

Original Research Article

Prospective comparison of post-operative quality of life (QOL) after laparoscopic total extra-peritoneal (TEP) and trans-abdominal pre-peritoneal (TAPP) repair of indirect inguinal hernia

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ABSTRACT

Background: As the laparoscopic method is becoming a popular choice of repair, the need to evaluate its impact on the patient's quality of life (QOL) is also warranted. This study was undertaken to compare post operative QOL in patients undergoing Totally Extraperitoneal (TEP) and Transabdominal preperitoneal (TAPP) repair for indirect inguinal hernia.

Methods: This prospective observational study was conducted in the Department of General Surgery at VMMC and Safdarjung Hospital, from June 2016 to March 2018. Patients with uncomplicated indirect inguinal hernia were included in the study after obtaining their informed consent. Post-operative QOL was evaluated using EuraHS-QOL scale at 24 hours and 1, 3 and 6 months after the surgery.

Results: A total of sixty patients were enrolled-30 in TEP group and 30 in TAPP group. There was no statistical significant difference in scores at 24 hours follow-up except cosmetic discomfort domain, with higher scores in TAPP (p-value=0.014). Statistical significant difference was present at 1 month follow up with higher scores in TAPP (p-value=0.011). At 3 and 6 months, no statistical difference was found in the scores.

Conclusions: Present study demonstrates a significant advantage of TEP over TAPP up to 1-month follow-up, in terms of post-operative QOL. Choosing a superior laparoscopic method between TEP and TAPP requires high powered RCTs with long term follow up to assess the technical advantages and post-operative complications along with post-operative quality of life in patients.

Keywords: Totally extra peritoneal hernia repair, Trans abdominal pre-peritoneal repair, Quality of life

INTRODUCTION

Inguinal hernias account for 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women.¹ Two-thirds of these are indirect and the remainder are direct inguinal hernias.² Inguinal hernia repair is one of the most common elective operations performed in general surgery. There are various methods for inguinal hernia repair, but tension free repair is the

procedure of choice.³ It can be done either by an open or laparoscopic approach. Since the introduction of laparoscopic techniques, these methods became equally accepted for inguinal hernia. The laparoscopic repair is increasingly becoming popular in India. Laparoscopic surgery is considered to reduce post-operative pain, incidence of wound complications and time to return to activities of daily living when compared to open hernia repair.⁴ However, no significant differences were found

between laparoscopic and open hernia repair in terms of quality of life at 3 and 6 months postoperatively.⁵

Totally Extra peritoneal hernia repair (TEP) and Trans abdominal pre-peritoneal (TAPP) repair are the two common laparoscopic methods used to address inguinal hernias. Both techniques are based on the principles of tension free repair and rely on mesh placement in the pre-peritoneal space to exclude inguinal defect and reinforce the abdominal wall.⁶ Both the approaches are well established and have advantages and disadvantages.

In recent years, attempts to evaluate the outcome of different health care interventions have increased dramatically. Patient-centered measures of outcome, measuring Quality of Life (QOL) after various interventions, have been developed and advocated for use in evaluation of treatment efficiency.⁷ QOL has become the principal outcome measure of hernia in the face of infrequent overall complications.⁶ There are various scales for QOL assessment in hernia patients-Short Form-36(SF-36), Visual Analogue Scale (VAS), Carolina Comfort Scale(CCS) and European Registry for Abdominal Wall Hernias-QOL Score (EuraHS-QOL) . SF-36 and VAS are generic QOL scales and can be used for other patients as well. CCS and EuraHS-QOL score are hernia-specific scales. CCS validated questionnaire, consisting of 23 questions, for QOL assessment after repair of abdominal wall hernias to evaluate mesh sensation, pain, and movement limitation after hernia repair.⁸ European Registry for Abdominal Wall Hernias (EuraHS-QOL) instrument is a short and valid patient-reported outcome measurement, that asks only 9 questions across 3 domains: pain, restriction of activities, and cosmetic discomfort, following groin hernia repair and has been recently validated to assess QOL following laparoscopic inguinal hernia repair.⁸ Thus, EuraHS-QOL (Appendix 1) scale was chosen in this study because it has fewer questions and simple for our patients to understand and answer.

As the laparoscopic method is becoming a popular choice of repair, the need to evaluate its impact on the patient's

quality of life is also warranted. Since there are very few studies evaluating this domain in Indian patients, this prospective study aims to compare the QOL in patients undergoing laparoscopic TEP and TAPP repair for uncomplicated inguinal hernia in a tertiary care hospital.

