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Surgical Site Infection Following Total Abdominal Hysterectomy: A Case Report

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Abstract

Surgical site infections (SSIs) are postoperative complications that can result in hospital readmission, prolonged treatment, and increased healthcare costs. This case describes a 47-year-old woman who developed an SSI following an elective total abdominal hysterectomy in the Dominican Republic, requiring a 12-day hospital readmission. This case exemplifies a multidisciplinary approach to the diagnosis and treatment of postoperative SSI. The patient presented to the emergency department seven days following a total abdominal hysterectomy and reported a five-day history of fever, pelvic pain, and diarrhea. An examination of the Pfannenstiel surgical incision revealed induration, erythema, and copious yellow, foul-smelling drainage. The gynecologic examination revealed foul-smelling vaginal discharge and a hyperthermic vagina. Wound and vaginal discharge cultures were obtained and yielded no growth. A transvaginal ultrasound was performed and showed an encapsulated pelvic fluid collection with internal echoes. A pelvic computed tomography (CT) scan revealed inflammation within areas of necrosis and subcutaneous emphysema in the lower abdominal wall. The patient was diagnosed with a postoperative SSI with an abdominal wall abscess following total abdominal hysterectomy. Treatment included intravenous ceftriaxone and metronidazole, regular wound dressing changes, supportive care, and delayed primary wound closure. After 12 days of hospitalization, the patient exhibited clinical improvement and was discharged in stable condition. This case stresses the importance of implementing perioperative infection-prevention measures and postoperative monitoring, which may help reduce complications, hospital readmissions, and additional healthcare costs.

Categories: Obstetrics/Gynecology, General Surgery, Infectious Disease
Keywords: abdominal wall abscess, case report, delayed primary closure, surgical site infection (ssi), total abdominal hysterectomy

Introduction

Surgical site infections (SSIs) are a severe postoperative complication. They develop at or near the surgical incision within the first 30 days after surgery or within one year in cases involving an implant [1]. In particular, most gynecological SSIs involve superficial incisional infections that affect the skin and subcutaneous tissue. SSI rates are disproportionately higher in low- and middle-income countries due to limited resources and challenges in infection control. Risk factors for SSIs include patient-related factors such as obesity, smoking, diabetes, and impaired immune function. Procedural factors, including operative duration and antimicrobial prophylaxis, as well as environmental factors, such as operating room conditions and infection control practices, may also influence SSI risk [1]. Because SSI risk is multifactorial, appropriate perioperative infection-prevention strategies are essential for reducing postoperative infections and related complications.

A global evaluation across 39 countries reported a pooled average SSI incidence of 2.5%, with Africa recording rates as high as 7.2% [2]. As of November 8, 2017, the Centers for Disease Control and Prevention (CDC) had identified 52 US patients from nine states who developed SSIs after undergoing cosmetic surgery in the Dominican Republic. Of these 52 patients, 38 (73%) were confirmed to have non-tuberculous mycobacterial infections, and one death was reported [3]. Furthermore, SSIs impose a substantial healthcare burden for patients, with affected patients spending an additional 10-11 days in the hospital for recovery [1].

Despite this documented outbreak, publicly available epidemiologic data describing the burden of SSIs in the Dominican Republic remain limited, with the 2021 Global Health Security Index reporting no evidence of active national tracking of healthcare-associated infections at the time [4]. Consequently, much of the available evidence consists of individual hospital reports and clinical cases rather than national surveillance data. National SSI (nSSI) surveillance programs are commonly implemented in higher-income countries, where stronger surveillance systems may support SSI prevention and detection. Therefore, increasing awareness of SSIs in low- and middle-income countries is important for supporting recognition, prevention, and patient outcomes.

SSI rates are influenced by multiple factors, including the patient's health history and the setting the patient

had the surgery in. Approximately 50% of SSIs appear after hospital discharge, supporting the importance of symptom recognition and prompt medical evaluation [5]. After discharge, patients are no longer under continuous monitoring which may lead to delayed recognition of a developing infection. Untreated SSIs have the ability to decrease the quality of life of patients. They can increase the risk of morbidity and reduce quality of life by contributing to depression, additional chronic health conditions, and mobility disorders that can interfere with an individual's ability to perform daily activities [6]. In addition to reducing quality of life, having unexpected extended hospital stays or return visits may create financial burdens for patients [5]. This is particularly concerning for patients in low- and middle-income countries, as returning to the hospital for additional treatment or requiring an extended hospital stay may create barriers to receiving necessary care.

