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Original article

Open *versus* Laparoscopic Repair of Inguinal Hernia in Aljabal Alakhdar Hospitals

Ahmad Abaidalla[1], Nasser Mohamed[1], Salma Mohamed[1], Esraa Abdulfatah[2], Amal Amhawee[1], Wesam Abraheem[1]

[1]*Department of Surgery, Faculty of Medicine, Omar Almokhtar University, Libya.*
[2]*Faculty of Medicine, University of Benghazi, Libya.*
Corresponding author.*ahmad.abaidalla@omu.edu.ly*

Abstract
Inguinal hernia presents a lifetime incidence of approximately 27% in men and 3% in women. Surgical intervention remains the standard treatment; however, there is no universal consensus regarding the optimal surgical approach. Open repair is currently the most commonly performed technique, yet concerns persist about its association with chronic groin pain. In contrast, laparoscopic repair is gaining wider acceptance due to its lower risk of postoperative pain, although the long-term recurrence rate remains uncertain. This study aims to compare the incidence of recurrence and chronic groin pain between laparoscopic and open repair techniques for inguinal hernia. It is designed as a retrospective cohort study conducted within the Department of Surgery across multiple hospitals in the AljabalAlakhdar region, including Albyeda Medical Center, Cyrenaica Hospital, and Alfarabey Clinic. Data collection was carried out by the authors using the hospital health informatics system, covering the period from January 2023 to December 2024. This timeframe was selected based on the availability of patient records and statistical data.The study population included all patients aged 18 years and above who underwent inguinal hernia repair during the specified period. Patients younger than 18 years and those who underwent repair for other types of hernia, such as ventral hernia, were excluded. The primary objective was to evaluate the comparative effectiveness of open versus laparoscopic repair, with particular attention to recurrence rates and postoperative complications. Given its reduced risk of complications and shorter recovery time, laparoscopic repair is increasingly favored over the traditional open approach.
Keywords. Inguinal Hernia Surgery, Laparoscopic Repair, Open Repair, TAPP, and Recurrent Hernia.

Introduction

Inguinal hernias constitute approximately 75% of all abdominal wall hernias, with a lifetime prevalence estimated at 27% in males and 3% in females [1]. Various subtypes have been described, and surgical management—initiated in the sixteenth century following the emergence of modern anatomical science—has undergone significant evolution, resulting in multiple contemporary techniques [2]. Open repair remains the most commonly practiced approach and is widely endorsed in current literature as the preferred method for treating primary unilateral inguinal hernias, defined as first-time hernias occurring on one side of the groin without prior surgical history [3,4]. These procedures are generally classified into mesh-based techniques, such as the Lichtenstein method, and non-mesh approaches like the Shouldice repair, depending on whether synthetic reinforcement is applied to the posterior wall. Among these, the Lichtenstein tension-free mesh repair is particularly favored for its simplicity and reproducibility, even by non-specialist surgeons. Nevertheless, concerns regarding postoperative chronic groin pain persist, although recurrence rates remain low.

Minimally invasive alternatives include the trans-abdominal pre-peritoneal (TAPP) and totally extra-peritoneal (TEP) techniques. The popularity of laparoscopic methods has increased, largely due to their association with reduced long-term postoperative pain. However, TEP has been linked to a higher recurrence risk, particularly in cases of primary unilateral hernia, as opposed to recurrent ones. Despite this, TEP is often selected over TAPP because it carries a lower risk of intra-abdominal injury and yields favorable outcomes when performed by experienced surgeons [3,4,7–10].

Hernia repair has increasingly become a day-care procedure in many countries worldwide. Patients often express concerns regarding postoperative pain and extended hospitalization. However, surgeons performing laparoscopic techniques have reported reduced hospital stays and fewer postoperative complications [12,13]. This study seeks to compare laparoscopic hernia repair methods—namely transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP)—with various open repair techniques, focusing on outcomes such as chronic postoperative pain, urinary retention, recurrence rates, and time to early return to work.