METHODS

This prospective observational study was conducted in the Department of General Surgery at Vardhman Mahavir Medical College and Safdarjung Hospital, from June 2016 to March 2018 in accordance with the ethical standards of the institution. Patients with uncomplicated indirect inguinal hernia, undergoing laparoscopic hernia repair were included in the study after obtaining their informed consent. Exclusion criteria: Patients younger than 12 years, direct inguinal hernia, clinical or during laparoscopic surgery, strangulated and obstructed i.e. complicated indirect inguinal hernia, patients with previous surgery performed in lower abdomen (below umbilicus), immunodeficiency and diabetes mellitus, hypertension, psychiatric disease and patients unable to perform the QOL assessment, because of language barrier or intellectual incapacity.

A total of sixty patients were enrolled-30 patients undergoing indirect inguinal hernia surgery by TEP and 30 patients undergoing indirect inguinal hernia surgery by TAPP. Patients were evaluated using the 9 question EuraHS-QOL scale (Appendix 1) post-operatively at 24 hours and at 1, 3 and 6 months after the surgery. The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0.

RESULTS

A total of 60 patients were included in this study with 30 patients in each group-TAPP and TEP. 58 (96.67%) were males and 2 (3.33%) were females. Mean age in TAPP group was 39.73 ± 14.62 and mean age in TEP group was 39.97 ± 13.94 . Most common diagnosis was right sided indirect inguinal hernia in 56.67%(34) patients (Table 1).

Table 1: Demographic characteristics of TEP and TAPP group.

	TEP(n=30)	TAPP(n=30)	p-value (<0.05 is significant)
Mean Age	39.97±13.94	39.73±14.62	0.95
Male:Female ratio	28:2	30:0	0.492
Indirect Inguinal hernia site- R/L/BL % (n)	60%(18)/13.3%(4)/26.6%(8)	53.3%(16)/26.6%(8)/20%(6)	0.42

The three individual domains-Pain, Restriction of Movement (ROM) and Cosmetic discomfort scores as well as the total score was compared between the two

groups and their trends were analyzed. There was no statistical significant difference in the scores at 24 hours follow-up except the cosmetic discomfort score, which

was higher in TAPP as compared to TEP (p-value=0.014).

Statistical significant difference was present at 1 month follow up scores with higher scores for TAPP as compared to TEP, indicating better QOL at 1 month following the TEP repair as compared to TAPP (p-value=0.011). ROM and cosmetic discomfort was more in TAPP patients as compared to TEP at 1 month (p-value=0.007 and 0.0002 respectively).

Post-operative pain was, however, not statistically significant at 1 month (p-value=0.646). At 3 and 6 months, no statistical difference was obtained in the scores.

Graphs depicting the trends of the scores (Figure 1-4) show that these scores tend to equalize by 3-6 months, thus, no statistical difference in overall QOL scores is present between TEP and TAPP by 6 months.

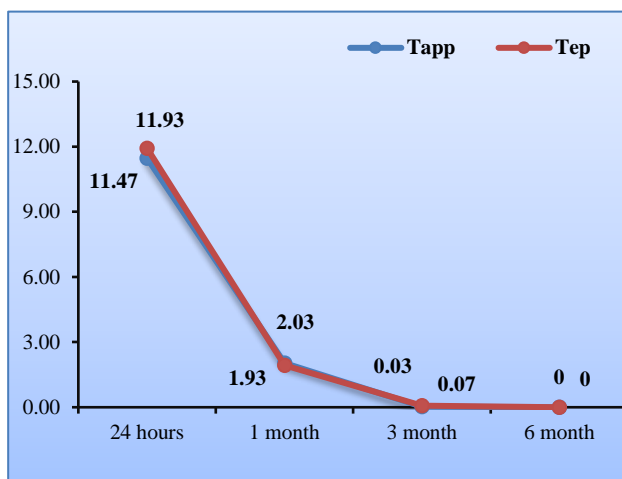


Figure 1: Comparison of post-operative pain between TEP and TAPP.

