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Original Article

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A Prospective Study of Ventral Hernia and Outcomes of Their Surgical Management at a Tertiary Care Center

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ABSTRACT

Background: Ventral hernias are among the most common hernias encountered in surgical practice, second only to inguinal hernias. They include epigastric, umbilical, paraumbilical, and incisional hernias. The increasing number of abdominal surgeries has led to a rise in the incidence of ventral hernias, particularly incisional hernias. This study aims to evaluate the clinical profile, predisposing factors, and short-term outcomes of various surgical management strategies for ventral hernias in a tertiary care hospital.

Methods: This prospective observational study included 61 patients diagnosed with ventral hernia and treated surgically over 18 months, from January 2024 to June 2025. Detailed clinical evaluation was performed for all patients, including demographic data, hernia type, associated comorbidities, and operative procedures. Patients were followed up postoperatively for 3 to 18 months to assess complications and recurrence.

Results: Incisional hernia was the most common type, accounting for 60% of cases, followed by para-umbilical, umbilical, and Epigastric hernias. Females were more commonly affected than males. About 22.5% of patients presented with complications such as irreducibility, obstruction, or strangulation. Postoperative complications were low (12.5%), and no recurrence was observed during follow-up.

Conclusion: Ventral hernias, especially incisional hernias, are common surgical conditions with favorable outcomes when managed appropriately. Proper patient evaluation, meticulous surgical technique, and appropriate choice of repair method result in low complication rates and satisfactory outcomes. Longer follow-up and larger sample sizes are required to assess long-term recurrence.

Key-words: Epigastric hernia; Incisional hernia; Paraumbilical hernia; Postoperative outcomes; Umbilical hernia; Ventral hernia

INTRODUCTION

Ventral hernias are defects of the anterior abdominal wall through which abdominal contents protrude, resulting in a clinically evident swelling. They comprise epigastric, umbilical, paraumbilical, and incisional hernias with incisional hernia being the most frequently encountered type in surgical practice due to the high volume of abdominal operations performed globally [1-3] Surgical repair remains one of the most commonly performed procedures by general surgeons and significantly impacts patients' quality of life and healthcare resources. [4] Patients with ventral hernia typically present with an abdominal swelling, which may or may not be associated with pain or discomfort, and a subset of cases present with complications such as irreducibility, intestinal obstruction, or strangulation, leading to increased morbidity and emergency

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intervention [5] Predisposing factors include obesity, multiparity, poor wound healing, postoperative wound infection, and increased intra-abdominal pressure.[6,7] Surgical repair techniques have evolved, including open, laparoscopic, and mesh-based procedures, improving postoperative outcomes and reducing recurrence. [8,9] However, variations in clinical presentation and surgical results continue to be reported in tertiary care settings, justifying the need for prospective evaluation of clinical profiles and surgical outcomes in this study.

MATERIALS AND METHODS

Study Design, Setting and Materials- This was a prospective observational study conducted in the Department of General Surgery, Basaveshwara Medical College and Hospital, Chitradurga. The study was conducted over 18 months, from January 2024 to June 2025. A total of 61 patients diagnosed with ventral hernia and admitted for elective surgical management were included in the study. The materials used included standard surgical instruments for open hernia repair, prosthetic mesh where indicated, and routine diagnostic investigations such as hematological tests, ultrasonography, and radiological imaging when required.

Inclusion Criteria

- All patients diagnosed with ventral hernia
- Patients admitted for elective surgical management
- Patients willing to participate in the study and give consent

Exclusion Criteria

- Patients with congenital hernias
- Patients who were unfit for surgery
- Patients who did not give consent for participation

Methodology- All patients who met the inclusion criteria were evaluated using a predesigned proforma. Detailed clinical history, demographic data, type of ventral hernia, predisposing factors, previous surgical history, and presenting complaints were recorded. A thorough general and local examination was performed in all cases. Patients underwent appropriate surgical procedures based on the type and size of hernia and surgeon's discretion, following standard surgical principles described in established surgical textbooks and guidelines. Postoperative outcomes, including complications and hospital stay, were documented, and patients were followed up for a period ranging from 3 to 18 months to assess early outcomes.

Statistical Analysis- Data were entered into a master chart and analyzed using descriptive statistics (n = 61). Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as mean ± standard deviation (SD). The study was primarily descriptive; therefore, no inferential statistical tests (such as t-test or ANOVA) were applied and no p-values were generated. Results were presented using appropriate tables and graphical representations where required.

