

Comparison Between Open Shouldice Versus Laparoscopic Unilateral Inguinal Hernia Repair: A Randomized Controlled Trial

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ABSTRACT

Aim: To compare the outcomes of laparoscopic Inguinal hernia repair and open Inguinal hernia Shouldice repair.

Study design: A randomized controlled trial

Place and duration: This study was conducted at Liaquat University of Medical Health Sciences Jamshoro, Pakistan from April 2020 to April 2021.

Methodology: In this study comparison of a laparoscopic and open procedure was done. A total of 124 patients were included in the study. A total of 64 patients underwent a Laparoscopic Transabdominal Pre Peritoneal (TAPP) Inguinal Hernia Mesh Repair and 60 patients underwent the Shouldice technique of hernia repair which is an open surgical Non Mesh Technique. The measured Variable were Early Complication, Return to work, Duration of analgesia requirement and Reoccurrence Rate. The data were analyzed using IBM SPSS version 26.

Results: The rate of complications in both groups was similar. Patients who underwent the laparoscopic procedure mean duration to return back to work was 12 days. On the other hand, those who had the Shouldice procedure mean duration was 17 days return back to work. The mean duration of analgesia intake after a laparoscopic procedure was 2.2 days and after a Shouldice procedure was 2.8 days. Recurrence of the hernia was reported by 3 (4.69%) patients who underwent the laparoscopic procedure and 2 (3.33%) patients who underwent the open procedure.

Conclusion: The laparoscopic procedure is a better procedure than the open procedure of primary unilateral hernia repair in terms of early recovery, return to work and postoperative pain.

Keywords: Laparoscopy, hernia repair, Shouldice procedure

INTRODUCTION

A hernia is a common surgical problem in the population of Pakistan. Hernia tend to get larger with increasing time span and if not treated lead to obstruction and strangulation which can be a life-threatening condition. Surgery is required cases for correction of hernia. The surgical procedure involves pushing the contents of the hernia back into its normal anatomical site and repairing it with a mesh or tissue reconstruction using sutures. Elective Surgery is recommended when the tissue is entrapped in case of incarceration to prevent strangulation [1]. If the hernia is strangulated, emergency surgery is required. Moreover, in case of pain and or any other complication, surgery is highly recommended.

There are two types of surgeries that are commonly practiced; Open surgical repair and laparoscopic repair. A prosthetic mesh can be used in both techniques [2]. After a laparoscopic repair, less time is required for recovery, and the patient experiences less pain. However, the rate of recurrence and complications is yet to be determined. On the other hand, the Shouldice procedure has proven excellent results in terms of hernia repair. It is conventional Repair involving tissue reconstruction using tissue flaps with sutures insertion. It is proven to be the best conventional surgical method with which innovations can be compared [3]. Many studies have been conducted to compare this conventional technique and the laparoscopic technique [4]. Nonetheless, none of those studies has compared their results regarding primary unilateral, hernias.

It has been observed that most of the studies are regarding the satisfactory results of laparoscopic hernia repair of recurrent and bilateral hernias [5]. At the same time, there is no ample data available about its results concerning primary unilateral hernia [6, 7]. The present study deals with the randomized clinical trial for the comparison of Shouldice hernia repair and laparoscopic hernia repair concerning recovery, postoperative complications, and recurrence of hernia in men presenting with a primary unilateral hernia.

METHODOLOGY

The present study included a total of 124 patients. Permission was taken from the ethical review committee of the institute. The ages of the patients ranged from 17 years to 80 years. Strict inclusion and exclusion criteria were set to select participants for the study. According to the inclusion criteria, only male patients with a primary unilateral hernia who had consented to the study were added to the study. According to the exclusion criteria, those patients who did not consent to the study, female patients, patients with a bilateral hernia, Obstructed or strangulated hernia, patients with a recurrent hernia, and patients who had a known malignancy, were not eligible for the study. A detailed history of the patients was taken. The history included their profile, presenting complaints, signs, and symptoms regarding the disease, past medical and surgical history, and their socioeconomic history. After a detailed history session, an examination of the hernia was done according to the standard protocols. Those patients who had a primary unilateral hernia were retained for an elective surgical repair as they were eligible for the study. Those patients that were detected with an irreducible hernia or were unfit for the anesthesia were excluded from the study.

All cases were done by a Competent surgeon, expert in these types of surgery and with experience of more than 10 years. All the surgical procedures were planned according to the operation theatre schedule. A randomized approach was used to do the procedures. A total of 64 patients were operated on by a Laparoscopic transabdominal peritoneal (TAPP) approach and 60 were operated on by the Shouldice technique of hernia repair. The allocation of the surgeons was done randomly.

During the laparoscopic procedure, a 6x11 cm polypropylene mesh was used for overlapping the defect. The mesh was fixed with the help of spiral tackers. The mesh was attached anteriorly with the abdominal wall and to Cooper's ligament. On the other hand, the open procedure was either done under general anesthesia or spinal anesthesia. The technique used was either the Shouldice technique which includes suturing of transversalis in two layers by raising Flaps and using a polydioxanone suture 2-0

along with narrowing of the internal ring by suturing. The latter was only done in patients with intact inguinal floor and small indirect hernia.

Following the standard anesthesia protocols, Intravenous tenoxicam 20 mg was given to all the patients before surgery. Paracetamol was given to the patients post-operatively for the discomfort. Buprenorphine was given to the patients with a complaint of more severe pain. The dosage of the drug was set according to the weight and requirement of the patient. All the patients were advised to return to work as soon as they felt comfortable. No specific days were defined to any of the patients in this regard to avoid any error in this parameter. Equal advice was given to all the 164 patients. Operative data were collected from the surgeons and the hernias were categorized as a direct hernia or indirect hernia. The time of operation was measured from when the first incision was given to when the last suture was placed. The time of recovery was measured from the time of operation to when the patient completely returned to a normal routine.

