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Original Article

Comparison of Outcome of Laparoscopic and Open Inguinal Hernioplasty

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ABSTRACT

Objective: To determine the outcome of Open and laparoscopic Inguinal Hernioplasty.
Study Design: Comparative prospective study.
Place and Duration of Study: Department of Surgery Combined Military Hospital, Multan Pakistan, from Sep 2021 to Oct 2022.
Methodology: One hundred patients were enrolled and divided into Group-A and Group-B based on a technique used. Patents with a working diagnosis of inguinal hernia aged 13 to 90 years were included in the study. The data was collected from the participants at one week and six months post-operatively.
Results: The mean age of patients was 43.87±13.63 years. The mean operative time was 70.5±10.48 minutes. The mean hospital stay was 1.88±0.79 days. The median post-op pain at 0 hours was 2(2–1); at 6 hours was 4(6–3); at 12 hours was 5(5–4) and at 24 hours was 5(6-3).
Conclusion: The laparoscopic surgical technique is a wonderful addition to the surgical tool kit of a surgeon. When performed by experienced persons, there is speedy recovery and reduced hospital stay with minimal morbidity and mortality. It is highly recommended for inguinal hernioplasty.

Keywords: Herniorrhaphy, Hernia, Laparoscopy, Hernia, Pain, Pain measurement, Length of stay, Postoperative.

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INTRODUCTION

Among the adult population, surgical intervention for inguinal hernia repair is one of the common procedures done.[1,2] A thorough knowledge of anatomy, meticulous surgical technique, and optimization of the patient before operation are essential for optimal outcomes. The surgical intervention for treating inguinal hernia has evolved.[3,4]

With the further development of surgical techniques to improve surgical outcomes with minimally invasive approaches, laparoscopy has gained widespread acceptance in today`s modern era.[5] The laparoscopic cholecystectomy has become the gold standard as compared to open cholecystectomy as the benefits and efficacy have been well established and accepted among the surgical community around the globe.[6] Initially, it was limited to basic procedures like diagnostic laparoscopy, cholecystectomy and appendectomy. However, the list of procedures using the laparoscopic technique has expanded widely.[7] Like other procedures performed laparoscopically, the surgeons started the laparoscopic approach for hernioplasty.8 The debate continues about open and laparoscopic approaches for the repair of inguinal hernia. Both approaches have their own merits and demerits. The open technique can be safely used under local and spinal anaesthesia. However, laparoscopic repair of inguinal hernia cannot be performed under local or spinal anaesthesia; general anaesthesia is required.[9,10]

With increasing trends towards the use of minimally invasive surgery around the globe, the open technique for inguinal hernia repair shows a downward trend. There are multiple studies on this topic internationally. However, there needs to be more local literature. The objective of this study was to share first-hand experience of inguinal hernioplasty in our set, comparing both techniques. This study was designed to compare these two approaches in our set-up.

METHODOLOGY

The comparative study was conducted at the Department of Surgery Combined Military Hospital Multan, Pkaitan from September 2021 to October 2022 after approval from the Institutional Review Board (letter no. 44/2022 dated 30th September 2022). The sample size was calculated by taking pain score (VAS)

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at 24 hours in the open hernia repair group as 6.32±2.81 and 3.76±1.53 in the laparoscopic repair group, using the standard formula.10

Inclusion Criteria: Patents aged 13 to 90 years with the diagnosis of inguinal hernia were included.

Exclusion Criteria: Patients with recurrent hernia, diabetes, Hepatitis and immunocompromised stats were excluded.

In total, 100 patients were enrolled for this study through consecutive sampling. These patients were randomly divided into two groups. Group-A patients were operated on using the open hernioplasty technique. In contrast, Group-B patients were operated on using the laparoscopic technique. For Group- B (laparoscopically operated), the trans-abdominal preperitoneal (TAPP) repair using synthetic Mesh was used. Before the study, the patients were informed about the procedure in detail. A written informed consent was obtained from every patient before using his data for this study. The patients were counselled in detail about the nature of the operation, use of Mesh, type of anaesthesia, duration of hospital stay, possible intra- and post-operative complications, and regular follow-ups in Out Patient Department.

