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Post-Operative Wound Complications Following Elective Abdominal Surgeries: A Hospital-Based Study

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Abstract

Background: *Post-operative wound complications significantly contribute to surgical morbidity following abdominal procedures. This study aimed to assess the incidence, risk factors, and short-term outcomes of wound complications following elective abdominal surgeries.*

Methods: *A prospective hospital-based study was conducted over 6 months including 80 patients undergoing elective abdominal surgeries. Data regarding demographic profile, comorbidities, wound classification, operative duration, and postoperative outcomes were collected. Statistical analysis was performed using chi-square test, with $p<0.05$ considered significant.*

Results: *The overall incidence of post-operative wound complications was 17.5% (14/80). Surgical site infection was the most common complication (64.3%), followed by seroma (21.4%). Diabetes mellitus ($p=0.02$), obesity ($p=0.04$), anemia ($p=0.03$), operative duration >2 hours ($p=0.01$), and clean-contaminated wound class ($p=0.02$) were significantly associated with complications. Patients with wound complications had significantly prolonged hospital stay (11.2 ± 3.4 days vs 6.1 ± 2.2 days; $p<0.001$). Secondary suturing was required in 21.4% of complicated cases.*

Conclusion: *Post-operative wound complications remain common after elective abdominal surgeries and are significantly associated with modifiable risk factors. Early identification and optimization of high-risk patients can reduce morbidity and healthcare burden.*

Keywords: *Surgical site infection, abdominal surgery, wound complications, risk factors, postoperative morbidity.*

Introduction

Post-operative wound complications remain a significant contributor to surgical morbidity despite advances in aseptic techniques and antimicrobial prophylaxis. Surgical site infections (SSIs), wound dehiscence, seroma, and hematoma are among the most common complications following abdominal surgeries and are associated with prolonged hospital stay, increased healthcare costs, and patient discomfort [(1,2)]. Globally, SSIs account for nearly 20% of healthcare-associated infections, making them one of the most frequent postoperative complications [(3)].

The incidence of wound complications following elective abdominal surgeries varies widely, ranging from 5% to 25% depending on patient comorbidities, wound classification, duration of

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surgery, and adherence to infection control protocols [4,5]. Factors such as diabetes mellitus, obesity, anemia, smoking, malnutrition, and prolonged operative time have been consistently identified as independent risk factors [6–8]. In low- and middle-income countries, the burden is often higher due to resource constraints and variability in perioperative care practices [9].

Elective abdominal surgeries, though planned and optimized preoperatively, still carry a measurable risk of postoperative wound morbidity. Understanding the local incidence, microbial profile, and associated risk factors is essential for implementing targeted preventive strategies. Hospital-based data can provide insight into modifiable risk factors and guide institutional infection control policies [10–12].

Objectives

1. To determine the incidence of post-operative wound complications following elective abdominal surgeries.
2. To identify risk factors associated with post-operative wound complications.
3. To evaluate short-term outcomes including duration of hospital stay and need for re-intervention.

Materials and Methodology

Study Design

A prospective observational hospital-based study.

Study Setting

Department of General Surgery at a tertiary care teaching hospital.

Study Duration

6 months.

Sample Size Calculation

Based on previous literature reporting a prevalence of post-operative wound complications of approximately 20% following abdominal surgeries (4,9), the sample size was calculated using the formula:

$$n = \frac{Z^2 \times p \times q}{d^2}$$

Where:

- Z = 1.96 (95% confidence interval)
- p = 0.20 (expected prevalence)
- q = 0.80
- d = 0.09 (absolute precision)

The calculated minimum sample size was approximately 76. Considering feasibility and possible attrition, a total of 80 patients were included in the study.

Inclusion Criteria

- Patients aged ≥18 years
- Undergoing elective abdominal surgery
- Provided informed consent

Exclusion Criteria

- Emergency abdominal surgeries
- Pre-existing wound infection
- Immunocompromised patients
- Patients lost to follow-up

Data Collection

Patients were followed from the preoperative period until discharge and up to 30 days postoperatively. Diagnosis of SSI was based on CDC criteria [3].

Statistical Analysis

Data were entered in Microsoft Excel and analyzed using SPSS version 25.0. Chi-square test was used to assess association between risk factors and wound complications. A p-value <0.05 was considered statistically significant.

Ethical Consideration

Institutional Ethics Committee approval was obtained prior to commencement of the study. Written informed consent was taken from all participants.

