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Original Research Article

The risk factors of laparoscopic and open repair surgery of inguinal hernia in a tertiary care center

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ABSTRACT

Background: The purpose of the present study to investigate the incidence of inguinal hernia and risk factors of laparoscopic and open repair surgery.
Methods: The present study contained 3 bilateral,17 right-sided and 7 left-sided hernia in the laparoscopic group and 2 bilateral, 19 right-sided and 6 left-sided hernia in open repair group. A total of 54 patients had an inguinal hernia, 27 underwent open repair and 27 underwent laparoscopic to open repair.
Results: The age group of patients of open repair is 51-60 years, whereas 41-50 years in laparoscopic repair. The mean age was 47 years in open repair against 43 years in the laparoscopic repair.
Conclusions: Among them, eight patients from open repair (1-COPD, 3-asthma,1-hypertension, 3-smoking) and five patients with the laparoscopic repair (2- COPD, 2-asthma, 1-hypertension) had one of the above-mentioned risk factors.

Keywords: Risk factors, Laparoscopic surgery, Open repair surgery

INTRODUCTION

The word hernia is derived from a latin term meaning a rupture, it is a condition which involves abnormal bulging of contents of the abdominal cavity through a weakness in the wall of the cavity that contains it, while inguinal hernia is bulging of part of contents of abdominal cavity through weakness in the wall of inguinal canal.[1-2]

Inguinal hernia is one of the most common surgical conditions in the world which is especially more common in developing countries due to occupational exposure associated with heavy weight lifting. Its diagnosis is made mostly by clinical examination and if needed ultrasound scan can be done.

Incidence of inguinal hernia in India is around 18% with 70 percent male predominance mostly due to their occupation and lesser occurrence in the female. However, world literature suggests a higher incidence of inguinal hernias are common, with a lifetime risk of 27% in men and 3% in women.[3] Inguinal hernia repair is one of the most common operations in general surgery. Surgeons and patients face many decisions when it comes to inguinal hernias: repair or no repair, mesh or no mesh, what kind of mesh, open or laparoscopic, extra-peritoneal or trans-abdominal, and so forth. Inguinal hernia repairs have morbidity and recurrence rates that are not inconsequential.[4]

The long-term recurrence rate remains the most important outcome parameter after the repair of inguinal hernias. Therefore, at present, the use of prosthetic material has

replaced traditional tissue repairs such as the shouldice-2 technique. Tension-free mesh repair is now the standard of care for inguinal hernia repair in adults.[5]

The use of preformed mesh to repair inguinal hernias is gaining wide acceptance and is replacing suture repairs such as the Shouldice repair or Maloney darn repair.[6-8]

Within the last few years, the use of minimal access surgery has expanded to encompass most procedures in general surgery. The use of endoscopic techniques in the repair of groin hernias, however, remains controversial.[9]

Laparoscopic hernia repair is similar to the open pre-peritoneal approaches and is performed trans-abdominally or extraperitoneal. Unlike laparoscopic cholecystectomy, this procedure has been slow to gain acceptance. This reluctance is mainly because of reports of rare serious complications during and after surgery which include visceral, vascular, and nerve injury, and small bowel obstruction. A further drawback has been the long learning curve associated with these techniques and a high rate of failure to repair the hernia in this transitional learning period for the surgeon.[10]

The laparoscopic technique has replaced the open approach in many surgical procedures. This development has largely taken place without desirable preceding studies proving the safety and benefit to the patient. Inguinal hernias are common, and although the results of surgical repair are often satisfactory, postoperative recovery may be slow, and the hernia may recur.[10] Laparoscopic techniques for the repair of inguinal hernias have recently been introduced and in several small trials, these techniques are superior to open repair in terms of postoperative pain and recovery.[11-14] These studies were too small, however, to detect differences in recurrence rates.[15,16]

To achieve the above aims, a prospective study was conducted at Pt. Jawaharlal Nehru memorial govt. medical college with the associated Dr. Bhim Rao Ambedkar Memorial Hospital, Raipur.

