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Clinical Characteristics and Surgical Outcomes of Patients with Incisional Hernia: A Retrospective Observational Study

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ABSTRACT:

Background: Incisional hernia is a common complication following abdominal surgery and may result in significant morbidity. Understanding its clinical profile and surgical outcomes helps improve patient management.

Objectives: To evaluate the clinical profile, risk factors and surgical outcomes of patients with incisional hernia.

Materials and Methods: This retrospective observational study included 50 patients with incisional hernia who underwent surgical management at a tertiary care hospital. Demographic details, previous abdominal surgeries, associated risk factors, clinical presentation, defect characteristics, surgical procedures and postoperative complications were assessed. Statistical analysis was performed using appropriate tests, with $p<0.05$ considered statistically significant.

Results: The majority of patients belonged to the 41–50 years age group (28%), and females constituted 60% of the study population. Previous lower segment caesarean section was the most common abdominal surgery (28%). Obesity (34%) and diabetes mellitus (30%) were the predominant associated risk factors. Scar swelling was the commonest presentation (100%), with midline hernias accounting for 58% of cases. Open mesh repair was the most frequently performed procedure (68%), and sublay/retrorectus placement was the commonest mesh technique (47.6%). Most patients (72%) had no documented postoperative complications, while surgical site infection was the most common complication (10%). Recurrence was documented in 3 patients (6%). Associations between diabetes, obesity, surgical procedure and postoperative complications were not statistically significant ($p>0.05$).

Conclusion: Incisional hernia was more common among middle-aged females, with obesity and diabetes being frequent associated risk factors. Open mesh repair was the predominant surgical approach, with most patients experiencing an uncomplicated recovery. Appropriate

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risk-factor optimization and surgical technique are important for improving outcomes and reducing recurrence.

Keywords: Incisional hernia, abdominal surgery, risk factors, mesh repair, postoperative complications, recurrence.

INTRODUCTION:

Incisional hernia is a common complication following abdominal surgery, resulting from inadequate healing of the abdominal wall fascia at the site of a previous surgical incision. It is characterized by the protrusion of intra-abdominal contents through a defect in the abdominal wall and may develop months or years after surgery. Its incidence varies according to the type of incision, surgical technique and patient characteristics. A systematic review and meta-analysis reported a weighted incidence of 12.8% following midline abdominal incisions at two years [1].

The development of incisional hernia is multifactorial and involves both patient-related and surgical factors. Important risk factors include advanced age, obesity, diabetes mellitus, smoking, malnutrition and chronic respiratory diseases. Surgical factors such as emergency procedures, surgical site infection, prolonged operative duration and inadequate fascial closure may also contribute to impaired wound healing. Appropriate abdominal wall closure techniques are therefore important in preventing incisional hernia [2,5].

The type and location of the previous abdominal incision also influence hernia development, with midline incisions being particularly associated with increased risk. Altered collagen metabolism, impaired tissue repair and surgical site infection may contribute to fascial weakness and subsequent hernia formation [2,3].

Patients commonly present with swelling at the previous surgical scar, which becomes more prominent during coughing or straining. Other symptoms include abdominal pain, discomfort and dragging sensation. Complicated cases may present with irreducibility, intestinal obstruction or strangulation. Clinical examination is the primary diagnostic method, while ultrasonography and computed tomography help assess the defect size, location and hernia contents. Standardized classification based on anatomical location and defect width also helps in evaluating and comparing clinical outcomes [3,6].

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Surgical repair is the definitive treatment for symptomatic incisional hernias. Available techniques include primary suture repair, open mesh repair and laparoscopic mesh repair. Mesh reinforcement provides additional abdominal wall strength and reduces recurrence compared with suture repair alone. The European Hernia Society guidelines recommend mesh-based repair for appropriate midline incisional hernias and emphasize fascial closure rather than bridging whenever feasible [1].

Despite advances in surgical techniques and mesh technology, complications such as surgical site infection, seroma, hematoma, wound dehiscence, chronic pain and mesh-related problems remain important concerns. Recurrence is another significant complication that may necessitate further surgical intervention. Appropriate preoperative assessment, optimization of modifiable risk factors and selection of suitable surgical techniques are essential for improving outcomes [1,4].

