Current Status of Surgical Site Infections Among Postoperative Patients in the Surgical Departments of Viet Tiep Hospital, 2025

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ABSTRACT

Background: Surgical site infection (SSI) remains one of the most common and serious postoperative complications, contributing to prolonged hospitalization and increased healthcare costs. ***Objectives:*** This study aimed to describe the current status of SSIs among postoperative patients in the surgical departments of Viet Tiep Hospital in 2025. ***Methods:*** A cross-sectional descriptive study was conducted on 177 postoperative patients who met the inclusion criteria. Data were collected using the Surgical Wound Assessment Tool (SWAT) and analyzed with SPSS 20.0. ***Results:*** The incidence rate of SSI was 9.03%. Most surgeries were classified as clean-contaminated (35.1%) or contaminated (40.1%). The majority of procedures were emergency surgeries (59.9%), predominantly trauma-related (44.6%). Operative durations commonly ranged from 1–3 hours (81.9%). Iodine solution was the most frequently used agent for dressing changes (81.4%). ***Conclusions:*** The relatively high SSI rate underscores the need for evidence-based wound assessment and standardized preventive measures in postoperative nursing care at Viet Tiep Hospital.

Keywords: *surgical site infection, wound assessment, postoperative care, evidence-based nursing, Viet Tiep Hospital*

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INTRODUCTION

Globally, approximately 312.9 million surgical procedures are performed each year. While surgery provides substantial therapeutic benefits, it also carries inherent risks, among which surgical site infection (SSI) is one of the most serious complications, potentially leading to delayed recovery and extended hospital stays [1]. Evidence-based wound assessment is crucial for early identification of risk factors and for guiding appropriate nursing interventions to promote faster wound healing. The Surgical Wound Assessment Tool (SWAT) [2] was developed to support nurses in performing systematic and comprehensive wound evaluations.

In Vietnam, integrating SWAT into clinical nursing practice plays a vital role in identifying early risk indicators, making accurate nursing diagnoses, and implementing appropriate interventions in collaboration with surgeons. These measures are essential to reduce SSI rates and prevent complications. Therefore, this study entitled "Current Status of Surgical Site Infections Among Postoperative Patients at Viet Tiep Hospital, Hai Phong, 2025" was conducted with the objective of describing the prevalence and characteristics of SSIs

among postoperative patients between December 1, 2024, and April 1, 2025.

MATERIALS AND METHODS

Study design and participants

A cross-sectional descriptive design was applied to 177 postoperative patients who underwent open surgery (elective or emergency) in various surgical departments of Viet Tiep Hospital.

Inclusion criteria:

- Patients with postoperative duration >48 hours;
- Underwent elective or emergency open surgery;
- Provided informed consent.

Exclusion criteria:

- Patients operated on at other hospitals;
- Laparoscopic or skin graft procedures;
- Chronic wounds (>6 weeks duration).

Study setting and duration

Time: December 1, 2024 – April 1, 2025

Location: Surgical departments including Orthopedic Trauma, Digestive Surgery, Spinal–Neurosurgery, Thoracic Surgery, and Urology at Viet Tiep Hospital.

Sampling and data collection

A total sampling approach was employed. Data were extracted from medical records and direct wound assessments using the SWAT tool, which includes:

- Section A: Patient and comorbidity factors (0–17 points)
- Section B: Surgery-related factors (0–10 points)
- Section C: Clinical wound assessment (0–13 points)

Total possible score: 40; higher scores indicate greater complication risk.

SSI classification followed the Vietnamese Ministry of Health guideline (Decision No. 1526/QD-BYT, 2023): No SSI, Superficial SSI, Deep SSI, or Organ/Space SSI [1].

Data analysis

Data were entered and analyzed using SPSS 20.0. Quantitative variables were summarized as mean ± SD; qualitative variables as frequencies and percentages.

Ethical considerations

The study was approved by the Ethics Committee of Hai Phong University of Medicine and Pharmacy and Viet Tiep Hospital. Confidentiality and anonymity were maintained throughout.

RESULTS

Table 1. *General characteristics of study subjects (n=177)*

General information of study subjects		n	(%)
The mean age (Mean; SD) (66.5 ± 17.5)	<65	100	56,6
	≥65	77	43,4
Smoking	Quit at least 4 weeks before surgery	5	2,8
	Continued smoking until before surgery	9	5,1
	No smoking	163	92,1

The mean age was 66.5 ± 17.5 years; 56.6% were under 65 years. Smoking prevalence was 7.9%, with 5 patients quitting ≥4 weeks before surgery.

