

## Early Postoperative Complications of Suture Versus Endotacker Mesh Fixation in Laparoscopic Hernia Repair.

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### Abstract

**Objective:** To compare difference in early postoperative complications like postoperative pain, wound infection, Hematoma formation and Seroma formation in LVHR done with sutures versus tackers.

**Material and Methods:** This Cross sectional study was conducted in Azra Naheed Medical College, Surgical Department from 1st September 2020 to 30th August 2023. Data was analysed with statistical analysis program (SPSS version 20). P value of  $\leq 0.05$  was considered significant.

**Results:** In the suture fixation group (A) there were 42 females and 18 males while in the tacker fixation group (B) there were 45 females and 15 males. Mean hospital Stay of group A was  $2.8 \pm 1.3$  days whereas, group B was of  $2.6 \pm 1.3$  days with a p value of 0.4. Foreign body sensation was significantly higher in group A however there was no difference between the two groups in terms of wound infection, hematoma formation and post operative pain.

**Conclusion:** Foreign body sensation was high in LVWH repair of patients with sutured mesh fixation with p value of 0.01 making it statistically significant as compared to patients who underwent mesh fixation with endotracker.

**Keywords:** Ventral Hernia, Wound Infection, Hematoma, Seroma, Mesh, Pain.

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### Introduction

Ventral hernias, such as umbilical and epigastric hernias, are major abnormalities of the anterior abdominal wall brought on by the spontaneous weakness of the abdominal wall muscles.<sup>1</sup> Secondary defects of the anterior abdominal wall that develop following a surgical incision are known as incisional hernias. Incisional Hernias are a common

complication of surgery occurring in 3-13% of laparotomies.<sup>2</sup> Abdominal wall hernias cause significant medical problems to the patient interfering with personal as well as professional activities, having an impact on Quality of Life. Hernias can be asymptomatic but surgical repair is required if it is causing symptoms or leading to complications like obstruction and strangulation.<sup>3</sup>

In open hernia repair, preventative non-absorbable synthetic meshes like polyester and polypropylene are utilized; nonetheless, over time, these uncoated meshes caused intestinal blockage, adhesions, and fibulae formation.<sup>4</sup> As a result, coated composite meshes were created and are now utilized for incisional hernia repairs and laparoscopic intraperitoneal ventral procedures. Early and late complications are avoided by selecting the right patient and using precise surgical technique, as well

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as by choosing the mesh fixation method based on the width of the defect.<sup>5</sup>

In the long run, these uncoated meshes caused intestinal blockage, adhesions, and fibulac development.<sup>6</sup> In contrast, prophylactic non-absorbable synthetic meshes like polyester and polypropylene are utilized in open hernia repair.<sup>7</sup> Coated composite meshes were created as a result, and they are being utilized in laparoscopic intraperitoneal ventral and incisional hernia repairs.<sup>8</sup> Early and late problems are avoided by appropriate patient selection, precise surgical technique, and mesh fixation method selection based on defect diameter.<sup>9</sup>

Our study compares the differences in early postoperative problems between LVHR performed with sutures and tackers, including wound infection, hematoma formation, seroma formation, and postoperative pain.

## Material and Methods

From September 1, 2020, to August 30, 2023, this cross-sectional study was carried out in the surgical department of Azra Naheed Medical College. With approval from the hospital's ethics committee, we enrolled 120 patients who met the study's inclusion requirements. The study's participants were over the age of eighteen, gave their written informed consent, had never undergone open or laparoscopic surgery before, and consented to provide contact information so that they could be reached during the recovery period. Patients under the age of eighteen who had already had surgery or who had co-morbid conditions such as diabetes, hypertension, or cardiovascular disease were not allowed to participate in the study.

Additionally, patients with a terminal condition or a history of substance misuse were not included in the study. The method of sequential non-probability sampling was used to choose the patients. Group A consisted of 60 patients who underwent laparoscopic ventral wall hernia repair with sutured mesh fixation, while Group B consisted of 60 patients who underwent endotacker mesh fixation. The on-call physician used a non-probability consecutive sampling technique to gather data, which was then

entered into a pre-made proforma that included pertinent questions. IBM-SPSS version 20, a statistical analysis application, was used to analyze the data. For qualitative indicators, such as wound infection, hematoma formation, and seroma formation, frequency and percentage were calculated. A hematoma is a collection of blood beneath the skin, whereas a seroma is a collection of clear fluid. Clinical examination and ultrasonography were used to diagnose each of these abnormalities. For quantitative factors such as patient age, the mean  $\pm$ SD was displayed. Early postoperative problems, such as postoperative discomfort, wound infection, hematoma formation, and seroma formation in LVHR performed using sutures as opposed to tackers, were compared between the two groups. The student t test was used to statistically assess the differences in the two groups' mean postoperative pain, while the chi square test was used to test for wound infection, hematoma formation, and seroma formation. A P-value of less than 0.05 was deemed significant.

