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Original Research Article

Evaluation of Surgical Site Infections in Cancer Patients Following Major Oncologic Procedures

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Abstract:

Background: Surgical site infections (SSIs) are an important cause of morbidity and mortality for cancer patients undergoing major oncologic procedures, but we have limited data on incidence, risk factors, and outcomes in this patient population.

Objectives: This study aimed to evaluate the medical and surgical characteristics, risk factors, microbiological milieu, antibiotic susceptibility, and postoperative outcomes of surgical site infections (SSIs) among a cohort of cancer patients undergoing major oncologic surgery.

Materials and Methods: A prospective, observational study was carried out in 128 cancer patients undergoing major surgery at the Department of General Surgery, JIMSH, Kolkata, India. Data collection included patient demographics, comorbidities, previous treatment, type of surgery, invasive device usage, and administration of prophylactic antibiotics. Wound cultures were performed for identification of pathogens and testing of antibiotic susceptibility. Statistical analysis was completed to identify risk factors for SSIs and postoperative mortality.

Results: A total of 128 post-operative surgical patients, 71 (55.5%) patients developed SSIs. The SSI patients tended to be older (mean age 49.6 years vs 43.2 years), more common in males, and they represented a significant risk with prolonged hospitalization, intra-operational blood loss, and invasive devices usage. Gram-negative bacteria were recovered from over 81.8% of the cultures, with Pseudomonas aeruginosa and Escherichia coli being the most common; 48% of the isolates were multidrug-resistant pathogens (resistant to antibiotics). Patients that developed SSIs had significantly increased mortality (43.7% vs 3.5%) and increased duration of stay. Additionally, the use of routine antibiotic prophylaxis differed between the two groups.

Conclusion: SSIs continue to pose significant challenges in cancer surgical procedures, involving multidrug-resistant pathogens, increased length of stay, and increased mortality. Reducing the risk of SSIs is complex and requires individualized prophylaxis approaches, high-quality perioperative management, and improved infection prevention measures that will help to reduce overall SSIs in this patient population.

Keywords: Surgical site infection, Cancer surgery, Oncologic procedures, antimicrobial resistance, Postoperative outcomes, Risk factors.

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Introduction

Surgical Site Infections (SSIs) continue to be an important and prevalent form of hospital-acquired infection, and in some countries account for a significant factor in global morbidity, mortality, and cost of care. SSIs refer to infections that occur at or near the site of surgical incisions or the consequence of a surgical intervention within a 30-day period post-operatively or over 30 days if the patient had an implant, or in specific surgical procedures such as breast or joint surgery [1,2]. Regardless of the significant advancements in surgical techniques, surgical asepsis, and approaches to infection control in the developed world and developing world, SSIs will continue to be a major issue. Worldwide, nearly 3% of surgical mortality is due in part to SSIs, and nearly 75% of patients who died due to SSI died due to the infective process. One study from Tamil Nadu, mentioned a global incidence of SSIs varies between 19.4%-36.5%, where in India it is between 3-12% [3]. The degree of variation across geography has multiple causes including surgical practice, surgical infection prevention, regional or country healthcare structure, but also patient-related risk factors.

Moreover, the rapid emergence and dissemination of Antimicrobial Resistance (AMR) is making the control of SSIs and all health care-associated infections harder to manage. AMR is now considered a global public health emergency of international concern associated with the increasing failure of antibiotics to treat common bacterial infections [4]. This increase in resistance has been due to a number of factors, such as the incorrect or overuse of antibiotics, insufficient infection protection methods, and the spread of resistant organisms in health care facilities. The worldwide effect of AMR is concerning — 4.95 million deaths globally occurred due to drug-resistant infections in 2019, with 1.27 million directly due to bacterial resistance. In India alone, 297,000 deaths directly resulted due to AMR, while more than a million deaths resulted due to resistant bacterial infections. Unless trends go out of hand, AMR is likely to threaten close to 10 million lives per year, and a likely economic cost of up to 92 trillion euros by 2050 [5].

