

# Suture Mesh Fixation versus Tacker Mesh Fixation in Laparoscopic Inguinal Hernia Repair

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## Abstract

**Introduction:** Laparoscopic hernia mesh repair is standard management option for adult symptomatic inguinal hernia to establish inguinal floor using mesh. However, the ideal method of mesh fixation is still controversial. The present study was designed to assess the efficacy of suture mesh fixation and tacker mesh fixation in the patient undergoing laparoscopic hernia repair.

**Material and Methods:** A source of 44 participants diagnosed with inguinal hernia undergoing laparoscopic hernia repair above 21 years if age were recruited. Study participants were randomly divided in to group 1 managed with suture mesh fixation and group 2 managed with tacker mesh fixation.

**Results:** The mean duration of surgery was 75.67 min and 54.35 min and mean duration of hospital stay was 2.46 days and 2.18 days in suture and tacker groups respectively. Post operative pain and discomfort was seen in 27.28% and 22.72% in both groups. Seroma formation was observed in one case of suture group and scrota swelling in one case of both groups. The duration for return to routine activity was <1 week in 77.28% and 72.72% and >1 week in 22.72% and 27.28% and duration for return to work was <2 weeks in 81.82% and >2 weeks in 18.18% of participants in suture and tacker groups respectively.

**Conclusion:** The suture mesh fixation and tacker mesh fixation are effective in the laparoscopic hernia repair. However, suture fixation was cost-effective than tacker fixation, but tacker fixation group showed less duration of surgery.

**Keywords:** Laparoscopic Inguinal Hernia, Suture Mesh Fixation, Tacker Mesh Fixation, Seroma.

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## Introduction

Inguinal hernia is a common health condition encountered in general surgery with a prevalence of 4% in those aged above 45 years and 1.7% of all age groups [1]. It is leading to more than 20 million global surgical repairs annually [2]. Inguinal hernia are predominant in males (27%) than females

(3%) [3]. Inguinal hernia affects the quality of life of patient and exhibits symptoms including groin pain or intestinal obstruction and strangulations in complicated cases [4]. According to the international guidelines for groin hernia management, open or laparoscopic operative repair with mesh graft

is the preferable choice to strengthen the inguinal floor in hernia patients [5,6].

Several surgical management options including laparoscopic inguinal hernia repair, open inguinal hernia repair, transabdominal preperitoneal repair and total extraperitoneal repair were frequently applied to manage inguinal hernia. Suture mesh fixation and tacker mesh fixation were commonly applied for laparoscopic and open hernia repair [7]. However, mesh fixation has several adverse events including local tissue and nerve damage, tack hernias, erosion, chronic pain, and infection [8,9]. Suture fixation is effective in providing higher tensile strength, that may lead to lower recurrence rates. The tack fixation provides low operative time with few postoperative complications including small bowel obstruction and perforation and chronic neuropathic pain [10,11]. The comparative efficacy of suture and tackers fixation was not extensively evaluated. Hence, the present study was designed to evaluate the efficacy of suture mesh fixation and tacker mesh fixation in the patient undergoing laparoscopic hernia repair.

### Material and Methods

The present prospective comparative study was conducted in the Department of General surgery, MNR Medical College and Hospital during February 2021 to August 2022. A total of 44 participants diagnosed with inguinal

hernia undergoing laparoscopic hernia repair admitted to general surgery department were recruited. Cases with reducible hernia, history of previous abdominal surgery, above 21 years of age and willing to participate in the study were included. Cases with cardiovascular complications, respiratory complication, recurrent hernia, and not willing to participate in the study were excluded. Written informed consent was obtained from all the participants and study design was approved by the institutional ethics committee.

Study participants were randomly divided in to two study groups. Group 1 participants were managed with suture mesh fixation and group 2 participants were managed with tacker mesh fixation. All the participants were subjected to detailed clinical and physical examination, laboratory investigations including liver function tests, renal function tests, glycaemic profile and CBC and radiological investigation including pelviabdominal USG, CT abdomen and X-ray chest. Postoperative follow up was conducted after patient discharge for 3 months.

The collected data was analysed by using SPSS version 23.0. categorical variables were presented in frequency and percentage. Continuous variables was presented in Mean and standard deviation. A p-value <0.05 was considered as statistically significant outcome.

### Results

**Table 1: Clinico-demographic details of study participants.**

Parameters	Total participants (n=44)		p-value
	Group 1 (n=22)	Group 2 (n=22)	
Age	47.89±8.45	43.67±7.12	0.946
Gender (Male)	22 (100%)	22 (100%)	-
<b>Side of hernia</b>			
Right	13 (59.10%)	15 (68.18%)	0.714
Left	09 (40.90%)	07 (31.82%)	
<b>Type of inguinal hernia</b>			

Direct	03 (13.64%)	03 (13.64%)	0.0592
Indirect	19 (86.36%)	19 (86.36%)	
<b>Associated comorbidities</b>			
Type-2 Diabetes mellitus	03 (13.64%)	03 (13.64%)	0.0673
Hypertension	03 (13.64%)	03 (13.64%)	
Hypertension / Type-2 DM	03 (13.64%)	02 (9.09%)	
No comorbidities	13 (59.09%)	14 (63.63%)	

**Table 2: Comparison of operative details between study groups**

Parameters	Total participants (n=44)		p-value
	Group 1 (n=22)	Group 2 (n=22)	
Duration of surgery	75.67±10.52	54.35±7.86	0.001
Time period of hospital stay	2.46±3.21	2.18±2.98	0.0586
<b>Intraoperative complication</b>			
Present	-	-	0.0709
Absent	22 (100%)	22 (100%)	