RESULTS

A total of 80 patients undergoing elective abdominal surgeries were included in the study. The mean age of patients was 44.8 ± 13.6 years (range: 19–72 years). Majority were males (55%). Comorbidities were present in 37.5% patients, with diabetes mellitus being the most common (20%).

The incidence of post-operative wound complications was 17.5%, with surgical site infections being the most common (64.3%) (Table 3). Diabetes mellitus, obesity, anemia, prolonged operative duration (>2 hours), and clean-contaminated wound class were significantly associated with wound complications (Table 4).

Table 1: Demographic and Clinical features

Variable	Frequency	Percentage (%)
Age Group (years)		
18–30	18	22.5
31–50	34	42.5
>50	28	35.0
Gender		
Male	44	55.0
Female	36	45.0
Comorbidities		
Diabetes Mellitus	16	20.0
Hypertension	12	15.0
Obesity(BMI>30)	10	12.5
Anemia	14	17.5

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***Multiple comorbidities were present in some patients.**

Table 2: Types of Elective Abdominal Surgeries

Type of Surgery	Frequency	Percentage
Hernioplasty	22	27.5
Cholecystectomy	18	22.5
Appendectomy (interval)	12	15.0
Colorectal procedures	16	20.0
Others	12	15.0

Table 3: Incidence and Type of Post-Operative Wound Complications (n = 14)

Complication	Frequency	Percentage (%)
Surgical Site Infection (SSI)	9	64.3
Seroma	3	21.4
Hematoma	1	7.1
Wound Dehiscence	1	7.1

Overall incidence of wound complications: **17.5% (14/80)**

Table 4: Association Between Risk Factors and Wound Complications

Risk Factor	Complication Present (n=14)	Complication Absent (n=66)	p-value
Diabetes	6	10	0.02 *
Obesity	4	6	0.04 *
Anemia	5	9	0.03 *
Duration >2 hrs	8	14	0.01 *
Clean-contaminated wound	7	18	0.02 *

*Statistically significant ($p < 0.05$)

Table 5: Short-Term Outcomes

Outcome	Complication Group	No Complication	p-value
Mean Hospital Stay (days)	11.2 ± 3.4	6.1 ± 2.2	<0.001
Secondary Suturing	3 (21.4%)	0	—
Re-operation	1 (7.1%)	0	—

DISCUSSION

The present study demonstrated an overall wound complication rate of 17.5%, which is comparable to previous studies reporting rates between 10–25% following abdominal surgeries [1,4,9]. Surgical site infection was the predominant complication, accounting for nearly two-thirds of cases, consistent with global literature identifying SSI as the most frequent postoperative wound morbidity [2,3].

Diabetes mellitus was significantly associated with wound complications (p=0.02), aligning with findings by Martin et al., who reported impaired glycemic control as an independent risk factor for SSI [5]. Hyperglycemia compromises neutrophil function and delays wound healing, thereby increasing infection susceptibility [6]. Obesity also showed significant association (p=0.04), likely due to poor tissue perfusion and longer operative times [7].

Prolonged surgical duration (>2 hours) was strongly associated with complications (p=0.01), consistent with WHO guidelines highlighting operative time as a modifiable risk factor [8]. Increased tissue exposure and bacterial contamination risk during prolonged surgeries may explain this observation [9].

Patients with clean-contaminated wounds had higher complication rates compared to clean wounds, which corroborates the established wound classification risk gradient [10]. Similar findings were reported by Owens and Stoessel, who emphasized wound class as a predictor of SSI [11].

The significant increase in hospital stay among patients with wound complications (11.2 vs 6.1 days) mirrors earlier cost-burden studies showing increased healthcare utilization associated with SSIs [4,12]. This highlights the economic and clinical impact of postoperative wound morbidity.

Overall, our findings are consistent with both international and regional data and underscore

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the importance of optimizing modifiable risk factors such as glycemic control, anemia correction, and operative duration.

CONCLUSION

Post-operative wound complications occurred in 17.5% of patients undergoing elective abdominal surgeries, with SSI being the most common. Diabetes, obesity, anemia, prolonged operative duration, and clean-contaminated wound class were significant risk factors. Wound complications significantly increased hospital stay and morbidity.

LIMITATIONS

1. Single-center study limiting generalizability.
2. Small sample size (n=80).
3. Short follow-up period (30 days).
4. Microbiological profile analysis was limited.

Author contribution

All authors have contributed equally

Conflict of Interest

Nil

Source of Funding

Nil

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