Of all at-risk patient groups, however, patients presenting for comprehensive oncologic surgery have a high likelihood for acquiring SSIs. This high likelihood is a consequence of several factors: weakened defense mechanisms due to malignancy or chemotherapeutic insult, high hospital microbial contamination, and highly virulent infecting organisms [6] .Furthermore, the majority of cancers — from simple primary resections of malignancy to extensive reconstructive surgery efforts — have long surgical times, extensive tissue mobility, and implant or catheter placement, factors which greatly enhance the risk for infection.

The relationship between antimicrobial resistance (AMR), surgical site infections (SSIs), and cancer represents a unique clinical challenge which influences treatment outcomes and patient survivorship. Broad-spectrum antibiotics, though often necessary for the prophylaxis and therapy of infections in cancer patients, can contribute to selective pressures on normal microbial flora, favoring the emergence of resistant organisms. Health care-associated infections in patients with cancer have been associated with delayed wound healing, prolonged hospital stay, increased health care costs, increased mortality, and increased risk of adverse events. Recognizing the evolving relationship between SSIs and antibiotic resistance in patients with cancer is essential to develop infection prevention strategies and effective antibiotic stewardship.

Recent findings present a growing concern regarding SSIs presented by multidrug-resistant organisms (MDROs) among oncology patients in low- and middle-income countries (LMICs), including India. Studies indicate that cancer patients in India may have a nearly 40% higher prevalence of MDRO infections compared to patients undergoing general surgical procedures. These infections pose a significant risk for postoperative complications and carry associated long-term implications for quality of life and health system costs. Additional barriers to infection reduction exist because of weak or no surveillance, inconsistent infection control practices, and limited access to microbiological diagnostic services, particularly in low-resource environments.

While there exists a considerable body of empirical research concerning surgical treatment of and infection prevention and control for surgical patients with cancer, there remain considerable gaps in our understanding of the epidemiology of surgical site infections in oncologic patients and their associated factors, particularly around pathogen transmission, trends in resistance, and patient-related risk factors. Much of the literature is derived from general surgery cohorts and, importantly, there is little attention afforded oncologic patients, given their distinctive circumstances and needs [9]. We must also note the lack of aggregated data from India and other low- and middle-income countries, examining the relationship between anti-microbial resistance (AMR), the type of oncologic surgery performed, and surgical site infections. Collectively, these gaps complicate our ability to complete research studies designed to inform the development of targeted, evidence-informed interventions to assist oncologists in minimizing the impact of surgical site infections and AMR.

We are concerned in this study to conduct a comprehensive assessment of surgical site infections of surgical patients with cancer undergoing invasive oncologic surgery, in relation to incidence rates, microbial causation, antimicrobial susceptibility profiles, and ensuing clinical endpoints. Identification of the predominant bacterial pathogens and resistance profiles will facilitate improvements in infection control practices, as well as evidence-based antibiotic practice. This study hopes to fill the gaps that currently exist through provision of quality data that could be used for both clinical practice decision-supporting intentions, societal public health policy-informing purposes, towards enhancement of patient care, surgical results, and oncologic surgical practice.

Methodology

Study Design: This research was conducted as a prospective observational study to assess the incidence of surgical site infections (SSIs) and the microbiology and risk factors associated with SSIs in cancer patients who had undergone an oncologic procedure of major complexity. A prospective study allows for systematic follow-up of patients from the time of surgery, through the postoperative period, to detect and assess SSIs as early as possible.

Study Area: The study took place in the Department of General Surgery, Jagannath Gupta Institute of Medical Sciences and Hospital (JIMSH), Budge Budge, Kolkata, West Bengal, India for 12 months.

Sample Size: The sample size for the study was calculated to be 128 patients. The initial calculation was performed using OpenEpi Version 3.0, a hypothesized frequency of 70% for SSI, a 5% margin of error, a 90% confidence level and a 1 design effect (DEFF). After considerations of feasibility and rates of patient admissions during the study period, a total of 128 eligible cancer patients undergoing major surgery were included using a convenient sampling approach.

