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THE RISK OF WOUND INFECTION AFTER LAPAROSCOPIC INGUINAL HERNIA REPAIR A RETROSPECTIVE STUDY AT THE ROYAL MEDICAL SERVICE, JORDAN

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ABSTRACT

Objective: to assess the risk of surgical site infection after laparoscopic inguinal hernia repair. Methodology: It's a retrospective study of 269 procedures performed at King Hussien Medical Hospital over a one-year duration from January 2023 to January 2024. All surgical procedures were transabdominal preperitoneal (TAPP) laparoscopic hernia repair with an underlay polypropylene mesh at the same hospital and by one unit. Data before surgery were collected and documented regarding age, sex, and type of inguinal hernia. All patients were followed for one month after surgery through two outpatient visits. Surgical site infection diagnosed clinically (hotness, redness, pain, and fever) and proven by doing laboratory tests of WBCs and detecting wound collection radiologically (ultrasound or CT scan). **Results:** The commonest site in both groups was the right side, followed by the left and finally the bilateral, Rt 116 (43.1%), Lt 105 (39.0%), bilateral 48 (17.8%), with a significant difference between the two groups, P value < 0.001; most of the bilateral inguinal hernia were managed laparoscopically. On the 7th day after surgery, the infection rate was significantly different and common in group B, open approach, with a P value of 0.003, while the results were completely different on the 14th day after surgery; there was a significant difference in both groups, and the rate of infection was very low, Phi test 0.178. **Conclusion:** we conclude that the laparoscopic inguinal hernia is better than the open technique and carries a lower infection rate and shorter hospital stay.

KEYWORDS: infection rate, inguinal hernia, laparoscopy.

INTRODUCTION

Inguinal hernia repair is the most common surgical procedure performed worldwide, It's common in both sexes, predominantly among male patients, and it occurs in all age groups. The disease could be congenital due to patent processes vaginalis or acquired due to chronic cough or constipation.[1]

Hernioplasty is a surgical procedure through which a hernial defect is repaired with the insertion of polypropylene mesh; it's performed either laparoscopically or with an open approach. Historically, open surgical repair, specifically tension-free Lichten schtien repair, was the gold standard technique. This idea became different in the era of laparoscopic surgery; the minimally invasive surgery became more popular with shorter hospital stay and good early recovery.[2]

There are two types of laparoscopic inguinal hernia repair: the 1st one is total abdominal preperitoneal (TAPP), which is the most common approach, and the 2nd one is total extraperitoneal (TEP).

The surgical site infection is a serious and uncommon complication after surgery; the infection rate differs according to the type of surgery and insertion of foreign bodies like mesh and prosthesis. The surgical site infection is classified into 4 major classes: clean wound, clean-contaminated, contaminated, and dirty wound.[3]

The main aim of our study is to compare the risk of infection between two procedure modalities, the open and the laparoscopic technique.

METHODOLOGY AND MATERIAL

Study design and sample size

The study is retrospective, conducted at King Hussien Medical Hospital over a one-year duration, from January 2023 to January 2024. The study includes 269 procedures performed by the same surgical team and at a single center. All surgical procedures were transabdominal preperitoneal (TAPP) laparoscopic hernia repair with insertion of underlay polypropylene mesh.

Retrospectively, data were collected and analyzed regarding certain variables such as age, gender, type of inguinal hernia, site of inguinal hernia, and presence of infection. All patients were followed up at the outpatient clinic twice, on the 7th day and on the 14th day after surgery.

Royal Medical Service electronic medical system (HAKEEM) was our medical records reference.

All patients were classified into two major groups: group A, 197 cases, the laparoscopic group, and group B, 93 cases, the open group.

Wound infection is identified as a regional and systemic response to microbial colonization of the surgical wound and is diagnosed clinically by the presence of wound collection, hottness, tenderness, redness, and fever.

Presence of leukocytosis, with WBC more than 14000, with local wound signs, confirms the diagnosis.

Inclusion and exclusion criteria

A healthy population that underwent the inguinal hernia repair was included, while all patients with comorbidities such as DM, Obesity, low immune patients and any factor that could increase the risk of infection were excluded from the study.

Surgical techniques

Laparoscopic approaches: after scrubbing and skin draping pneumoperitoneum was created under pressure of 14, by insertion of a 12mm trocar through an open technique, and another two 5mm trocars were inserted as working graspers. First step is creating a peritoneal flap, then reducing the hernial sac, and then applying the polypropylene mesh, which is fixed by tissue tackers, finally wound closure after securing hemostasis and counting.

