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Early surgical site infection following open appendectomy in a United Nations peacekeeping field hospital: a case report

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Case Report

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Abstract

Background.

Surgical site infection (SSI) is a frequent complication after open appendectomy, particularly in patients with predisposing factors such as obesity or complicated appendicitis. Management in austere settings is challenging when microbiological investigation is unavailable.

Case presentation.

A 43 year old male peacekeeping serviceman of West African origin with a body mass index of approximately 32 kg/m² underwent open appendectomy for suppurative appendicitis at a Level 2 United Nations peacekeeping field hospital. On postoperative day 3 the patient developed fever, leukocytosis and local wound inflammation. Abdominal ultrasonography on postoperative day 4 demonstrated a heterogeneous fluid collection within the abdominal wall musculature of the right iliac fossa, consistent with an early incisional SSI. Because bacterial culture and antimicrobial susceptibility testing were unavailable in the field setting, empirical antibiotic escalation with intravenous vancomycin, an extended spectrum beta lactam combination, and oral metronidazole was initiated, together with surgical drainage and daily wound care. The patient became afebrile within 24 hours, inflammatory markers normalised by postoperative day 7, and the patient was discharged on postoperative day 10 with complete clinical recovery and a healed wound at one week follow up.

Conclusion.

This case highlights the value of early clinical and sonographic recognition of SSI, individualised empirical antimicrobial therapy guided by patient body habitus, and rigorous wound management in resource limited field hospital settings where culture guided therapy is not feasible.

1. Introduction

Surgical site infection (SSI) remains one of the most common postoperative complications following abdominal surgery, with reported incidence ranging from 0.5% to 3% across all procedures and up to 6.7% following open appendectomy for complicated appendicitis [1, 2]. The transition from open to laparoscopic appendectomy has been associated with a substantial reduction in incisional SSI rates; however, open appendectomy remains the predominant technique in many resource limited environments, including military and peacekeeping field hospitals [3].

Patient related risk factors for incisional SSI include advanced age, obesity, increased visceral adipose tissue and diabetes mellitus, while operation related factors include duration of surgery, contamination class and intraoperative haemostasis [4, 5]. In obese patients, increased volume of distribution and

altered drug clearance can render standard empirical antibiotic doses subtherapeutic, particularly for beta lactams and fluoroquinolones [4].

United Nations peacekeeping field hospitals operate under additional constraints. Bacterial culture and antimicrobial susceptibility testing are frequently unavailable, the antimicrobial formulary is restricted, and patient populations are demographically diverse [6]. In this context, prompt clinical recognition of SSI and judicious empirical therapy are essential.

We report a case of early incisional SSI managed at a Level 2 United Nations peacekeeping field hospital in a patient of West African origin with a high body mass index, in whom culture guided therapy was not feasible. The case illustrates principles of empirical antimicrobial escalation, weight based dosing and continuous clinical monitoring in austere environments.

2. Case presentation

A 43 year old male peacekeeping serviceman of West African origin presented to the Level 2 Field Hospital with a 6 hour history of right iliac fossa pain and an axillary temperature of 38.7°C. He was tall and obese, with a body mass index of approximately 32 kg/m². There was no history of chronic illness, diabetes mellitus, immunosuppression or known drug allergies. On examination there was tenderness at McBurney's point with a positive Blumberg sign. The white blood cell count was 9.6 × 10⁹/L with 80.9% neutrophils. Abdominal ultrasonography demonstrated an inflamed appendix with a maximal diameter of 12 mm and surrounding inflammatory fluid (Fig. 1A). A clinical diagnosis of acute suppurative appendicitis was made.

The patient underwent open appendectomy under general endotracheal anaesthesia. Intraoperative findings included a purulent appendix with localised purulent fluid in the right iliac fossa. The appendix was excised, the peritoneal cavity was irrigated with 0.9% normal saline, a drain was placed in the right paracolic gutter, and the wound was closed in two layers.

Postoperative antibiotic prophylaxis consisted of intravenous cefotaxime 2 g/day in two divided doses combined with intravenous ciprofloxacin 1.2 g/day in two divided doses. Analgesia was provided with paracetamol, and the patient was monitored in the surgical ward.

Inpatient course (postoperative days 1 to 10)

Postoperative days 1 and 2. The patient was alert with stable haemodynamics, decreasing abdominal pain, a soft abdomen, no wound discharge and no fever. White blood cell counts ranged between 9 and 10 × 10⁹/L. Continuous monitoring was provided on day 1 with parenteral nutrition. A soft diet was introduced on day 2 and the abdominal drain was removed.

Postoperative day 3. Oral intake and bowel function had returned to normal, but the patient developed increased pain at the surgical wound, fever of 38.5°C, and erythema with mild swelling of the wound

edges. The white blood cell count rose to 14.1 × 10^9/L with 89.4% neutrophils. Daily wound care, antipyretics, analgesics and the existing antibiotic regimen were continued.