This case describes a 47-year-old Dominican woman who developed an SSI seven days after an elective total abdominal hysterectomy, requiring hospital readmission for further evaluation and treatment. This case is relevant to public health awareness in the Dominican Republic and other low- and middle-income countries because it highlights the recognition and management of postoperative SSI in a resource-limited setting.

Case Presentation

The patient was a 47-year-old Mestizo-Dominican woman with an O Rh (+) blood type and a 21-year history of chronic hypertension managed with enalapril 20 mg orally once daily. She also had a two-year history of abnormal uterine bleeding characterized by prolonged episodes lasting 8-10 days. She reported two previous hospitalizations, most recently approximately five months before admission, when the bleeding resulted in anemia requiring three blood transfusions. An endometrial biopsy revealed endometrial intraepithelial neoplasia. Medical treatment was initiated to control the bleeding; however, her symptoms did not improve. Consequently, a total abdominal hysterectomy was performed on day -7.

Her previous surgical history included a bilateral partial salpingectomy performed 15 years earlier, and her obstetric history was gravida 4, para 4. No relevant substance use or behavioral risk habits were reported. Information regarding medication allergies, relevant family history, and genetic conditions was not documented in the available case report. Admission vital signs, body mass index (BMI), diabetes status, and history of immunocompromising conditions were not documented in the available clinical record.

Following the total abdominal hysterectomy, the patient presented to the emergency department on day 0 with a five-day history of fever, pelvic pain, and diarrhea.

On physical examination, the patient had no abnormalities of the head, neck, or cardiopulmonary system. The abdomen was semiglobular due to adipose tissue, soft, and depressible, with normal bowel sounds. The examination of the Pfannenstiel surgical incision revealed induration, erythema, and copious yellow, foul-smelling drainage. Gynecologic examination revealed foul-smelling vaginal discharge and a hyperthermic vagina, while examination of the extremities revealed intact peripheral pulses without edema.

The patient's complete blood count (CBC) showed abnormalities related to anemia and intermittent leukocytosis, as shown in Table *1*.

	Day 0	Day 1	Day 2	Day 4	Day 6	Reference range
Hemoglobin	9.7 g/dL	9.4 g/dL	7.7 g/dL	8.8 g/dL	10.0 g/dL	12.0-15.5 g/dL
Hematocrit	28.5%	28.1%	22.9%	26.2%	30.5%	37.0-48.0%
Platelets	364×10³/µL	266×10³/µL	419×10³/µL	329×10³/µL	417×10³/µL	150-450×10³/µL
White blood cell count	14.97×10³/µL	15.3×10³/µL	10.8×10³/µL	16.8×10³/µL	10.9×10³/µL	4.0-11.0×10³/µL

TABLE 1: Complete blood count

g/dL: grams per deciliter; µL: microliter

Electrolyte testing revealed hyponatremia and hypokalemia, as summarized in Table *2*.

	Day 1	Reference range
Potassium	3.1 mEq/L	3.5-5.0 mEq/L
Sodium	133 mEq/L	135-145 mEq/L

TABLE 2: Electrolytes

mEq/L: milliequivalents per liter

Additional laboratory markers such as C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), procalcitonin, fibrinogen, and D-dimer were elevated, as summarized in Table *3*.

	Day 2	Reference range
D-dimer	582 ng/mL	<500 ng/mL
Procalcitonin	0.74 ng/mL	<0.10 ng/mL
Fibrinogen	931 mg/dL	200-400 mg/dL
C-reactive protein	133 mg/L	<3-10 mg/L
Erythrocyte sedimentation rate	130 mm/hr	0-20 mm/hr

TABLE 3: Inflammatory and coagulant markers

ng/mL: nanograms per milliliter; mg/dL: milligrams per deciliter; mg/L: milligrams per liter; mm/hr: millimeters per hour

The timeline of the patient's medical history and hospitalization is summarized in Figure *1*.

