *Length of hospital stay *Cost

Materials and methods

The study was a Prospective Study the data was obtained from 120 patients who met a pre-defined criteria and consented to get operated for abdominal and groin hernias at Anugrah Narayan Magadh Medical College and Hospital, Gaya Bihar. Study duration of Two Years. The study was initiated after obtaining ethical clearance from the institutions ethical clearance committee.

Inclusion criteria

- *Patients with unilateral or bilateral inguinal hernias
- *Patients with umbilical hernias
- *Patients with ventral hernias
- *Patients with recurrent hernias

Exclusion criteria:

- *Age less than 18 years.
- *Obstructed or strangulated hernias.
- *Those converted from laparoscopic to open surgery (since it alters the duration of surgery)

Preoperative evaluation:

All the patients were evaluated by proper history and detailed physical examination. Data was collected on a proforma. All the patients underwent the routine blood investigations and in our study we got ultrasound abdomen done for all our patients to know the size of defect, the contents and any other abdominal pathology

During postoperative period all patients received intramuscular aqueous diclofenac injections 12 th hourly for two days post operatively followed by oral preparation for 3 days. All the patients are encouraged for oral feeds after 8 hours, initially the feeds were sips of liquids followed by normal diet after the resolution of post-operative ileus (indicated by passing of flatus and normal bowel sounds on auscultation and return of appetite). 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. The wounds were inspected for any seroma, hematoma or any infection. Patients were discharged after complete ambulation and tolerating normal diet.

Postoperative assessment of pain:

The pain experienced by the patients in the post-operative period was been graded according to the Visual Analogue Scale (VAS) ranging from no pain to the worst possible pain on the

scale of 0 to 10 After discharge, patients were encouraged to take normal diet and return to their normal activities as early as possible. After the discharge, patients were followed up at 1 week, 1 month, 3 months, 6 month intervals. In the initial follow up, the patients were evaluated for short-term complications like seroma or hematoma and wound infection.

Results

in the prospective Study from 120 patients observation and results obtained oncomparing laparoscopic ventral hernia with open ventral hernia repair are as follows:

Table 1: Mean age and standard deviation

	N	Mean	Std Deviation
Open group	30	52.10	11.511
Laparoscopic group	30	43.20	9.379

In our study the mean age for open group is 52.10 while the mean age for the laparoscopic group is 43.20. (p is not significant)

Type of Hernia

Table 2: Type of Hernia

Type of Hernia	Open group	Laparoscopic group	Frequency	Percent (%)
Epigastric Hernia	2	2	4	6.7%
Incisional Hernia	6	7	13	21.7%
Paraumbilical hernia	10	3	13	21.7%
Umbilical Hernia	12	18	30	50%
Total	30	30	60	100%

In the open group, there are a total of 30 patients. Of the 30 patients, 2 (6.7%) had epigastric hernia, 12 (40%) had umbilical hernia, 10 (33.3%) had paraumbilical hernia and 6 patients (20%) had incisional hernia. The discomfort experienced by the group who underwent laparoscopic surgery (n=30) was compared to the discomfort experienced for the group who underwent open surgery (n=30). Well accepted pain scoring system, the verbal response scale (VRS) were used to grade the pain

Table 3: Mean age and standard deviation

	N	Mean	Std Deviation
Open group	30	48.70	15.786
Laparoscopic group	30	43.17	11.525

In our study minimum age at which occurrence of inguinal hernia was at 21 years and the eldest being at 84 years. There were more males in both laparoscopic and open group as compared to females. (p is not significant), overall males in the study was 51. The average stay for patients undergoing laparoscopic inguinal hernioplasty was 3.07 days. (range 2-5 days). Patient who underwent open surgery mean duration of post operative stay was 5.20 days (range 3-9 days) (p is significant). The average cost of patients undergoing laparoscopic inguinal hernioplasty was higher as compared to the patients who underwent open inguinal hernioplasty (p is significant). The patients who underwent laparoscopic inguinal hernioplasty had an early return to normal activity as compared to the patients who underwent open inguinal hernioplasty p is significant.