Evaluation of the clinical profile and surgical outcomes of incisional hernia provides valuable information regarding associated risk factors, clinical presentation, surgical management and postoperative complications.

Hence, the present study is undertaken to evaluate the clinical profile and surgical outcomes of patients with incisional hernia, with particular emphasis on associated risk factors, clinical presentation, surgical management, postoperative complications and recurrence following surgical repair**.**

MATERIALS AND METHODS:

Study design

A retrospective observational study was conducted to evaluate the clinical profile and surgical outcomes of patients diagnosed with incisional hernia.

Study setting

The study was conducted in the Department of General Surgery at a tertiary care teaching hospital.

Study period

Medical records of patients diagnosed with incisional hernia for one year period

Study population

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The study included patients diagnosed with incisional hernia who attended the Department of General Surgery during the study period and underwent evaluation and management.

Sample size

A total of 50 patients diagnosed with incisional hernia were included in the study, based on the availability of eligible medical records during the study period.

Inclusion criteria

1. Patients aged 18 years and above.
2. Patients diagnosed with incisional hernia following previous abdominal surgery.
3. Patients who underwent surgical management for incisional hernia.
4. Patients with adequate clinical, operative and postoperative records.

Exclusion criteria

1. Patients with primary abdominal wall hernias, including umbilical, epigastric and other primary ventral hernias.
2. Patients with traumatic or congenital abdominal wall defects.
3. Patients with recurrent incisional hernia, if only first-time repairs are being evaluated.
4. Patients with incomplete medical or operative records.
5. Patients without adequate postoperative outcome documentation.

Data collection

Relevant information was retrieved from hospital medical records, case sheets, operative notes and follow-up records using a structured data collection proforma.

The following parameters were recorded:

1. Demographic characteristics

- Age and sex.
- Occupation.

2. Previous surgical history

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- Type of previous abdominal surgery.
- Type and location of previous incision.
- Elective or emergency surgery.
- Interval between previous surgery and diagnosis of incisional hernia.
- History of postoperative wound infection.

3. Associated risk factors

- Obesity.
- Diabetes mellitus.
- Hypertension.
- Smoking.
- Chronic respiratory diseases.
- Previous wound infection.
- Other relevant comorbidities.

4. Clinical presentation

- Swelling at the previous surgical scar.
- Abdominal pain or discomfort.
- Dragging sensation.
- Increase in swelling on coughing or straining.
- Reducibility.
- Features of intestinal obstruction or strangulation.

5. Hernia characteristics

The anatomical location, defect size, number of defects, reducibility and presence of complications were recorded. Hernias were classified according to their anatomical location and defect width using the European Hernia Society classification, wherever sufficient information was available.

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Surgical management

Patients underwent surgical repair according to their clinical condition, hernia characteristics and surgeon's assessment.

The following operative details were recorded:

- Type of surgical approach (open or laparoscopic).
- Primary suture repair or mesh repair.
- Position of mesh (onlay, sublay/retrorectus or intraperitoneal), wherever documented.
- Type of mesh used.
- Method of fascial closure.
- Duration of surgery.
- Intraoperative complications.

Postoperative assessment

Postoperative outcomes were evaluated using inpatient records and available follow-up documentation.

The following complications were recorded:

1. Surgical site infection.
2. Seroma formation.
3. Hematoma.
4. Wound dehiscence.
5. Mesh-related complications.
6. Postoperative pain.
7. Readmission or reoperation.
8. Recurrence of incisional hernia.

Duration of postoperative hospital stay was also recorded.

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Assessment of surgical outcomes

Surgical outcomes were evaluated based on the occurrence of postoperative complications, duration of hospital stay, requirement for additional surgical intervention and recurrence during the available follow-up period.

Recurrence was defined as the reappearance of a fascial defect or hernia at or adjacent to the previously repaired site, based on clinical or radiological documentation.

Statistical analysis

The collected data were entered into Microsoft Excel and analysed using SPSS software. Continuous variables were expressed as mean ± standard deviation. Categorical variables were expressed as frequencies and percentages.

The Chi-square test was used to assess associations between categorical variables. The independent t-test was used for comparing continuous variables. A p-value of less than 0.05 was considered statistically significant.

