International Surgery Journal
Singhal VK et al. Int Surg J. 2023 May;10(5):842-846
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902
DOI: https://dx.doi.org/10.18203/2349-2902.isj20231378

Original Research Article

Closure of peritoneal in inguinal hernia transabdominal preperitoneal by intracorporeal suturing versus tackers

Vinod Kumar Singhal[1]*, Faris Dawood Alaswad[2], Varsha Ojha[1], Vidher Varsha Vinod Singhal[3]

[1]Department of General Surgery, Prime Hospital, Dubai, UAE
[2]Department of General Surgery, NMC Specialist Hospital, Dubai, UAE
[3]University College London, London, United Kingdom

Received: 18 February 2023
Revised: 18 March 2023
Accepted: 31 March 2023

***Correspondence:**
Dr. Vinod Kumar Singhal,
E-mail: drvinodsinghal@yahoo.co.in

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Hernia surgeries are among the most frequently carried out surgical procedures. Minimal recurrence rates, great patient comfort, rapid return to work, and low cost should all be characteristics of the optimal hernia treatment method. Objective of this study was to investigate whether tacker and suture materials used for peritoneal closure after mesh placement in the laparoscopic TAPP inguinal hernia repair technique.
Methods: Present study is a retrospective, observational and comparative study conducted in Department of General Surgery in a tertiary care hospital from January 2021 to December 2021. Institutional ethical committee clearance was obtained. Patient identity was kept confidential. According to the type of peritoneal closure, patients were separated into two groups: group S (which underwent closure with sutures) and group T (which received closure with tackers) 48 and 52 during the study period. SPSS was used for analysis.
Results: The study was male preponderance comprising 94% of study participants, while the most common age group was found to be 61-70 years in both groups S and T (32%). most patients in the suture fixation group (39%) had left-sided hernias, but right-sided hernias (40%) were more typical in the tacker fixation group.
Conclusions: Our research revealed no differences between the two peritoneal closure approaches in terms of VAS score at day 30, hernia recurrence rate, hospital stay, or complication rate. VAS score on day 1 and cost of operation were in favor of the suture group.

Keywords: Inguinal hernia, Laparoscopic hernia repair, Mesh, Suture, Tacker, TAPP

INTRODUCTION

Hernia surgeries are among the most frequently carried out surgical procedures. Minimal recurrence rates, great patient comfort, rapid return to work, and low cost should all be characteristics of the optimal hernia treatment method. Compared to open surgery, laparoscopic hernia surgery has a far higher success rate in fulfilling these requirements.[1,2] Due to the effectiveness and safety of this method, laparoscopic repair of inguinal hernias has gained widespread acceptance. Laparoscopic repair has several benefits over open hernioplasty, including improved cosmetic results, reduced postoperative pain, a shorter hospital stay, quicker resumption to normal activities, fewer problems, and a lower risk of recurrence.[3] The peritoneal closure in the laparoscopic TAPP inguinal hernia repair technique can be done with suture, tacker, or stapler. Only one study evaluating various materials for peritoneal closure in the laparoscopic TAPP inguinal hernia repair procedure was found in our literature search.[4] According to the study's findings, the suture group experienced less postoperative

pain and more mobility during the first two weeks than the other two groups. In laparoscopic TAPP, peritoneal closure following mesh replacement is the key issue. Using a suture material to sew the peritoneum can occasionally be tedious and challenging. The peritoneal closure method employed in the laparoscopic TAPP inguinal hernia repair procedure is often tacker or suture.

This study aims to investigate whether tacker and suture materials used for peritoneal closure after mesh placement in the laparoscopic TAPP inguinal hernia repair technique would yield significant difference in peritoneal closure and the operation.

METHODS

Present study is a retrospective, observational and comparative study conducted in Department of General Surgery at Prime Hospital, Dubai from January 2021 to December 2021. Institutional ethical committee clearance was obtained. Patient identity was kept confidential.

Inclusion criteria

Inclusion criteria were patients between 18 and 70 years of age, either gender, who underwent primary laparoscopic surgery for all type of inguinal hernia (TAPP) intracorporeal at our tertiary hospital.

