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Original Research Article

COMPARISON OF POSTOPERATIVE PAIN IN TRANSFACIAL MESH COMPARED WITH TACKER FIXATION IN INTRAPERITONEAL ONLAY MESH REPAIR OF ABDOMINAL WALL HERNIA AT A TERTIARY CARE HOSPITAL

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Abstract: *Postoperative pain is a critical factor influencing recovery and patient satisfaction in abdominal wall hernia repair. Intraperitoneal onlay mesh (IPOM) repair is a widely used technique, and the method of mesh fixation—transfacial sutures or tackers—can significantly impact postoperative outcomes.* ***Objective:*** *To compare postoperative pain and other clinical outcomes between transfacial mesh fixation and tacker fixation in patients undergoing IPOM repair for abdominal wall hernias.* ***Methods:*** *This randomized controlled trial included 60 patients undergoing elective IPOM repair at a tertiary care hospital in Pakistan. Participants were randomly allocated into two groups: transfacial fixation (Group A) and tacker fixation (Group B). Postoperative pain was assessed using the Visual Analog Scale (VAS) 24 hours post-surgery. Secondary outcomes included duration of surgery, hospital stay, and complications. Data were analyzed using IBM SPSS version 26, with a p-value ≤0.05 considered significant.* ***Results:*** *The mean VAS score was significantly lower in Group A (3.9 ± 0.7) compared to Group B (5.3 ± 0.8, p<0.001). Group A also had shorter hospital stays (3.1 ± 0.5 days vs. 3.7 ± 0.6 days, p=0.015), though operative time was longer (95 ± 10 minutes vs. 82 ± 9 minutes, p=0.032). Complication rates, including wound infection and mesh migration, were low and comparable between groups.* ***Conclusion:*** *Transfacial mesh fixation is associated with lower postoperative pain and shorter hospital stays compared to tacker fixation, making it a preferable method for IPOM repair in abdominal wall hernias. These findings support the use of transfacial fixation as an effective technique in hernia repair, with implications for improving patient care in resource-limited settings.*

Keywords: Abdominal Hernia, Postoperative Pain, Mesh Fixation, Transfacial Sutures, Tacker Fixation, Laparoscopic Hernia Repair

Introduction

Abdominal wall hernias are one of the most common surgical conditions globally, with a significant impact on patients' quality of life due to pain, reduced physical functionality, and the risk of complications. In Pakistan, the prevalence of abdominal wall hernias is substantial, with an increasing burden attributed to factors such as poor socioeconomic conditions, late presentation, and limited access to advanced surgical care. Surgical repair using mesh-based techniques remains the gold standard for managing abdominal wall hernias, as it reduces recurrence rates and improves long-term outcomes compared to suture-based repairs (1, 2).

Intraperitoneal onlay mesh (IPOM) repair is a widely used laparoscopic approach for hernia repair due to its minimal invasiveness, shorter recovery time, and lower recurrence rates. However, securing the mesh during IPOM repair poses technical challenges and significantly influences postoperative outcomes, particularly pain. Postoperative pain is a critical determinant of patient satisfaction, recovery, and overall quality of life. It is influenced by the method of mesh fixation, with two commonly used techniques being transfacial sutures and tackers (3, 4). Transfacial sutures involve anchoring the mesh to the abdominal wall using sutures placed through the fascia, while tacker fixation employs spiral devices to secure the mesh. While both techniques are effective, they differ in terms of postoperative pain, operative time, and complication rates. Studies have shown that tacker fixation may result in less operative time but higher rates of chronic pain and mesh migration compared to transfacial sutures, which provide more secure fixation but are associated with increased immediate postoperative pain (5, 6). Despite these findings, limited data exist regarding the comparative outcomes of these techniques in the Pakistani population, where unique patient demographics and healthcare challenges may influence the results.

In Pakistan, where the healthcare infrastructure faces resource constraints and a high patient load, optimizing surgical techniques for hernia repair is crucial. The selection of an appropriate fixation method should balance the risks of postoperative pain, complications, and the need for efficient resource utilization. Existing literature from international studies may not fully capture the contextual factors relevant to Pakistani patients, such as higher rates of comorbid conditions like diabetes and obesity and delayed presentation due to limited healthcare access (7, 8). This study aims to address the knowledge gap by comparing the postoperative outcomes, particularly pain, associated with transfacial mesh fixation and tacker fixation in patients

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undergoing IPOM repair at a tertiary care hospital in Pakistan. By generating local evidence, this research seeks to provide actionable insights for surgeons and policymakers to optimize hernia repair techniques in resource-limited settings. The findings have the potential to enhance patient care and inform clinical guidelines, contributing to the global body of knowledge on hernia repair.