All patients of Group-B were operated on under general anaesthesia, and Group-A patients were operated on under spinal or general anaesthesia.

A specifically designed proforma for this research project was provided to the patients willing to participate. Each participant was assigned an identity (ID) NO for this study for identification. Demographic variables for this research work were age, gender, qualification level and address. The results of the study recorded in the post-operative period included duration of operation in hours, duration of hospital stay in days, seroma formation, hematoma formation and post-operative wound infection (Major and Minor). The post-operative pain was measured using a Likert scale (7), rating from 0 to 10. It was further divided into three groups: Mild (score 1-3), Moderate (Score 4-7) and severe (score 8-10).[12]

The pain assessment was done at o, 6, 12, and 24 hours post-operatively. The variables recorded at six months post-operatively were chronic pain, scar pain, recurrence of hernia and reoperation.

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 23.00.Mean±SD was calculated for continuous variables. Median (IQR) was calculated for pain scores at 0, 6, 12 and 24 hours. Frequency and percentage were calculated for categorical variables. For the Pain score, the Mann-Whitney U test was used; for continuous variables, an independent sample t-test was used; and for categorical variables, the chi-square test was used. The *p*-value of ≤ 0.05 was considered significant.

RESULTS

A total of 100 patients (50 each group) were studied. The mean operative time was 70.5±10.48 minutes. The mean hospital stay was 1.88±0.79 days. Of the total, 98 % of patients were male, and 2% were females. The median post-operative pain at 0 hours was 2(2 – 1); at 6 hours was 4(6 – 3); at 12 hours was 5(5 – 4) and at 24 hours was 5(6-3).

There was no report of seroma formation, hematoma formation, or wound infection (major or minor). There was no recurrence of hernia, gut adhesion, or reoperation. The Chronic pain was as follows: 9(9%) patients had mild pain, 5% had moderate pain, and 2% had severe pain. The difference between different study groups is shown in the Table-1.

DISCUSSION

Laparoscopy is a wonderful addition to the armamentarium of surgical specialists for a wide spectrum of diagnostic and therapeutic procedures. With advancements in modern technologies, the list of operations performed using minimally invasive techniques continues to expand. This addition has contributed positively by reducing morbidity and mortality in surgical patients.[12] As the metabolic response to trauma in surgical patients is proportionate to the severity of the injury, the use of the laparoscopic technique reduces post-operative metabolic response and stress. This leads to smooth and speedy post-operative recovery, a reduced hospital stay, and an early return to resume daily activities.[13] In our study, the hospital stay of laparoscopically operated patients was significantly lower than those operated by an open approach (1.48±0.814 ver 2.28±0.53 days, *p*-value < 0.05). Similar findings were reported by Colak *et al*.[13]

Compared to the open hernioplasty technique, the laparoscopic technique consumes more time to complete this procedure. This duration may be reduced with further refinement in technology and surgical experience. In our study, the average operation time in an open approach was 60±3.003 minutes, while in laparoscopic patients, the average operation time was 80.10±2.62 minutes. This finding is

Table-I:. Characteristics of Patients in both Study Groups (n=100)

