Janaki Medical College Journal of Medical Sciences (2026); Vol.14 (2):82-89

JMCJMS

DOI : https://doi.org/10.3126/jmcjms.v14i02.98094

ISSN: 2091-2242
eISSN: 2091-2358

OPEN ACCESS

Original Research

Clinical Profile and Surgical Outcomes of Incisional Hernia: A Prospective Observational Study from a Tertiary Care Hospital in Nepal

Aditya Prakash Yadav[1], Binod Kumar Rai[2], Amrit Lamsal[3], Akash Raya[4*], Rohit Kumar Mishra[5]

[1]Lecturer, Department of General Surgery, National Medical College and Teaching Hospital, Nepal
[2]Associate Professor, Department of Pediatric Surgery, National Medical College and Teaching Hospital, Nepal
[3]Resident, Department of General Surgery, National Medical College and Teaching Hospital, Nepal
[4]Associate Professor, Department of General Surgery, Chitwan Medical College and Teaching Hospital, Nepal
[5]Assistant Professor, Department of General Surgery, Chitwan Medical College and Teaching Hospital, Nepal

Correspondence to:
Dr. Akash Raya
Department of Surgery, Chitwan Medical College, Chitwan, Nepal
Email: akashraya@gmail.com
ORCID: 0000-0002-8474-110x

Received: 6 June 2026
Revised: 20 July 2026
Accepted: 28 July 2026

Citation:
Yadav AP, Rai BK, Lamsal A, Raya A, Mishra RK. Clinical Profile and Surgical Outcomes of Incisional Hernia: A Prospective Observational Study from a Tertiary Care Hospital in Nepal. Janaki Med Coll J Med Sci. 2026;14(2):82-89.

ABSTRACT:

Background and Objectives: Incisional hernia is a recurrent complication following abdominal surgery and remains a significant surgical problem despite advances in techniques, contributing to increased morbidity, healthcare costs, and reduced quality of life. This study aimed to evaluate the clinical profile, risk factors, surgical management, and postoperative outcomes of patients with incisional hernia at a tertiary care hospital.

Materials and Methods: A prospective study was conducted at the Department of General Surgery, National Medical College and Teaching Hospital, Nepal, from December 2025 to May 2026 involving 32 adult patients with clinically and ultrasonographically confirmed incisional hernia. Data on demographics, clinical features, risk factors, prior surgeries, operative techniques, and postoperative outcomes were collected and analyzed using SPSS.

Results: Of the 32 patients, 68.8% were older than 40 years and 65.6% were female. Swelling was present in all cases, while 43.8% had pain. Most hernias were reducible (84.4%), and 90.6% had defect size >3 cm. Surgical site infection (34.4%) was most common risk factor, followed by wound dehiscence (15.6%). Hysterectomy (37.5%) and exploratory laparotomy (25%) were common prior surgeries. Lower midline incision (31.2%) predominated. Sublay mesh repair was used in 78.1%. Complications were low: seroma 6.2%, infection 3.1%. The observed mean hospital stay was 3.66 days (±0.57) for primary repair and 8.14 days (±1.66) for mesh repair; no statistical test was applied given the descriptive nature of the study.

Conclusion: Incisional hernia was more common in females and patients over 40 years. Surgical site infection and wound dehiscence were major risk factors. Sublay mesh repair showed favourable outcomes with low complications and remains an effective treatment modality.

Key Words: Incisional hernia, Postoperative complication, Risk Factor, Sublay mesh repair

INTRODUCTION

An incisional hernia is characterized as "a protrusion of abdominal contents through a defect in the abdominal wall at the site of a previous surgical incision" [1]. It is unique among hernias as it is considered genuinely iatrogenic. Ian Aird describes an incisional hernia as a broad protrusion of peritoneum and abdominal contents through a weakened surgical scar [2].