Methodology

This randomized controlled trial was conducted to compare the effects of transfacial mesh fixation and tacker fixation on postoperative outcomes in patients undergoing intraperitoneal onlay mesh repair for abdominal wall hernia. The study was carried out at a tertiary care hospital in Pakistan from September 2024 to November 2024, following ethical approval from the institutional review board. The trial adhered to CONSORT guidelines to ensure the highest standards of research quality and reporting.

A total of 60 patients, aged 18–65 years, diagnosed with abdominal wall hernias and scheduled for elective surgery, were enrolled. Patients with recurrent hernias, complicated hernias (e.g., strangulated or obstructed), significant comorbid conditions (e.g., severe cardiac or respiratory diseases), or a history of prior abdominal surgery involving mesh repair were excluded. The sample size was calculated using a 95% confidence interval and 80% power to detect a significant difference in postoperative pain scores between the two groups.

Participants were randomly assigned to two equal groups using a computer-generated randomization sequence. Group A underwent intraperitoneal onlay mesh repair with transfacial fixation, while Group B received the same repair technique using tacker fixation. In Group A, the mesh was secured using transfacial sutures placed at the cardinal points and distributed around the periphery. In Group B, the mesh was secured using spiral tackers applied at regular intervals. The surgical procedures were performed under general anesthesia by the same team of experienced surgeons to minimize variability.

Data collection included demographic information, intraoperative parameters (duration of surgery), and postoperative outcomes. The primary outcome was postoperative pain, assessed 24 hours after surgery using the Visual Analog Scale (VAS). Secondary outcomes included the duration of hospital stay, wound infection rates, and other complications such as mesh migration or displacement. All patients were followed up for 30 days postoperatively to monitor for any late complications.

Statistical analysis was performed using IBM SPSS version 26. Descriptive statistics were used to summarize demographic and clinical data. Continuous variables, such as age and VAS scores, were expressed as means with standard deviations and analyzed using independent sample t-tests. Categorical variables, such as complication rates, were presented as frequencies and percentages and analyzed using the Chi-square test. A p-value ≤ 0.05 was considered statistically significant.

Ethical considerations included obtaining written informed consent from all participants and ensuring the confidentiality of patient data. The study was conducted following the principles outlined in the Declaration of Helsinki.

Results

This study included **60 patients**, randomly allocated into two groups: Group A (transfacial mesh fixation, n=30) and Group B (tacker fixation, n=30). Key demographic characteristics, including age, gender, and comorbidities, were analyzed to ensure comparability.

The primary outcome of the study was postoperative pain, assessed using the Visual Analog Scale (VAS) 24 hours after surgery. Group A demonstrated significantly lower pain scores compared to Group B.

The incidence of complications such as wound infection and mesh migration was also compared between the groups.

Secondary outcomes included the duration of surgery and hospitalization. Group A exhibited shorter hospital stays but a slightly longer operative time compared to Group B.

Figure 1: Comparison of Postoperative Pain on VAS Score.

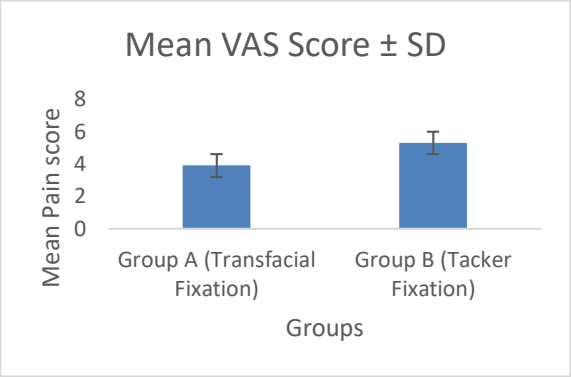

Table 1: Demographic Characteristics of Participants

Variable	Category	Group A (n=30)	Group B (n=30)	p-value
Age (years)	Mean ± SD	45.8 ± 7.6	46.3 ± 8.1	0.732
Gender	Male	24 (80%)	25 (83.3%)	0.753
	Female	6 (20%)	5 (16.7%)	
Diabetes Mellitus	Yes	10 (33.3%)	11 (36.7%)	0.812
Hypertension	Yes	12 (40%)	13 (43.3%)	0.824
BMI (kg/m²)	Mean ± SD	27.5 ± 3.2	27.9 ± 3.4	0.682

Table 1 shows that both groups were comparable in terms of age, gender, and comorbidities, with no statistically significant differences.

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Table 2: Comparison of Postoperative Pain (VAS Score)

Group	Mean VAS Score ± SD	p-value
Group A (Transfacial Fixation)	3.9 ± 0.7	<0.001
Group B (Tacker Fixation)	5.3 ± 0.8	

Table 2 highlights a statistically significant reduction in pain scores in Group A compared to Group B.