METHODS

Sample selection

The study was conducted during the period of one year from July 2017 to July 2018. Patient having a bulge in the inguinal region whether unilateral, bilateral, primary or recurrent resulting in discomfort or dragging pain with positive cough impulse admitted in surgical wards of Dr. Bhim Rao Ambedkar Memorial Hospital, Raipur were included in the study. A total of 54 patients were selected for the present study.

Inclusion criteria

The present study inclusion criteria were logically and scientifically fit for the study, these patients were between the age group of 18 to 65 years old, patients with direct or indirect inguinal hernia, bilateral inguinal hernia, with primary or recurrent inguinal hernia, only male patients were involved the present study, patients fit for general anesthesia, and written consent for permission in surgical procedure.

Exclusion criteria

The present study exclusion criteria were following the minimal criteria logically not fit in the research, the children below the age of 18 years and above the age 65 years were excluded, female patients, patients with strangulated, irreducible, obstructed inguinal hernia, huge inguinoscrotal hernia, patients unfit for general anaesthesia, patients not consenting for the study and bleeding diasthesis.

Procedure of the study

Patients with direct or indirect, unilateral or bilateral, primary and recurrent hernias were taken into study. A detailed clinical examination of all patients was carried out. Each case was thoroughly investigated and cases were taken up for surgery. Written informed consent was obtained from patients pre-operatively.

Patients were admitted in the surgical wards of Dr. Bhim Rao Ambedkar Memorial Hospital, Raipur and the facilities in the wards were utilized. The biochemical laboratory facilities, the radiological, sonographic and ECG facilities of the same were utilized. Patients were operated in surgical theaters of the same hospital. General anaesthesia was given to all patients for laparoscopic hernia repair and spinal anaesthesia was given to patients of open mesh repair. The instruments used for routine hernia surgeries and laparoscopic facilities available in the same hospital were used. The site of hernia namely right, left or bilateral was also noted.

Statistical analyses

The descriptive analysis technique was done for the current study with the help of SPSS 22.

RESULTS

The patients were selected from the age group of 18-65 years in both the study and control groups. Table 1 and Table 2 shows the maximum no. of the patient were in the age group of 51-60 years in open repair whereas 41-50 years in laparoscopic repair. The mean age was 47 years in open repair against 43 years in laparoscopic repair.

In both, the group cases (laparoscopic and open repair) right-sided hernia is common.

No risk factors are seen in nineteen patients from open repair and twenty-two patients from laparoscopic repair.

Table 1: Age-wise distribution of cases.

Age group (in the year)	Open		Laparoscopic	
	No. of patients	N (%)	No. of patients	N (%)
≤20	0	0	2	7.41
21-30	2	7.41	3	11.11
31-40	7	25.93	4	14.81
41-50	6	22.22	9	33.33
51-60	7	25.93	6	22.22
>60	5	18.52	3	11.11
Total	27	100	27	100

Table 2: Mean and standard deviation of age-wise.

Age (years)	Open repair		Laparoscopic repair	
	Mean	SD	Mean	SD
	47.07	11.30	43.66	13.57
P-value	0.32 NS			

Table 3: Site of the hernia.

	Open		TEP	
	N	N (%)	N	N (%)
Right	19	70.37	17	62.96
Left	6	22.22	7	25.93
B/L	2	7.41	3	11.11
Total	27	100	27	100

Table 4: Site of hernia in age-wise.

Age (in years)	Open repair			Laparoscopic repair		
	Right	Left	Bilateral	Right	Left	Bilateral
11-20	0	0	0	2	0	0
21-30	1	1	0	1	2	0
31-40	5	2	0	3	1	0
41-50	6	0	0	5	3	1
51-60	5	1	1	4	0	2
61-70	2	2	1	2	1	0

Table 5: Risk factors of the open and laparoscopic repair.