Sample Population: The study population included patients with cancer that were admitted to the inpatient department (IPD) and underwent a major oncologic surgical procedure from which postoperative wound samples were submitted for analysis by the microbiology department. The types of surgical procedures included were colon (COLO), gastric (GAST), abdominal hysterectomy (HYST), vaginal hysterectomy (VHYS), breast (BRST), and neck surgeries (NECK).

Inclusion Criteria

Patients were included in the study if they met the following criteria:

- Patients of any age or gender undergoing surgery for cancer treatment.
- Patients admitted to the inpatient department (IPD) during the study period.
- Patients whose clinical wound samples were submitted to the microbiology department.
- Patients with clean or clean-contaminated surgical wounds.
- Patients who provided informed consent to participate in the study.

Exclusion Criteria

Patients were excluded from the study if they met any of the following criteria:

- Patients with existing infections at the time of surgery.
- Patients with contaminated or dirty wounds.
- Patients infected with community-associated organisms, such as Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus, or Pneumocystis.
- Patients infected with latent pathogens, such as Herpes, Syphilis, or Mycobacterium tuberculosis.
- Patients who refused to provide informed consent.

Data Collection: Data collection was conducted prospectively utilizing standardized SSI surveillance forms. Data on patient demographics, type of cancer, operative details, patient comorbidities, and postoperative outcomes were captured. Pertaining to microbiological data, the laboratory provided any culture results, identified pathogens, and resistant patterns. All data collected were organized and input into Microsoft Excel for further analysis.

Procedure: Each patient suspected of having a surgical site infection (SSI) underwent the aseptic collection of at least two wound samples (either swabs or aspirates) and transported to the microbiology laboratory immediately. One sample was utilized for Gram staining, and the other was cultured on blood agar plates and MacConkey agar plates. The microorganisms isolated were identified with standard biochemical methods, and antimicrobial susceptibility was determined by the Kirby–Bauer disc diffusion method. Results were interpreted following Clinical and Laboratory Standards Institute (CLSI, 2021) guidelines. Clinical and microbiological findings were correlated to establish the diagnosis of SSI according to NHSN criteria.

Statistical Analysis: The occurrence of SSIs was defined as patients developing infections, expressed as a percentage of the total number of patients in the study. Data from our descriptive methodology contained evidence to conduct statistical analysis with the software SPSS Version 27. Continuous variables were reported as mean ± standard deviation (SD) or median (interquartile range, IQR), depending on the data distribution pattern. Categorical variables were reported as a frequency and percentage (e.g., number and proportion of appendicitis and Wound Class I faecal contamination). Chi-square tests or Fisher's exact tests were performed for categorical data, while an independent t-test was utilized for continuous variables. Univariate logistic regression was performed to identify possible risk factors for SSI and variables with a $p < 0.05$ were included in multivariate logistic regression to determine independent predictors. Results were reported as odds ratios (OR) with a 95% confidence interval (CI) and a p-value < 0.05 was statistically significant."

Result

Table 1 presents the characteristics of the 128 participants included in the study. The mean age of participants was 46.8 ± 17.3 years, with the SSI group slightly older (49.6 ± 15.7) than the non-SSI group (43.2 ± 18.6). Gender distribution was nearly equal overall, with 63 females (49.2%) and 65 males (50.8%), though females were more in the non-SSI group (56.1%) and males predominated in the SSI group (56.3%). Regarding cancer status, 11.7% had recurrence, 25% underwent surgery after 3 months of diagnosis, and 63.3% within 3 months. Solid tumors accounted for the majority (96.9%), with carcinoma being the most common histological type (85.9%). Comorbidities included hypertension (8.6%), diabetes mellitus (7.8%), tuberculosis (2.3%), and thyroid disease (1.6%). Prior surgical, radiation, or chemotherapy history was reported in 39.1%, 7%, and 11.7% of participants, respectively. Most patients received surgery only (91.4%), while a smaller proportion had surgery combined with chemotherapy or radiotherapy. Use of invasive devices was frequent, particularly Foley catheters (97.7%), Romo drains (57.8%), and ADK drains (40.6%), with higher proportions of NI tube, stoma bag, ET tube, and Ryle's tube use in the SSI group. Overall, Table 1 highlights demographic, clinical, and procedural differences between patients with and without SSIs.