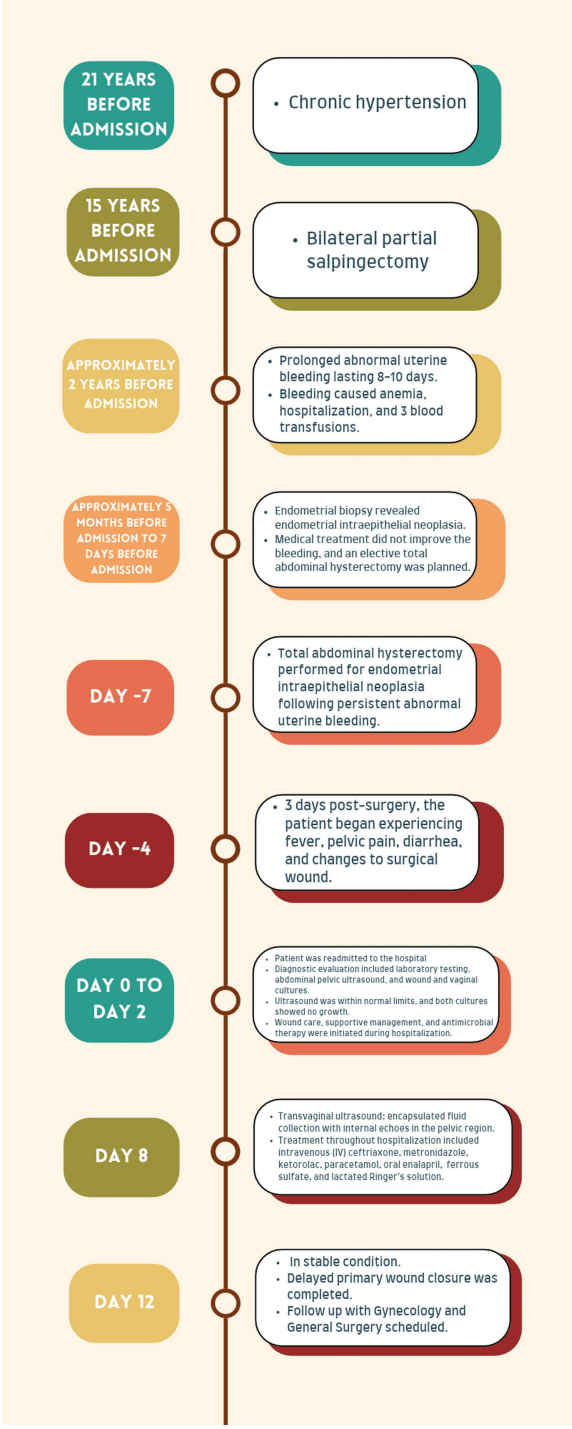


FIGURE 1: Timeline

Day 0 represents the day of hospital admission; subsequent and preceding events are presented relative to this date.

After hospital admission, the diagnostic evaluation focused on determining the source and extent of the suspected postoperative SSI. Physical examination was followed by laboratory testing, which revealed a CRP level of 133 mg/L, an ESR of 130 mm/hr, leukocytosis, mild hyponatremia with a sodium level of 133 mEq/L, and hypokalemia with a potassium level of 3.1 mEq/L. The initial abdominal-pelvic ultrasound, performed on day 0, showed findings within normal sonographic parameters. A follow-up transvaginal ultrasound was performed on day 8 and revealed an encapsulated pelvic fluid collection with internal echoes. The available clinical documentation did not establish whether this collection represented a postoperative hematoma, seroma, or infected fluid collection. Additionally, a pelvic computed tomography (CT) scan was performed and revealed an inflammatory process with areas of necrosis and subcutaneous emphysema in the lower abdominal wall.

The primary diagnostic challenge in this case was that clinical, laboratory, and imaging findings suggested postoperative infection, while both surgical wound secretion and vaginal discharge cultures collected on day 1 yielded no growth. The available clinical documentation does not specify whether the cultures were collected before or after the initiation of antibiotic treatment. The specimen collection method and whether anaerobic or blood cultures were obtained were not documented. Additionally, no aspiration or drainage procedure involving the pelvic fluid collection was documented, and no culture of pelvic fluid collection was reported. Infectious Diseases was consulted because of the patient's recurrent fever and appearance of the surgical wound. The consultation recommended additional laboratory testing, including wound and vaginal cultures, to further evaluate the suspected infection.