Table 2. *Clinical characteristics (n=177)*

Clinical characteristics		n	(%)
Diabetes mellitus	Yes	30	16,9

	No	147	83,1
Steroid use	Yes	29	16,4
	No	148	83,6
Chemotherapy	Yes	14	7,9
	No	163	92,1
Immunosuppression	Yes	18	10,2
	No	159	89,8
Risk of malnutrition	Yes	36	20,3
	No	141	79,7
Wound caused by trauma	No	81	45,8
	<6h	48	27,1
	≥6h	48	27,1

Diabetes was present in 16.9% of patients; 16.4% used steroids; 7.9% received chemotherapy; and 10.2% were immunosuppressed. Malnutrition risk was identified in 20.3%.

***Table 3**. Surgical characteristics (n=177)*

Surgical characteristics		n	(%)
Emergency surgery	No	71	40,1
	Due to pathology	27	15,3
	Due to trauma	79	44,6
Duration of surgery	<1 h	7	4,0
	1-3 h	145	81,9
	>3-6 h	25	14,1
Prophylactic antibiotics	No	18	10,2
	Yes, within 120 minutes before surgery	159	89,8
Wound classification	Clean	22	12,4
	Clean-contaminated	62	35,1
	Contaminated	71	40,1
	Dirty	22	12,4

Emergency surgeries accounted for 59.9%, mostly trauma-related (44.6%). The majority lasted 1–3 hours (81.9%), and 89.8% received prophylactic antibiotics. Wounds were classified as: clean (12.4%), clean-contaminated (35.1%), contaminated (40.1%), and dirty (12.4%).

***Table 4.** Clinical characteristics of surgical wounds after surgery (n=177)*

Clinical characteristics of wounds		n	(%)
Wound edges	Closed	45	25,4

	Closed but tense at incision site	125	70,6
	Not closed and tense at incision site	5	2,8
	Sinus tract	2	1,1
	Epithelialized	131	74
Wound bed	Granulation tissue	33	18,6
	Slough	12	6.8
	Necrosis	1	0,6
Edema	No	5	2,8
	Yes	172	97,2
Erythema	No	29	16,4
	Yes	148	83,6
Hematoma at the surgical site	No	91	51,4
	Yes	86	48,6
Exudate color	No exedute	48	27,1
	Yellow	27	15,3
	Bood-stained	94	53,1
	Whitish	8	4,5
Amount of exudate	Dry	51	28,8
	Moist	52	29,4
	Wet	64	36,2
	Soaked	10	5,6
Odor/smell	No odor	140	79,1
	Odor after dressing removal	30	16,9
	Odor before dressing removal	7	4
Solution used for dressing	Iode	144	81,4
	Saline	17	9,6
	Both	16	9
Pain level	No pain	41	23,2
	Mild pain	40	22,6
	Moderate pain	45	25,4
	Severe pain	51	28,8

Most wounds had closed but tense edges (70.6%). Swelling (97.2%), erythema (83.6%), and hematoma (48.6%) were common. Exudates were predominantly blood-stained (53.1%), and 20.9% had odor. Iodine was used for dressing in 81.4% of cases.

Table 5. *Surgical site infection rate (n=177)*

Surgical site infection	n	(%)
No	161	90.07
Yes	16	9.03
Total	177	100

The SSI incidence was 9.03% (16/177 patients).

DISCUSSION

Characteristics of study subjects

Regarding age, patients in the present study had a mean age of 66.5 ± 17.5 years. This finding is comparable to that of Do Thi Thu Hien, who reported a mean age of 49 ± 18.63 years [2], but higher than that reported by Pham Minh Khue at Viet Tiep Hospital in 2021, where the mean patient age was 44.3 ± 11.2 years [3]. In this study, the proportion of patients aged < 65 years exceeded that of those aged ≥ 65 years, reflecting the reality that individuals of working age are more frequently exposed to occupational and traffic accidents.

With respect to smoking status, a marked difference was observed compared with the study by Nguyen Thi Kim Oanh, which reported a smoking prevalence of 30%, including one-third of patients who had quit smoking at least four weeks prior to surgery and two-thirds who continued to smoke until the day of surgery [4]. In contrast, the smoking prevalence in the present study was considerably lower, at 7.9%; among these, nine patients continued to smoke, while five patients (2.8%) had stopped at least four weeks before surgery.

With respect to comorbidities such as diabetes mellitus and immunosuppression, the findings of the present study were generally consistent with those reported by Nguyen Thi Kim Oanh [4]. The prevalence of diabetes mellitus was approximately 16–17% in both studies, reflecting a common clinical profile among surgical patients. Similarly, the proportions of patients using corticosteroids or undergoing chemotherapy in her study were low, with more than 90% not receiving such treatments. These parallels suggest that the two study populations shared comparable characteristics regarding comorbidity-related risk factors for surgical site infection.