Risk factors	Open repair		Laparoscopic repair	
	N	%	N	%
COPD	1	3.7	2	7.41
Asthma	3	11.11	2	7.41
Hypertension	1	3.7	1	3.7
Smoking	3	11.11	0	0
Total	8	29.63	5	18.52
P value	0.82 NS			

Among the eight patients from open repair (1- chronic obstructive pulmonary disorder, 3- asthma, 1- hypertension, 3- smoking) and five patients with the laparoscopic repair (2- chronic obstructive pulmonary disorder, 2- asthma, 1- hypertension) had one of the above-mentioned risk factors.

DISCUSSION

Hernias have been a subject of interest since the dawn of surgical history. The ideal repair should allow a patient a rapid gain to normal work, leisure and recreation at a reasonable cost to the patient. The laparoscopic technique has replaced the open approach in many surgical procedures. This development has largely taken place without desirable proceeding studies providing safety and benefit to the patient.

In contrast to various criticisms, many favors using laparoscopic repair for a hernia which is more desirable for the patients. The postoperative recovery period, postoperative pain and rapid return to normal occupational activity are considerably less in laparoscopic hernia repair than to comparable postoperative characteristics following the classical open or approaches in hernia repair.

The mean age is 47.07 years in open repair whereas 43.66 in laparoscopic repair. Among those operated, the largest percentage of patients are between 31-40 years and 51-60 years in open repair while in laparoscopic TEP repair it is 41-50 years.[17]

In the present study, 70.37% of patients were of right-sided inguinal hernia belong to open repair and 62.96% in laparoscopic TEP repair. So, it is the most common side of hernia in this study which is well correlated with the current demographic parameter which is also well correlated with studies of Jull et al.[18]

In the present study, 29.63% of open repair and 18.52% of laparoscopic repair had one of the risk factors like COPD, Asthma, smoking, hypertension. Patients with such comorbidities may be high-risk candidates for general anaesthesia more amenable to regional anaesthesia. smoking was the most common risk factors

associated with poor wound healing and accelerated degeneration in fascial collagenous structures.

Prospective studies on operative and long-term results have led to the improvement of techniques and implant materials. For example, after Halm et al reported high rates of adhesions and bowel resection associated with intraperitoneal use of polypropylene mesh, use of this technique became obsolete.22 Meanwhile, significant improvements have been achieved in research and development of less adhesive prosthetic materials. For open incisional hernia repair, sufficient evidence exists to support the superiority of mesh repair over suture repair in terms of recurrences.19-23 Polypropylene is the most widely used material for open mesh repair and is most often placed in the sublay (retro-muscular) position.24

A recent cochrane review, however, yielded insufficient evidence as to which type of mesh or which mesh position (onlay or sublay) should be used.25 In the underlying trial, the use of mesh was mandatory for all incisional hernia repairs, frequently using polypropylene material in the sublay or intraperitoneal position. Shorter operative time for laparoscopic incisional hernia repair was reported by several recently published studies, while other studies show no differences or longer operative times in the laparoscopic group.20-29 In small incisional hernia, the introduction of trocars and positioning of instruments can be time-consuming. In the open technique, the hernia is often already reduced within this time.

In the laparoscopic technique, the positioning and fixation of the mesh to the ventral abdominal wall can be time-consuming. A major factor that might have affected the operative time in the laparoscopic group was the extensive adhesiolysis in the midline of the abdominal wall. Adhesiolysis was necessary for positioning the mesh but also for observing any other small hernia or 'swiss-cheese' defects. A combination of these factors could explain the significantly longer operative time in the laparoscopic group.

CONCLUSION

This prospective study conducted in the department of general surgery in Dr. Bhim Rao Ambedkar memorial hospital, Raipur. Concluded the current study that the average age of study group were18-65 years (mean age 43.66 years) while the control group was 18-65 years (mean age 47.07 years). The study contained 3 bilateral, 17 right-sided and 7 left-sided hernia in the laparoscopic group and 2 bilateral, 19 right-sided and 6 left-sided inguinal hernia in open mesh repair group.

Some patients were showing the risk factor in both operative techniques, open repair technique risk factors were namely chronic obstructive pulmonary disease, asthma, hypertension, and smoking; laparoscopic repair technique risk factor was chronic obstructive pulmonary disease, asthma, and hypertension.

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