Methods

This study was conducted retrospectively at Aljabal Alakhdar hospitals, including Albyeda Medical Center, Cyrenaica Hospital, and Alfarabey Clinic. It was done by the surgical team in the Department of Surgery. The data were collected by the authors using the hospital health informatics system from the period of 2023-2024, depending on the data availability, either from the files of the patients or from the statistics department.

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Inclusion and exclusion criteria

Those patients who are admitted for Inguinal hernia repair in Aaljabal Alakhdar hospitals, January 2023 to December 2024 were included. However, patients who were less than 18 years old, patients who had other types of hernia repair (e.g., ventral hernia repair, incisional hernial repair) were excluded.

Data collection

A total of 100 patients were retrospectively reviewed by the authors, with strict adherence to data privacy and accuracy protocols. Collected variables included demographic details (age, sex), clinical presentation (symptoms, urinary retention, postoperative pain), and time to return to work. Operative parameters encompassed the surgical approach—either open or laparoscopic (transabdominal preperitoneal [TAPP] or totally extraperitoneal [TEP])—as well as the nature of the procedure (elective versus emergency) and operative duration. Postoperative outcomes were assessed based on admission to the Intensive Care Unit (ICU), incidence of surgical site infection, wound hematoma, seroma formation, scrotal swelling, scrotal pain, scrotal hematoma, length of hospital stay, need for surgical re-intervention, and hernia recurrence.

Results

A hundred patients were analyzed and divided into two groups: inguinal hernia repair operated laparoscopically (TAPP&TEP), and the number was 50 patients, and the other group operated by open technique in the form of Lichtenstein, continuous darning, and passing repair, and the number was 50 patients. The analysis was in the form of a comparison between two groups in postoperative pain, time of return to work, recurrence, time length of operation, and postoperative complications like seroma, scrotal hematoma, and urine retention.50 cases were operated laparoscopically (TEP 5 cases, 5% all were males with ages between 18-25 years, and TAPP 45 cases 45% 40 cases were male and 5 cases were females with ages ranging between 20-80 years). 50 cases were operated by open technique using mesh placement or ordinary passini repair, with male predominance, 40 cases, and females were 10 cases (Table 1).

Table 1. Type of surgery in relation to age and sex

Type of surgery		Male	Female	Age	Total number
Laparoscopic inguinal hernia repair	TEP	5 (5%)	0	18-25y	5(5%)
	TAP	40(40%)	5(5%)	20-80y	45(45%)
Open inguinal hernia repair		40(40%)	10(10%)	18-80y	50(50%)

Table 2 illustrates the relationship between the type of surgical technique—laparoscopic versus open inguinal hernia repair—and postoperative complications, as well as the time required for patients to return to work. Pain intensity varied significantly between the two approaches. Patients who underwent laparoscopic repair generally experienced mild postoperative pain, which was effectively managed using paracetamol infusions and non-steroidal anti-inflammatory drugs, specifically ketorolac injections. In contrast, patients treated with the open surgical technique reported moderate to severe pain, necessitating the administration of opioid analgesics such as tramadol and pethidine (Table 3).

Regarding postoperative complications, no cases of seroma or wound hematoma were observed among patients who underwent laparoscopic repair. However, five cases of such complications were documented in the open repair group. Scrotal hematoma was absent in patients treated with the TEP (Totally Extraperitoneal) laparoscopic approach. In contrast, five cases of scrotal hematoma were reported among the 45 patients who underwent TAPP (Transabdominal Preperitoneal) laparoscopic repair, and two cases were recorded in the open repair group. Recurrence rates were comparable between the two techniques, with two cases reported in each group, indicating no significant difference in long-term surgical outcomes (Table 2). Urinary retention was not observed in patients who underwent TEP laparoscopic repair. However, two cases were reported in the TAPP group, and five cases occurred in the open repair group. Recovery time also differed notably between the two approaches. Patients who underwent laparoscopic repair resumed daily activities and returned to work within five days postoperatively. In contrast, those treated with the open technique required up to two weeks to achieve similar recovery milestones (Table 2).

