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Research Article

Clinical Profile and Surgical Outcomes of Inguinal and Femoral Hernias: A Prospective Observational Study from a Tertiary Care Centre in India

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ABSTRACT
Introduction: Groin hernias are a common surgical condition, with inguinal hernias being the most prevalent and femoral hernias less frequent but clinically more urgent. Understanding the demographic profile, clinical presentation, and outcomes of hernia repair is essential for optimizing surgical management.
Aim: To evaluate the clinical characteristics, management strategies, and postoperative outcomes of patients undergoing surgical repair for inguinal and femoral hernias at a tertiary care center.
Materials and Methods: A prospective observational study was conducted on 100 patients diagnosed with inguinal or femoral hernias. Data on age, sex, hernia type, laterality, risk factors, clinical presentation, surgical approach (elective vs emergency), and postoperative complications were collected using a structured proforma. All patients underwent open hernia repair. Statistical analysis was performed using SPSS software.
Results: The majority of patients (70%) were aged 51–70 years, with right-sided inguinal hernias being most common (48%). Femoral hernias accounted for 4% of cases and were exclusively bilateral. Most hernias were reducible (85%), and elective surgery was performed in 94% of cases. Emergency surgery was required in 6%, predominantly for femoral hernias. Postoperative complications included surgical site infection (4%) and cord oedema (3%), with no anastomotic leaks reported. Overall, 93% of patients had uneventful recoveries.
Conclusion: Inguinal hernias are more prevalent and typically managed electively with favorable outcomes. Femoral hernias, though rare, are associated with emergency presentation and higher complication rates. Early diagnosis and timely surgical intervention are critical to reducing morbidity and improving patient outcomes.

Keywords: Inguinal Hernia, Femoral Hernia.

INTRODUCTION

Hernias represent a common surgical condition characterized by the protrusion of abdominal contents through a weakened area in the abdominal wall. Inguinal hernias account for the majority of cases, particularly among adult males, while femoral hernias, though less frequent, are associated with higher rates of complications due to their anatomical location and propensity for strangulation[1]. The global burden of groin hernias remains substantial, with millions of repairs performed annually, making it one of the most frequently conducted general surgical procedures[2].

The clinical presentation of hernias varies from asymptomatic swelling to acute obstruction or strangulation, necessitating prompt surgical intervention[3]. Elective hernia repair is generally associated with favourable outcomes, whereas emergency procedures carry increased risk of postoperative morbidity[4]. Risk factors such as chronic cough, constipation, and heavy lifting contribute to hernia formation and recurrence[5]. Despite advances in surgical techniques, the choice between open and laparoscopic approaches, especially in resource-limited settings, continues to be influenced by patient factors, surgeon expertise, and institutional protocols[6]. This study aims to evaluate the demographic characteristics, clinical presentation, hernia types, management strategies, and postoperative outcomes among patients undergoing hernia repair at a tertiary care centre. By comparing inguinal and femoral hernias, the study seeks to identify patterns that may inform surgical decision-making and optimize patient care.

Aim

To evaluate the clinical profile, management

strategies, and postoperative outcomes of patients undergoing surgical repair for inguinal and femoral hernias at a tertiary care centre.

Objectives

1. To analyse the demographic characteristics (age, sex, laterality), distribution of hernia types, management of patients presenting with inguinal and femoral hernias.
2. To generate evidence that may inform surgical decision-making and improve patient outcomes in hernia repair.

MATERIAL AND METHODS

Study Design and Setting

This was a prospective observational study conducted at the Department of General Surgery, in tertiary care teaching hospital in India. The study period spanned from 2024 to 2025 during which consecutive patients presenting with groin hernias were evaluated and managed.

Inclusion Criteria

1. Patients of any age and gender presenting with clinically diagnosed inguinal or femoral hernias.
2. Both primary and recurrent hernia cases scheduled for surgical repair.
3. Patients consenting to undergo open hernia repair and participate in the study.
4. Cases managed electively or on an emergency basis within the study period.