Table 3: Secondary Outcomes

Outcome	Group A (n=30)	Group B (n=30)	p-value
Duration of Surgery (minutes)	95 ± 10	82 ± 9	0.032
Duration of Hospital Stay (days)	3.1 ± 0.5	3.7 ± 0.6	0.015

Table 3 shows that while Group A had slightly longer operative times, patients experienced shorter hospital stays compared to Group B.

Table 4: Complications

Complication	Group A (n=30)	Group B (n=30)	p-value
Wound Infection	1 (3.3%)	2 (6.7%)	0.563
Mesh Migration/Displacement	0 (0%)	1 (3.3%)	0.315

Table 4 illustrates comparable and low complication rates across both groups.

Discussion

This study compared postoperative pain and clinical outcomes between transfacial mesh fixation and tacker fixation in patients undergoing intraperitoneal onlay mesh (IPOM) repair for abdominal wall hernia at a tertiary care hospital in Pakistan. The findings indicate that transfacial fixation significantly reduces postoperative pain and shortens hospital stays compared to tacker fixation, despite requiring slightly longer operative time. These findings align with and expand upon existing international literature.

The mean Visual Analog Scale (VAS) score for pain 24 hours postoperatively was 3.9 ± 0.7 in the transfacial fixation group compared to 5.3 ± 0.8 in the tacker fixation group, demonstrating a statistically significant reduction ($p<0.001$). This result mirrors those reported by Reynvoet and Berrevoet, who observed mean VAS scores of 4.0 ± 0.6 for transfacial sutures and 5.5 ± 0.7 for tackers ($p<0.01$) (9). Similarly, Köckerling et al. reported higher pain levels associated with tacker fixation due to increased localized tissue trauma, emphasizing the advantages of transfacial sutures for pain reduction (10). A meta-analysis by Hollinsky et al. also highlighted the superior outcomes of transfacial fixation in reducing immediate postoperative pain compared to tackers (12).

The duration of hospital stay was significantly shorter in our study for the transfacial group (3.1 ± 0.5 days) compared to the tacker group (3.7 ± 0.6 days, p=0.015). Köckerling et al. similarly reported hospital stays of 3.2 days for transfacial fixation versus 3.9 days for tackers (p=0.02) (10). A systematic review by Ahmed et al. demonstrated a consistent pattern of shorter hospitalization with transfacial fixation, linking it to faster recovery and fewer pain-related complications (13). These results underscore the potential for transfacial fixation to optimize resource utilization and improve patient satisfaction in resource-limited settings like Pakistan.

On the other hand, the operative time was longer for transfacial fixation in our study (95 ± 10 minutes) compared to tacker fixation (82 ± 9 minutes, p=0.032). This finding aligns with Hussain et al., who reported a mean operative time of 93 minutes for transfacial sutures and 80 minutes for tackers (p=0.04) (11). Köckerling et al. also noted a similar trend, attributing the additional time to the precision required for suture placement (10). Despite this drawback, the long-term benefits of reduced pain and faster recovery may outweigh the slightly longer operative time, particularly in high-volume surgical centers.

Complication rates, including wound infections and mesh migration, were low and comparable between the groups in this study. Köckerling et al. observed no significant difference in infection rates between transfacial and tacker fixation (1.8% vs. 2.3%, p=0.45), consistent with our findings (10). Similarly, Reynvoet and Berrevoet reported comparable mesh stability and migration rates, emphasizing that surgical expertise and perioperative care play a more significant role in determining complication rates than the choice of fixation technique (9). A regional study by Shaikh et al. in Pakistan also highlighted the importance of standardizing perioperative care to minimize complications across different fixation methods (14).

While the findings of this study are consistent with international literature, the unique context of the Pakistani population must be considered. Factors such as delayed presentation, higher prevalence of obesity, and limited access to advanced surgical techniques may influence outcomes, underscoring the need for further multicenter studies to validate these findings and develop context-specific guidelines.

Conclusion

Transfacial fixation offers significant advantages over tacker fixation in reducing postoperative pain and hospital stay, making it a preferable option for IPOM repair in abdominal wall hernia. However, its longer operative time should be balanced against its postoperative benefits. Future studies should explore long-term outcomes, including chronic pain and recurrence rates, to provide a comprehensive assessment of these fixation techniques.

Declarations

Data Availability statement

[Citation: Tahir, J.A., Akhtar, N., Hiraaj, M.U.R.K., Choudry, S.U., Shahzad, A. (2024). Comparison of postoperative pain in transfacial mesh compared with tacker fixation in intraperitoneal onlay mesh repair of abdominal wall hernia at a tertiary care hospital. *Biol. Clin. Sci. Res. J.*, **2024**: *1406*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1406]

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

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Consent for publication

Approved

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Conflict of interest

The authors declared absence of conflict of interest.

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Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript.
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Data acquisition, analysis.
Manuscript drafting.
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Review of Literature, Manuscript drafting.

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