Postoperative day 4. Pain and fever did not improve despite intensive care. The wound remained erythematous and mildly swollen. The white blood cell count increased to 14.8 × 10^9/L (85.3% neutrophils) and the C reactive protein was 85 mg/L. Repeat abdominal ultrasonography revealed a heterogeneous fluid collection of 20 to 42 mm within the abdominal wall musculature of the right iliac fossa, suggestive of a localised haematoma or abscess (Fig. 1B). A diagnosis of early incisional SSI was made.

Because bacterial culture and antimicrobial susceptibility testing were not available at the field hospital, the treating team escalated antimicrobial therapy empirically. The new regimen comprised intravenous vancomycin (loading dose 2.5 g, then 3 g/day for 6 days), intravenous vicimlastatin 0.75 g three times daily for 6 days (a broad spectrum beta lactam combination) and oral metronidazole 0.5 g three times daily for 6 days. A drain was placed at the wound site. Wound care, analgesia, parenteral and enteral nutrition, and daily monitoring of complete blood count, renal function and abdominal ultrasonography were continued. The patient ambulated independently and tolerated the regimen well.

Postoperative days 5 and 6. Fever resolved, local pain decreased, and only clear serous wound discharge persisted. The white blood cell count decreased mildly to 14.0 × 10^9/L with preserved renal function. Ultrasonography demonstrated marked reduction of the fluid collection to 15 × 25 mm, with homogeneous appearance and no extension. Triple antimicrobial therapy was continued, with daily wound care using 0.9% saline and povidone iodine.

Postoperative days 7 and 8. The patient was clinically stable, tolerating oral intake well, with progressive drying of the wound and no further discharge. The white blood cell count normalised to 9.1 × 10^9/L on day 7 and 8.6 × 10^9/L on day 8. Renal function remained within normal limits. Ultrasonography demonstrated no residual fluid in the right iliac fossa and a normal abdominal wall structure. The 6 day antibiotic course was completed.

Postoperative days 9 and 10. The patient was pain free, the wound had healed completely without fever, and all laboratory parameters had returned to normal. Abdominal ultrasonography was unremarkable. The wound drain was removed and the patient was discharged on postoperative day 10.

At follow up one week after discharge, the patient remained pain free and afebrile, with a well healed surgical wound and normal complete blood count and abdominal ultrasonography.

Table 1
Laboratory and imaging findings during hospitalisation.

Day	WBC ($\times 10^9$/L)	Neutrophils (%)	CRP (mg/L)	Abdominal ultrasound findings
1	9.6	80.9	NA	Appendix diameter of 12 mm with surrounding inflammatory fluid
3 (POD 3)	14.1	89.4	NA	Heterogeneous fluid collection within the abdominal wall musculature of the right iliac fossa, measuring 25 to 45 mm, suggestive of a localised haematoma or abscess
4 (POD 4)	14.8	85.3	85	Persistent heterogeneous fluid collection, 20 to 42 mm, in the right iliac fossa
5 (POD 5)	NA	NA	NA	Substantial reduction of fluid collection to 15 × 25 mm, with homogeneous appearance and no extension
6 (POD 6)	14.0	89.8	NA	Minimal residual fluid in the right iliac fossa without any inflammatory focus
7 (POD 7)	9.1	68.6	NA	Complete resolution of fluid; normal appearance of abdominal wall musculature
8 (POD 8)	8.6	NA	NA	NA
9 (POD 9)	8.5	NA	NA	Complete resolution of lesion; normal abdominal wall architecture

CRP, C reactive protein; NA, not assessed; POD, postoperative day; WBC, white blood cell count.

3. Discussion

Several aspects of this case warrant discussion in the context of surgical practice in a peacekeeping field hospital.

First, the patient had a high body mass index with a thick abdominal wall and substantial subcutaneous adipose tissue. Obesity is a well established risk factor for SSI; visceral adiposity in particular has been shown to predict incisional infection independently of body mass index [5, 7]. A thick abdominal wall increases the technical demands of surgical dissection and exposure, predisposing to microvascular injury, tissue trauma and serous fluid accumulation in the wound bed, all of which contribute to incisional SSI.

Second, the pharmacokinetics of many antimicrobial agents, including beta lactams and fluoroquinolones, are altered in obese patients owing to increased volume of distribution and clearance. Initial empirical doses calibrated for average weight adults may fail to achieve adequate target tissue concentrations [4]. This may explain the recurrence of fever and rising leukocyte count on postoperative day 3 despite standard prophylaxis.

Third, without access to bacterial culture and antimicrobial susceptibility testing, a common limitation in field hospitals, the surgical team escalated therapy empirically with a combination of vancomycin, a broad spectrum beta lactam combination and metronidazole. This regimen provides broad coverage against Gram positive, Gram negative and anaerobic organisms commonly implicated in abdominal SSI [1, 4]. The rapid clinical response, with defervescence and decreased pain within 24 hours of escalation, suggests a localised infection susceptible to the new regimen and indicates that adequate bactericidal concentrations were achieved after both spectrum and dosing were adjusted.

