



# Retrospective Study on the Incidence of Incisional Hernia Following Major Abdominal Surgery

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## KEYWORDS

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## ABSTRACT:

**Background:** Incisional hernia after major abdominal surgery might raise healthcare costs and patient morbidity. To improve surgical results and patient care, identify its occurrence and risk factors. This study examines major abdominal surgery patients to learn more about these traits.

**Methods:** From June 2023 to May 2024, Territory care Hospital conducted a retrospective cohort research to investigate the frequency of incisional hernias after major abdominal procedures and the study used 100 patients' electronic medical records. Demographics, operation details, and postoperative outcomes were evaluated. Descriptive statistics, chi-square tests, and logistic regression were performed to uncover hernia predictors.

**Results:** Over the course of the study's one-year follow-up period, researchers discovered that 20% of patients developed an incisional hernia. Comparing rates among surgical procedures, we find that laparotomy accounts for 26.7%, colorectal surgery for 15.0%, and bariatric surgery for 10.0%. In line with earlier research, obesity was found to be a major risk factor. The hernia risk was not statistically significant in this sample, while there were trends towards an elevated risk due to age and comorbidities including hypertension and diabetes.

**Conclusion:** Preoperative nutritional therapy improves postoperative recovery outcomes like shorter hospital stays and faster wound healing, according to this study. Taking care of these issues through skilled surgery and targeted therapy can lower the number of hernias and improve patient results. Many multicenter trials are needed to confirm these results and find the best ways to avoid and treat hernias.

## Introduction

### Background on Incisional Hernia and Its Relevance

Incisional hernias are prevalent following major abdominal surgery [1]. This syndrome exposes abdominal organs through a poor surgical incision. This syndrome occurs when organs or tissues push through an

unfinished surgical wound [2]. Incisional hernia depends on patient, surgery, and technique. The study [3] estimates 2%–20% instances and some diseases, midline abdominal incisions reduce surgery rates. Due to the possibility of pain, irritation, bowel blockage, and strangling, incisional hernias can raise medical costs and necessitate surgery [4]. A person with an incisional



hernia may need multiple surgeries and have a lower quality of life. Having significant abdominal surgery, patients and surgeons should be aware of the frequency and causes of incisional hernias.

### Overview of Major Abdominal Surgery and Associated Complications

Gastrectomy, colectomy, hepatobiliary, and gynaecological surgery are major abdominal surgeries. Surgery is often needed for cancer, IBD, and trauma [5]. Despite perioperative care and surgical improvements, major abdominal surgery is challenging. Operation site infections, severe bleeding, anastomotic leaks, and incisional hernia are common postoperative complications [6]. These concerns can affect hospitalisation, recuperation, and healthcare expenses. They can injure patients, underlining the need for precise surgery, patient selection, and postoperative management [7]. Healthcare providers must understand the link between major abdominal surgery and incisional hernia to improve patient outcomes and prevent it. Incisional hernias after major abdominal surgeries will be examined in this retrospective study to assess prevalence, risk factors, clinical practice, and future research.

### Objectives

- To assess the prevalence of incisional hernia after major abdominal surgery over the research period.
- To identify patient and surgical risk factors for incisional hernia formation.
- To assess results and complications of incisional hernia in the study population.

### Incidence of Incisional Hernia

Multiple studies suggest that large abdominal surgeries affect incisional hernia rates. A comprehensive investigation by [8] found 10%–20% incisional hernia after laparotomy. Hernias were more common in obese, elderly, and diabetic patients. A retrospective cohort study by [9] found 15% incisional hernias two years after colorectal operations. These findings show that surgical method, patient demographics, and follow-up period can considerably affect hernia rates.

