The Cost of Delay: Amputation Secondary to Osteomyelitis in an Undiagnosed Diabetic

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Case Presentation

Setting: Gateway Regional Medical Center Emergency Department, Granite City, IL
Date: August 17, 2022

Patient Demographics: 43-year-old American Indian male
Chief Complaint: Left great toe pain and swelling

History of Present Illness: History obtained using Punjabi-to-English bedside translator. 5 days prior, he kicked a wall causing minor injury to his left foot 1st digit that has worsened. Reports swelling, erythema, and drainage. Rates his pain as 5/10, described as a constant dull ache worse with walking and direct pressure. Denies fever or chills. The wound has been covered with cotton pads and duct tape for 3 days. He has not taken any medication for his symptoms.

Past Medical History: Unremarkable
- No surgeries or hospitalizations, preventative health history, or primary care provider (PCP)
- No known drug allergies
- Immunization status unknown
- Takes no prescribed or over the counter medications

Family Medical History: Unknown

Social History:
- Lives with a friend – family resides in India
- No history of alcohol, tobacco, or illicit drug use
- Diet: avoids pork, beef containing products, and turkey plays a vital role in coordination

Review of Systems:
- General: No fever, chills, malaise, unintentional weight loss
- Respiratory: No dyspnea, cough, wheezing
- Cardiovascular: No chest pain, palpitations
- Gastrointestinal: No abdominal pain, nausea, vomiting, diarrhea, appetite changes
- Genitourinary: No polyuria, dysuria
- Musculoskeletal: Pain, swelling, bruising and drainage on left great toe; no limited range of motion
- Neurologic: No numbness, tingling, gait abnormalities
- Endocrine: No polydipsia, heat or cold intolerance

Physical Exam:
- BP 127/76 mmHg | Pulse 110 bpm | Resp 16 breaths/min | Temp 36.9 ºC | SpO2 98% | Height 5’11” | Weight 155 lbs | BMI 21.26 kg/m²
- General: Well developed, well nourished patient who is awake, alert, and in no acute distress. Cooperative and calm
- Cardiovascular: Regular rate and rhythm, no murmurs, rubs, clicks, or gallops noted
- Respiratory: No signs of respiratory distress. Respirations normal without accessory muscle use. Chest clear to auscultation
- Musculoskeletal: Extremities grossly normal except for left 1st digit wrapped on arrival. On removal, patient’s digit has marked swelling that is edematous.
- Neurologic: Orientation is normal, appropriate for stated age, to person, place, time, & situation. Mentation is normal, lucid, able to follow commands. Moves all 4 extremities. Soft touch and pin prick can be felt in the left great toe.

Emergency Department Course:
- Labs:
  - Glucose 391 mg/dL
  - H1Ac 9.9%
  - C reactive protein 2.01 mg/L
  - Sedimentation rate 50 mm/hr

Case Presentation Cont.

Blood, wound tissue culture + gram stain: no growth
Imaging:
- Left foot x-ray: comminuted fracture, periosteal lifting, and erosive changes at the interphalangeal joint suggesting osteomyelitis

Management:
- IV saline lock and 0.9% saline normal saline
- Piperacillin-Tazobactam 3.375 g
- Vancomycin 20 mg/kg
- Podiatry consult
- Diagnosis: osteomyelitis and new onset diabetes (DM)
- Symptoms improved with IV antibiotics. Condition represents a certified medical emergency. Admit to general medical floor.

Hospital Course:
- 8/18/22:
  - Left foot MRI: multifocal osteomyelitis involving proximal and distal phalanges of the great toe
  - Cardiology: recommend amputation after confirming good vascular flow with ankle brachial index and arterial duplexes
  - Piperacillin-Tazobactam 3.375 g IVPB Q8 hours 25 mL/hr
  - Metformin 500 mg PO BID
  - Insulin lispro 100 Units/mL SQ sliding scale 8/19/22:
  - Podiatry: left great toe amputation, bone biopsy of left cubital and left foot debridement – continue IV antibiotics, monitor cultures for possible long-term IV antibiotic therapy
  - No complications post operatively
  - Evaluated by physical therapy

Follow Up:
- Referred to a PCP and is to follow up in the next week. Advised to call the recommended clinic for follow up for his diabetes.

Discussion

Introduction:
- Contiguous, or nonhematogenous, osteomyelitis is a bone infection secondary to direct spread from a soft tissue infection.

Epidemiology:
- Overall incidence in the US is estimated at 50,000 cases annually.
- Occurs most commonly in men with underlying comorbid factors such as DM and peripheral vascular disease.
- Osteomyelitis is present in 10% of moderate and in 50% of severe diabetic patients.

Case Specific Teaching Points:
- Management involves a multifaceted, interprofessional approach. The PCP plays a vital role in coordination of care across specialties such as radiology, surgery, podiatry, infectious disease, pharmacy, and wound care.
- USPSTF: prediabetes & type 2 diabetes screening with fasting plasma glucose, HbA1c, or an oral glucose tolerance test for asymptomatic adults aged 35-70 years who have overweight or obesity (BMI ≥ 25 or ≥ 30 kg/m²).
- Consider earlier screening in American Indians or other high-risk populations.

Success rates range from 60-90%
- Highly variable given the heterogeneity in debridement completeness and vascular insufficiency at the infection site

References

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