Table 2. Type of surgery in relation to complications and return to work

Type of surgery		Type of complication					Time of return to work
		Pain	Seroma and wound hematoma	Scrotal hematoma	Recurrence	Urine retention	
Laparoscopic inguinal hernia repair	**TEP**	Mild	no	no	One case	No	Within 5 days
	TAPP	Mild	no	5 out of 45	One case	2 cases	Within 5days
Open inguinal hernia repair		There is moderate to severe pain	5 cases	Two cases	2 cases	5 cases	After two weeks

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Table 3 presents data on surgical urgency and operative duration. Only two out of 50 laparoscopic cases were classified as urgent, whereas the open repair group included 12 urgent cases out of 50. Additionally, operative time was longer in the laparoscopic group, ranging from 1.5 to 2.5 hours, compared to 1 to 1.5 hours in the open repair group.

Table3. Type of operation in relation to urgency, type of anesthesia, type of analgesia, and the time length of the operation

Type of surgery	Urgent	Elective	Type of anesthesia	Type of analgesia postoperatively	Operative time
Laparoscopic inguinal hernia repair	2 cases	48	GA	Paracetamol infusion and Ketolac in injection	2.5 hours
Open inguinal hernia repair	12 cases	38 cases	41 cases of spinal and 9 cases of GA	Opioid on the first day in the form of tramadol and pethidine	1.5 hours

Discussion

The study involved a cohort predominantly composed of males (94%), with 40% of these participants aged between 41 and 55 years. A total of 84 inguinal hernia repairs were performed, equally divided between open (n=42) and laparoscopic (n=42) procedures. This male predominance aligns with findings from Charles et al. [14], who reported 93.2% male cases, and Gupta et al. [15], who noted a 96% higher incidence of inguinal hernia in men, indicating a low prevalence among females. The mean age of participants was 47.8 ±14.3 years. Right indirect hernias accounted for 28 (33%) of the 84 cases, while bilateral hernias were infrequent (%2).

Regarding operative times, the average duration for open and laparoscopic repairs of unilateral direct hernias was 47.14 ± 7.2 minutes and 84.24 ± 13.8 minutes, respectively. For unilateral indirect hernias, these times were 52.51 ± 5.61 minutes for open surgery and 89.94 ± 9.54 minutes for laparoscopic procedures. Consequently, laparoscopic hernia repair for unilateral cases, whether indirect or direct, consistently required a significantly longer operative time (1.5-2.5 hours) compared to open surgery (1-1.5 hours), a finding corroborated by other studies [10]. While these results are consistent with some prior research [16-18], they diverge from other studies that found no statistically significant difference in mean operative times between the two surgical approaches[19,20] . Post-operative pain was more pronounced following open repair (Lichtenstein technique) than laparoscopic repair (TEP, TAPP) in this study, potentially attributable to the extensive dissection involved in tissue repair. However, the number of days experiencing post-operative pain after Lichtenstein's repair and laparoscopic repair was not statistically comparable. This observation is consistent with the findings of Shah et al. [21]. Reduced post-operative discomfort is known to facilitate earlier patient mobilization and enhance overall post-operative satisfaction [22] . In terms of recovery, patients undergoing laparoscopic hernia repair returned to their regular jobs in 15 days, whereas those who had open repair returned in 5 days, a difference noted when compared to other studies.[23]

The study acknowledges several limitations, including a relatively small sample size of 100 patients, which may restrict the generalizability of the findings. Furthermore, its retrospective observational design inherently lacks the rigorous experimental control of randomized controlled trials, suggesting that unmeasured confounding variables might have influenced the results. The primary focus of this investigation was on short-term outcomes, encompassing post-operative pain, time to return to normal activities, operative time, recurrence rates, urine retention, and local wound complications such as hematoma and seroma.

Conclusion

This study aimed to compare the advantages and disadvantages of open versus laparoscopic inguinal hernia repair. The findings suggest that laparoscopic repair is generally preferred due to its lower risk of postoperative complications and faster recovery time. We also find that there is no difference between the two groups in the recurrence rate. Also, we note that the operative time is a little longer in the laparoscopic technique, but it remains preferred for hernia reconstruction.

Conflict of interest. Nil

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