The diagnosis was a postoperative SSI with an abdominal wall abscess. No alternative diagnoses were documented in the available record. The infection was initially described as a superficial incisional SSI based on the documented skin and subcutaneous tissue findings. According to the CDC's criteria, the involvement of the skin and subcutaneous tissue supports a superficial incisional classification along with purulent drainage, erythema, and swelling. However, the CT findings of necrosis and subcutaneous emphysema in the lower abdominal wall, together with the encapsulated pelvic fluid collection identified on transvaginal ultrasonography, raise concern for possible deeper involvement. The available clinical documentation does not establish whether the infection extended beyond the skin and subcutaneous tissue. Therefore, the classification as a superficial incisional SSI cannot be definitively confirmed from the available findings. A long-term prognosis was not documented. At discharge, the patient was in stable general condition after successful delayed primary wound closure.

The patient received a multidisciplinary treatment approach consisting of pharmacologic therapy, supportive care, and surgical management. General supportive measures included close hemodynamic and temperature monitoring, frequent wound dressing changes, and routine nursing care. General Surgery and Infectious Diseases were consulted as part of the patient's management. The available clinical documentation does not specify whether the pelvic fluid collection underwent drainage or was managed conservatively, nor does it establish the clinical criteria used to determine readiness for delayed primary wound closure. For surgical management, the General Surgery team recommended continued wound dressing changes and management by the primary treating department. Delayed primary wound closure was performed before discharge, as shown in Figure *2*.

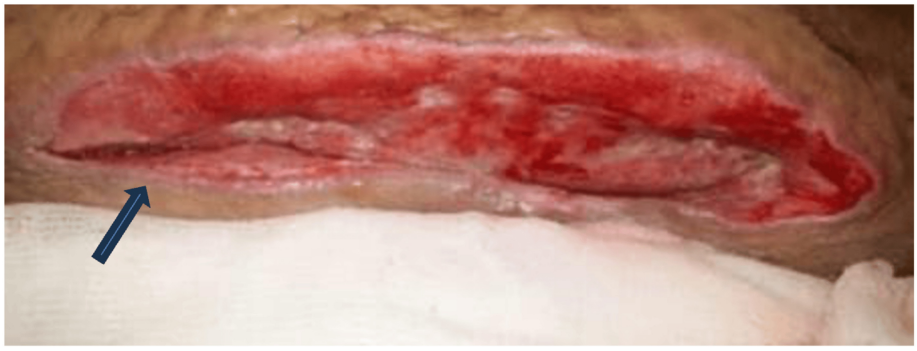


FIGURE 2: Postoperative Pfannenstiel surgical wound

The arrow points directly to the inferolateral margin highlighting the edge of the surgical incision. Wound findings include separation of the Pfannenstiel incision, leaving a gaping wound bed with exposed tissue and epithelial margins showing mild erythema. The precise day on which the photograph was obtained was not documented in the original clinical source.

During the patient's 12-day hospitalization, the documented treatment regimen involved pharmacological and supportive therapies. Intravenous (IV) metronidazole (500 mg every eight hours) was administered as part of the treatment regimen. Ketorolac (30 mg IV every eight hours) and paracetamol (1 g IV every eight hours) were administered. Oral enalapril (20 mg every 24 hours) was continued for the management of the patient's chronic hypertension, while ferrous sulfate (300 mg orally every six hours) was also administered. Additional medications consisted of vitamin C (500 mg IV every 12 hours), albumin (one vial IV every 24 hours), furosemide (20 mg IV following albumin administration), and omeprazole (40 mg every 24 hours). Supportive therapy included lactated Ringer's solution (2,000 mL IV at 28 drops per minute). Following the Infectious Diseases consultation for recurrent fever and the concerning appearance of the surgical wound, ceftriaxone (1 g IV every 12 hours) was added to the patient's treatment plan.

After 12 days of hospitalization involving wound dressing changes, antibiotic therapy, and medical management, the patient was discharged in stable condition. At presentation, signs included lower abdominal induration, erythema, and copious yellow, foul-smelling drainage. Changes in the patient's CBC during hospitalization demonstrated a decrease in white blood cell count from $14.97\times10^3/\mu L$ to $10.9\times10^3/\mu L$.

Hemoglobin initially decreased from 9.7 g/dL on day 0 to 7.7 g/dL on day 2 before increasing to 10.0 g/dL on day 6. Hematocrit increased from 28.5% to 30.5%, although both remained below the listed reference ranges. Oral ferrous sulfate was included in the documented treatment regimen. The underlying reasons for these hemoglobin fluctuations remain unclear from the available clinical documentation. No blood transfusion during the postoperative readmission was documented.