Table 1: Characteristics of participants (N = 128)

Characteristics	**Total (n = 128)**	**SSI Group (n = 71)**	**Non-SSI Group (n = 57)**
Age, years — Mean (±SD)	46.8 (±17.3)	49.6 (±15.7)	43.2 (±18.6)
Gender			
Female	63 (49.2)	31 (43.7)	32 (56.1)
Male	65 (50.8)	40 (56.3)	25 (43.9)
Cancer status			
Recurrence	15 (11.7)	9 (12.7)	6 (10.5)
Surgery done after 3 months of diagnosis	32 (25.0)	17 (23.9)	15 (26.3)
Surgery done within 3 months of diagnosis	81 (63.3)	45 (63.4)	36 (63.2)
Types of cancer			
Solid tumor	124 (96.9)	71 (100.0)	53 (92.9)
Histological classification			
Carcinoma	110 (85.9)	61 (85.9)	49 (86.0)
Sarcoma	14 (10.9)	10 (14.1)	4 (7.0)
Lymphoma	3 (2.3)	0 (0.0)	3 (5.3)
Leukemia	1 (0.8)	0 (0.0)	1 (1.8)
Comorbidities			
Tuberculosis	3 (2.3)	2 (2.8)	1 (1.8)
Thyroid disease	2 (1.6)	1 (1.4)	1 (1.8)
Diabetes mellitus	10 (7.8)	7 (9.9)	3 (5.3)
Hypertension	11 (8.6)	9 (12.7)	2 (3.5)
History			
Prior surgery	50 (39.1)	27 (38.0)	23 (40.4)
Prior radiation	9 (7.0)	2 (2.8)	7 (12.3)
Prior chemotherapy	15 (11.7)	8 (11.3)	7 (12.3)
Treatment received			
Surgery only	117 (91.4)	63 (88.7)	54 (94.7)
Surgery + chemotherapy	7 (5.5)	5 (7.0)	2 (3.5)
Surgery + radiotherapy	3 (2.3)	2 (2.8)	1 (1.8)
Surgery + radiotherapy + chemotherapy	1 (0.8)	1 (1.4)	0 (0.0)
Invasive devices (may overlap; patients can have >1)			
NI tube	3 (2.3)	3 (4.2)	0 (0.0)
Stoma bag	7 (5.5)	6 (8.5)	1 (1.8)
Endotracheal (ET) tube	12 (9.4)	11 (15.5)	1 (1.8)
Foley catheter	125 (97.7)	68 (95.8)	57 (100.0)
Ryle's tube	34 (26.6)	26 (36.6)	8 (14.0)
Romo drain	74 (57.8)	41 (57.7)	33 (57.9)
ADK drain	52 (40.6)	27 (38.0)	25 (43.9)

Table 2 presents the bivariate logistic regression analysis of risk factors for surgical site infections (SSI) and mortality. For SSI development, significant factors included stoma bag use, which reduced the odds of SSI (OR 0.03; 95% CI 0.00–0.64; p = 0.026), and intraoperative blood loss, which slightly increased the risk (OR 0.996; 95% CI 0.99–1.00; p = 0.027), while other factors such as length of stay, prior surgery or radiation, comorbidities, invasive devices, and duration of surgery were not statistically significant. For mortality prediction, carcinoma diagnosis (OR 5.36; 95% CI 1.56–18.4; p = 0.008), prior radiation (OR 4.74; 95% CI 1.13–19.8; p = 0.033), blood loss (OR 0.997; 95% CI 0.99–1.00; p = 0.031), Ryle's tube use (OR 0.27; 95% CI 0.12–0.60; p < 0.001), and endotracheal tube use (OR 0.16; 95% CI 0.03–0.83; p = 0.029) were significant predictors, whereas age, gender, other comorbidities, and additional devices were not. Overall, Table 2 indicates that specific procedural factors, device usage, and patient characteristics significantly influence SSI occurrence and mortality risk in this population.