The data regarding operation as well as postoperative complications was collected. The wound was looked for hematoma, infection, wound abscess, pain at the surgical site, and pain in the scrotum or groin. Hematoma needed emergency surgical intervention. The persistence of pain in the scrotum and groin after one month of surgery was considered to be a complication of surgery. A reducible swelling in the area of the groin was defined as a recurrence of the hernia.

The follow-up of the patient was once weekly for 4 weeks after the surgery. After that, the patients were asked to visit after 6 to 12 months and then every year. In those follow-up visits, information regarding complications and the period of recovery was gathered. The patients were examined physically on every follow-up visit. They were asked for complications such as swelling and discomfort in the groin. The rate of recurrence, postoperative complications, period of recovery, and postoperative pain were assessed. The rate of recurrence was identified as 2 (3.33%) percent in the open hernia repair procedure and 3 (4.67%) in the laparoscopic repair. The data was recorded and evaluated in the IBM SPSS version 26. Mann-Whitney U test and Fischer's exact test were applied on the software for the comparison of the results.

RESULTS

A total of 135 participants were included in the study initially. However, 11 were excluded later and only 124 remained in the trial. They were excluded because some did not have a true hernia, some withdrew the consent, some had any other open procedure, and some had a bilateral hernia. A total of 64 participants underwent laparoscopic hernia repair and 60 participants had Shouldice hernia repair. Table 1 shows the baseline data of both groups. The duration of surgery was shorter in the case of open procedure and longer in the case of the laparoscopic procedure. The patients who underwent laparoscopic hernia repair had to take analgesics for a shorter duration compared to those who underwent the Shouldice procedure. A total of 31 (48.44%) patients in the laparoscopic group did not have to use analgesics at all, whereas, 18 (30%) patients in the open repair group did not use them. Participants of laparoscopic repair came back to work sooner as compared to those in the open repair group. Out of 124 participants, 120 (96.77%) were retained in the hospital for less than 24 hours. 3 (2.42%) were discharged after 36 hours and 1 (0.80%) was discharged after 28 hours of the surgery. The duration of operation, duration of hospital stay, use of analgesics after the surgery and time is taken by patients to return to normal activity are given in table 2. The rate of complications in both groups was similar. Table 3 shows different complications and their comparison in both groups. The follow-up of the patients was arranged according to the condition of the patients. Most of the patients visited after 12 months. Recurrence was observed in 2 (3.33%) participants in the open group and 3 (4.67%) participants in the laparoscopic group.

Table 1: Baseline data of participants in the open and laparoscopic group

Variables	Open (Shouldice) group n=60 Mean (range)	Laparoscopic group n=64 Mean (range)
Age (years)	47 (18-73)	48 (19-75)
Weight (kg)	77 (55-102)	76 (59-109)
Spinal anesthesia	41	0
General anesthesia	19	64
Direct hernia	22	23
Indirect hernia	38	41

Table 2: Mean duration of surgery, recovery and analgesics in both groups

	Open (Shouldice) group n=60	Laparoscopic group n=64
Duration of surgery in minutes	45 ± 20	77 ± 50
Duration of hospital stay in days	1 ± 0.2	1 ± 0.1
Use of analgesics in days	2.6 ± 2.1	2.1 ± 1
No use of analgesics at all	18 (30%)	31 (48.44%)
Time to return to normal activity in days	18.2 ± 6.1	12.9 ± 5.8

Table 3: Complications found in both groups after the surgery

Complications	Open (Shouldice) group n=60	Laparoscopic group n=64	P-Value
Wound abscess	1	2	0.532
Pain for more than one month	4	3	0.725
Infection in mesh	0	1	0.132
Hematoma	1	0	0.498
Testicular atrophy	1	0	0.915
Recurrence	2	3	-

DISCUSSION

The present study has been done on a large scale and does not have many limitations. The study is significant as it presents a comparison between open hernia repair and laparoscopic hernia repair. There are several studies done on a similar motive. The study of Juul et al⁸ included a total of 268 participants. A total of 138 patients underwent laparoscopic hernia repair and 130 patients underwent open hernia repair. They concluded that fewer postoperative complications, less use of analgesia, and quicker recovery were seen in the case of laparoscopic hernia repair [8].

A meta-analysis was done by Patterson et al in which 7192 records were analyzed. According to the results of this research, the outcomes of laparoscopic hernia repair were much better than open repair in terms of pain and recovery [9]. According to the study of Perez et al, a significantly low rate of postoperative complications, morbidity and mortality was observed in laparoscopic hernia repair comparatively. Moreover, the cost of the hospital was also lower. They concluded that the laparoscopic approach of hernia repair should be encouraged since it is the appropriate management of inguinal hernias [10]. This conclusion is consistent with the results extracted from the present study. Pokala et al compared the outcomes and postoperative complications of robotic inguinal hernia repair, laparoscopic hernia repair, and open hernia repair. They concluded that robotic hernia repair was better than the other two approaches. Whereas, laparoscopic hernia repair was better than open hernia repair [11].

CONCLUSION

The duration of laparoscopic surgery was longer than that of open surgery. The duration of the hospital stay was similar in both groups. The postoperative complications in both groups were also similar. However, the use of analgesics was lesser in laparoscopic hernia repair compared to open hernia repair. Similarly, the patients who underwent laparoscopic hernia repair had earlier

return to work as compared to those who undergo open hernia repair. Overall, laparoscopic hernia repair is a better approach.

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Permission: Approved by Ethical review committee of the institute

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