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Original research article

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

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Abstract

Background: 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.

Material and methods: The study is obtained from patients who consented to get operated for inguinal and ventral hernias at A.N.M.M.C.H. Gaya. 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.

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.

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. 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. 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

compare open versus laparoscopic repairfor 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

Review of Literature

Hernia has been a subject of interest, since the dawn of surgical history and their treatment has evolved through several stages.

Epigastric hernia, Umbilical hernia, Paraumbilical hernia, Incisional hernia.

The anterior abdominal wall extends from the xiphisternum, right and left costal margins above, to the anterior part of the iliac crest, fold of the groin, pubic tubercle, pubic crest and symphysis pubis, and on each side below and is separated from the posterior abdominal wall by downward prolongation of mid axillary line. It takes its origin as eight fleshy slips from the outer surfaces and lower borders of the lower eight ribs. The upper four slips interdigitate with serratus anterior and lower four slips with latissimus dorsi. Posterior fibres get inserted into the anterior half of outer lip of iliac crest. It is also known as obliquus internus abdominis. It takes its origin from the lateral 2/3rd of upper surface of the inguinal ligament. Also arises from intermediate lip of the ventral segment of the iliac crest and from the fusion of anterior and middle layers of thoracolumbar fasciae at the lateral border of quadratus lumborum. Insertion inguinal fibres pass upwards and medially forming anterior wall of the inguinal canal, then arch backwards forming the roof and finally turn downwards and medially and become aponeurotic. The aponeurosis of the internal oblique forms the conjoint tendon after blending with similar aponeurosis of the transverses muscle and is inserted into the pubic crest. The umbilicus is a cicatrix which represents the site of entry of the umbilical cord in the fetus. The floor of the umbilicus is formed by the fibrous tissue. The scaris directly adherent to the superficial fascia, because the fatty tissue ceases at the margin of the umbilical ring. Deep to this are situated the inter lacing transverse fibers known as "umbilical fascia". The fetal umbilical vessels and urachus create a weak spot through which protrusion of viscus can occur. The most frequent point of exit ofa hernia is a site of the umbilical veins represented in the adults by the attachment of a ligamentum teres. The peritoneal fossae are created by the presence of peritoneal folds, which radiate from the umbilicus or umbilical area. These types of fossae have two important roles firstly to delineate the sites of groin herniation and then are an essential landmark for orientation during hernia repairs, The preperitoneal space that lies deep to the supravesical fossa and also the medial umbilical fossa may be the Prevesical space of Retzius. This space contains loose connective tissue and fat. Dissection of the space during a laparoscopic hernia repair is mandatory to enable proper mesh overlap from the hernial defect to aid in proper mesh placement/ fixation. Important vascular structures on this space are: Normal and aberrant obturator vessels and the Accessory pudendal vessels (10%).

Incisional hernias were classified by Chevrel and Rath in 2000 using 3 parameters. Firstly, the localization of the hernia of the abdominal wall: divided into median (M1–M4) and lateral (L1–L4) hernias. Secondly, the size of the hernia: it was postulated that the width of the hernia defect is the most important parameter (greater than hernia defect surface, length of the hernia or size of the hernia sac), which was divided into four groups (W1–W4). As a third parameter

of this classification, subgroups were made for incisional hernias and recurrences: the number of previous hernia repairs was recorded as (R0, R1, R2, R3,...). Although apparently easy to use, this classification has not been commonly used in the literature. Korenkov et al. reported on the results of an expert meeting on classification and surgical treatment of incisional hernia, but no detailed classification proposal resulted from this meeting. Repair of recurrent incisional hernias: successful repair of recurrent hernias in patients whose musculature is of poor quality and weak and flabby, fascial coverings are thin and weak, requires prosthetic material.

Material and methods

This is 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.

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.

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. 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).

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

prospective Study from 120 patients observation and results obtained on comparing 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 thelaparoscopic group is 43.20.

Table 2: Type of Hernia

Type of Hernia	Opengroup	paroscopicgroup	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 Of the 30 patients in the laparoscopic group, 2 (6.7%) had epigastric hernia, 18 (60%) had umbilical hernia, 3 (10%) had paraumbilical hernia and 7 (23.3%) patients 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.Pain relief was achieved by injectable NSAIDS administered by IM route. Theaverage duration of post-operative analgesia required in the laparoscopic Group was 1.37 while that required by the open group was 2.63 days.

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. On the day of surgery most of the patients who underwent laparoscopic inguinal hernioplasty experienced grade II to III pain as compared to open group who experienced grade III to IV pain.
The average cost of patients undergoing laparoscopic inguinal hernioplasty was higher as compared to the patients who underwent open inguinal hernioplasty .

Table 3: Cost of hospital stay

	N	Mean	Std. Deviation
Open group	30	5466.67	1015.512
Laparoscopic group	30	7156.67	1067.928

Return to normal activity
The patients who underwent laparoscopic inguinal hernioplasty had an early return to normal activity as compared to the patients who underwent open inguinal hernioplasty.

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%). They often (3% to 13%) complicate an otherwise uneventful abdominal operation, 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. 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. Neumayer et al, 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. by Ira M. Rutkow 90% of total cases were male and 10% female. In a study by Martin Kurzer of British hernia center, 975 cases were male and 3% female. In our study there were more males in Udwadia Tehemton et al 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. laparoscopic group (83.30%) and open group (86.70%) as compared to females. Mean duration of postoperative stay was longer in open group (5.20 days) as compared to laparoscopic group (3.07 days). In the study conducted by Ioannis et al majority were women in both open (66.8%) and laparoscopy (63.4%) groups. Similar findings were seen in our study where women were more in both laparoscopic and open group. Laparoscopic surgery is generally associated with reduced pain. In 2 RCTs (Barbaros2006, Misra2006 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.

Operative time:

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 at, and Mishra et al have not shown any significant difference between the two procedures. In a study by McCormack et al , length of hospital stay did not differ between the two groups. Neumayer et al, 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 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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