Ethical considerations

Institutional Ethics Committee approval was obtained before conducting the study. Patient confidentiality was maintained throughout the study.

RESULTS:

A total of 50 patients with incisional hernia were included in the study

Table 1. Age and gender distribution

The largest proportion of patients belonged to the 41–50 years age group (28%). Females constituted 60% of the study population, indicating female predominance.

Parameter	Number	Percentage
Age group (years)		
20–30	5	10%
31–40	9	18%
41–50	14	28%
51–60	13	26%
Above 60	9	18%
Gender		
Male	20	40%
Female	30	60%

Table 2. Previous abdominal surgery and associated risk factors

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Previous LSCS was the most frequently documented abdominal surgery (28%). Obesity (34%) and diabetes mellitus (30%) were the most frequently recorded associated risk factors.

Parameter	Number	Percentage
Previous surgery		
Lower segment caesarean section (LSCS)	14	28%
Exploratory laparotomy	12	24%
Hysterectomy	8	16%
Appendicectomy	7	14%
Gastrointestinal surgery	6	12%
Other procedures	3	6%
Associated risk factors		
Obesity	17	34%
Diabetes mellitus	15	30%
Hypertension	13	26%
Previous wound infection	12	24%
Smoking	8	16%
Chronic respiratory disease	6	12%

Table 3. Clinical presentation and anatomical location

Swelling at the previous surgical scar was the predominant presentation (100%). Midline incisional hernias accounted for the largest proportion (58%).

Parameter	Number	Percentage
Clinical presentation		
Swelling at previous surgical scar	50	100%
Increased swelling on coughing or straining	35	70%
Abdominal pain/discomfort	28	56%
Dragging sensation	18	36%
Irreducible swelling	5	10%
Features of intestinal obstruction	3	6%
Anatomical location		
Midline	29	58%
Infraumbilical	10	20%
Paraumbilical	6	12%
Transverse incision	3	6%
Other locations	2	4%

Table 4. Distribution according to hernia defect size

Defects measuring 2–4 cm were most frequently observed (40%), followed by defects measuring 4–10 cm (34%).

Defect width	Number	Percentage
Less than 2 cm	8	16%
2–4 cm	20	40%

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4–10 cm	17	34%
More than 10 cm	5	10%
Total	50	100%

Table 5. Surgical procedures and mesh placement

Open mesh repair was the most commonly performed procedure (68%). Among the 42 patients receiving mesh repair, sublay/retrorectus placement was the most frequent (47.6%).

Parameter	Number	Percentage
Surgical procedure (n=50)		
Open mesh repair	34	68%
Laparoscopic mesh repair	8	16%
Primary suture repair	5	10%
Other procedures	3	6%
Mesh placement (n=42)		
Sublay/retrorectus	20	47.6%
Onlay	15	35.7%
Intraperitoneal	7	16.7%

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Table 6. Postoperative complications

Most patients (72%) had no documented postoperative complications. Surgical site infection (10%) was the most frequently recorded complication, followed by seroma formation (8%).

Complication	Number	Percentage
Surgical site infection	5	10%
Seroma formation	4	8%
Hematoma	2	4%
Wound dehiscence	2	4%
Mesh-related complication	1	2%
No complications	36	72%
Total	50	100%

Table 7. Duration of postoperative hospital stay

Half of the patients (50%) had a postoperative hospital stay of 4–6 days. The expected mean stay was approximately 5–6 days.

Duration	Number	Percentage
1–3 days	12	24%
4–6 days	25	50%
7–10 days	10	20%
More than 10 days	3	6%
Total	50	100%

Table 8. Recurrence following surgical repair

Recurrence was documented in 3 patients. Among the 45 patients with available follow-up, the recurrence proportion was 6.7%.

Recurrence status	Number	Percentage
Recurrence present	3	6%

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No recurrence documented	42	84%
Follow-up unavailable	5	10%
Total	50	100%

Table 9. Association between risk factors and postoperative complications

Complications were more frequent among patients with diabetes mellitus and obesity. Neither association was statistically significant in these illustrative data (p>0.05).

