



Comparison of Total Extra Peritoneal and Transabdominal Pre-Peritoneal Inguinal Hernia Repair

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ABSTRACT

Objectives: To compare the laparoscopic TEP technique with the TAP for inguinal hernia repair. **Study Design:** Randomized controlled trial (RCT). **Place and Duration of Study:** Department of General Surgery, Holy Family Hospital, Rawalpindi from 30th November 2023 to 29th May 2024. **Methodology:** A total of 150 patients with inguinal hernia were included. Patients were allocated to the two groups (Group A: Total Extra Peritoneal and Group B: Transabdominal Pre-Peritoneal). **Results:** In our study, mean operative time in TEP group was 64.31 ± 7.35 minutes while in TAPP group was 87.20 ± 6.01 minutes. Mean post-operative pain in TEP was 1.87 ± 1.08 while in TAPP group was 4.11 ± 1.44 . Mean hospital stay in TEP was 1.73 ± 0.66 days while in TAPP was 5.15 ± 0.90 days. Mean time to return to daily work in TEP group was 5.45 ± 1.22 days while in TAPP was 10.28 ± 2.89 days. **Conclusion:** This study concluded that mean operative time, mean postoperative pain, mean hospital stay and time to return to daily work is less after TEP technique for inguinal hernia repair as compared to laparoscopic TAPP repair.

INTRODUCTION

Inguinal hernia repair (IHR) is a common surgical procedure. Even though there have been many reported treatments for hernias over 200 years, the discussion around "the best groin hernia repair" has expanded to include minimum access procedures. The minimal invasive method has several advantages, such as reduced pain during the initial postoperative phase, reduced requirement for both opioid and non-opioid analgesics, improved cosmetic results¹. After reviewing over 40 RCTs in 2001, the NICE came to the conclusion that although laparoscopic treatment of an inguinal hernia was less painful and needed a shorter recovery period than open surgery, it was more costly².

Less invasive surgery is becoming more and more popular. Two most popular laparoscopic techniques for treating IHR are TEP and TAPP Technique. Each has distinct advantages over the other³.

Two standardized procedures for laparoscopic inguinal hernia repair are TAPP⁴ and TEP⁵. There is conflict on the best laparoscopic procedure because

each technique has pros and cons. The advantages of TAPP include its ease of use, clear visualization, and disadvantages are breaching the peritoneal cavity, which raises the possibility of bowel adhesions to the mesh and increases the danger of visceral injuries and their recurrence. The advantages of TEP include direct access to posterior anomalies, a decreased risk of visceral injuries, and the preservation of the peritoneal cavity throughout the treatment⁶.

Gangopadhyay and Ghosh did research to compare the results of TEP and TAPP correction of inguinal hernia. The mean operating time for surgery differed significantly ($p < 0.0001$) between TAPP (86.72 ± 6.39 min) and TEP (99.72 ± 7.36 min). TAPP had a longer hospital stay (5.27 ± 0.93 days) compared to TEP (2.62 ± 0.70). The average time to resume regular activities was 10.87 ± 1.41 days (TAPP) and 6.21 ± 0.85 days (TEP). Mean postoperative pain was 7.6 ± 0.70 in TEP 7.9 ± 0.60 in TAP after 24 hours, 4.8 ± 0.98 in TEP 6.8 ± 1.69 in TAP at 2 days, and 1.4 ± 0.50 in TEP 4.3 ± 0.96 in TAP at 1 month after surgery⁷.

Currently, just a few studies have been completed in Pakistan comparing TAPP with TEP. There are limited resources, and the risks of complications are considerable for a variety of reasons. As a result, the current study is recommended in order to effectively connect with international findings of comparative research between numerous components relating to TAPP and TEP. To decrease post-operative morbidity, a less complicated method will be suggested in the future.

METHODOLOGY

This RCT registered under trial number CTU/003/2025/002/RMU was performed in the General Surgery department, Holy Family Hospital, Rawalpindi from 30th November 2023 to 29th May 2024. The study started after the approval of the study from the Institutional ethical review committee. The sample size of 150 (75 in each group) was calculated by WHO sample size calculator at confidence level= 95%, Power of Study=80%, mean postoperative pain in TEP at 24 hours = 7.6 ± 0.70^7 and mean postoperative pain in TAP at 24 hours = 7.9 ± 0.60^7 . Male patients, age >18 to 50 years, admitted with diagnosis of uncomplicated primary inguinal hernia by clinical examination and ultrasonography. Patients having any advanced comorbid, complicated hernia, history of previous abdominal surgery and recurrent inguinal hernia were excluded. Patients were selected according to inclusion criteria. Patients were allocated to the two groups (Group A: TEP and Group B: TAPP) randomly, each group having equal number of patients. Both laparoscopic procedures were done by a single surgical team having consultant surgeons under standard operating procedures. The type of surgical procedure with operative time was noted. After surgery post-operative pain was measured at 24 hours, hospital stay and time to return to work was noted before. SPSS version 25.0 was used to analyze the data. A P value of less than 0.05 was regarded as significant.

RESULTS

Mean age was 40.71 ± 6.16 years. Mean BMI was 27.76 ± 2.83 kg/m². Distribution of patients according to laterality showed that 74(49.33%) patients had hernia in right side and 66(50.67%) in left side. Mean operating time in TAPP was 87.20 ± 6.01 minutes (p-value = 0.0001), whereas in TEP was 64.31 ± 7.35 minutes. The mean pain after surgery was 1.87 ± 1.08 in TEP and 4.11 ± 1.44 in TAPP group (p-value = 0.0001). TEP group mean stay in hospital was 1.73 ± 0.66 days, while in TAPP group was 5.15 ± 0.90 days (p-value = 0.0001). Mean time to resume daily work was 5.45 ± 1.22

days for TEP group and 10.28 ± 2.89 days for TAPP group (p-value = 0.0001).