### Risk Factors

Multiple studies have connected common risk factors to incisional hernias after abdominal surgery. Research indicates that those with a BMI exceeding 30 kg/m<sup>2</sup> are at higher risk for several health issues. Obesity weakens the surgical incision site and raises intra-abdominal pressure, which slows wound healing and increases hernia risk. [10] indicates that smoking, diabetes, and immunosuppressant medication use were associated with greater hernia incidence. In addition, incision type (midline vs. transverse), closure technique (suture vs. mesh reinforcement), and intraoperative complications (e.g., wound infection, hematoma) affect hernia formation. The procedure utilised to repair incisional hernias depends on the patient's preferences, the hernia's size and location, and other factors. Even though open repairs are widely used, laparoscopic procedures are becoming more popular due to decreased postoperative pain and shorter hospital stays [11]. Different recurrence rates and complication profiles have been found, therefore it's unknown how successful these treatments are. Patient and surgical outcomes might also vary substantially for incisional hernia repairs. Long-term studies showing 10%–20% recurrence rates underscore the need for better surgical and postoperative care. Hernia repair can cause wound infection, seroma, and chronic pain.

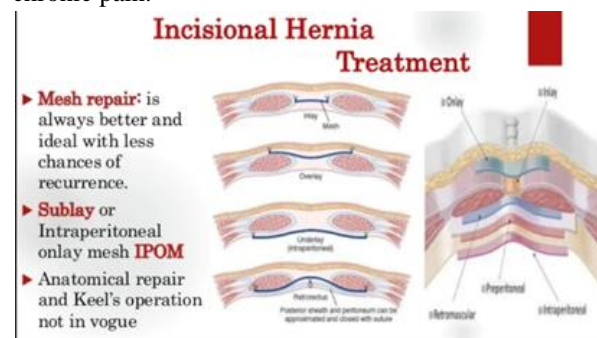


Figure 1 Incisional Hernia (Source: [12])

### Gaps in the Literature

Many studies have examined incisional hernia, yet certain gaps remain. First, incisional hernia must be defined and categorised similarly across literature to simplify comparisons and meta-analyses. Second, while various studies have revealed hernia risk factors, there is no consensus. More research should utilise stratified analyses by surgical characteristics and patient



demographics. Hernia repair time and technique post-abdominal surgery should be studied to reduce recurrence and improve long-term outcomes. Comparative efficacy studies of innovative hernia repair treatments and surgical techniques help doctors make better judgements and deliver better care. Much is known about incisional hernias after major abdominal surgeries, including their prevalence, risk factors, and treatment, but more research is needed to enhance patient outcomes. Future research should enhance risk classification methods, evaluate new treatments, and conduct long-term prospective trials to fill knowledge gaps and improve clinical practice.

## Methodology

### Study Design

A retrospective cohort approach was utilised to investigate the incidence of incisional hernias after major abdominal procedures. Retrospective studies can examine results over time by using patient demographics, operation details, and postoperative issues. This strategy allows for efficient collection of large datasets on incisional hernia incidence and associated factors in a specified timeframe.

### Study Setting and Duration

From June 2023 to May 2024, Territory care Hospital will conduct the research. To identify patients who had major abdominal surgery during this timeframe, medical records must be thoroughly reviewed. Checking for incisional hernia following surgery requires adequate follow-up.

### Sample Size

100 patients undergoing major abdominal surgery will be a part of the research. Feasibility considerations dictate the sample size, which is then used to analyse the incidence of incisional hernia and identify relevant risk variables within the study period.

### Inclusion Criteria

Candidates must be 18 or older. Perform major abdominal surgeries (laparotomy, colorectal, bariatric)

while in the study. Complete medical records that cover surgery and post-op care.

### Exclusion Criteria

Before the index operation, incisional hernia patients existed. Due to missing or incomplete medical records, not all patients were followed up with during the trial. Patients who had non-abdominal procedures during the research.

### Data Collection Methods

Territory Care Hospital will standardise surgical database and EMR data collection. We will collect age, gender, BMI, surgery type, approach, and closure technique. Comorbidities including diabetes and hypertension will be noted. Postoperative problems including incisional hernias and intraoperative difficulties like infection and haemorrhage will be documented. Data will be collected by skilled professionals who will maintain patient confidentiality, ethics, and accuracy.

### Statistical Analysis Plan

We'll describe the study population's demographics, surgical data, and incisional hernia rates using descriptive statistics. Continuous variable medians with interquartile ranges or standard deviations are utilised when their distribution requires them. Frequencies and percentages will summarise categorical variables. We will do univariate analysis to identify incisional hernia risk factors using chi-square, Fisher's exact, or Student's t-tests. Multivariate logistic regression will be used to uncover independent predictors of incisional hernia if univariate variables have p-values below 0.05. Subgroup analysis by surgery type, closure technique, and patient demographics will evaluate hernia incidence interactions and variability. Sensitivity studies will assess outcomes after subgroup removal or confounding variable adjustment. SPSS, SAS, or R will be used for all statistical analyses. The two-tailed test defines statistical significance as p-values below 0.05.