It is a prevalent condition that often necessitates significant surgical intervention, even with improvements in surgical methods and suture materials. The incidence of incisional hernia in literature is 2- 11% following all laparotomies and contributes to increased patient morbidity and health costs [3]. The causes of incisional hernia is multifactorial, involving both patient and surgical related factors. Patient-related factors such as obesity, older age, poor nutrition, diabetes, smoking habits, and raised intra-abdominal pressure, like chronic coughing and constipation. Surgical factors include incision made, performing emergency surgeries, inadequate closure methods, and wound infections after surgery, which are regarded as significant risk factors [4].

Clinically, patients usually present with a swelling at or near the site of a previous surgical scar, which may be associated with pain or discomfort. The swelling often becomes more prominent on standing or straining and may reduce on lying down. Although various cases are asymptomatic but complications such as irreducibility, intestinal obstruction, and strangulation may occur and required surgical intervention [4].

Incisional hernia significantly affects the patient's quality of life and poses a challenge in surgical management due to the risk of recurrence. Therefore, understanding the clinical profile is essential for early diagnosis, effective treatment, and its prevention.

MATERIALS AND METHODS

This prospective observational study was conducted at National Medical College and Teaching Hospital, Birgunj, from December 2025 to May 2026. The study was approved by the Institutional Review Board (Ref No. F-NMC/742/082-083). All procedures were performed in accordance with the ethical standards of the Declaration of Helsinki. Written informed consent was obtained from all participating patients. During the study period, all the eligible patients with incisional

hernia who underwent surgical repair were included in the study. A total of 32 patients who underwent surgery for incisional hernia and met the inclusion criteria were included in the study.

Patients aged≥18 years with a diagnosis of incisional hernia were included for this study. The hernia had to be detectable on clinical examination and confirmed by ultrasonography. Recurrent incisional hernia (previous repair of the same site), concomitant parastomal hernia, emergency surgery, and pregnant women were excluded from this study. Recurrent incisional hernias were excluded because previous repairs alter the abdominal wall anatomy, which can influence surgical outcomes. Parastomal hernias were excluded due to their distinct pathophysiology, anatomical characteristics, and management strategies, which differ from those of primary incisional hernias.

Detailed clinical history, including demographic data, comorbidities, history of previous abdominal surgery, type of incision, postoperative wound infection, and duration of hernia, was recorded. Clinical examination findings such as size, location, reducibility, and presence of complications were recorded. Size of defect was measured with ultrasonography. Routine laboratory investigations were performed. Imaging studies such as ultrasonography abdomen and if required contrast-enhanced computed tomography (CECT) was done.

All patients underwent surgical repair under appropriate anaesthesia. The choice of procedure, primary repair and open mesh repair was determined on the basis of size of the defect; if the defect was less than 3 cm, primary repair was done and if the defect was more than 3 cm, open mesh repair was done. Polypropylene mesh was used in mesh repair cases. Patients were observed for postoperative complications such as wound infection, seroma, and hematoma.

The collected data was entered in Microsoft excel sheet to prepare master chart. Entered data analysis was done using Statistical Package for Social Sciences (SPSS) version 20. The continuous variables were expressed as mean ± SD and categorical variables as frequency and percentage. Crosstabulation was done to show the outcome of the study. Due to the limited number of cases presented to the surgery department, the comparative group could not be compiled as only 3 patients presented with <3 cm defect in this study. Hence, a descriptive study was done.

RESULTS

A total of 32 patients were evaluated to determine demographic distribution and clinical characteristics, including defect size and surgical complications, as shown in Table 1. The majority of patients were aged more than 40 years (68.8%), while 10 patients (31.2%) were younger than 40 years. Incisional hernia was more common in females (65.6%) than in males (34.4%).