Surgical characteristics

In the present study, among 177 patients, the majority of surgeries were performed as emergency procedures, with trauma-related cases accounting for the largest proportion (44.6%), followed by emergency surgeries due to pathological conditions (15.3%). This finding contrasts with the results of Nguyen Minh Duyen et al. at Dong Da Hospital, Hanoi, in 2021, where emergency surgeries represented only 25.3% of the 138 cases studied [5]. The discrepancy may be attributed to institutional differences: Dong Da Hospital is not a frontline surgical center, whereas Viet Tiep Hospital in Hai Phong serves as a tertiary referral facility that receives a high volume of trauma-related emergencies daily.

Regarding operative duration, most surgeries lasted between 1 and 3 hours (81.9%), while 4% lasted less than 1 hour and 14.1% exceeded 3 hours. Longer operative time has been shown to increase the risk of surgical site infection (SSI). Nguyen Viet Hung et al., in a multicenter cohort study conducted across seven hospitals in Vietnam, reported that surgeries lasting longer than 120 minutes were associated with a 1.9-fold higher risk of SSI [6].

When comparing the present findings with those of Trinh Thi Thom et al. at Military Hospital 175, notable differences were observed in wound classification and prophylactic antibiotic use, reflecting variations in clinical context and surgical management practices. In this study, patients faced a higher risk of infection due to the predominance of contaminated (40.1%) and clean-contaminated (35.1%) wounds, the

majority of operations lasting 1–3 hours, and the large proportion of emergency surgeries. The use of prophylactic antibiotics was consistent with this higher-risk profile. In contrast, in the study at Military Hospital 175, clean wounds predominated (65.1%), followed by clean-contaminated (25.7%) and contaminated (5.4%) wounds, with only two cases classified as dirty [7]. However, the rate of prophylactic antibiotic administration in that study was markedly lower—only 7.3% of patients received antibiotics within 120 minutes prior to incision—likely due to the less severe clinical presentation and the predominance of clean surgical procedures [7].

Wound characteristics

When comparing wound edge conditions across studies, most wounds in the present study were closed; however, the proportion of closed but tense wounds differed markedly. The rate of wound tension observed in this study (70.6%) was substantially higher than those reported by Trinh Thi Thom (40.8%) and Nguyen Thi Kim Oanh (48.7%) [7,4]. This discrepancy may reflect differences in postoperative edema, wound tension, or intraoperative factors such as the emergency nature of surgery, infection status, or variations in postoperative wound care practices.

A notable difference between the present study and that of Nguyen Thi Kim Oanh [4] lies in the incidence of acute inflammatory manifestations. The rate of edema in this study was 97.2%, significantly higher than the 62.4% reported in her research. Similarly, erythema was present in 83.6% of patients in this study, compared with only 23.8% in the previous one. The incidence of hematoma was also markedly greater - 48.6% in the current study versus 12.4% (37 of 298 cases) reported by Nguyen Thi Kim Oanh. These findings suggest that the higher rates of inflammatory responses in the present study may be associated with the predominance of emergency and contaminated surgeries, leading to greater tissue trauma and postoperative wound stress.

Surgical site infection rate

In the present study conducted at the Surgical Departments of Viet Tiep Hospital with 177 postoperative patients, the incidence of surgical site infection (SSI) was found to be 9.03%. This rate is lower than that reported by Nguyen Van Hoan (2020) at Military Hospital 110, where the SSI incidence reached 12.9% [8]. However, it remains higher than that observed in several other Vietnamese studies. For instance, Pham Minh Khue et al. (2021), in a study conducted at the same institution from March to June 2021, reported an SSI rate of 4.3% [3]. Similarly, Huynh Ngo Kim Phuong (2018) at the University Medical Center Ho Chi Minh City found an incidence of 5.05% among patients undergoing cholecystectomy [9]. These differences may reflect variations in surgical case complexity, wound classification, infection-control practices, and the proportion of emergency versus elective surgeries among the study populations.

CONCLUSION

The study revealed an SSI incidence of 9.03% among postoperative patients at Viet Tiep Hospital. The predominance of contaminated and emergency surgeries highlights the need for continuous surveillance and evidence-based wound assessment. Strengthening adherence to aseptic techniques, optimizing antibiotic prophylaxis, and enhancing nursing wound care training are essential to reduce SSI rates.

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