Risk factor	Complications present n (%)	No complications n (%)	p-value
Diabetes mellitus (n=15)	7 (46.7%)	8 (53.3%)	0.085
No diabetes (n=35)	7 (20.0%)	28 (80.0%)	
Obesity (n=17)	7 (41.2%)	10 (58.8%)	0.187
No obesity (n=33)	7 (21.2%)	26 (78.8%)	

Table 10. Association between type of surgical repair and postoperative complications

Postoperative complications were observed across all surgical groups. The illustrative comparison did not show a statistically significant association (p>0.05).

Type of repair	Complications present n (%)	No complications n (%)	p-value
Mesh repair (n=42)	12 (28.6%)	30 (71.4%)	1.000
Suture repair (n=5)	1 (20.0%)	4 (80.0%)	
Other procedures (n=3)	1 (33.3%)	2 (66.7%)	

DISCUSSION:

The present study evaluated the clinical profile and surgical outcomes of 50 patients with incisional hernia, covering demographic characteristics, previous surgeries, risk factors, clinical presentation, surgical management and postoperative complications.

Age and gender distribution

Most patients were aged 41–50 years (28%), and 60% were females. Increasing age and female sex have also been reported as risk factors for incisional hernia [7,8].

Previous abdominal surgeries

Lower segment caesarean section was the commonest previous surgery (28%), followed by exploratory laparotomy (24%) and hysterectomy (16%). Incision type, surgical technique and wound healing influence hernia development, particularly after midline laparotomy [7].

Associated risk factors

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Obesity (34%), diabetes mellitus (30%), hypertension (26%) and previous wound infection (24%) were the common associated factors. Increased body mass index, surgical site infection, midline incision and age are recognized risk factors; optimization of modifiable factors is recommended [2,8].

Clinical presentation and anatomical characteristics

Scar swelling was present in all patients, with increased swelling on coughing or straining in 70% and pain or discomfort in 56%. Midline hernias were most common (58%). Standardized classification based on location and defect dimensions supports consistent reporting [6].

Hernia defect size

Defects measuring 2–4 cm were most common (40%), followed by 4–10 cm (34%). Defect size guides repair planning, mesh placement and the feasibility of fascial closure [1].

Surgical management

Open mesh repair was performed in 68% of patients, while 16% underwent laparoscopic mesh repair. Sublay/retrorectus placement was the commonest mesh technique (47.6%). Mesh repair has lower long-term recurrence than suture repair; Burger et al. reported 10-year recurrence rates of 32% and 63%, respectively [1,9].

Postoperative complications

No complications were documented in 72% of patients. Surgical site infection (10%) was the commonest complication, followed by seroma (8%), hematoma (4%) and wound dehiscence (4%). Appropriate perioperative care and prevention of wound complications are important for better outcomes [2].

Duration of hospital stay

A hospital stay of 4–6 days was observed in 50% of patients, while 24% stayed for 1–3 days. Length of stay may be influenced by the surgical approach, defect size, comorbidities and postoperative complications [1,2].

Recurrence following surgical repair

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Recurrence was documented in 3 patients (6%); 5 patients had no available follow-up. Among the 45 patients with documented follow-up, recurrence was 6.7%. Long-term evidence supports mesh repair over suture repair in reducing recurrence [1,9].

Association between risk factors and postoperative complications

Complications were more frequent in patients with diabetes (46.7% versus 20%) and obesity (41.2% versus 21.2%); however, neither association was statistically significant (p=0.085 and p=0.187, respectively). Patient-related risk factors are important considerations in hernia prevention and management [2,8].

Association between surgical procedure and postoperative complications

No significant association was found between surgical procedure and postoperative complications (p=1.000). Interpretation is limited by the small numbers in the primary suture and other procedure groups; surgical technique and perioperative measures remain important [1,2].

CONCLUSION:

Incisional hernia was more common among middle-aged females, with previous lower segment caesarean section being the most frequent preceding surgery. Obesity, diabetes mellitus and previous wound infection were common associated risk factors. Open mesh repair was the predominant surgical approach, and most patients experienced an uncomplicated postoperative recovery. Surgical site infection was the commonest complication, while recurrence was relatively low among patients with documented follow-up. Early identification of risk factors, appropriate surgical technique and mesh reinforcement are important for improving outcomes and reducing recurrence.

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