Ethical Approval- The study was approved by the Institutional Ethical Committee of Basaveshwara Medical College and Hospital (BMCH), Chitradurga. Written informed consent was obtained from all participants before inclusion in the study.

RESULTS

A total of 61 patients with ventral hernia were included in the study and analyzed. The results are presented concisely using descriptive statistics. The majority of patients were in the 41–60-year age group, indicating a higher incidence of ventral hernias in middle-aged adults. Female patients predominated over males, largely due to prior obstetric and gynecological surgeries. Incisional hernia was the most common type observed, accounting for approximately 60% of cases. Other types included paraumbilical, umbilical, and epigastric hernias, in descending order of frequency (Fig. 1).

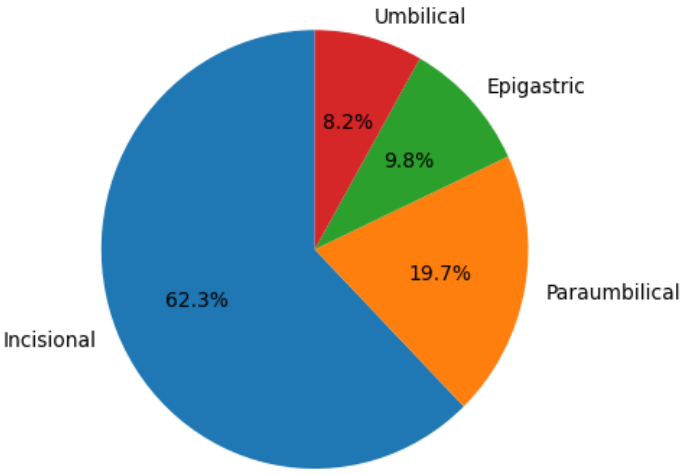

Fig. 1: Clinical types of ventral hernia

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All patients presented with abdominal swelling, which was the most consistent clinical feature. A subset of patients also reported pain or discomfort. Complicated presentations such as irreducibility, intestinal obstruction, and strangulation were observed in 22.5% of cases. shown in Fig. 2.

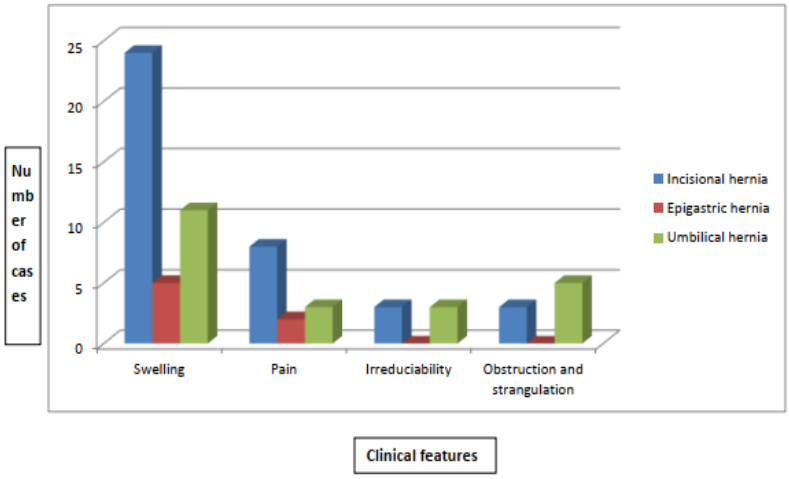

Fig. 2: Clinical Features of Ventral Hernia

Among patients with incisional hernia, the most common preceding surgery was exploratory laparotomy (21%). Among gynecological procedures, lower segment caesarean section (18%) was the most frequent antecedent surgery. Most patients underwent open surgical repair, with mesh reinforcement used where indicated. Results are shown in Table 1.

Table 1: Treatment For Various Types of Hernia

Type of repair	Incisional hernia	Umbilical hernia	Epigastric hernia
Anatomical repair	23	4	6
Anatomical with mesh repair	13	0	1
Interpositional inlay mesh repair	8	0	0
Double breasting	3	4	0

The overall postoperative complication rate was 12.5%, with surgical site infection and seroma being the most commonly observed complications. No mortality was reported during the study period. The postoperative out comes summarized in Fig. 3.