All patients presented with swelling (100%), and 14 patients (43.8%) had associated pain with swelling. Most hernias were reducible (84.4%), while irreducible swelling was observed in 5 patients (15.6%). The hernia defect was

Table 1. Demographic and Clinical Characteristics of Patients

Age	n(%)

< 40 year	10 (31.2%)
>40 year	22 (68.8%)
Gender	
Male	11 (34.4%)
Female	21 (65.6%)
Clinical Presentation	
Swelling	32 (100%)
Pain & swelling	14 (43.8%)
Reducible swelling	27 (84.4%)
Irreducible swelling	5 (15.6%)
Comorbidity	
Present	15 (46.9%)
Absent	17 (53.1%)
Risk Factor	
Surgical site infection	11(34.4%)
Wound dehiscence	5 (15.6%)
Obesity	1 (3.1%)
Obstructive uropathy	3 (9.4%)
No known risk factor	12 (37.5%)
Defect of hernia	
< 3 cm	3 (9.4%)
> 3cm	29 (90.6%)

more than 3 cm in 29 patients (90.6%), which, according to the European Hernia Society (EHS) classification, falls under W2 or W3, while defects less than 3 cm were present in 3 patients (9.4%), corresponding to the W1 category. Among the risk factors, surgical site infection was the most common (34.4%), followed by wound dehiscence (15.6%), obstructive uropathy (9.4%), and obesity (3.1%). Comorbidities were present in 15 patients (46.9%).

Figure 1 and Figure 2 shows previous surgeries leading to incisional hernia included hysterectomy in 12 patients (37.5%), followed by exploratory laparotomy in 8 patients (25%), appendectomy in 5 patients (15.6%), open and laparoscopic cholecystectomy in 2 patients each (6.2%), herniorrhaphy in 2 patients (6.2%), and nephrectomy in 1 patient (3.1%). The most common previous abdominal incision was lower midline incision in 10 patients (31.2%), followed by upper midline incision in 8 patients (25%). Other incision types included grid iron incision in 4 patients (12.5%), subcostal and paramedian incisions in 2 patients each (6.2%), umbilical port site incision in 2 patients (6.2%), oblique incision in 2 patients (6.2%), and drain site and flank incisions in 1 patient each (3.1%).

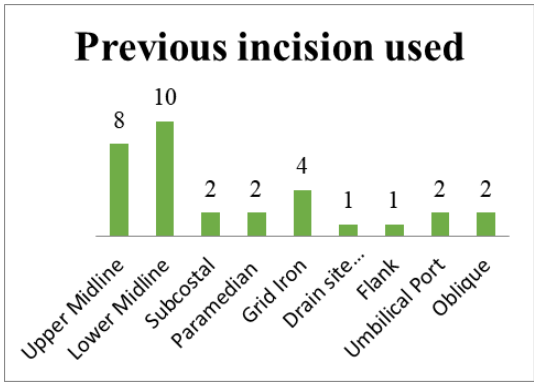

Figure 1: Bar diagram of previous incision used

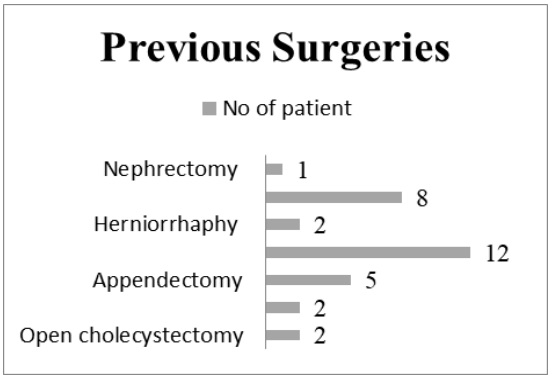

Figure 2: Bar diagram of previous Surgeries

Regarding operative management, sublay mesh repair was the most commonly

performed procedure in 25 patients (78.1%), followed by onlay mesh repair in 4 patients (12.5%) and primary repair in 3 patients (9.4%). Seroma formation was most common postoperative complications seen in 2 patients (6.2%), followed by wound infection in 1 patient (3.1%). Mean hospital stay was in primary repair was 3.66 days and in mesh repair 8.14 days. Table 2.