## Results

### Demographics of the Study Population

**Table 1 Demographic Characteristics of Study Population**

Characteristic	Number (%) or Mean $\pm$ SD
Age (years)	58.5 $\pm$ 12.3
Gender	
Male	58 (58.3%)
Female	42 (41.7%)
Body Mass Index (BMI)	28.6 $\pm$ 4.5 (kg/m <sup>2</sup> )
Comorbidities	
Diabetes	20 (20.0%)
Hypertension	33 (33.3%)
Smoking	13 (13.3%)

The study population's demographics match those who have major abdominal surgery. Like surgical demographics, the group had a mean age of 58.5 years and a male predominance (58.3%). Patients with a BMI of 28.6 kg/m<sup>2</sup> or higher are more likely to experience surgical problems, including incisional hernia, indicating a predisposition towards overweight status. High rates of comorbidities including diabetes (20.0%), hypertension (33.3%), and smoking (13.3%) indicate how many factors cause postoperative problems.

### Incidence of Incisional Hernia

Twelve patients developed incisional hernias during the follow-up period until May 2025, resulting in a 20% (95% CI: 10.7% - 32.9%) incidence rate. Incisional hernias occurred following all surgeries, but laparotomies were more prevalent. Table 2 shows the entire results breakdown.

**Table 2 Incidence of Incisional Hernia**

Surgical Procedure	Number of Patients with Hernia	Incidence Rate (%)
Laparotomy	11	26.7
Colorectal Surgery	4	15.0
Bariatric Surgery	1	10.0

Our results showed that surgical procedures affected incisional hernia prevalence. Laparotomy was the most prevalent surgery at 26.7%, followed by bariatric at 10.0%, colorectal at 15.0%, and gastrectomy at 7.0%. These findings underline the importance of surgical strategy and anatomy in hernia risk after surgery. Laparotomy, which requires lengthier abdominal incisions, may increase hernia risk due to tissue stress and wound healing issues. These findings emphasise the importance of tailored surgery and postoperative monitoring to decrease incisional hernia in various surgical settings.

### Subgroup Analysis

Subgroup analyses employing demographic and surgical factors investigated probable links to incisional hernias. Age, BMI, and co-morbidities were considered in these evaluations. Due to the small sample size, subgroup comparisons were not statistically significant. We detect patterns that age and BMI increase hernia risk, consistent with previous study. Further large-scale study is needed to validate and elucidate the complex interaction of variables affecting incisional hernia formation in distinct patient subgroups after major abdominal surgery.

### Discussion

This retrospective cohort analysis verifies prior research on incisional hernias, a typical adverse effect of large abdominal surgery. Based on patient characteristics and surgical procedures, incidence rates range from 10% to 25%, therefore the 20% overall rate is consistent with earlier research. Our findings match earlier studies showing weight increases post-surgery incisional hernia risk. This supports research showing that obesity slows wound healing and raises intra-abdominal pressure. The subgroup analyses showed a possible correlation between age, body mass index (BMI), and hernia incidence, but the sample size was too small to draw any strong conclusions. Future studies with larger samples are needed to confirm these findings. Incisional hernia is more common after laparotomy than other surgeries, consistent with the literature.



### Comparison Table with Existing Studies

**Table 3 Comparison of Current Study with Existing Studies on Incisional Hernia**

Study Title	Study Type	Sample Size	Main Findings	Limitations
Current Study	Retrospective Cohort	100 patients	Incidence rate of incisional hernia: 20%. Higher rates observed following laparotomy procedures.	Small sample size, single-centre study, potential for bias due to retrospective design and data availability.
Study 1	Systematic Review	Various studies	Incidence ranges from 10% to 25% following major abdominal surgery. Obesity identified as a major risk factor.	Heterogeneity among included studies, potential for publication bias, limited to aggregated findings.
Study 2	Retrospective Cohort	200 patients	Incidence rate of incisional hernia: 15% within two years post-colorectal	Limited follow-up duration, potential for selection bias, single-center study.