Fourth, this was the first case in which the surgical team managed a patient of West African origin with a high body mass index in a peacekeeping field hospital setting. The experience reinforced the principle of individualising antimicrobial dosing according to body weight and metabolic characteristics, particularly when standard empirical regimens prove insufficient.

Finally, alongside antimicrobial therapy, sterile wound care, close monitoring of inflammatory markers and daily clinical reassessment were decisive in achieving recovery. In austere settings with limited laboratory support, clinicians must rely on careful clinical assessment, trend analysis of inflammatory markers and ultrasonography, and flexible antimicrobial adjustment to optimise outcomes.

4. Conclusion

Surgical site infection is a frequent complication after open appendectomy, particularly in patients with suppurative appendicitis and a high body mass index. Anatomical factors such as a thick abdominal wall and large muscle mass may significantly affect postoperative recovery. Early recognition, appropriate antimicrobial adjustment and standardised wound care are essential for effective infection control. This case also underscores the importance of individualised antibiotic dosing and clinical flexibility in resource limited field hospital settings where culture based therapy is not available.

Declarations

Ethics approval and consent to participate.

This single case report did not require formal ethics committee approval under institutional policy. Written informed consent for medical care, surgical procedure and use of medical records was obtained from the patient on 5 October 2025 prior to admission and surgery, using the standard United Nations consent forms, and is documented in the patient's medical record at the Level 2 Field Hospital.

Consent for publication.

Written informed consent for publication of this case report and any accompanying images was obtained from the patient. A copy of the written consent is available for review by the Editor in Chief upon request. All identifying patient information has been removed from this report.

Competing interests.

The authors declare that they have no competing interests.

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Authors' contributions.

VHP, as first author and operating surgeon, performed the appendectomy, led perioperative patient management and provided clinical data. CTN participated in postoperative care and data collection. TL supervised perioperative anaesthesia and resuscitation. KNP, as corresponding author, conceived the case report, analysed clinical data, drafted the manuscript and revised the final version. All authors read and approved the final version of the manuscript.

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Availability of data and materials.

All data generated or analysed during this case are included in this published article.

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Figures

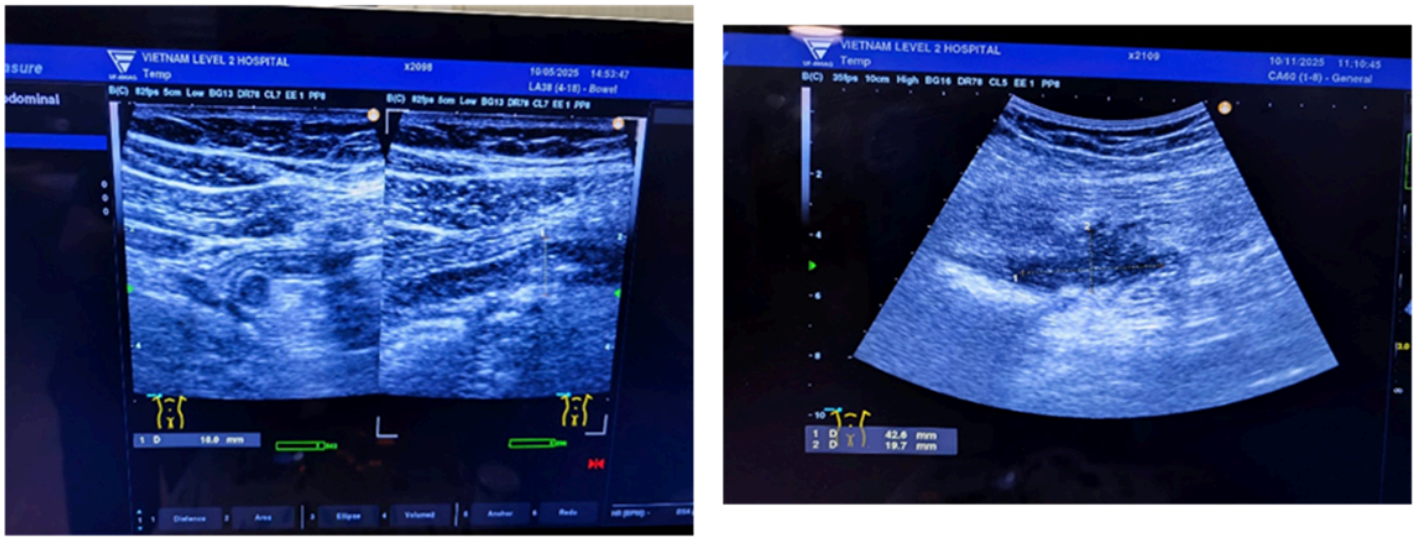


Figure 1

A. Preoperative abdominal ultrasound.

Transverse and longitudinal views demonstrating an inflamed appendix with a maximal diameter of 12 mm and surrounding inflammatory fluid, consistent with acute suppurative appendicitis.

B. Postoperative abdominal ultrasound (postoperative day 4).

Heterogeneous fluid collection within the abdominal wall musculature of the right iliac fossa, measuring approximately 42.6 × 19.7 mm, consistent with an incisional surgical site infection (localised haematoma or abscess).