**Table 3: Details of post-operative follow up.**

Parameters	Total participants (n=44)		p-value
	Group 1 (n=22)	Group 2 (n=22)	
<b>Postoperative pain &amp; discomfort</b>			
Present	06 (27.28%)	05 (22.72%)	0.0425
Absent	16 (72.72%)	17 (77.28%)	
<b>Seroma</b>			
Present	01 (4.55%)	-	1.934
Absent	21 (95.45%)	22 (100%)	
<b>Hematoma</b>			
Present	01 (4.55%)	02 (9.10%)	0.178
Absent	21 (95.45%)	20 (90.90%)	
<b>Scrotal swelling</b>			
Present	01 (4.55%)	01 (4.55%)	0.619
Absent	21 (95.45%)	21 (95.45%)	
<b>Time period for return routine activities</b>			
<1 week	17 (77.28%)	16 (72.72%)	-
>1 week	05 (22.72%)	06 (27.28%)	
<b>Time period for return to work</b>			
<2 weeks	18 (81.82%)	18 (81.82%)	-
>2 weeks	04 (18.18%)	04 (18.18%)	

**Discussion**

The total participants were males with mean age 47.89 years in suture group and 43.67 years in tacker group. Majority participants reported hernia on right side (59.10% in

group 1 & 68.18% in group 2) than left side (40.90% in group 1 & 31.82% in group 2). Indirect inguinal hernia was most common in both groups than direct inguinal hernia.

Type-2 diabetes mellitus, hypertension and both together was commonly associated comorbidities in participants of both study groups. However, majority participants exhibited no associated comorbidities in both groups (Table 1). Kitamura RK *et al.*, on suture versus track mesh fixation in laparoscopic umbilical hernia repair reported hypertension (36% in suture group & 30% in tacker group) and diabetes (16% in suture group and 10% in tacker group) were commonly associated comorbidities among participants of both study groups [12].

The mean duration of surgery was 75.67 min in group 1 and 54.35 min in group 2. The duration of hospital stay was 2.46 days in group 1 and 2.18 days in group 2. In both study groups, no intraoperative complications were observed. A study by Bansal VK *et al.*, on comparing suture versus tacker mesh fixation for laparoscopic repair of hernia found higher pain score at 1 hr, 6 hrs, 24 hr, 1 week, 1 month, and 3 months in tacker mesh fixation group. The mean operative time was high in suture fixation group (77.5 min) than tacker group (52.6 min) [13]. A study by Aziz SS *et al.*, on suture mesh fixation versus tacker mesh fixation in laparoscopic transabdominal preperitoneal repair of inguinal hernia found that the mean pain score was significantly less in suture group than tacker group [14]. Kleidari *et al.*, reported that the mean pain at 1<sup>st</sup> day and 6<sup>th</sup> days after discharge was significantly less in suture fixation group than tacker group [15]. Dandey A *et al.*, reported higher mean operative duration in suture fixation (89.77 min) than tacker fixation group (84.17 min); duration of hospital was 2.04 days in suture group and 2.27 days in tacker group and the difference was not significant ( $p=0.067$ ) [16]. The current study findings were similar to the above findings where suture fixation group showed prolonged surgical duration, less pain score than tacker fixation group.

Post operative pain and discomfort was seen in 27.28% and 22.72% of participants in two study groups. One case in suture fixation group showed seroma formation and none in tacker fixation group. Scrotal swelling was observed in one cases of each group. The duration for return to routine activity was <1 week in 77.28% and 72.72% and >1 week in 22.72% and 27.28% in suture and tacker mesh fixation group. Duration for return to work was < 2 weeks in 81.82% of participants in both groups and >2 weeks in 18.18% of participants in both groups. A study by Kitamura RK *et al.*, found pain and discomfort, seroma formation and urinary retention in 7%, 14% and 3% of cases in suture group and 3% and 6% in tacker group respectively. None of the cases exhibited urinary retention in tacker mesh group [21]. A study by Bansal VK *et al.*, found that the incidence of seroma was high in suture fixation group [13]. A study by Aziz SS *et al.*, found urinary retention, formation of seroma, and scrotal hematoma in 4.16%, 2.78% and 2.78% of cases under tacker fixation respectively. No seroma formation was observed in suture fixation group [14]. Dandey A *et al.*, found seroma formation in one case of tacker fixation group and none in suture group. The mean duration to return to routine work was 1.42 days and 1.16 days, and mean duration to return to office work was 4.29 days and 4.95 days in suture and tacker groups respectively [16]. Similarly, in present study, majority participants were returned to routine within 7 days after surgery and returned to work within 2 weeks.

Kitamura RK *et al.*, concluded that postoperative complication rate was not different between suture and tacker mesh fixation groups and have equal effect in the laparoscopic umbilical hernia repair [12]. A study by Bansal VK *et al.*, concluded that suture mesh fixation was cost effective alternative to tacker fixation with significantly less post operative pain, but

required prolonged operative duration [13]. A study by Aziz SS *et al.*, concluded that suture mesh fixation was less painful than tack fixation [14]. Dandey A *et al.*, opined that suture mesh fixation has comparable perioperative and quality of life outcomes against tack fixation [16].

The present study findings were similar to the above findings where suture mesh fixation showed better outcome. The present study was single centric study limited to less sample size. Further studies are required to assess more parameters with wider range of participants and prolonged postoperative follow-up.

### Conclusion

In conclusion, the suture mesh fixation and tack mesh fixation are effective in the laparoscopic hernia repair. However, suture fixation was cost-effective than tack fixation, but tack fixation group showed less duration of surgery.

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