Exclusion Criteria

1. Patients with non-groin hernias (e.g., umbilical, incisional, epigastric, or diaphragmatic hernias).
2. Individuals with incomplete clinical or operative records.
3. Patients who declined surgical intervention or withdrew consent.
4. Cases requiring bowel resection or presenting with generalized peritonitis.
5. Patients lost to follow-up before postoperative outcome assessment

Study Population:

A total of 100 patients diagnosed with inguinal or femoral hernias were enrolled based on predefined inclusion and exclusion criteria. Patients of all ages and genders presenting with primary or recurrent groin hernias were included.

Data Collection

Demographic details (age, sex), clinical presentation (swelling, pain, vomiting, abdominal distension), hernia characteristics (type, side, reducibility), associated risk factors (chronic cough, constipation, heavy lifting), and operative details (elective vs emergency surgery) were systematically recorded using a structured proforma. Postoperative outcomes including surgical site infection (SSI), cord oedema, and anastomotic leak were monitored during hospital stay and follow-up visits.

Classification of Hernias

Hernias were classified as reducible, irreducible, obstructed, or strangulated based on clinical examination and intraoperative findings. Inguinal and femoral hernias were further subclassified by laterality (right, left, bilateral).

Surgical Management

All patients underwent open hernia repair under spinal or general anesthesia. Elective procedures were scheduled following outpatient evaluation, while emergency surgeries were performed for obstructed or strangulated hernias. Standard surgical techniques were employed, and mesh placement was performed where indicated.

Postoperative Follow-up

Patients were followed for a minimum of [X] weeks postoperatively to assess wound healing and detect early complications. SSI was defined according to CDC criteria, and cord oedema was assessed clinically. No bowel resections were performed during the study period.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version [X]. Descriptive statistics were used to summarize categorical variables as frequencies and percentages. Comparative analysis between inguinal and femoral hernia groups was performed using Chi-square or Fisher's exact test, with a p-value <0.05 considered statistically significant.

OBSERVATION AND RESULT

Table 1: Demographic Variables

Sr No	Variables	Inguinal Hernia 96 (96 %)	Femoral Hernia 4 (4 %)	Total 100 (100 %)

1	Age (Years) a. 18 to 30 b. 31 to 50 c. 51 to 70	6 (6 %) 21 (21 %) 69 (69 %)	0 (0 %) 3 (3 %) 1 (1 %)	6 (6 %) 24 (24 %) 70 (70 %)
2	Side a. Right b. Left c. Bilateral	48 (48 %) 33 (33 %) 15 (15 %)	0 (0 %) 0 (0 %) 4 (4 %)	48 (48 %) 33 (33 %) 19 (19 %)
3	Risk factors a. Present b. Absent	31 (31 %) 65 (65 %)	0 (0 %) 4 (4 %)	31 (31 %) 69 (69 %)
4	Clinical Presentation a. Swelling b. Localized pain c. vomiting d. Constipation/ abdominal distension	74 (74 %) 22 (22 %) 9 (9 %) 1 (1 %)	0 (0 %) 4 (4 %) 4 (4 %) 3 (3 %)	74 (74 %) 26 (26 %) 13 (13 %) 4 (4 %)

The demographic profile of the study population reveals a predominant age group of 51–70 years, accounting for 70% of cases. This age distribution underscores the increased vulnerability to hernia formation among older adults, likely attributable to age-related weakening of the abdominal wall and connective tissue. Notably, femoral hernias were confined to the 31–50 age bracket, suggesting a distinct etiological pattern compared to inguinal hernias.

Laterality analysis showed that right-sided inguinal hernias were most prevalent (48%), followed by left-sided (33%) and bilateral presentations (15%). Interestingly, all femoral hernias (4%) were bilateral, which may reflect anatomical predispositions or delayed clinical recognition.

The presence of identifiable risk factors such as chronic cough, constipation, or heavy lifting was documented in 31% of patients, exclusively within the inguinal hernia cohort. This finding reinforces the multifactorial nature of inguinal hernia pathogenesis and highlights the absence of such associations in femoral hernias.