Exclusion criteria

Exclusion criteria were hernias other than inguinal hernias; recurrent inguinal hernia; patients who had undergone previous abdominal surgeries.

Methodology

The department of medical records provided clinical data, and case sheets were located. All patients who underwent primary laparoscopic inguinal hernia repair surgery (TAPP) had their clinical data retrospectively obtained from them, and they were also checked to see if they qualified for the current study.

The data capture sheet was used to retrieve information about eligible patients, including their age, sex, co-morbidity, history of prior surgery, pertinent medical history, details about the preoperative morbid status, comorbidities, renal functions, serology status, clinical parameter, type of hernia, side of hernia, operative time, duration of peritoneal closure, postoperative pain measured by VAS scale (visual analogue scale) on postoperative day 1, 7, and 30, and re according to the type of peritoneal closure, patients were separated into two groups: group S (which underwent closure with sutures) and group T (which received closure with tackers) 48 and 52 during the study period. Manual data collection from case sheets with regards to details of management, outcome, and recurrence was retrieved, and data analysed descriptively from the data base. Postoperative pain and hernia recurrence during follow up is recorded in the Data capture sheet which is maintained in the out-patient department general surgery.

Statistical analysis

The statistical analysis was performed using SPSS for windows version 22.0 software (Mac, and Linux). The findings were present in number and percentage analyzed by frequency, percent, and Chi-squared test. Chi-squared test was used to find the association among variables. The critical value of P indicating the probability of significant difference was taken as <0.05 for comparison.

RESULTS

As per Table 1 the study was male preponderance comprising 94% of study participants, while the most common age group was found to be 61-70 years in both groups S and T (32%) and it was statistically significant ($p<0.05$).

Table 1: Age and gender wise distribution of study participants.

	Group S (n=48)		Group T (n=52)		Total	
	N	%	N	%	N	%
Age group (in years)						
19-30	3	8	6	12	9	10
31-40	4	11	7	13	11	12
41-50	6	16	12	23	18	20
51-60	9	24	14	27	23	26
61-70	26	42	13	25	29	32
Gender						
Male	44	89	49	94	93	92
Female	4	11	3	6	7	8
P value	0.04*		0.01*		0.01*	

Table 2: Distribution according to side and type of hernia.

Gender	Group S (n=48)		Group T (n=52)	
	No of patients	%	No of patients	%
Right	13	34	21	40
Left	25	39	11	21
Bilateral	10	26	20	38

As per table 2 most patients in the suture fixation group (39%) had left-sided hernias, but right-sided hernias (40%) were more typical in the tacker fixation group. 26% and 38% of patients in the suture group and the tacker group, respectively, had bilateral hernias. The most prevalent co-morbidities among study participants were chronic obstructive pulmonary disease, hypertension, and diabetes mellitus. In the suture fixation group, indirect inguinal hernias accounted for the majority of cases

(37%) while indirect + direct inguinal hernias (52%) predominated in the tacker fixation group.

Table 3: Distribution according to duration required for peritoneal closure.

Duration required for peritoneal closure (Min)	Group S (N=48)		Group T (N=52)	
	N	%	N	%
2 min or less	0	0	32	62
3-5 min	0	0	20	38
6-10 min	39	76	0	0
>10 min	9	24	0	0
Mean duration	7.13±0.41 Min		3.24±0.34 Min	
P value	0.01*			

Table 4: Distribution according to duration required for surgery.

Duration required for surgery (min)	Group S (n=48)		Group T (n=52)	
	N	%	N	%
80-100 min	6	16	32	62
101-120 min	33	61	10	19
>120 min	9	24	10	19
Mean duration	124.2±20.6 min		107.3±12.8 min	
P value	0.01*			

Table 5: Distribution of pain on day 1/7/30 as per VAS.