Table 2: Operative Details and Postoperative complication

Operative Management	n(%)
Primary repair	3 (9.4%)
Sublay Mesh	25 (78.1%)
Onlay Mesh	4 (12.5%)
Post operative complication	
Nil	29 (90.6%)
Wound Infection	1 (3.1%)
Seroma	2 (6.2%)
Mean Length of hospital stay (days)	
Primary Repair	3.66 ±0.57
Mesh Repair	8.14 ± 1.66

DISCUSSION

The present study prospectively evaluated the clinical profile, risk factors, operative management, and short-term postoperative outcomes of 32 patients undergoing surgical repair of incisional hernia at a tertiary care hospital in Nepal. The findings are discussed below in the context of existing literature, with attention to demographic characteristics, aetiological risk factors, surgical technique, and complication profile.

The majority of patients in the present study (68.8%) were older than 40 years, which is comparable to the findings of Bhamre et al. (63%) [5], Ellis et al. (49.5%) [6], and Soni et al. (48.2%) [7]. The higher incidence in older individuals may be related to age-associated changes in the abdominal wall, including reduced collagen quality, decreased tissue strength, and the increased prevalence of comorbidities that impair wound healing and predispose to fascial weakness. Females constituted 65.6% of the study population. Although several studies, including those by Bhutia et al. [8] and Deshmukh et al. [9], have reported a male predominance, our findings likely reflect the surgical profile of our institution. Hysterectomy was the most common previous operation (37.5%), and our centre manages a large number of gynaecological patients [10]. In addition, factors such as repeated lower abdominal surgery and abdominal wall laxity following multiple pregnancies may contribute to the higher frequency of incisional hernia among women. Similar female predominance has also been reported by Bhutia et al. (84% female) [8] and Bhattacharya et al. (64.6% female) [10], where most patients had undergone previous gynaecological procedures.

Swelling at the prior incision site was the universal presenting complaint (100%), with 43.8% reporting associated pain, consistent with Kondreddy et al. [11] and Nanjappa et al. [12]. The predominance of reducible hernias (84.4%) suggests most patients presented before development of irreducibility, obstruction, or strangulation. Despite this, large defects (greater than 3 cm) were present in 90.6% of patients, reflecting a well-recognised paradox: fascial defects enlarge progressively under intra-abdominal pressure, yet contents may remain reducible until late-stage disease. The predominance of large defects reflects delayed presentation to a tertiary referral centre and underscores the importance of early surgical referral once an incisional hernia is diagnosed, regardless of reducibility.

Surgical site infection (SSI) was the most prevalent risk factor (34.4%), followed by wound dehiscence (15.6%), consistent with Bucknall et al. [2], who demonstrated that SSI impairs fascial healing by disrupting collagen deposition and promoting proteolytic matrix degradation. Obesity (BMI 30 kg/m2 or greater, measured on admission for all 32 patients) was identified in only 3.1% of cases, likely reflecting the lower background obesity prevalence in the lower-middle socioeconomic population served by this institution, consistent with Mudge et al. [13] and Bhat et al. [14], who noted obesity as a risk factor in higher-income country cohorts. Comorbid conditions like diabetes mellitus, hypertension, and COPD were present in 46.9% of patients. These systemic conditions affect the process of wound healing. These comorbidities are pathophysiologically distinct from wound-related risk factors such as SSI and wound dehiscence, though both categories independently contribute to hernia formation and are not mutually exclusive in individual patients.

