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Original Research Article

Incisional Hernia Repair Outcome

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Abstract

Background: Incisional hernia is a common complication after abdominal operation. Surgery repair is the definitive treatment, though options such as non-mesh or mesh reinforcement are also considered. The kind initial surgical technique has been associated with recurrence and postoperative complications.

Methods: A retrospective comparative analysis of 55 patients, who underwent elective open incisional hernia repair in a tertiary care center between January 2025 and December 2025 was performed. The patients were categorized into mesh (n=49) and non-mesh (n=6) groups. Primary outcome was hernia recurrence. Secondary outcomes included surgery-related complications (surgical site infection (SSI) and seroma/hematoma), chronic pain, and length of hospital stay. A $p < 0.05$ level was considered to be statistically significant.

Results: Recurrence was found only in the non-mesh group (66.7%), and none of the recurrences was noted in the mesh group ($p < 0.01$). SSI was 10.2% in the mesh group and 16.7% in the non-mesh group. Seroma/hematoma was presented in 8.2% vs 16.7%, with chronic pain in 10.2% vs 16.7% of the mesh and none mesh groups, respectively. The average hospitalization was slightly less in the mesh group (4.1 ± 1.2 days) than that of non-mesh (4.5 ± 1.4 days).

Conclusion: Mesh repair of open incisional hernia is better than that of non-mesh repair, providing lower recurrence rate and postoperative complications are acceptable. Non-mesh-repair has high recurrence rates. Prospective patient selection, control of comorbidities and careful surgical handling are important for favourable long-term results.

Keywords: Incisional hernia, Mesh repair, non-mesh repair, Hernia recurrence, Postoperative complications, Open surgery.

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Introduction

When the intestines stick out through a weak spot in the abdominal wall where surgery was done, this is called an incisional hernia [1].It is one of the most common late complications after abdominal surgery and remains a major challenge for general surgeons globally. Incisional hernias can occur several months and even years following the primary surgery, and can present as small asymptomatic defects all the way to large-often complex-hernia with pain, cosmetic deformity and functional impairment [2]. Incisional hernias may enlarge and develop in complexity if not treated, leading to potential complications including bowel obstruction, incarceration and strangulation.

The published incidence of incisional hernia is variable and the literature reports this to be 10-20% following laparotomy, with higher rates seen in high-risk groups [3]. Incisional hernias remain a significant source of morbidity despite improvements in surgical technique, suture materials and perioperative care [4,5]. They are related to higher rates of hospitalization, secondary surgical procedures, and a longer convalescence time, as well as important costs for the health system. Furthermore, incisional hernia repair accounts for a significant number of elective general surgical operations and thus the necessity to achieve good operative results.

Several patient- and procedure-specific factors predispose to the development of an incisional hernia. Due to high intra-abdominal pressure, poor wound healing, and obesity are known risk factors [6]. Surgical site infection after index operation is a major risk factor for fascial dehiscence and subsequent hernia [7]. Other risk factors are smoking, leading to a decrease in tissue oxygenation and collagen synthesis, diabetes mellitus affecting wound healing and immune response, elderly age, malnutrition, chronic cough and immunosuppressive drugs. Technical factors, including failure of fascial closure and urgent surgery contribute to the risk for developing hernia [8].

The definitive treatment for incisional hernias is surgical repair and various operative techniques have been described [9]. Open repair has traditionally been the accepted surgery, which permits direct visualisation and closure of the defect. However, the recurrence rates after suture repair alone are unacceptably high and have therefore favoured mesh reinforcement. The usage of synthetic mesh has greatly decreased recurrence rates with acceptable long-term results [10]. More recently, laparoscopic incisional hernia repair has been developed and is widely accepted because of its minimally invasive character, lower postoperative pain, shorter hospital stays and fewer wound complications. However, there are concerns about mesh-related complications, chronic pain and long-term recurrence in particular, especially for large or complex hernias. Evalution of the results of incisional hernia repair is important as recurrence still represents a major issue despite evolution in operative strategies. Postoperative complications, such as seroma, wound infection, mesh infection and chronic pain can play an important role in impairing patient recovery and satisfaction [11]. Furthermore, incisional hernias reduce the quality of life related to physical activity, body image and psychological status. Outcome measurement should thus go beyond rates of recurrence and include postoperative morbidity, functional recovery and patient-reported quality-of-life data.

While several investigations have discussed various repair methods, there is currently no clear strategy for the operative management of incisional hernia. Patient population heterogeneity, lack of uniformity in hernia size, expertise of the surgeon and length of follow-up have led to mixed results across studies [12]. In addition, few centers publish typical results and complications following incisional hernia repair. This supports the idea that surgical results should be constantly evaluated to help doctors make decisions and improve patient care. This study looks at the outcomes of incisional hernia repair by looking at recurrences, general complications after surgery, and the overall recovery of the patient.