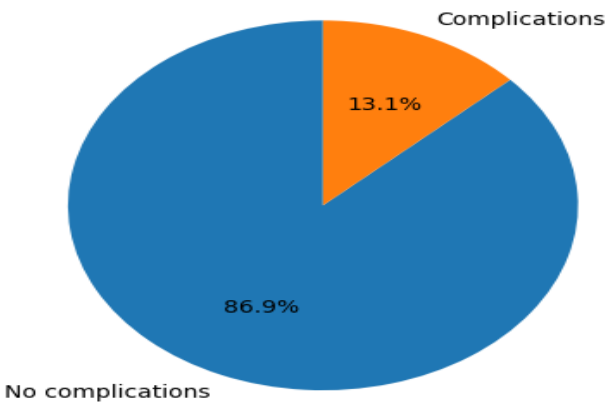

Fig. 3: Postoperative outcomes

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Patients were followed for 3 to 18 months. No recurrence was observed during follow-up. However, due to the limited sample size and relatively short follow-up, long-term recurrence rates could not be conclusively assessed.

DISCUSSION

Ventral hernias continue to represent a significant challenge in general surgical practice, particularly in the context of the increasing number of abdominal operations performed worldwide. In the present study, incisional hernia constituted the most common type of ventral hernia, accounting for approximately 60% of cases. This finding is consistent with large prospective and observational studies, including the nationwide analysis by Helgstrand et al., which demonstrated a high incidence of incisional hernias following laparotomy, as well as the classic Indian series reported by Bose *et al.* [9,10]. These observations reinforce the role of previous abdominal surgery as a major etiological factor in ventral hernia formation.

The present study demonstrated a predominance of ventral hernias among middle-aged adults, with a clear female preponderance. Similar demographic trends have been reported in epidemiological studies, where increased exposure of females to obstetric and gynecological procedures has been identified as a significant risk factor for incisional hernia development [11,12]. In our series, exploratory laparotomy was the most common antecedent surgery, followed by lower segment caesarean section. These findings are in concordance with previously published data on post-surgical ventral hernias [13].

Abdominal swelling was the universal presenting symptom in all patients, with pain and discomfort being common associated complaints. Complicated presentations such as irreducibility, intestinal obstruction, and strangulation were observed in 22.5% of cases. This proportion is comparable to that reported in studies focusing on emergency ventral hernia repairs, highlighting the importance of early diagnosis and elective surgical intervention to prevent morbidity [13].

Regarding surgical management, open repair with prosthetic mesh reinforcement was the most commonly used technique in this study. Mesh-based repair has been consistently shown to reduce recurrence rates compared with primary suture repair, without a significant increase in postoperative complications. Furthermore, evidence from systematic reviews and network meta-analyses suggests that appropriate mesh placement is crucial for optimizing outcomes and minimizing complications, such as infection and seroma formation [14]. The overall postoperative complication rate in the present study was low (12.5%), with surgical site infection and seroma being the most frequently encountered complications, findings comparable to the contemporary literature.

No recurrence was observed during the follow-up period of 3 to 18 months in the present study. Although this outcome is encouraging, it should be interpreted with caution. Previous studies have demonstrated that true recurrence rates may become evident only with long-term follow-up, and reoperation rates may underestimate the actual incidence of recurrence [15]. Historical perspectives on incisional hernia repair also emphasize the chronic nature of the disease and the need for prolonged surveillance following surgical repair [16].

CONCLUSIONS

Ventral hernias constitute a significant surgical burden, with incisional hernia emerging as the most common type, particularly among middle-aged females with a history of previous abdominal surgery. Abdominal swelling was the universal presenting symptom, while a notable proportion of patients presented with complications such as irreducibility and obstruction. Open surgical repair with appropriate use of prosthetic mesh resulted in favorable outcomes, with a low postoperative complication rate and no recurrence observed during short-term follow-up. These findings highlight the importance of meticulous surgical technique, appropriate patient selection, and correction of predisposing factors to achieve optimal results in ventral hernia management. Long-term follow-up studies with larger sample sizes are required to accurately assess recurrence rates and compare different surgical techniques. Emphasis on preventive strategies, standardized closure techniques, and patient risk-factor modification may further reduce the incidence of incisional hernias and improve surgical outcomes.

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CONTRIBUTION OF AUTHORS

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Data analysis and interpretation- Dr. Pradeep Kumar J and Dr Sushanth PT

Literature search- Dr. Sushanth PT and Dr Sunilkumar Hallur

Writing article- Dr. Sunilkumar Hallur and Pradeepkumar J

Critical review- Dr Pradeepkumar J and Dr Madhu RT

Final approval- Dr Sunilkumar Hallur and Dr Pradeepkumar J

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