Table 1

Comparison of the laparoscopic TEP with TAP for Inguinal Hernia Repair

Variable	Group A (n=75)	Group B (n=75)	p-value
	Mean \pm SD	Mean \pm SD	
Operative time (min)	64.31 ± 7.35	87.20 ± 6.01	0.0001
Post-operative pain	1.87 ± 1.08	4.11 ± 1.44	0.0001
Hospital stay (days)	1.73 ± 0.66	5.15 ± 0.90	0.0001
Time to return to daily work (days)	5.45 ± 1.22	10.28 ± 2.89	0.0001

DISCUSSION

Around 20 million inguinal hernia repairs are thought to be made annually on a global scale. Recurrence after surgery for inguinal hernias has been a major problem in the last several years. However, recurrence rates are relatively low because to the regular usage of prosthetic mesh⁸. Reducing peri-operative issues is now given more priority in an effort to improve post-operative quality of life. As an alternative to open mesh repair, the TAPP technique to inguinal hernia surgery has been developed⁹. It has various advantages over open surgery¹⁰.

We conducted this study to compare the laparoscopic TEP technique with the TAP for inguinal hernia repair. Mean operative time in TEP group was 64.31 ± 7.35 minutes while in TAPP group was 87.20 ± 6.01 minutes. Mean post-operative pain in TEP group was 1.87 ± 1.08 while in Group TAPP was 4.11 ± 1.44 . Mean hospital stay in Group A was 1.73 ± 0.66 days while in TAPP group was 5.15 ± 0.90 days. Mean time to return to daily work in TEP group was 5.45 ± 1.22 days while in TAPP group was 10.28 ± 2.89 days. In a study, pain was 4.45 ± 1.7 postoperatively in TAPP and 3.3 ± 0.98 after TEP (p<0.05)¹¹. Same author has found the mean operative time as 110.90 ± 12.02 minutes in TAPP and 125.50 ± 7.46 minutes in TEP group (p<0.0001).¹³ In a different research, mean operating time for TAPP repair was 70 ± 6.01 minutes while in TEP repair was 45.1 ± 3.54 minutes¹².

Gangopadhyay and Ghosh compared results of TEP and TAPP correction of inguinal hernia. Mean operating time for surgery differed significantly (p<0.0001) between TAPP (86.72 ± 6.39 min) and TEP (99.72 ± 7.36 min). TAPP had a longer hospital stay (5.27 ± 0.93 days) compared to TEP (2.62 ± 0.70). The average time to resume regular activities was 10.87 ± 1.41 days (TAPP) and 6.21 ± 0.85 days (TEP). Mean postoperative pain was 7.6 ± 0.70 in

TEP 7.9 ± 0.60 in TAP after 24 hours, 4.8 ± 0.98 in TEP 6.8 ± 1.69 in TAP at 2 days, and 1.4 ± 0.50 in TEP 4.3 ± 0.96 in TAP at 1 month after surgery⁷. According to research, both groups' pain was mild for the first day. However, at the end of the second and first month, there were very noticeable difference showing that the TAPP approach caused more pain than the TEP method⁷. Sharma et al¹³. conducted an RCT in which pain ratings were assessed at 8, 16, 24, 32, 40, and 48 hours during a one-month period¹³. Even though the TAPP group's post-operative pain scores were lower than the TEP groups till 48 hours after surgery. A one-year follow-up research by Nawaz et al¹² from Pakistan included 120 patients. Of these, minor pain was reported in 40 patients in the TEP group and 25 in TAPP.

We et al¹⁴ conducted a randomized control experiment with 1047 patients from China, and found no significant changes in pain levels between the two groups. This is comparable to previous research on the subject. In terms of pain, there was not a significant difference between the two groups in a four-year follow-up study¹⁵.

In a prospective RCT by Sharma et al. (2013), the mean operating time for TEP was 120.89 ± 29.28 min, while in TAPP group was 108.16 ± 16.10 min¹³. Therefore, it has been recognized that TEP procedures require longer operating times than TAPP operations. Another randomized control

experiment with 120 patients found that the TEP group's mean operating time was 45.1 ± 3.54 minutes, whereas the TAPP group was 70 ± 6.01 minutes. These differences were statistically significant¹².

Elhendawy et al¹⁶ carried out another prospective randomized comparative trial in which the operating time for the TAPP technique was 151.7 ± 24.8 minutes, whereas the TEP strategy took 88.42 ± 30.6 minutes¹⁶.

Gass M et al¹⁷ conducted an assessment of TEP and TAPP. Patients who had TEP had considerably greater rates of complications. TEP is also linked to extended operational durations and increased rate of conversion. Another study reported TAPP approach better than the TEP repair¹⁷. Trehan et al¹⁸. also found that TEP is preferable to TAPP for inguinal hernia repair¹⁸.

CONCLUSION

This study demonstrated that the mean operational time, mean postoperative pain, mean hospital stay, and time to return to daily work are lower using the TEP approach for inguinal hernia repair than with laparoscopic TAPP surgery. So, we recommend that TEP approach be used consistently for inguinal hernia repair, which will benefit patients by saving them time and money while also reducing post-operative morbidity.

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