Objectives

- To evaluate the result of open incisional hernia repair with mesh versus without mesh.
- To compare the frequency of recurrences between mesh and non-mesh repair.
- To evaluate postoperative complication, which is defined as surgical site infection, seroma/hematoma, chronic pain and length of hospital stay.

Materials and Methods

Study Design: This study was a retrospective comparative analysis directed at a tertiary care center, concentrating on patients who underwent selected open incisional hernia repair from January 2025 to December 2025.

The aim was to compare the result of repairs with and without mesh, particularly regarding recurrence, postoperative morbidity, and length of hospital stay. The institutional ethics committee approved the study and patient confidentiality was preserved.

Study Population: The study enrolled adult patients aged ≥ 18 years presenting with either a clinical or radiological diagnosis of incisional hernia who underwent elective open repair during the study period. The exclusion criteria included recurrent hernias, emergency intervention, strangulated or incarcerated hernias and those that required bowel resection, patients with incomplete medical records or insufficient follow-up data. All eligible patients were identified from hospital and operative logs. A total of 55 patients were fulfilled the inclusion criteria and were enrolled in the study.

Surgical Technique: Patients were classified into two groups, those who had mesh repair and those who had non-mesh repair. The use of mesh was at the discretion of the surgeon, defect size, quality of tissue and risk for contamination. Synthetic mesh was the most common type of mesh used in repairs, and biologic mesh was reserved for patients who were at higher risk for infection.

Open repair was undertaken through the direct fascial exposure and closure, with mesh use in an only or sublay position anchored by sutures. The non-mesh repairs were performed by primary fascial closure, without prosthetic support. All operations were done by high-volume general surgeons according to uniform surgical techniques.

Outcome Measures: The primary outcome was incisional hernia recurrence during follow-up. Secondary outcome were SSI, seroma or hematoma formation, chronic postoperative pain, and length of hospital stay. From clinical records and patient follow-up, functional outcomes and quality of life were measured when available.

Data Collection and Follow-Up: Data were collected from hospital record, operative reports, and follow-up visits. Information on baseline patient demographics, comorbidities, body mass index (BMI), prior surgeries and perioperative variables were collected with a standardized data collection form. Postoperative surveillance consisted of physical examination and imaging (ultrasound or CT) in case of recurrent tumors. The mean follow-up time was sufficiently long to detect early and mid-term results, such as adverse events and recurrence rate.

Statistical Analysis: Quantitative variables were presented as mean ± SD, and categorical variables as frequency (n) and percentage (%). Categorical outcomes (eg, recurrence and infection) were compared between mesh types using chi-square tests. Continuous variables including the operative time and hospital stay were compared by independent sample t-tests. $P < 0.05$ was deemed significant. All statistical analyses were performed with standard statistical software, to ensure precision and reliability in data interpretation.

Results

Demographics and Clinical Characteristics: In total, 55 patients were treated using an elective open incisional hernia repair during the study period. Forty-nine patients (89.1%) of these had mesh repair and 6 patients non-mesh-repair. The mean age of patients in the (mesh) group was 52.1 ± 11.5 years, while it was 54.3 ±12.1 years for patients in the (non-mesh) group.

There were more male patients than female in both groups with a percentage of 59% (mesh group) and 67% (non-mesh group). The majority of patients were overweight/obese since BMI >25 kg/m² was recorded in 69% and 83% of both the mesh group and the non-mesh group, respectively.

The most common comorbidities were diabetes mellitus (32.7% mesh, 33.3% non-mesh) and hypertension (38.7% mesh, 33.3% non-mesh). Twenty one patients in the mesh group and 16 in the non-mesh group had a history of previous abdominal surgery, prior wound infection presented in 22.4% mesh versus 16.7% non-mesh (Table 1).

Table 1: Demographic and Clinical Characteristics of Patients (n = 55)

Variable	Mesh Repair (n=49)	Non-Mesh Repair (n=6)
Mean age (years)	52.1 ± 11.5	54.3 ± 12.1
Male/Female	29/20	4/2
BMI >25 kg/m²	34 (69%)	5 (83%)
Diabetes mellitus	16 (32.7%)	2 (33.3%)
Hypertension	19 (38.7%)	2 (33.3%)
Previous abdominal surgery	49 (100%)	6 (100%)
Prior wound infection	11 (22.4%)	1 (16.7%)

Operative Details: Mesh repair group had higher mean operative time (88 ± 18 minutes) compared to the non-mesh group (70 ± 12 minutes). 48 patients underwent mesh repair with synthetic mesh and 1 patient received biologic implant; no mesh was used in the non-mesh group. The mesh was fixed either sutured, tacked to abdominal wall or combined and properly covering the defect. Non-mesh repair was done by primary fascial closure alone (Table 2).

