



“COMPARATIVE ANALYSIS OF TACKER VS. SUTURE FIXATION IN LAPAROSCOPIC INGUINAL HERNIA REPAIR: OUTCOMES AND EFFECTIVENESS”

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ABSTRACT This randomized clinical trial compared the efficacy of tacker versus suture fixation methods for mesh attachment in laparoscopic transabdominal preperitoneal (TAPP) hernia repair. Conducted on 20 patients, the study assessed pain levels, operative time, and complication rates associated with each technique. Findings revealed that suture fixation resulted in significantly lower pain scores at 6 and 24 hours postoperatively compared to tacker fixation ($p < 0.001$). The average operative time was notably shorter for tacker fixation (100 minutes) compared to suture fixation (130 minutes). Complication rates, including hematoma, seroma, and scrotal edema, were similar between the two groups. These results suggest that while suture fixation may offer superior pain management, tacker fixation may be more time-efficient. Further research with larger samples and longer follow-up is needed to evaluate long-term outcomes and recurrence rates to comprehensively compare the two fixation techniques.

KEYWORDS : Laparoscopic Inguinal Hernia Repair, Tacker Fixation, Suture Fixation, Pain Levels, Operative Time

INTRODUCTION

Hernia surgeries are among the most commonly performed surgical procedures. The ideal hernia treatment method should have low recurrence rates, prioritize patient comfort, enable quick return to work, and be cost-effective. Compared to traditional open surgery, laparoscopic hernia repair significantly excels in meeting these criteria^{1,2}. In particular, laparoscopic repair of inguinal hernias has become widely accepted due to its effectiveness and safety.

Laparoscopic hernioplasty is suitable for all patients with inguinal hernia who are eligible for general anesthesia, but it is particularly advantageous in specific cases such as hernia recurrence following open repair, bilateral inguinal hernias, and concurrent laparoscopic procedures like cholecystectomy. Conversely, absolute contraindications to laparoscopic hernioplasty include any indication of intra-abdominal infection, coagulation disorders, bowel obstruction, and significant comorbidities that preclude general anesthesia.

Partial contraindications encompass conditions such as obesity, arrhythmias, aneurysms, pregnancy, peritonitis, intra-abdominal adhesions, incarcerated hernia, and other medical complexities³. These factors should be carefully evaluated to determine the appropriateness of laparoscopic versus open surgical approaches for inguinal hernia repair.

Despite the advantages of using sutures for peritoneal closure, it can be challenging and time-consuming in laparoscopic TAPP procedures. Therefore, alternative methods such as tackers or staplers are often used. This study aims to determine whether the choice between tacker and suture materials for peritoneal closure after mesh placement in laparoscopic TAPP inguinal hernia repair significantly affects surgical outcomes

AIM OF STUDY

To compare the effects of different methods of mesh fixation-Tacker fixation and Suture fixation in laparoscopic inguinal hernia repair

METHODOLOGY

This randomized clinical trial was conducted on individuals undergoing laparoscopic hernia repair at j.k hospital . All participants provided written informed consent. The patients were divided into two groups: one group underwent tacker mesh fixation, another had the mesh sutured into the abdominal wall using endosuturing. Each group consisted of 10 participants, determined by sample size calculation.

Pain levels were assessed using the visual analogue scale (VAS) on days 6 and 24 hrs after the operation. Additionally, the 30-day recurrence rate ,Comparison of various complication was recorded. Statistical analysis was performed using the Chi-square test and t-test in SPSS version 22.

Inclusion Criteria:

The study enrolled patients aged between 18 and 70 years, of any gender, who underwent primary laparoscopic surgery for all types of inguinal hernia (Transabdominal Preperitoneal Patch [TAPP] technique) at our tertiary hospital.

Exclusion Criteria:

Patients were excluded if they had hernias other than inguinal hernias, had recurrent inguinal hernia, or had undergone previous abdominal surgeries.

Surgery was performed using general anesthesia. Transabdominal Preperitoneal Mesh Hernioplasty (TAPP) was carried out in all patients. In this technique, three laparoscopy ports are used that give access to intraperitoneal space from where preperitoneal space is approached by raising peritoneal flaps, and dissection is done in the inguinal region to separate the hernial sac from its contents. Then mesh is applied and is fixed to the anterior abdominal wall using different techniques such as titanium tacks, fibrin glue, and sutures, and the space is closed again by stitching together the peritoneal flaps. In our study, the suture fixation group underwent mesh fixation by taking three stitches with vicryl 2/0 against the anterior abdominal wall and coopers ligament for anchoring the mesh. Taking stitches in the triangle of doom and the triangle of pain were specifically avoided. The tack fixation group underwent mesh fixation with three titanium tacks taken against the anterior abdominal wall and coopers ligament. Taking tacks in the triangle of doom and triangle of pain was specifically avoided. Post-operatively all patients were administered the same analgesics.