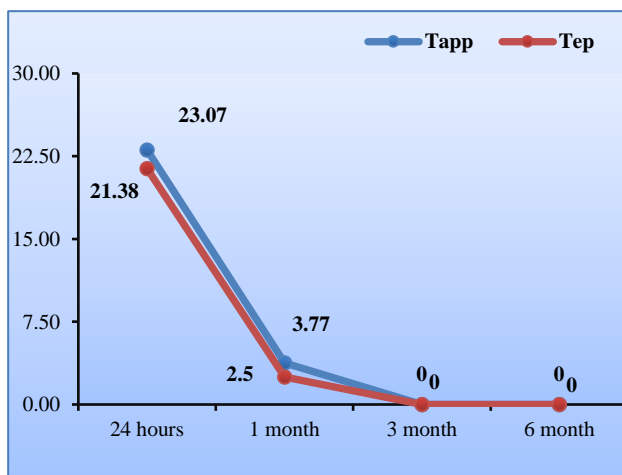


Figure 1: Comparison of post-operative restriction of movement between TEP and TAPP

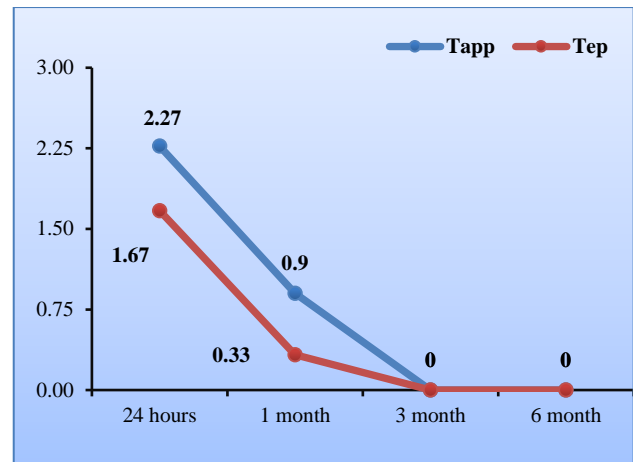


Figure 3: Comparison of post-operative Cosmetic discomfort between TEP and TAPP

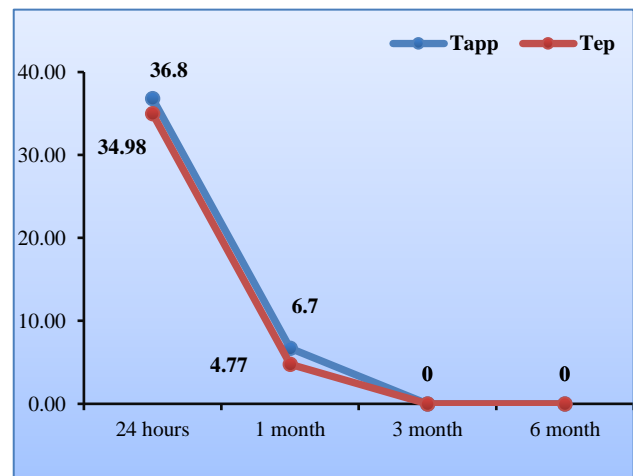


Figure 4: Comparison of overall QOL score between TEP and TAPP.

DISCUSSION

The clinical outcomes of laparoscopic inguinal hernia repair are appreciable irrespective of limitations, risks and steep learning curve.⁹ Laparoscopic hernia repair has significant advantages over open repair in terms of short term outcomes-less post-operative pain and morbidity as well as long term outcomes-less incidence of chronic pain and recurrence. The two techniques of laparoscopic hernia repair-Totally Extra peritoneal hernia repair (TEP) and Trans abdominal pre-peritoneal repair (TAPP) have been compared in various Randomized Controlled Trials (RCT) as well as non-RCT studies in terms of operative technique and post-operative complications. The results have been largely non-consistent, with no significant differences between TEP and TAPP.^{7,10-13} Few studies indicate TEP repair superior to TAPP in terms of post-operative complications, however, learning curve is steeper for TEP, making it a less preferred option as compared to TAPP.¹⁴⁻¹⁶ As the era of minimally invasive surgery is advancing, the impact of these techniques on

patient's quality of life is necessary to evaluate. Patient centered outcomes should be taken into consideration as operative technique is selected. This prospective study was taken with the aim of determining the superiority of technique between TEP and TAPP in terms of post-operative QOL. After analyzing the QOL scores, entered on EuraHS-QOL scale, a significant difference was noted in the QOL scores at 1-month post-operative follow-up, with TAPP scores higher than TEP. This reflects the superiority of TEP over TAPP in patients with uncomplicated indirect inguinal hernia up to 1 month follow up in terms of better QOL. The difference, however, seemed to resolve by 3 and 6 months. A similar outcome was seen in prospective comparative study of post-operative QOL between TEP and TAPP and open Modified Lichtenstein (ML) repair by Belyansky et al, which analyzed the outcome of more than 2000 patients using the Carolina comfort scale.⁶ It showed a significant difference during first follow-up month with more symptomatic patients after TAPP as compared to TEP; however, a year after surgery, there remained no difference in discomfort with activities of daily living between patients undergoing TEP, TAPP and open ML repair.⁶ This study was, however, not inclusive of Indian population. A prospective randomized comparative study of quality of life in Indian patients by Bansal et al shows no difference between TEP and TAPP groups in terms of QOL, testicular and sexual functions.¹⁷