Table 2: Risk factors associated with surgical site infections and associated mortality (bivariate logistic regression)

A. Bivariate logistic regression — development of SSI

Factor	Odds ratio	95% CI	P-value
Length of stay (days)	0.78	0.70–0.87	0
Surgery within 3 months of diagnosis	0.6	0.12–3.00	0.53
Surgery after 3 months of diagnosis	0.55	0.11–2.80	0.48
Carcinoma (vs others)	1.95	0.42–9.10	0.39
Prior surgery	1.45	0.45–4.60	0.54
Prior radiation	3.25	0.32–32.3	0.33
Tuberculosis	1.42	0.08–27.5	0.82
Diabetes mellitus	2.53	0.33–19.4	0.36
Hypertension	0.1	0.00–1.15	0.06
Thyroid disease	4.92	0.24–99.0	0.29
Romo drain	4.61	0.70–29.6	0.11
ADK drain	3.3	0.48–22.6	0.22
Endo-tracheal tube	0.21	0.02–1.50	0.13
Ryle's tube	0.33	0.10–1.02	0.055
Stoma bag	0.03	0.00–0.64	0.026*
Duration of surgery (min)	1	0.99–1.01	0.34
Blood loss (mL)	0.996	0.99–1.00	0.027*
WBC (10^3/mm^3)	0.995	0.94–1.04	0.85
HCT (%)	0.987	0.93–1.04	0.65
PLT (%)	1.05	0.70–1.57	0.81
Neutrophil (%)	0.97	0.93–1.00	0.11

B. Bivariate logistic regression — prediction of mortality

Factor	Odds ratio	95% CI	P-value
Age	0.98	0.95–1.00	0.07
Female	1.31	0.65–2.59	0.45
Carcinoma	5.36	1.56–18.4	0.008*
Prior surgery	1.29	0.52–3.15	0.58
Prior radiation	4.74	1.13–19.8	0.033*
Duration of surgery	1	0.99–1.00	0.33
Blood loss	0.997	0.99–1.00	0.031*
Tuberculosis	0.34	0.02–4.30	0.41
Diabetes mellitus	0.96	0.20–4.57	0.96
Hypertension	0.4	0.08–1.95	0.26
Thyroid disease	5.67	0.25–125.7	0.27
Romo drain	1.73	0.52–5.71	0.37
ADK drain	1.31	0.38–4.43	0.66
Ryle's tube	0.27	0.12–0.60	<0.001*
ET tube	0.16	0.03–0.83	0.029*
Stoma bag	0.12	0.01–1.04	0.055

Table 3 compares prophylactic antibiotic usage and associated clinical outcomes between patients with and without surgical site infections (SSI). Among the SSI group (n = 71), the most commonly used antibiotics were amoxicillin/clavulanic acid (56.3%), metronidazole (31.0%), and ceftriaxone (16.9%), while in the non-SSI group (n = 57), amoxicillin/clavulanic acid and piperacillin/tazobactam were used equally (35.1%), with sulbactam/cefoperazone also frequently used (21.1%). Clinical outcomes showed markedly higher mortality in the SSI group (43.7%) compared to the non-SSI group (3.5%), and patients with SSI had longer hospital stays: 47.9% stayed over 4 weeks and 32.4% for 3–4 weeks, whereas most non-SSI patients (70.2%) were discharged within 2 weeks. Overall, Table 3 highlights that SSI is associated with different patterns of prophylactic antibiotic use, significantly higher mortality, and prolonged hospitalization.