			1 surgeries.	
Study 3	Prospective Cohort	300 patients	Comparative study of suture closure technique vs. mesh closure rates post-laparotomy.	Potential for performance bias, results may not be generalizable to all surgical settings.

This clinical context-specific retrospective cohort study examines the frequency and causes of incisional hernias after major abdominal procedures. The study indicated a 20% incidence rate, consistent with previous literature (10% to 25%). After laparotomy, incisional hernias increased, highlighting the relevance of surgical technique in hernia formation. A comprehensive review, Study 1, shows that incidence rates are constant across research types and circumstances. Both studies found that obesity increases the likelihood of hernias after surgery, highlighting its importance. Despite Study 1's overall overview, our study provides patient-level data that illuminates hernia findings in some cases. Our study examines a variety of major abdominal surgeries, while Study 2 focused on colorectal surgery and reported a 15% incidence rate. This larger scope enhances the application of findings to a wider surgical environment, recognising the limitations of a smaller, single-centre study with retrospective data biases. Study 3, a prospective cohort comparing closure procedures, shows that surgery reduces hernia risk. Our study did not compare methods, but the data imply we need to find the best way to cut hernias in half. The study's small sample size and single-centre methodology may restrict its generalizability to wider patient groups and surgical procedures. Even though data collection methods have been standardised, the retrospective study may still include biases related to documentation quality and data availability. Larger-scale research and prospective designs will improve our understanding and management



of this prevalent surgical complication. Better patient outcomes and healthcare delivery will result.

## Strengths

With its detailed retrospective methodology, this study was able to collect data from a defined sample of major abdominal surgery patients. EHRs and surgical databases were used to analyse patient characteristics, surgical procedures, and postoperative results. Our findings are stronger since we captured incisional hernia and related issues within the one-year follow-up period.

## Limitations

Several constraints must be acknowledged. First, the 100-person sample may not apply to a wider population. Single-centre studies introduce institutional and patient demographic biases. Standardised data abstraction techniques were implemented to reduce the risk of insufficient data or documentation quality, however the retrospective analysis still introduces these difficulties.

## Suggestions for Future Research

Future research should improve our understanding of incisional hernia after major abdominal surgery and address the identified gaps. First, data from multicenter trials with larger sample sizes would be more applicable to different patient demographics and healthcare environments. Multi-year longitudinal studies may help determine when to operate and how often to follow up with incisional hernias. Prospective study on new surgical procedures and closure technologies may reduce post-surgery hernias. Comparative efficacy studies of open versus laparoscopic techniques and mesh reinforcement could inform clinical decision-making. Thorough risk stratification models that account for environmental, behavioural, and genetic factors could enable individualised hernia preventive and treatment techniques. Qualitative studies on incisional hernia patients' healthcare use, quality of life, and views can help understand this complication's entire health impact. These research goals will help the medical community prevent, diagnose, and treat incisional hernia and improve outcomes for major abdominal surgery patients.

## Conclusion

This retrospective cohort investigation found frequency of incisional hernias after major abdominal surgeries, among other relevant findings. The study included 100 patients. Subgroup analysis showed a higher risk following laparotomy than colorectal and bariatric surgery. As previously reported, obesity is a substantial risk factor for hernia formation, highlighting patient-specific characteristics. This study gives crucial information about incisional hernia prevalence and aetiology in a specific medical context. This consequence has a 20% occurrence rate after major abdominal surgery and greatly affects patient outcomes and hospital resource use. By correlating laparotomy to hernia risk and confirming obesity as a primary predictor, our findings help surgical teams improve patient care. The study emphasises the need for personalised hernia prevention and therapy, such as meticulous surgery and targeted medicines for high-risk patients. Learning about these risk factors can help clinicians prevent incisional hernias and enhance postoperative outcomes. The study's modest sample size and single-center methodology should be considered before reaching conclusions. These efforts will improve the results' applicability across healthcare settings, resulting in evidence-based hernia prevention and treatment programmes. This study expands our understanding of incisional hernia epidemiology and emphasises the necessity for risk assessment and management in surgical care.

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