Discussion

Incisional and primary ventral hernias represent a frequently encountered and at times frustrating problem for the general surgeon. Open repair of these hernias can be very challenging with significant associated morbidity (20% to 40%).^(2, 3) They often (3% to 13%) complicate an otherwise uneventful abdominal operation,⁽⁴⁾ or present as an acute incarceration (6% to 15%) and strangulation (2%) mandating immediate surgical repair. Additionally, a significant period of hospitalization is often required for recovery. Furthermore, depending upon whether a simple suture or prosthetic repair is used, open ventral hernia repair is associated with a 46% and 23% recurrence rate, respectively.⁽⁵⁾ The present study is a prospective study comparing the results of open inguinal hernia repair with laparoscopic hernia repair and open ventral hernia repair with laparoscopic ventral hernia repair. The worldwide acceptance of laparoscopic surgery, has paved the way for an alternative to open hernia surgery. There have been numerous RCT comparing laparoscopic with open repair for abdominal and groin hernias. In the present study, the mean age is comparable between the two groups: 52.10yrs in open group and 43.2yrs in laparoscopy group. In the study conducted by HH Eker et al⁽⁶⁾ in May, 2006 the mean age of the patients in open group is 56.7 years and laparoscopy group is 59.1 years. Sex: and laparoscopy (63.4%) groups. Similar findings were seen in our study where women were more in both laparoscopic and open group. In our study the mean operative time was more in laparoscopic group (116min) as compared to open group (67.3min). (p is significant). In other studies by Ioannis et al⁽⁷⁾ and Mishra et al⁽⁸⁾ have not shown any significant difference between the two procedures. Laparoscopic surgery is generally associated with reduced pain. In 2 RCTs (Barbaros2006⁽⁹⁾, Misra2006⁽⁸⁾) all reported almost equal incidence of postoperative pain scores in both the groups. In our study patient experienced less post operative pain in lap group as compared to open group. In our study patients in laparoscopic group (1.2 days) resumed oral diet quicker as compared to open group (1.77 days). Similarly, in a study by Ioannis et al⁽¹¹⁾ the lengths of NPO status was 55.3 hours for open group and 10 hours for lap group (p<0.001) Mean duration of hospital stay was longer in open group (6.23 days) as compared to laparoscopic group (3.17days). In a study by Ioannis et al⁽⁷⁾ the hospital stay (5.38 vs 1.88 days, P<0.001) were significantly longer in the patient group that underwent open repair. In a study by Ecker BL et al⁽¹⁰⁾, laparoscopic ventral hernia repair was associated with lower total costs at 1 year.

In a study by Neumayer et al⁽¹¹⁾, the mean age for open group was 58.4 years while laparoscopic group was 58.6 years. In our study the mean age for open group is 48.70 while the mean age for the laparoscopic group is 43.17. In a study by Ira M. Rutkow⁽¹²⁾, 90% of total cases were male and 10% female. In a study by Martin Kurzer⁽¹³⁾ of British hernia center, 975 cases were male and 3% female. In our study there were more males in laparoscopic group (83.30%) and open group (86.70%) as compared to females. In a study conducted by Udwardia Tehemton et al⁽¹⁴⁾, the mean duration for lap was more than open technique (67.5min vs 55.5min). In our study the mean operative time was more in laparoscopic group (120.33 min) as compared to open group (64.77 min). This may be due to the initial learning curve of the surgeons in our study leading to prolonged operating time.

Post-op pain:

In a study by Neumayer et al⁽¹¹⁾, Patients in the open-repair group had significantly greater levels of pain than did those in the laparoscopic group during the two-week postoperative assessment period. In our study patients undergoing laparoscopic inguinal hernioplasty experienced grade II to III pain as compared to open group who experienced grade III to IV pain. In a study by McCormack et al⁽¹⁵⁾, length of hospital stay did not differ between the two

groups. In our study we found that the laparoscopic hernia repair cost Rs. 1690 more than the open hernioplasty surgery. In the MRC trial ⁽¹⁶⁾, they found the laparoscopic hernia repair to be 314 pounds more than the hernioplasty group.

Return to normal activity

In a study by Neumayer et al ⁽¹¹⁾, the time to the resumption of daily activities was significantly shorter among those undergoing laparoscopic repair (median time, four days) than among those undergoing open repair (five days) In our study, the mean duration for return to normal activity in open group is 2.8 weeks, and in laparoscopy group is 1.27 weeks.

Conclusion

The present study is a comparative study of open ventral hernia repair with laparoscopic ventral hernia repair and open inguinal repair with laparoscopic inguinal repair. The study has been carried out to compare the two in terms of duration of surgery, severity of postoperative pain, cost of surgery, duration of analgesia and return to normal activity. While comparing the two groups it was seen that laparoscopic group was superior in terms of reduced postoperative pain, reduced hospital stay, and reduced need for analgesia and early return to normal activity. The laparoscopic group was more expensive and duration of surgery was longer. The drawback in the study is the time period for the assessment of recurrence rates is short

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