Table 3: Comparison of prophylactic antibiotic utilization and associated clinical outcomes.

Antibiotic	**SSI Group (n = 71) — n (%)**	**Non-SSI Group (n = 57) — n (%)**
Prophylactic antibiotics		
Amoxicillin/clavulanic acid	40 (56.3)	20 (35.1)
Piperacillin/tazobactam	11 (15.5)	20 (35.1)
Metronidazole	22 (31.0)	3 (5.3)
Amikacin	9 (12.7)	0 (0.0)
Ceftriaxone	12 (16.9)	7 (12.3)
Sulbactam/Cefoperazone	3 (4.2)	12 (21.1)
Clindamycin	8 (11.3)	0 (0.0)
Linezolid	2 (2.8)	2 (3.5)
Meropenem	1 (1.4)	2 (3.5)
Ceftazidime	0 (0.0)	2 (3.5)
Levofloxacin	1 (1.4)	0 (0.0)
Cefuroxime	1 (1.4)	0 (0.0)
Ciprofloxacin	0 (0.0)	2 (3.5)
Clinical outcomes		
Outcome	**SSI Group (n = 71)**	**Non-SSI Group (n = 57)**
Alive	40 (56.3)	55 (96.5)
Death	31 (43.7)	2 (3.5)
Length of hospital stay		
< 2 weeks	11 (15.5)	40 (70.2)
3–4 weeks	23 (32.4)	11 (19.3)
> 4 weeks	34 (47.9)	3 (5.3)

Discussion

The findings of this study indicate that cancer patients undergoing major oncological surgery are at a dramatically increased risk for surgical site infections (SSIs), with 71 of 128 patients (55.5%) suffering an infection. The rate of SSI prevalence in our data is considerably higher than has been reported in other studies from India. For example, Mohan et al. (2023) reported an SSI prevalence of 5.6% in patients undergoing abdominal surgery, identifying age, male sex, emergent surgery, and diabetes mellitus as major risk factors. Similarly, Bhatiani et al. (2023) reported an SSI prevalence of 8.2% in patients from Uttar Pradesh, with sex, emergent surgery, and history of diabetes mellitus as major risk factors for SSI.”

The much higher rate of SSI in our cohort may reflect variation in the study population, tumor type, and (the lack of) infection prevention protocols or procedures. Internationally, Mezemir et al. (2020) reported an SSI prevalence of 24.6% in Ethiopia, indicating that prevalence varies based on the types of surgery performed and local health care practices. In this study, age and sex were statistically significant predictors of SSI, given that those with SSIs had an average age of 49.6 ± 15.7 years while patients without SSIs had an average age of 43.2 ± 18.6 years indicating a greater risk for older patients. These results are consistent with the findings of Catherin et al., who reported age, sex, duration of surgery, and wound classification as major risk factors for SSI. Moreover, our study found a higher percentage of SSI in males (56.3%), which aligns with previous findings. These demographic patterns imply that inherent patient characteristics, including hormonal and immune differences, may predispose patients to postoperative infections.

The comorbidities, particularly diabetes mellitus (9.9% in SSI versus 5.3% non-SSI) and hypertension (12.7% in SSI and 4.0% non-SSI), were present in according to the SSI experience. This is supported by Wang et al. (2024) [13] which reported diabetes mellitus as an important indicator to the occurrence of SSI after surgery in a urology cohort. While we identified some evidence of occurrence for comorbidities, they were not statistically significant in our analysis. Nevertheless, comorbidities are likely to overlap with perioperative stress, immuno-depression associated with cancer, chemotherapy or radiation therapy and may indicate a risk for infection (Elfayeg et al. 2024) [14]. Additionally, procedural factors, including blood loss (0.996, p = 0.027) and invasive devices-Ryle's tube (36.6% vs 14.0%) and endotracheal tube (15.5% vs 1.8%) were still more prevalent at entry for SSI indication signalling procedural complexity relating to the higher risk for post-surgery infection.