Visual analog score (VAS) for pain	Group S (n=48)		Group T (n=52)	
	N	%	N	%
VAS day 1				
3	35	66	0	0
4	11	29	2	4
5	1	3	19	37
6	0	0	22	42
7	1	3	9	17
Mean VAS	3.91±0.63		5.82±0.63	
P value	0.01*			
VAS day 7				
0	30	53	5	10
1	14	37	15	29
2	4	11	28	54
3	0	0	4	8
Mean VAS	0.91±0.16		2.09±0.31	
P value	0.01*			
VAS day 30				
0	46	95	47	90
1	0	0	1	2
2	2	5	3	6
3	0	0	1	2
Mean VAS	0.38±0.1		0.42±0.1	
P value	0.05			

As per Table 3 Mean duration required for peritoneal closure in suture group was 7.13±0.41 min as compared to 3.24±0.34 min in tacker group, difference was statistically significant.

As per Table 4 Mean duration required for surgery in suture fixation group was 124.2±20.6 min as compared to 107.3±12.8 min in tacker fixation group, difference was statistically significant.

As per Table 5 post-operative a pain was measured on visual analog score (VAS). On day 1 and day 7, we noted significantly lesser VAS score in suture fixation group as compared to tacker fixation group and difference was statistically significant. While on day 30 similar VAS scores were noted in both groups and difference was not statistically significant.

Table 6: Recurrence and hospital stay in study groups.

Other characteristics	Group S (n=48)		Group T (n=52)	
	Mean±SD	%	Mean±SD	%
Hospital stay (days)	3.21±1.69		3.61±1.93	
Lost to follow up	0	0	2	4
Recurrence	1	3	1	2
Seroma	2	5	2	4

As per table 6 in both groups, hospital stay was comparable; recurrence was noted in one patient while seroma was noted in two patients. No serious morbidity or any mortality was noted in study patients during study period.

DISCUSSION

To reduce the hernia sac and provide room in the preperitoneal plane during TAPP laparoscopic groin hernia, peritoneal flaps must be developed. The peritoneal defect must be properly closed after the mesh has been fixed in place in order to protect it from exposure to the abdominal viscera, which reduce adhesion, and to stop internal herniation through the defect into the preperitoneal area.[5] The techniques for closing peritoneal defects were categorized as mechanical techniques using tackers, clips, and staples, which may increase the risk of nerve damage, inadequate closure, laceration of peritoneal flaps, and herniation at the tacking site.[6,7]

Bansal et al compared suture fixation with a tacker fixation and found that the suture group had significantly less postoperative discomfort up to one month (1 hour, 6 hours, 24 hours, and one week) and recovered faster from surgery.[8] The fixation time comparison considerably favored the target group. Similar results were seen in the

current investigation. Additionally, Ross et al reported that the suture closure group's post-operative pain score was lower than the tacker closure group's.[9]

According to Kitamura et al analysis, there is no difference between peritoneal closure with tacker and suture in terms of wound infection and intestinal obstruction.[10] According to Selva et al there is no difference between peritoneal closure with tacker and suture in terms of morbidity following TAPP inguinal hernia repair surgery.[11] Similar results were seen in the current investigation. Hematomas, wound infections, respiratory infections, and urinary tract infections were significant postoperative problems in both groups.

Additionally, permanent fixation devices are more expensive and have been linked to postoperative groin pain, which subsides following the removal of tacks.[11,12] Given the price of tackers, suture fixation is a more affordable option without sacrificing the patient's safety. Suture fixation may be perfect to practice in a nation like ours, India, where access to healthcare is limited.

Due to nerve entrapment, tackers are linked to some surgical injuries and consequences such neuralgia or paresthesia. By attaching the prosthesis to Cooper's ligament, pubalgia is brought on. Also possible are hematomas or bleeding in the Retzius space (muscular, corona mortis). According to a theory, placing tacks could harm the nerves directly or indirectly by causing fibrosis surrounding the tack, which could then affect the nerves.[13] During laparoscopic inguinal hernia surgery (LIHS), nerve injury that might happen during mesh dissection or fixing is the main cause of chronic groin pain (CGP). There were several tacks applied, which is how laparoscopic tackers typically fixate mesh.