RESULT

The study involved 20 participants with inguinal hernia, aged between 18 and 60 years, with an average age of 46.36 years. The demographic characteristics of the study groups were statistically equivalent (refer to Table 1).

- **Male:** There were 10 males in Group A and 10 in Group B, with no significant difference
- **Age:** The average age was 46.53 ± 10.01 years in Group A and

- 46.19 ± 9.58 years in Group B, with no significant difference (p=0.839).
- **Weight:** The average weight was 73.49 ± 6.88 kg in Group A and 74.51 ± 6.74 kg in Group B, with no significant difference (p=0.367).
 - **Years of Education:** The average years of education were 10.4 ± 4.88 years in Group A and 9.03 ± 4.98 years in Group B, with no significant difference (p=0.097).

Table 1

Patient Demographics	Group A (Tack Fixation)	Group B (Suture Fixation)	P-Value
Male	10	10	
Age (mean ± SD)	46.53 ± 10.01 years	46.19 ± 9.58 years	0.839
Weight (mean ± SD)	73.49 ± 6.88 kg	74.51 ± 6.74 kg	0.367
Years of Education (mean ± SD)	10.4 ± 4.88 years	9.03 ± 4.98 years	0.097

Table 2

Complication	Group A	Group B
Hematoma formation	0	0

Table 4: Time Comparison Between Two Groups

OPERATIVE TIME								Chi-square value	p-value
TIME(MINS)	Tacker		TOTAL	Suture		TOTAL			
	DIRECT	INDIRECT		DIRECT	INDIRECT				
60-80	2(20%)	00	2(20%)	00	00	00	27.01	0.007	
80-100	3(30%)	00	3(30%)	00	00	00			
100-120	00	3(30%)	3(30%)	3(30%)	00	3(30%)			
120-140	00	2(20%)	2(20%)	2(20%)	2(20%)	4(40%)			
140-160	00	00	00	1(10%)	2(20%)	3(30%)			
AVERAGE TIME	82mins	118mins	100mins	123.3mins	140mins	130mins			

Operative times varied across different intervals, with a noticeable distribution in both tacker and suture group. Tacker group showed an average time of 100 minutes, while suture group averaged 130 minutes. The operative times were 82 minutes for direct and 118 minutes for indirect in tacker group and 123.3 minutes for direct and 140 minutes for indirect in suture group, respectively. These findings suggest that the type of procedure (tacker vs. suture) influences operative times, highlighting potential differences in surgical complexity.

CONCLUSION

In laparoscopic transabdominal preperitoneal (TAPP) hernia repair, using sutures to secure the mesh tends to cause less pain compared to using tacks also there is significant difference between operative time in two groups. Nonetheless, early postoperative complication rates do not show significant differences between these two methods. To confirm these observations, more extensive multicentric research with longer follow-up is required. Additionally, it is important to assess other significant factors such as long-term pain, the likelihood of hernia recurrence, and the occurrence of mesh displacement to fully compare the efficacy of both fixation techniques.

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Urinary retention	2	1
Seroma formation	1	0
Scrotal edema	1	1
Neuralgia	0	0

Pain Scores Comparison Between Groups

The pain distribution was assessed at 6 hours and 24 hours postoperatively for two groups. At 6 hours, Group B (Suture fixation) reported a mean pain score of 3.43 ± 0.962, which was significantly lower compared to Group A (Tack fixation) with a mean pain score of 4.88 ± 0.887. Similarly, at 24 hours, the mean pain score in Group B was 4.11 ± 0.703, significantly lower than the 5.29 ± 0.777 observed in Group A. The p-values for these differences were both less than 0.001, indicating statistically significant differences in pain levels between the two groups at both time points.

Table 3: Mean Pain Scores At 6 And 24 Hours Postoperatively (n=20)

Time Point	Group A (Tack Fixation) (n=72)	Group B (Suture Fixation) (n=72)	P-value
6 hours	4.88 ± 0.887	3.43 ± 0.962	<0.001
24 hours	5.29 ± 0.777	4.11 ± 0.703	<0.001