Open technique: after scrubbing and skin draping, a 10 cm skin incision over the inguinal canal, open the abdominal wall layers and external oblique to open the inguinal canal, identification of the hernial sac, separation of the hernial sac from the spermatic cord, and resection of the hernial sac. The 1st step in hernioplasty is repairing the posterior wall (internal oblique), the conjoint tendon to the inguinal ligament, then applying polypropylene mesh, and finally closing the external oblique aponeurosis and skin after securing hemostasis and correct counting.

Statistical analysis

The categorical data were expressed in frequency and percentage, while the scale data were expressed as mean and standard deviation. Chi-square test or Fisher exact test as appropriate, was used to investigate proportion differences in categorical data. However, an independent t-test was utilized for continuous variable. SPSS software Version 28 was used to analyze the data, and a P-value less than 0.05 was deemed statistically significant.

Ethical approval: the study was approved for publication by the Ethical Committee at the Royal Medical Service number 32\12\2025.

RESULTS

There was no significant difference between the two groups regarding age, and the mean and SD were 54.71 (15.42) years. The percentage was more common in males than in females, 176 (65.4%), 93 (34.6%), respectively.

The commonest site in both groups was the right side, followed by the left and finally the bilateral, Rt 116 (43.1%), Lt 105 (39.0%), bilateral 48 (17.8%), with a significant difference between the two groups, P value < 0.001; most of the bilateral inguinal hernia were managed laparoscopically.

On the 7th day after surgery, the infection rate was significantly different and common in group B, open approach, with a P value of 0.003, while the results were completely different on the 14th day after surgery; there was a significant difference in both groups, and the rate of infection was very low, Phi test 0.178.

DISCUSSION

Our study has several strengths. The single-center design and standardized surgical approach performed by a single surgical team minimized variability and potential biases associated with differing surgical techniques. In addition, comprehensive data collection, including detailed demographic information, allowed for thorough comparisons between the two patient groups.

There was no difference between two groups regarding standard deviation of age it was around 45.7 years, which is almost similar to many studies in the literature review.[4]

The commonest side was the right side, accounting for 43%, the left side was 39%.

While the bilateral side was 18% just like the result of Yahia, Ahmed M.; and Arafa, Mohamed A. in The

development of metachronous contralateral inguinal hernia after unilateral inguinal hernia repair in infants and children.[5]

Li, MW., Fang-Sheng Tsai, and his colleagues noticed that the rate of bilateral inguinal hernia repair is 25%, and around 93% of patients were male patients. We found a lower percentage among male, and the bilaterality is lower than their results.[6]

Paul, B., and his colleagues concluded from their study(Laparoscopic Transabdominal Preperitoneal Repair Is Better Than Open Lichtenstein Hernioplasty in Inguinal Hernia Surgery in Terms of Initial Outcome) that Lichtenstein inguinal hernia repair is associated with worse postoperative outcomes in terms of wound infection and prolonged hospital stay. At the same time, the rate of infection was 7 % in the laparoscopic group and 30% in the open approach. It's not exactly like our study, we found 7% infection rate in the open group and 0.6% in the laparoscopic group.[7]

In the literature review, we found results similar to ours, as described by P, JAYAN & L, DEEPAK, they found the rate of infection after the laparoscopic group was 2% while it was 25% among the open group.[8]

Most of the studies in the literature review proved good postoperative outcomes among laparoscopic groups in terms of surgical wound infection.[9,10,11,12]

Table 1: Shows Differences Between The Open And Laparoscopic Groups Regarding Age, Gender, Type, And The Site Of Hernia.

Variables	Total	laparoscopic	open	Test value	p-value
Age / year Mean (SD)	54.71 (15.42)	54.68 (14.39)	54.76 (16.81)	-0.043 ^{t}	0.966
Gender					
Male	176 (65.4%)	109 (69.4%)	48 (30.6%)	2.666 ^{X2}	0.102
Female	93 (34.6%)	48 (30.6%)	45 (40.2%)		
Site of inguinal hernia					
Left side	105 (39.0%)	49 (31.2%)	56 (50.0%)	28.306 ^{X2}	***<0.001***
Right side	116 (43.1%)	64 (40.8%)	52 (46.4%)		
Bilateral	48 (17.8%)	44 (28.0%)	4 (3.6%)		

X^2 Chi-square, t : independent t-test

Table 2: The percentage of infection after inguinal hernia repair, comparison between the two groups.