This highlights a significant association between duration of hospitalization and infection development. Longer length of stays was statistically associated with infection (odds ratio = 0.78, 95% CI = 0.70–0.87, $p < 0.001$), in keeping with Elfayeg et al. (2024) [14] associating a longer length of stay as inversely associated with risk for exposure to nosocomial pathogens. Among the SSI patients, 47.9% had a length of stay >4 weeks compared with 5.3% of the control group that were not infected. This finding contradicts Mohan et al. (2023) [3] who reported a shorter average length of stay for patients who develop an SSI — perhaps associated with patient acuity, surgical specialty, or institutional practices changing around protocols for postoperative care.

The trends in the use perioperative prophylactic antibiotics we report in our study agree with some studies from the literature but also present new contradicting findings to studies from the literature. In our patients who developed an SSI infection, Amoxicillin/clavulanic acid was the most frequent choice (56.3%); whereas piperacillin/tazobactam and sulbactam/isepamicin were noted, albeit less often in patients without SSI (35.1% and 21.1% respectively), proposing an opportunity for increased coverage. The findings are partly in agreement with Sabir et al. (2023) [15] which identified high rates of multidrug resistant organisms in previously drug exposed patients for antibiotics under consideration. Our study also illustrated prophylaxis targeting, which is for example metronidazole for anaerobic coverage which probably lowers infection for specific groups of patients.

Microbiological investigation for our study on SSIs is comparable to previous reports. Most organisms were Gram-negative (81.8%), with Pseudomonas aeruginosa (33%) and Escherichia coli (19%) being common, whereas Gram-positive MR-CoNS were dominant at 55%. Similar findings have appeared for Indian and international surveillance, for example, Sievert et al. (2013) [16], which emphasize the risk of opportunistic infection for the immunocompromised oncology patient. Antimicrobial resistance is a concern here; 48.01% of isolates were multidrug-resistant, comparable to Vidya Roa et al. (2023) [17], which highlights the challenge of effective postoperative care for oncology patients.

Mortality results confirm the clinical significance of SSIs. Our investigation demonstrates that patients experiencing surgical site infections (SSI) have a substantially higher mortality rate (43.7%) compared to non-SSI patients (3.5%), which is similar to the findings of Danielsen et al. (2023) [18]. This further highlights the importance of prioritizing infection control when it comes to improving surgical outcomes in oncologic patients. The cancers located in the neck and head areas in our series, which comprised 24.5% of solid cancers, experienced an even higher mortality rate confirming Rao et al. (2023) [17] findings which identified these patients as being at higher risk for postoperative infections.

Overall, our analysis is generally in agreement with previous reports documenting demographic, procedural and microbiological risk factors for SSI while acknowledging a higher infection burden associated with mortality within our patient population. We suggest that the differences between our study's retrospective epidemiology and other studies describing rates of incidence and outcomes of SSI reflects localized issues, histological types of cancers, surgical intervention, and perioperative care. These points demonstrate a need for infection control, prophylactic antibiotics, and post-operative infection monitoring to potentially reduce morbidity and mortality in patients undergoing surgical treatment for oncologic indications.

Conclusion

This study shows that SSIs are a vexing complication among surgical oncology patients that delay recovery and compromise clinical outcomes. Risk factors for SSI included patient demographics (age, sex, etc.), type of malignancy, comorbidities, length of illness, medical device usage, and intraoperative variables (bleeding, need for ostomy, etc.), while prior radiation and some cancer diagnoses were associated with higher mortalities among infected patients. Length of stay and variances in antibiotic prophylaxis also influenced infections with infected patients having longer lengths of stay and greater percent mortality. In conclusion, this study shows a complex source of SSIs in surgical oncology patients, and that aggressive perioperative care with monitoring, and patient specific prophylaxis are recommended practices among this at-risk patient population to reduce infection risk and facilitate postoperative recovery.

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