Hysterectomy was the most common previous surgery (37.5%), followed by exploratory laparotomy (25%). Similar findings have been revealed by Bewo et al. [15] and Nanjappa et al. (32%) [12], where gynaecological procedures and major abdominal surgeries were the most frequent antecedent operations. The higher proportion of hysterectomy in the present study reflects the large volume of gynaecological cases managed at our centre. The lower midline incision was the most common incision associated with incisional hernia (31.2%), followed by the upper midline incision (25%). This is similar to the observations of Ellis et al. (38%) [6] and Israelsson et al. (45%) [16]. Midline incisions are known to have a higher risk of incisional hernia because healing depends on a single fascial layer of the relatively poorly vascularized linea alba. In comparison, transverse incisions are strengthened by the abdominal muscles and have a good blood supply, which may contribute to a lower risk of hernia formation.

Sublay (retromuscular) mesh repair was performed in 78.1% of patients, followed by onlay mesh (12.5%) and primary repair (9.4%, reserved for defects less than 3 cm), consistent with Kondreddy et al. (72%) [11] and Nanjappa et al. (75%) [12]. The preference for sublay repair reflects its well-established advantages: retromuscular mesh placement provides superior placement, avoids direct mesh-to-subcutaneous contact, reduces seroma and infection risk. This is associated with lower long-term recurrence rates compared with onlay repair. The frequent use of open sublay repair at our institution reflects resource availability, existing surgical expertise, and patient-related factors including predominantly large defect size and prior laparotomy, rather than unawareness of evolving techniques.

In this study, the overall complication rate was low. Seroma was the most common complication, occurring in 6.2% of patients, while wound infection was seen in 3.1%. These rates are lower than those reported by Bhamre et al. [5] (seroma 8%, wound infection 4%), Dhali et al. [17] (seroma 10%, surgical site infection 15%), and Garg et al. [18] (seroma 7%). The low complication rate may be explained by the predominance of elective sublay mesh repair and the exclusion of emergency operations and contaminated wounds. Patients who underwent primary repair had a mean hospital stay of 3.66 ± 0.57 days, whereas those treated with mesh repair stayed for a mean of 8.14 ± 1.66 days. These findings are similar to those of Deshmukh et

al. [9], who reported mean hospital stays of 6.18 and 10.35 days, respectively. The longer hospital stay in the mesh repair group was largely related to drain care, wound observation, and postoperative recovery. Because only three patients underwent primary repair, statistical comparison between the two groups was not considered meaningful.

The study was limited by its short follow-up period, extending only to discharge and a 4-week postoperative visit. Incisional hernia recurrence is often detected months or years after surgery; therefore, the present study was not designed to evaluate long-term recurrence. Larger prospective studies with extended follow-up are required to determine the durability of sublay mesh repair and its long-term outcomes.

CONCLUSIONS

Incisional hernia was more commonly seen in patients above 40 years age group and incisional hernia was more frequent in females. Swelling was the most common clinical feature, and most of hernias were reducible. Surgical site infection and wound dehiscence were considered as important risk factors for developing incisional hernia. Most commonly incision hernia was associated with lower midline incisions. Sublay (preperitoneal) mesh repair was the most commonly performed technique and was associated with low postoperative complication rates. Early diagnosis, optimization of risk factors, meticulous surgical technique, and appropriate use of mesh repair can help reduce postoperative complications. Long-term follow-up studies are needed to assess recurrence rates.

ACKNOWLEDGEMENT

We are thankful to National Medical College Teaching Hospital, Birgunj, Nepal for all the logistic support during this study.

AUTHOR'S CONTRIBUTION: Concept and design- **APY, BKR, AL**; Data acquisition-**APY, AL, AR**; Data analysis and interpretation-**APY, BKR, AR, RKM;** Drafting of the manuscript-**APY**; Revision of the manuscript-**BKR, AL, AR, RKM;** Final approval of the version to be published-**APY, BKR, AL, AR, RKM;** Accountability for all aspects of the work-**APY, BKR, AL, AR, RKM.**