## Results

A total of 120 patents were included and divided equally two groups. Out of 60 patients in group A treated with laparoscopic ventral wall hernia with sutured mesh fixation there were 42 females and 18 males, with age mean and SD of  $43.85 \pm 15$ . In group B 60 patients were enrolled who underwent LVHR with mesh fixation via endotacker. 45 patients were females and 15 were males, with age mean and SD of  $48.7 \pm 15$ . Median hospital Stay of group A was 2.12 days whereas, group B had a hospital stay of 2.7 days with a p value of 0.4. Significant high postoperative foreign body sensation was noted among patients of in group A compare to group B (p value of 0.01) and postoperative foreign body sensation, being high in group A and post operative seroma formation details given in table :1. However, there were no significant difference between hematoma formation, wound infection and post operative pain among both groups detail given in table :1 below. There were no cases which had recurrent seroma formation or underwent re-do surgery.

**Table 1:** *Early postoperative complications.*

Variables		LVHR With Sutured Mesh Fixation	LVHR With Mesh Fixation via Endotacker	Pvalue
Foreign body sensation	Yes	15	4	0.01
	No	45	55	
Hematoma	Yes	5	4	1
	No	55	56	
Seroma	Yes	21	12	0.05
	No	39	48	
WoundInfection	Yes	4	2	0.4
	No	56	58	
Pain	Mild	33	39	0.2
	Moderate	70	20	
	Severe	0	1	

## Discussion

A typical surgical treatment that can be done openly or laparoscopically is the correction of abdominal hernias with mesh placement. International guidelines recommend laparoscopic repair over open repair because a meta-analysis of six RCTs with 751 patients showed that laparoscopic surgery reduced wound complications compared to open hernia repair.<sup>10</sup> Le Blanc K. pioneered laparoscopic abdominal wall hernia repair (LVHR) in the 1990s. Primary fascial closure, laparoscopic component separation, intracorporeal fascial defect suturing, mesh placement reinforcement, and intra-peritoneal onlay mesh (IPOM) repair are among the laparoscopic repair approaches.<sup>11</sup> In terms of post-operative morbidity, it is regarded as a feasible and effective approach for treating primary (epigastric, umbilical) and secondary (incisional hernias) hernias as compared to open surgery.<sup>12</sup>

The mesh fixation technique is not well understood; despite the fact that laparoscopic hernia repair is a common and often used procedure. Our results are supported by a similar study that was carried out in the setting of ventral hernia repair and that revealed no appreciable variation in postoperative discomfort between groups. According to a 2021 study, 26.6% of ventral hernia repairs in the US are performed laparoscopically, which results in early post-operative patient release and, ultimately, is a more affordable surgical alternative for the patients.<sup>13,14</sup>

According to one study, individuals who had open ventral hernia repair saw a postoperative wound infection rate of 3 to 8%, while those who had a laparoscopic procedure experienced a reduced risk of

0.1 to 5%.<sup>15</sup> However, many centers continue to question the extended operating time in comparison to open ventral hernia repair.<sup>16</sup> A frequent side effect of open or laparoscopic ventral hernia surgery is seroma development. Mild skin infections, non-healing wounds, intestinal blockage due to bowel entrapment, chronic fistulas from persistent mesh infection, and hernia recurrence are among the 16 other problems that have been documented.<sup>17</sup>

Patients were sent home from the hospital about three days following the intervention, with a median operating time of 62 minutes for IPOM (Intra-peritoneal Onlay Mesh) repair. 20 Because of the tensile strength of the suture material employed, Sharma suggested that intracorporeal suturing has a higher tensile strength than endotacks.<sup>18</sup> However, current research does not demonstrate that any mesh fixation technique is better than any other in terms of post-operative complications such recurrence rates.<sup>19</sup> In our study, patients who received mesh fixation for a lap ventral wall hernia using sutures reported higher foreign body sensations ( $P=0.01$ ) than those who had endotacker mesh fixation.

The most common complaint among patients is post-operative discomfort, and research has shown that titanium tacks are more likely to cause pain than absorbable tacks.<sup>14</sup> The majority of patients in our study reported mild to moderate pain in both groups during the post-operative phase, and none of them needed pain management interventions. However, Liu Y found no difference between absorbable and non-absorbable sutures and tacks in terms of post-operative results.<sup>11</sup> However, one study found that mesh fixation with fibrin glue completely eliminated pain; however, further research is need to confirm this.<sup>3</sup>

No significant problems were observed in any of the groups in our investigation; however, 21 out of 60 patients (35%) who had mesh fixed with sutures experienced seroma formation in the early post-operative period, with a p-value of 0.05. According to reports, seroma was identified in 35% of patients based on physical examination, however ultrasound scanning identified all serums.<sup>18</sup> Ileus and missed enterotomy were identified by Asencio F et al. as major complications in laparoscopic ventral hernia repair; seroma formation was the most common minor complication in the study, with a P value of less than 0.05.<sup>15</sup>

## Conclusion

Compared to patients who had mesh fixation with an endotacker, patients who had sutured mesh fixation experienced a higher level of foreign body sensation in the early postoperative period after LVWH repair ( $p = 0.01$ ; statistically significant). Between the two groups, there was no statistically significant difference in hematoma, seroma development, or wound infection.

**Conflict of Interest** *None*

**Funding Source** *None*

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### **Authors Contribution**

**MQ:** Conceptualization of Project

**DAS:** Data Collection

**MS:** Literature Search

**FH:** Statistical Analysis

**ASA:** Drafting, Revision

**HA:** Writing of Manuscript