Table 2: Operative Details

Parameter	Mesh Repair (n=49)	Non-Mesh Repair (n=6)
Mean operative time (minutes)	88 ± 18	70 ± 12
Synthetic mesh	48	0
Biologic mesh	1	0

Postoperative Outcomes: Hernia recurrence was observed during the post-operative follow-up period in the non-mesh group exclusively, and involved 4 of 6 patients (66.7%), whereas no hernias occurred in the mesh group ($p < 0.01$). The surgical site infection rate was 10.2% in mesh patients and 16.7% in non-mesh patients. Seroma or hematoma occurred in 8.2% of the mesh group and 16.7% of the non-mesh group. Chronic postoperative pain was observed in 10.2% of patients in the mesh group and 16.7% of those in the non-mesh group. The average period of hospitalization was marginally less in the mesh group (4.1 ± 1.2 days) than non-mesh group (4.5 ± 1.4 days) (Table 3). In general, mesh repair was more effective in reducing recurrences compared with their non-mesh counterparts and placement of mesh did not lead to increased complication rates.

Table 3: Postoperative Outcomes

Outcome	Mesh Repair (n=49)	Non-Mesh Repair (n=6)
Recurrence	0	4 (66.7%)
Surgical site infection	5 (10.2%)	1 (16.7%)
Seroma / Hematoma	4 (8.2%)	1 (16.7%)
Chronic pain	5 (10.2%)	1 (16.7%)
Mean hospital stay (days)	4.1 ± 1.2	4.5 ± 1.4

Recurrence was significantly higher in the non-mesh group ($p < 0.01$). Complication rates were slightly higher in the non-mesh group, although these differences were not statistically significant.

Discussion

We have shown in the present study that open incisional hernia repair with mesh repair, as opposed to non-mesh repair, is associated with significantly lower recurrence rates of postoperative complications. Recurrence developed only in 55 women from non-mesh arm (66.7%) and none at all in the mesh repair group. The incidence of wound infection, seroma or hematona formation and chronic postoperative pain were a little higher in the non-mesh group but the differences were not significant. The average hospitalization time did not differ between groups, indicating that mesh repair does not add to the short-term morbidity while offering a significant long-term benefit in reduction of recurrence. These findings underscore the importance of prophylactic prosthetic reinforcement to reinforce the abdominal wall and reduce recurrence.

Comparison with Literature: Our study results are in line with literature demonstrating effectiveness of mesh repair compared to primary suture techniques. According to the meta-analyses and cohort studies, recurrence rates range between 5 and 15% in patients who have mesh repair with failure involving significantly higher rates for non-mesh repair—particularly if the defect is a large or complex. Study 1 describing low recurrence after mesh repair in patients with post liver transplantation and by Study 2 reported better short-term results with mesh repair in complex ventral hernias. Similarly, Study 3 showed lower rates of postoperative wound infection in the mesh repair compared to non-mesh repair, consistent with the direction of our findings. The results from these trials have supported the use of mesh as a standard in the elective open incisional hernia repair.

Table 4: Comparison with existing studies

Study	Type	Sample Size	Key Findings
Present Study (2025)	Retrospective comparative	55	Mesh repair: 0% recurrence, fewer complications; Non-mesh: 66.7% recurrence.
Study 1 [13]	Meta-analysis	90	Mesh reduced recurrence and improved outcomes; non-mesh higher recurrence.
Study 2 [14]	Systematic review	1000+	Mesh reduced recurrence and wound complications; shorter hospital stay.
Study 3[15]	Prospective cohort	407	Mesh repair had low recurrence (~4–5%) and faster recovery; non-mesh higher recurrence.

Role of Mesh in Incisional Hernia Repair: The creation of a mechanical advantage through the mesh promotes redistribution of intra-abdominal pressure spanning expanded surface area, resulting in decreased fascial tension and minimized risk for hernia recurrence. Synthetic mesh is long-lasting and practical for elective clean cases whereas biologic mesh, due to cost and early degradation, tends to be utilized in contaminated fields.

Appropriate mesh location with sufficient defect overlap is important for ensuring long term stability and reducing complications. Complete lack of recurrences in our mesh group reflects the complementarity between mesh reinforcement and meticulous surgery.

Strengths and Limitations: The merit of this study is the comparative nature, uniform follow-up and "real-world" data from a tertiary care centre. The limitations of our study are as follows:

Its single-center and retrospective nature, the small number of patients in whom no mesh was used, and the short follow-up period that may have resulted to an under-reporting of late complication and long-term recurrence. More prospective multicenter and large-scale follow-up studies are needed to confirm these results.

Conclusion

Open incisional hernia repair with mesh provides better results than non-mesh repair, and has a low rate of recurrence and acceptable complications. Repair without mesh has a vastly increased risk of hernia recurrence, especially in larger defects. Selective patient selection, optimization of comorbidities, and attention to surgical technique including mesh placement and fixation are required for favorable long-term outcomes with regard to overall patient recovery.

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