Clinical response was evaluated through serial laboratory testing and ongoing clinical assessment. Adverse drug reactions or unexpected complications were not documented in the available case materials. Delayed primary closure, also known as tertiary intention wound closure, was successfully performed before discharge. The latest laboratory assessment showed the patient's hemoglobin and hematocrit remained below the listed reference ranges. Outpatient follow-up was scheduled with General Surgery and Gynecology after the patient was discharged. Subsequent follow-up information regarding wound healing, infection recurrence, or readmission was not documented in the available clinical record.

Discussion

A strength of this case was the multidisciplinary management of the patient's infection through antimicrobial therapy, wound care, and ongoing monitoring. The diagnostic evaluation incorporated laboratory testing, imaging, and specialist consultation. Transvaginal ultrasonography was also used to assess the postoperative infection and identify an encapsulated pelvic fluid collection. The pelvic CT further demonstrated an inflammatory process with necrosis and subcutaneous emphysema in the lower abdominal wall. Infectious Diseases recommended additional laboratory testing, including wound and vaginal cultures, to further evaluate the suspected infection, although both cultures ultimately yielded no growth. The use of antimicrobial therapy and wound care was consistent with established approaches to SSI management [5].

The patient received 2 g cefazolin 60 minutes before the procedure, which is considered the recommended timing and medication of antimicrobial prophylaxis for most gynecologic procedures [7]. Preoperative skin preparation is an important component to prevent SSIs, as removing soil and transient microorganisms from the skin prior to surgery, along with preoperative decolonization, bathing, and application of an effective skin antiseptic at the surgical site, can help reduce microorganisms to safe, sub-pathogenic levels [8]. In this case, povidone-iodine was used for preoperative skin preparation rather than chlorhexidine. Additionally, the patient did not undergo the recommended preoperative bathing with 2% chlorhexidine soap on the day before surgery.

One environmental concern in this case was the absence of air conditioning in the operating room. The procedure was performed with the windows open because of the high temperature in the operating room. The International Society for Infectious Diseases (ISID) recommends maintaining operating room temperatures between 68°F (20°C) and 75°F (24°C), with a humidity of 20-60% [9]. Detailed operative information was unavailable, and the reported operating room conditions could not be confirmed as the cause of infection.

Understanding the factors associated with SSI development is important to help prevent and reduce future postoperative complications. SSIs are among the leading causes of hospital-acquired infections, accounting for 20-31% of healthcare-associated infections in hospitalized patients [10]. SSIs can substantially increase healthcare costs and negatively affect patient health [11]. SSIs are correlated with prolonged hospitalization, increased healthcare utilization, medical costs, and higher mortality in specific patient populations [12].

This case is clinically significant because the patient required an unexpected 12-day hospitalization for the management of a postoperative infection. This case helps by demonstrating how the infection was diagnosed and what the leading symptoms were to come to that consensus. It exemplifies clinical findings, laboratory abnormalities, and imaging that support the final diagnosis, despite negative wound and vaginal cultures. This case was limited by incomplete clinical records, unavailable original imaging, and insufficient operative and follow-up details, restricting further assessment of the infection and its management.

Conclusions

This case reinforces the importance of perioperative infection-prevention practices and continued postoperative monitoring. It extends the existing information about SSI cases in the Dominican Republic by documenting the clinical presentation and management of a postoperative infection in a resource-limited setting. The reported operating room conditions underscore potential challenges in maintaining infection-prevention practices, although their contribution to this infection remains uncertain. Inadequate perioperative preparation and infection-prevention practices can increase the risk of postoperative infections, potentially resulting in hospital readmissions, prolonged care, and a greater financial burden for patients.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Natalie D. Rivera, Carly D. Powell, Katherin Aponte Gonzalez

Acquisition, analysis, or interpretation of data: Natalie D. Rivera, Carly D. Powell, Katherin Aponte Gonzalez

Drafting of the manuscript: Natalie D. Rivera, Carly D. Powell

Critical review of the manuscript for important intellectual content: Natalie D. Rivera, Carly D. Powell, Katherin Aponte Gonzalez

Supervision: Natalie D. Rivera, Carly D. Powell, Katherin Aponte Gonzalez

Disclosures

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