Characteristics of Patients		Group-A (Open operation)(n=50)	Group-B (laparoscopic operation)(n=50)	*p*-value
Age		42.34±13.72 years	45.40±13.5 years	0.153
Gender	Male	50(100%)	48(96%)	0.495
	Female	0(0%)	2(4%)	
Type of Hernia	Direct	17(34%)	17(34%)	0.583
	Indirect	33(66%)	33(66%)	
Side of Hernia	Right	30(60%)	26(52%)	0.693
	Left	17(47.2%)	19(52.8%)	
Scar Pain	No Pain	42(84%)	48(96%)	0.196
	Mild Pain	5(10%)	2(4%)	
	Moderate Pain	2(4%)	0(0%)	
	Severe Pain	1(2%)	0(0%)	
Chronic Pain	No Pain	37(74%)	47(94%)	0.027*
	Mild Pain	6(12%)	3(6%)	
	Moderate Pain	5(10%)	0(0%)	
	Severe Pain	2(4%)	0(0%)	
Operative time(minutes)		60.00± 3.00	80.10±2.62	<0.01*
Hospital Stay(days)		2.28±0.53	1.48±0.814	<0.01*
Post Operative Pain at 0 Hours		2(2-2)	1(1.25–1)	<0.01*
Post Operative Pain at 6 Hours		6(6-4)	3(4–3)	<0.01*
Post Operative Pain at 12 Hours		5(6–5)	4(4–4)	<0.01*
Post Operative Pain at 24 Hours		6(6.25–6)	3(4–3)	<0.01*

statistically significant, *p*-value <0.05. These findings are similar to the study conducted by Rathod *et al*.[14] They revealed 55.24 minutes in the open approach and 72.02 minutes in the laparoscopic technique.

Post-operative pain is one of the main concerns among all surgical patients. Although the post-operative pain is subjective, it is associated with the magnitude of trauma to the tissues caused during the procedure. This can be diminished by using the minimally invasive approach. Our study revealed that post-operative pain was significantly lower (*p*-value <0.05) among the patients operated by the laparoscopic technique than the open technique. This finding was the same in the immediate period, at 6 hours, 12 hours, and 24 hours post-operatively. The lower use of post-operative analgesics can be cost-effective and avoid complications associated with the use of these drugs. This may be due to smaller incisions, minimal dissection and handling of cord structures. Amid *et al*.[15] reported similar findings.

In early post-operative follow-up, Post-operative scar pain is another major concern among surgical patients. In our study, the post-operative scar pain in the early post-operative period was reported in a lower number of patients laparoscopically as compared to the patients operated by open technique. However, the difference was not statistically insignificant (*p*-value 0.196). However, on long-term follow-up, the chronic pain was significantly lower among the patients treated by the laparoscopic approach as compared to the open one (*p*-value 0.027).

Although mentioned in the previous study, there was no case of testicular atrophy and late post-operative hydrocele.[16] This can be a worry for the patients and can lead to litigation. Moreover, the hydrocele may require surgical intervention, adding additional cost and stay in the hospital.

Infection can be a very devastating complication in patients with inguinal hernia operated by placement of synthetic Mesh. It is often difficult to manage, and sometimes synthetic Mesh has to be removed if the infection does not settle with antibiotics and dressings. This can lead to extended hospital stays, additional procedures, increased cost, delayed recovery and return to normal life. Fortunately, there was no case of infection in any group of patients. This may be attributed to proper aseptic measures, meticulous surgical technique and rationale use of antibiotics pre-

operatively and post-operatively in these patients. On the contrary, various studies have reported some cases of infection among these patients.[17,18]

Recurrence after hernioplasty is a concern among all patients, and they do inquire about it in pre-operative counselling sessions. The incidence of hernia recurrence has reduced after using synthetic Mesh as compared to earlier techniques using local tissues only for hernia repair. Recurrence can occur both in early and late follow-up periods. In our study, neither case had any early or late follow-up recurrence. This can be credited to sound knowledge of anatomy and meticulous surgical technique for placing synthetic Mesh in these patients.

In the present study conducted in our set-up, no mortality was reported in any laparoscopic or open surgery. Similarly, complications like vascular injury, bladder injury, and injury to the spermatic cord were not reported in any group of patients. Jin *et al*. reported similar findings in their study published in 2020.[19]

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CONCLUSION

The laparoscopic surgical technique is a wonderful addition to the surgical tool kit of a surgeon. When performed by experienced persons, there is speedy recovery and reduced hospital stay with minimal morbidity and mortality.It is highly recommended for inguinal hernioplasty.

Conflict of Interest: None.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

MAM & ZUK: Data acquisition, critical review, approval of the final version to be published.

GA & HUR: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

AW & SMM: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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