This study has few limitations firstly small sample size in a study can change the associations and impact. Secondly, our findings cannot be useful in development of clinical practice guidelines for mesh fixation and further economic evaluations. Thirdly, no information was reported on the expertise of the surgeons performing the mesh procedures. Fourthly, retrospective record based study will not always give the true picture of present evaluations for comparison.

CONCLUSION

Our research revealed no differences between the two peritoneal closure approaches in terms of VAS score at day 30, hernia recurrence rate, hospital stay, or complication rate. VAS score on day 1 and cost of operation were in favor of the suture group. Thus, in laparoscopic inguinal hernia repair surgery, peritoneal closure using suture should be chosen over tackers for peritoneum closure.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Tolver MA, Rosenberg J. Pain during sexual activity before and after laparoscopic inguinal hernia repair. Surg Endosc. 2015;29(12):3722-5.
2. Oguz H, Karagulle E, Turk E, Moray G. Comparison of peritoneal closure techniques in laparoscopic transabdominal preperitoneal inguinal hernia repair: a prospective randomized study. Hernia. 2015;19:879-85.
3. Hoseini M, Mousavie SH, Farazmand B, Jodai E, Negahi A. Comparison of peritoneum closure with suturing or tacker or using dual mesh without peritoneal closure in laparoscopic inguinal hernia repair. J Adv Pharm Edu Res. 2019;9(S2):150-3.
4. The Hernia Surg Group. International guidelines for groin hernia management. Hernia. 2018;22:1–165.
5. Sharma D, Yadav K, Hazrah P, Borgharia S, Lal R, Thomas S. Prospective randomized trial comparing laparoscopic transabdominal preperitoneal (TAPP) and laparoscopic totally extra peritoneal (TEP) approach for bilateral inguinal hernias. Int J Surg. 2015;22:110–7.
6. Bittner R, Leibl BJ, Jäger C, Kraft B, Ulrich M, Schwarz J. TAPP - Stuttgart technique and result of a large single center series. J Minim Access Surg. 2006;2(3):155–9.
7. Mayer F, Niebuhr H, Lechner M. When is mesh fixation in TAPP-repair of primary inguinal hernia repair necessary? The register-based analysis of 11, 230 cases. Surg Endosc. 2016;30:4363-71.
8. Bansal VK, Misra MC, Babu D, Singhal P, Rao K, Sagar R, et al. Comparison of long-term outcome and quality of life after laparoscopic repair of incisional and ventral hernias with suture fixation with and without tacks: a prospective, randomized, controlled study. Surg Endosc. 2012;26(12):3476–85.
9. Ross SW, Oommen B, Kim M, Walters AL, Augenstein VA, Heniford BT. Tacks, sta-ples, or suture: method of peritoneal closure in laparoscopic transabdominal preperitoneal inguinal hernia repair effects early quality of life. Surg Endos. 2015;29(7):1686-93.
10. Kitamura RK, Choi J, Lynn E, Divino CM. Suture versus tack fixation of mesh in laparo-scopic umbilical hernia repair. JSLS. 2013;17(4):560.
11. Selvakumar S, Sankar SS, Balaji P. Comparative study on suture fixation vs tacker fixation for laparoscopic inguinal hernia repair-TAPP. Global J Res Analysis. 2019;8(3):52-54.
12. Morrison JE Jr, Jacobs VR. Laparoscopic preperitoneal inguinal hernia repair using preformed polyester mesh without fixation: Prospective study

with 1-year follow-up results in a rural setting. Surg Laparosc Endosc Percutan Tech. 2008;18(1):33-9.
13. Lau H, Patil NG, Yuen WK, Lee F. Prevalence and severity of chronic groin pain after endoscopic totally extraperitoneal inguinal hernioplasty. Surg Endosc. 2013;17:1620-3.

Cite this article as: Singhal VK, Alaswad FD, Ojha V, Singhal VVV. Closure of peritoneal in inguinal hernia transabdominal preperitoneal by intracorporeal suturing versus tackers. Int Surg J 2023;10:842-6.