Infection on the 7th day	Surgery		Test value	p-value	Phi
	laparoscopic	open	8.556	***0.003*** ^{X2}	0.178
No	156 (99.4%)	104 (92.9%)			
Yes	1 (0.6%)	8 (7.1%)			
Infection on the 14th day					
No	156 (99.4%)	111 (99.1%)	---	1.0 ^{F}	0.015
Yes	1 (0.6%)	1 (0.9%)			

X2 Chi-square, F Fisher exact test

CONCLUSION

We conclude that the laparoscopic inguinal hernia is better than the open technique and carries a lower infection rate and shorter hospital stay.

REFERENCES

1. Dalaf, F. A., Abed, F. N., & Ibrahim, O. K. Epidemiology and Risk Factors for Recurrence of Inguinal Hernia. South Eastern European Journal of Public Health, 2024; 350–358. https://doi.org/10.70135/seejph.vi.712
2. Schwab, Marisaa; Khan, Faraza; Kieran, Kathleenb,c. Pediatric inguinal hernia: open versus laparoscopic approaches to surgical management. Current Opinion in Pediatrics, October 2025; 37(5): 482-487. | DOI: 10.1097/MOP.0000000000001498.
3. Jae H Joe, Francine Breckler, Samina S Bhumbra, Rodica loana Mararu, Comparison of the incidence of surgical site infections in patients who receive clindamycin vs. beta-lactam antibiotics for pediatric gastrointestinal surgery, Journal of the Pediatric Infectious Diseases Society, October 2024; 13(3): S11–S12.
4. Meier J, Stevens A, Berger M, et al. Comparison of Postoperative Outcomes of Laparoscopic vs Open Inguinal Hernia Repair. *JAMA Surg.*, 2023; 158(2): 172–180. doi:10.1001/jamasurg.2022.6616.
5. Yahia, Ahmed M.; Arafa, Mohamed A.; Khirallah, Mohammad G.; Turki, Ali M. The development of metachronous contralateral inguinal hernia after unilateral inguinal hernia repair in infants and children. Tanta Medical Journal, July-September 2024; 52(3): 265-269. | DOI: 10.4103/tmj.tmj_3_24.
6. Li, MW., Fang-Sheng Tsai, V., Chao, TC. *et al*. Laparoscopic versus robotic total extraperitoneal (TEP) inguinal hernia repair: a multicenter, propensity score weighted study. *Hernia*, 2025; 29: 276. https://doi.org/10.1007/s10029-025-03467-9.
7. Paul, B., Alam, K. Z., Mostafa, F., Abedin, M. A., Hossain, A., & Akter, S. Laparoscopic

Transabdominal Preperitoneal Repair Is Better Than Open Lichtenstein Hernioplasty in Inguinal Hernia Surgery in Terms of Initial Outcome. *Journal of Chittagong Medical College Teachers' Association*, 2025; *34*(2): 141–145.

8. P, JAYAN & L, DEEPAK & ANTONY, AJIL. (2023). A COMPARATIVE STUDY BETWEEN LICHTENSTEIN'S TENSION FREE HERNIOPLASTY UNDER LOCAL ANAESTHESIA VERSUS MINIMALLY INVASIVE LAPAROSCOPIC APPROACH FOR INGUINAL HERNIAS. International Journal of Surgery and Medicine. 1. 10.5455/ijsm.136-1659691651.
9. Saikumar, Immadi & Kshirsagar, Vinayak & Dnyanmote, Anuradha & Tirmanwar, Vedanth & Agarwal, Saumya. (2025). A Comparative Study of Open versus Laparoscopic Sublay Repair for Ventral Hernia. Annals of African medicine. 10.4103/aam.aam_206_25.
10. Hadi, Hala & Maw, Andrew & Sarmah, S & Kumar, P. Intraperitoneal tension-free repair of small midline ventral abdominal wall hernias with a Ventralex hernia patch: Initial experience in 51 patients. Hernia: the journal of hernias and abdominal wall surgery, 2006; 10: 409-13. 10.1007/s10029-006-0127-x.
11. Gabriel, Kevin & Berhimpon, Siemon. LAPARASCOPIC VERSUS OPEN MESH REPAIR FOR RECURRENT INGUINAL HERNIA: A SYSTEMATIC REVIEW. Journal of Advanced Research in Medical and Health Science (ISSN 2208-2425). 2024; 10: 22-28. 10.61841/7d4qq784.
12. El-Dhuwaib, Yesar & Corless, David & Emmett, Charis & Deakin, Mark & Slavin, John. Laparoscopic versus open repair of inguinal hernia: A longitudinal cohort study. Surgical endoscopy, 2012; 27. 10.1007/s00464-012-2538-3.