CONFLICT OF INTEREST: None declared

FUNDING: None

REFERENCES

1. Hope WW, Tuma F. Incisional Hernia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jun 12. PMID: 30571026
2. Bucknall TE, Cox PJ, Ellis H. Burst abdomen and incisional hernia: a prospective study of 1129 major laparotomies. Br Med J (Clin Res Ed). 1982 Mar 27;284(6320):931-3. DOI: 10.1136/bmj.284.6320.931
3. TA S, Roslyn JJ. Incisional hernia. Surg Clin North Am. 1993 Jun;73(3):557-70. DOI: 10.1016/s0039-6109(16)46037-8
4. Zabaglo M, Leslie SW, Sharman T. Postoperative wound infections. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Mar 5. PMID: 32491419
5. Bhamre SD, Pingale ND. A clinical study of incisional hernia. MVP J Med Sci. 2016 Feb 29;3(1):1-6. DOI: 10.18311/mvpjms/0/v0i0/8456
6. Ellis H, Gajraj H, George CD. Incisional hernias: when do they occur? Br J Surg. 1983 May;70(5):290-1. DOI: 10.1002/bjs.1800700514
7. Soni AK, Sahu SK, RK VK. A study on clinical profile and risk factors in incisional hernia patients. Panacea Journal of Medical Sciences.

2023 Jan 16;12(3):528-32. DOI: 10.18231/j.pjms.2022.099

8. Bhutia WT, Chandra SS, Srinivasan K, Ananthakrishna N. Factors predisposing to incisional hernia after laparotomy and influencing recurrences rate after different methods of repair: A prospective study of 220 patients. IJS. 1993;55(11):535-43.
9. Deshmukh SK, Varudkar AS, Chopde AV. Clinical study and management of incisional hernias: a prospective monocenter experience. Int Surg J. 2017 May;4(5):1657-61. DOI: 10.18203/2349-2902.isj20171616
10. Bhattacharya S, Upadhyay V, Santhosh S. A study of clinical profile in incisional hernia and the etiological factors associated with incisional hernia. Int J Acad Med Pharm. 2025;7(4):413-7. DOI: 10.47009/jamp.2025.7.4.77
11. Kondreddy S, Rigved N. Incisional hernia- a prospective study of 50 cases for 1 year. Indian J Appl Res. 2014;4(5):403-7. DOI: 10.15373/2249555X/MAY2014/123
12. Nanjappa N, Mohanty A, Smile SR. Incisional hernia repair–a clinical study of 30 patients. Int J Cur Res Rev. 2013 Aug 1;5(15):35-41.
13. Mudge M, Hughes L. Incisional hernia: a 10 year prospective study of incidence and attitudes. British Journal of Surgery. 1985 Jan;72(1):70-1. DOI: 10.1002/bjs.1800720127
14. Bhat N, Zadie S, Riyad M, Bukhari S. Clinical Profile And Management Of Incisional Hernias: An Experience. The Internet Journal of Surgery. 2009;26(1). DOI: 10.5580/190f
15. Bewö K, Österberg J, Löfgren M, Sandblom G. Incisional hernias following open gynecological surgery: a population-based study. Archives of Gynecology and Obstetrics. 2019 May 1;299(5):1313-9. DOI: 10.1007/s00404-019-05110-3
16. Israelsson LA, Jonsson T. Suture length to wound length ratio and healing of midline laparotomy incisions. British Journal of Surgery. 1993 Oct;80(10):1284-6. DOI: 10.1002/bjs.1800801030
17. Dhali DK, Sardar A, Hossain SM, Dey PK, Mohmood SA. Clinical profile and management of incisional hernia at a tertiary care hospital, Khulna, Bangladesh. Int J Dent Med Sci Res. 2023 May-Jun;5(3):235-240. DOI: 10.35629/5252-0503235240
18. Garg N, Batra P, Bali S. The clinical study of the incisional hernia and its management. International Surgery Journal. 2017 Jun;4(7):2281-5. DOI: 10.18203/2349-2902.isj20172780