Clinical presentation was dominated by swelling (74%), a hallmark of hernia pathology, while localized pain was reported in 26% of cases. Vomiting and abdominal distension were more frequently observed in femoral hernia patients, suggesting a higher likelihood of bowel involvement and acute complications in this subgroup

Table 2: Type of Hernia

Sr No	Type of Hernia	Inguinal Hernia 96 (96 %)	Femoral Hernia 4 (4 %)	Total 100 (100 %)
1	Reducible	83 (83 %)	2 (2 %)	85 (85 %)
2	Irreducible	6 (6 %)	2 (2 %)	8 (8 %)
3	Obstructed	4 (4 %)	0 (0 %)	4 (4 %)
4	Strangulated	3 (3 %)	0 (0 %)	3 (3 %)

Classification of hernias based on reducibility revealed that 85% were reducible, indicating early-stage disease amenable to elective repair. Irreducible (8%) and obstructed (4%) hernias were less common but clinically significant, as they may necessitate urgent intervention. Strangulated hernias, although rare (3%), were exclusively inguinal and represent a surgical emergency due to the risk of ischemia and bowel necrosis.

Table 3: Management

Sr No	Management	Inguinal Hernia 96 (96 %)	Femoral Hernia 4 (4 %)	Total 100 (100 %)
1	Elective	92 (92 %)	2 (2 %)	94 (94 %)
2	Emergency	4 (4 %)	2 (2 %)	6 (6 %)

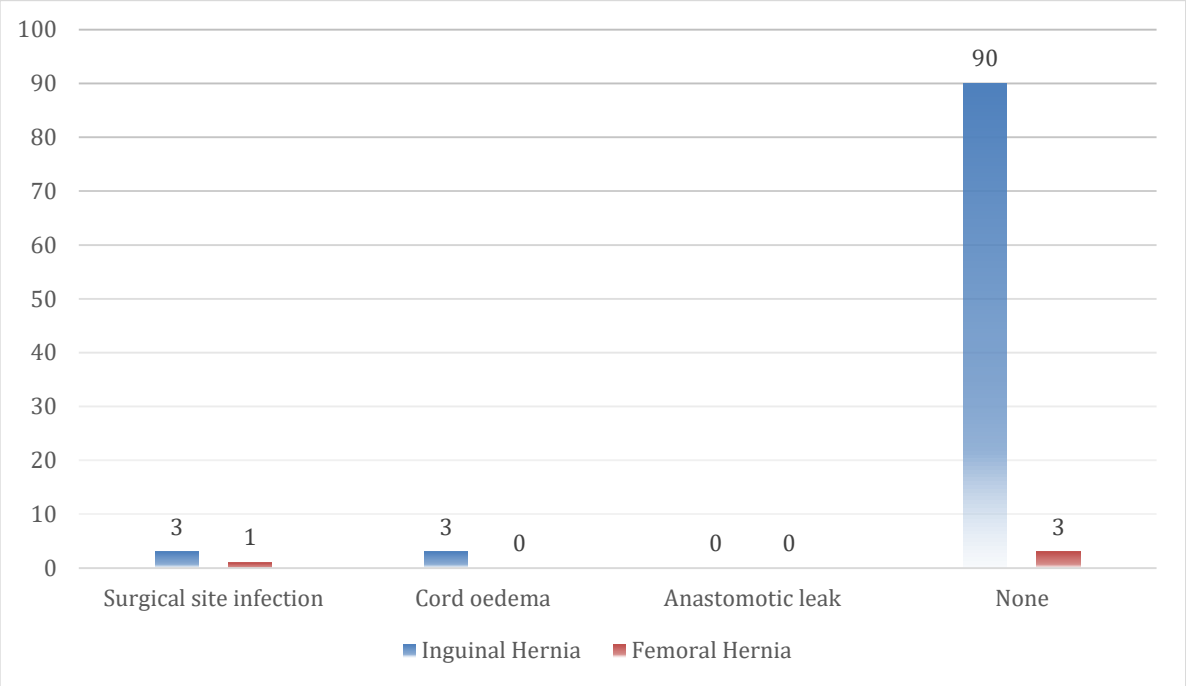
Management data demonstrated that 94% of patients underwent elective surgery, reflecting effective outpatient triage and scheduling. However, 6% required emergency procedures, with femoral hernias disproportionately represented—50% of femoral cases necessitated urgent repair. This finding aligns with the known propensity of femoral hernias to present acutely and supports the need for heightened vigilance in their diagnosis.

