

Introduction

- *Vibrio vulnificus* (*V. vulnificus*) is a gram-negative, curved, motile bacterium. ¹⁻³
- *V. vulnificus* infections are acquired through consumption of raw or undercooked shellfish or contact of an open wound with warm, brackish seawater. ¹⁻²
- There are approximately 150 to 200 infections of *V. vulnificus* yearly in the United States with a mortality rate of 30 to 40%. ¹⁻²
- Individuals with any chronic condition are at a significantly higher risk for infection, with the highest risk lying in patients with chronic liver disease at 97% risk of infection with exposure. ²
- Patients with primary infection of *V. vulnificus* typically develop sepsis with rapidly developing ecchymosis and bullae which can progress into necrotizing fasciitis in severe cases. ⁴
- Routine blood cultures should be performed when *V. vulnificus* is suspected due to the high incidence of sepsis. ⁵
- Laboratory results with a concurrent *V. vulnificus* infection will typically show a marked left shift in white blood cell count, renal injury with a rising serum creatinine, and an elevated creatinine kinase when necrotizing fasciitis is present. ⁶
- First line management is antibiotic therapy with aggressive supportive therapy and potential surgical intervention. Patients presenting with hemorrhagic bullae or signs of necrotizing infection should receive prompt surgical debridement. ⁷
- An east coast outbreak began in July 2023 thought to be a result of increased bacterial colonization secondary to extensive heat waves. The first three recorded cases were in Connecticut, two of which resulted in fatalities. ¹

References

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Case Description

History

- Patient's hospital course shown in Figure 1.
- Seventy-six-year-old Caucasian male
- Past medical history remarkable for atrial fibrillation, Factor V Leiden, and diabetes mellitus.
- Medications: metformin 1000mg PO BID, rivaroxaban 20mg tablet PO daily.
- No known drug allergies.
- Family history unremarkable.
- Social history remarkable for 5 pack year.
- Patient visited emergency department (ED) two consecutive days with worsening symptoms.
- ED visit 1 – three-day history of left lower leg pain, swelling and redness after walking into a trailer hitch. Reported significant bleeding with swelling and minimal pain day of the accident. Reported nausea and vomiting. Denied calf tenderness or fever
- ED visit 2 – returned to emergency department next day. Reported increased swelling with new onset blisters of left lower leg and new onset shortness of breath. Denies fever or chest pain.

Physical

- ED Visit 1
 - BP = 138/90 mmHg
 - Temp = 98.8°F
 - Maroon discoloration of distal left lower leg to ankle
 - No calf tenderness
- ED Visit 2
 - BP = 142/94 mmHg
 - Temp = 101.3 °F
 - 2 hemorrhagic bullae on posterior and medial left lower leg as seen in figure 2
 - Calf tenderness present

Diagnostic Results

- ED Visit 1
 - Labs unremarkable
- ED Visit 2
 - X-ray = diffuse left lower extremity edema with no subcutaneous air
 - Venous duplex US unable to be completed due to intolerable pain.
 - BUN = 51 mg/dL
 - Cr = 3.49 mg/dL
 - WBC = 18 x 10⁹/L
 - Blood cultures positive for *Vibrio vulnificus*
- Surgery 2
 - Deep wound cultures positive for *Vibrio vulnificus*

Differential & Final Diagnosis

- Differential includes cellulitis, deep vein thrombosis, gas gangrene
- Final diagnosis - Necrotizing soft tissue infection due to *V. vulnificus*

Fig 1. Hospital Course

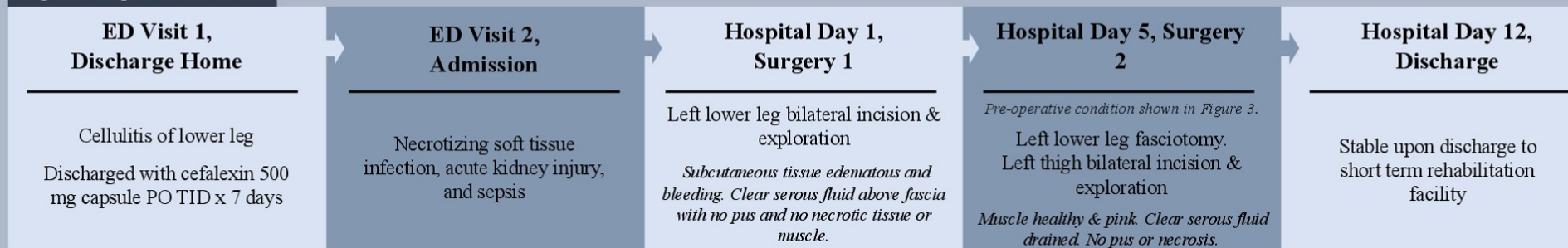


Fig 2. ED Visit 2



Fig 3. Hospital Day 5



Fig 4. Outpatient Follow Up



Patient Management & Follow Up

CDC Guidelines of Antibiotic Therapy for *Vibrio vulnificus* Wound Infections⁸

- Third generation cephalosporin plus doxycycline is recommended
 - ex: ceftazidime 1 to 2g IV/IM q8 hrs plus doxycycline 100mg PO/IV BID x 7 to 14 days
- Alternative regimens
 - Third generation cephalosporin plus fluoroquinolone
 - Fluoroquinolone alone

Antibiotic Therapy

- *Hospital Day 1* – patient started on vancomycin 1g in 0.9% NaCl 250mL IVPB, clindamycin 150mg PO q 6hr and piperacillin/tazobactam 3.375g IV q 6hr
- *Hospital Day 3* – all antibiotics discontinued; patient started on 14-day course of ceftriaxone 1g IV daily, doxycycline 100mg PO BID, and clindamycin 150mg PO q 6hr

Wound Care

- BID dressing changes to all wounds. Wounds packed with gauze soaked in Dakins solution, covered with ABD pads and wrapped with Kerlix.
- *Hospital Day 8* – wound VAC placed on thigh wounds

Patient to finish antibiotic course & continue BID dressing changes of left lower leg at short term rehabilitation facility. Patient followed up in office one week after hospital discharge. Lower extremity wounds overall healthy with minimal sloughing as seen in Figure 4. No further need to follow up with surgery service and patient instructed to continue follow up with wound management.

Conclusion

- *V. vulnificus* is a rapidly progressing necrotizing soft tissue infection that requires prompt intervention for successful management.
- Surgical intervention and antibiotic therapy should not be delayed while awaiting culture results and susceptibility testing.
- Individuals with liver disease or immunocompromising conditions are at an increased risk of developing severe *V. vulnificus* infection, and therefore should avoid open wound exposure to seawater or eating undercooked seafood.
- Although *V. vulnificus* infections are rare, providers must remain knowledgeable in its presentation and should always be considered when evaluating aquatic related sepsis or necrotizing infections.