Post-operative pain is a significant factor that determines post-operative patient satisfaction as well as quality of life. The etiology of postoperative pain after laparoscopic surgery includes patient related factors, surgical related factors and inadequate preoperative analgesic treatment. Furthermore, postoperative pain intensity is largely dependent on inter-individual threshold and variation [9]. Various studies have been done to evaluate the post-operative pain after laparoscopic hernia repair with varying results. TEP had a significant advantage over TAPP for significantly reduced postoperative pain which resulted in a better patient satisfaction score as well earlier return to the activities.^{7,18-19} However, this difference is present up to 3 and 6 months, after which there is no statistical difference between the two groups in terms of pain.^{7,19} In present study, TAPP group had higher pain scores than TEP group up to 1 month; although they were not statistically significant. In contrast, a study by Sharma et al, there was more post-operative pain in patients undergoing TEP as compared to TAPP, attributed to small peritoneal rents created during TEP.²⁰

Chronic inguinodynia (Chronic pain >3 months) is a postoperative complication, which is associated with discomfort and pain. The incidence of chronic inguinodynia is less after laparoscopic procedures as compared to open repairs.⁹ There is a correlation between chronic pain and fixation of mesh with staples/tacks as compared to fibrin glue and number of tacks, rather than the technique of TEP and TAPP.^{6,9} In present study, two

(6.6%) patients had chronic pain at 3 months follow-up in TAPP group as compared to the one (3.3%) patients in the TEP group. These results were, however, not statistically significant.

After reviewing the literature and comparing the results of various studies, including present study, TEP technique seems to have advantage over TAPP in terms of short term post-operative QOL, especially pain. The difference is noted up to few months following the surgery and seem to be comparable after 6 months. The difference in QOL can be largely attributed to major difference in the operative technique between TEP and TAPP, i.e. entry into the peritoneal space. The incision of parietal peritoneum and handling of bowel in TAPP results in somatic as well as visceral pain stimulation. Small peritoneal rents are possible in TEP but the deliberate incision of the parietal peritoneum in TAPP possibly causes increased pain stimulation. Less pain in the immediate post-operative period allows earlier return to activities and less restriction of movements in patients undergoing TEP. Cosmetic discomfort score was significantly higher in TAPP group at 24 hours follow up in present study and could be explained by possible residual distention due to pneumoperitoneum, perceived as abnormal shape/discomfort. In the long term, no significant difference is present between the two groups across all domains-Pain, restriction of activities and cosmetic discomfort.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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APPENDIX

European registry of abdominal wall hernias. Available at <http://www.eurahs.eu/EuraHS-QoL-download.php>



EuraHS QoL



EuraHS Quality Of Life scale

Post-operative _____ w/m

1. Pain at the site of the hernia repair																					
	0 = no pain										10 = worst pain imaginable										
Pain in rest (lying down)	0	1	2	3	4	5	6	7	8	9	10										
Pain during activities (walking, biking, sports)	0	1	2	3	4	5	6	7	8	9	10										
Pain felt during the last week	0	1	2	3	4	5	6	7	8	9	10										
2. Restrictions of activities because of pain or discomfort at the site of the hernia repair																					
	0 = no restriction										10 = completely restricted										
Restriction from daily activities (inside the house)	0	1	2	3	4	5	6	7	8	9	10	X									
Restriction outside the house (walking, biking, driving)	0	1	2	3	4	5	6	7	8	9	10	X									
Restriction during sports	0	1	2	3	4	5	6	7	8	9	10	X									
Restriction during heavy labour	0	1	2	3	4	5	6	7	8	9	10	X									
X = If you do not perform this activity																					
3. Cosmetic discomfort																					
	0 = very beautiful										10 = extremely ugly										
Shape of your abdomen	0	1	2	3	4	5	6	7	8	9	10										
Site of the hernia and the scar	0	1	2	3	4	5	6	7	8	9	10										