Table 4: Post-operative Outcome

Sr No	complication	Inguinal Hernia 96 (96 %)	Femoral Hernia 4 (4 %)	Total 100 (100 %)
1	Surgical site infection	3 (3 %)	1 (1 %)	4 (4 %)
2	Cord oedema	3 (3 %)	0 (0 %)	3 (3 %)
3	Anastomotic leak	0 (0 %)	0 (0 %)	0 (0 %)
4	None	90 (90 %)	3 (3 %)	93 (93 %)

Post-operative outcomes were largely favorable, with 93% of patients experiencing no complications. Surgical site infections occurred in 4% of cases, more frequently among femoral hernia repairs (25% of femoral cases), potentially due to emergency operative conditions or anatomical challenges. Cord oedema was observed in 3% of inguinal hernia cases, likely secondary to intraoperative manipulation of spermatic cord structures. Importantly, no anastomotic leaks were reported, suggesting that bowel resections were either avoided or successfully executed without compromise.

Graph 1: Post-operative Outcome



DISCUSSION

Groin hernias are among the most frequently encountered conditions in general surgery, with inguinal hernias comprising the majority and femoral hernias presenting less commonly but with greater clinical urgency[7]. The present study provides a detailed analysis of demographic distribution, hernia characteristics, surgical management, and postoperative outcomes in a cohort of 100 patients treated at a tertiary care centre.

In present study the age distribution revealed a predominance of patients aged 51–70 years, consistent with the degenerative changes in connective tissue that predispose older adults to hernia formation. Right-sided inguinal hernias were most common (48%), followed by left-sided (33%) and bilateral (15%) presentations. Femoral hernias accounted for 4% of cases and were exclusively bilateral, with no associated risk factors such as chronic cough or constipation. Most hernias were reducible

(85%), indicating early-stage disease suitable for elective repair. Irreducible (8%), obstructed (4%), and strangulated (3%) hernias were less frequent but clinically significant. Elective surgery was performed in 94% of cases, while 6% required emergency intervention—half of which involved femoral hernias. Postoperative outcomes were favorable, with 93% of patients experiencing no complications. Surgical site infections occurred in 4% of cases, and cord oedema was noted in 3%, exclusively among inguinal hernia repairs. No anastomotic leaks were reported.

The demographic profile in this study aligns with findings from Satapathy et al., who reported a peak incidence of inguinal hernias in males over 50 years of age[1]. The predominance of right-sided hernias is consistent with global data from Zhang et al., which attribute this trend to delayed closure of the processus vaginalis on the right side[3]. The low incidence of femoral hernias and their association with emergency surgery reflect observations by Karthikeyan et al., who emphasized the acute nature and higher complication rates of femoral hernias[4]. The proportion of reducible hernias (85%) in our cohort is comparable to the 82% reported by Misra et al. in elective surgical settings[5]. The surgical site infection rate (4%) falls within the expected range for clean-contaminated procedures, as noted in multicenter audits. Cord oedema, though infrequent, has been described in open mesh repairs due to manipulation of spermatic cord structures[6].

The age-related increase in hernia prevalence may be attributed to progressive weakening of the transversalis fascia and reduced collagen synthesis with advancing age[7]. The anatomical predisposition for right-sided hernias could reflect embryological factors, including delayed involution of the processus vaginalis and increased intra-abdominal pressure on the dominant side[8]. The absence of risk factors in femoral hernia patients suggests a more congenital or anatomical etiology, possibly involving a wider femoral canal or weaker lacunar ligament[9]. The higher rate of emergency surgery and postoperative complications in femoral hernias may be explained by their deep anatomical location, which delays clinical detection and increases the risk of bowel entrapment. The favorable outcomes in elective cases underscore the importance of timely diagnosis and intervention, while the absence of anastomotic leaks suggests that bowel viability was preserved, likely due to early surgical decision-making.

CONCLUSION

This study highlights the predominance of inguinal hernias among older male patients, with right-sided presentations being most common. Femoral hernias, though infrequent, demonstrated a higher propensity for emergency presentation and postoperative complications. The majority of hernias were reducible and managed electively, resulting in favorable outcomes with minimal morbidity. The findings underscore the importance of early diagnosis and timely surgical intervention, particularly in femoral hernias where delayed presentation may lead to obstruction or strangulation. The low incidence of postoperative complications affirms the safety and efficacy of open hernia repair in appropriately selected patients. These insights may inform clinical decision-making and support targeted surveillance strategies to reduce emergency hernia surgeries and improve patient outcomes.

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