Case Report

Pyomyositis: A Diagnosis Not To Be Missed

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Abstract

Introduction: Pyomyositis is a suppurative bacterial infection of skeletal muscle that is more prevalent in tropical climates than in temperate regions. Its nonspecific presentation often leads to delayed diagnosis, particularly in immunocompromised individuals. **Case Presentation:** We report a 32-year-old man with poorly controlled diabetes mellitus who presented with a three-week history of progressive left calf swelling and pain. He had a prior open tibial fracture but denied recent trauma or systemic symptoms. Examination revealed fluctuant, tender swelling over the medial calf without crepitus. Point-of-care ultrasound (POCUS) revealed an extensive intramuscular hypoechoic collection with internal echogenic debris, suggestive of an abscess. Definitive imaging confirmed multiple intramuscular and subcutaneous collections. The laboratory results revealed elevated inflammatory marker levels and transaminitis. Pus culture produced methicillin-resistant Staphylococcus aureus (MRSA). The patient received intravenous vancomycin and underwent incision and drainage with a vacuum-assisted closure (VAC) dressing, resulting in clinical improvement. **Discussion:** Pyomyositis progresses through invasive, suppurative, and late septic stages. Early recognition is critical to prevent complications such as sepsis and multiorgan failure. Although MRI is the diagnostic gold standard, POCUS offers a rapid, bedside diagnostic tool that can guide early surgical consultation, especially in resource-limited or emergency settings. In this case, POCUS enabled a timely diagnosis after an earlier admission for cellulitis, without ultrasound assessment, and failed to detect the underlying abscess. **Conclusion**: A high index of suspicion is required for pyomyositis in patients with limb swelling, particularly those with risk factors such as diabetes. POCUS serves as an accessible and valuable supplement to clinical assessment, expediting diagnosis and treatment.

Keywords: *pyomyositis, methicillin-resistant staphylococcus aureus, point-of-care ultrasonography, soft tissue infections*

INTRODUCTION

Pyomyositis is the spontaneous development of an abscess within skeletal muscle. Primary pyomyositis is most often of hematogenous origin and is typically attributed to transient or simultaneous bacteremia. Secondary pyomyositis, on the other hand, results from penetrating trauma or spread from a nearby site of infection.[1,2] It is most frequently observed in tropical countries such as sub-Saharan Africa, Southeast Asia, and the Caribbean, hence the earlier term "tropical pyomyositis." However, its occurrence is now increasingly reported in nontropical countries.[3,4] In Asia, the most common causative organism is staphylococcus aureus, which is responsible for 75–90% of cases.[2,5,6] Owing to its various stages and nonspecific symptomatology, pyomyositis is frequently missed during initial visits to the emergency department.

CASE REPORT

A 32-year-old man with a history of diabetes mellitus presented to the Emergency Department (ED) with a three-week history of left calf swelling accompanied by severe pain. He had a history of an open fracture of the left tibia in 2012, which was managed with an external fixator for a few months. He had been well since then.

He denied any recent trauma or fever and reported tolerating oral intake well. He also denied any history of sports-related injuries, HIV, illicit drug use, contact with methicillin-resistant staphylococcus aureus (MRSA), or living in crowded housing conditions. He had previously been admitted to another hospital for a similar complaint—left lower limb cellulitis—and had completed a one-week course of intravenous antibiotics. However, owing to worsening swelling and increasing pain, the patient returned for further medical evaluation two days after discharge.

On examination, the patient appeared nontoxic, was well hydrated, and had stable vital signs. Physical examination revealed generalised swelling of the left calf with a fluctuant area predominantly over the medial aspect. The area was tender and warm to the touch. The muscle compartments were soft, and there was no crepitus (Figure 1).

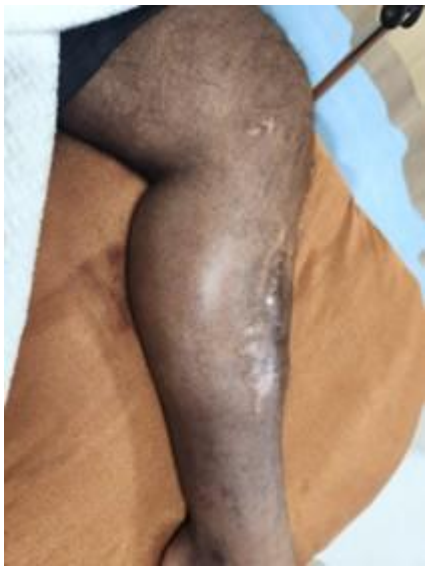

Figure 1: Left medial calf with swelling of the muscle bulk

Point-of-care ultrasonography (POCUS) performed in the ED revealed a nonpulsatile, noncompressible hypoechoic intramuscular area with internal moving echogenic debris. The most extensive collection measured approximately 16 × 3 cm. The irregular margins were suggestive of an abscess (Figures 2 and 3). For comparison, ultrasound was not performed during the previous admission.

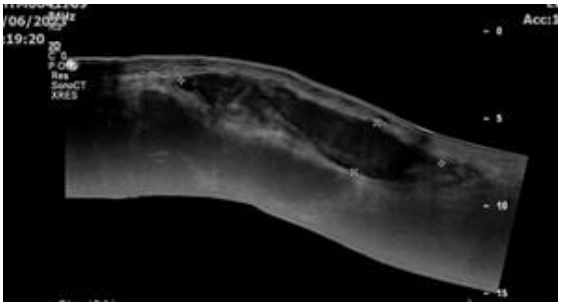

Figure 2: Hypoechoic intramuscular region with moving echogenic debris over the medial calf

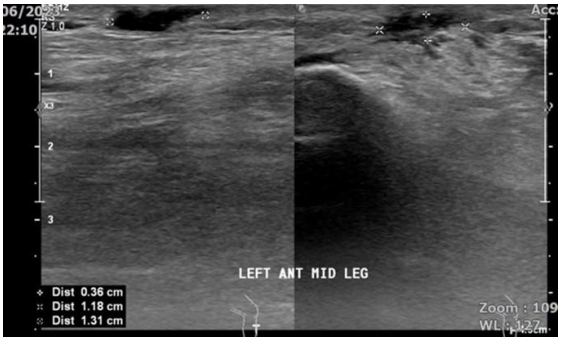

Figure 3: Left anterior mid-leg

A plain radiograph of the affected limb was unremarkable. Intravenous ampicillin/sulbactam was initiated following local treatment protocols. The orthopedic surgery team was consulted. Laboratory investigations, summarised in Tables 1 and 2, revealed elevated inflammatory marker levels and evidence of transaminitis. No tuberculosis screening was performed during this admission.

Lab value (normal value)	On admission	Day 1
Total white blood cell (4.0-10.0 x10^9/L)	12.2	
Neutrophil % (40.0-80.0)	77.2	
Lymphocyte % (20.0-40.0)	16.1	
Absolute lymphocyte count (1.00-3.00 x 10^9/L)	1.96	
Haemoglobin (13.0-17.0 g/dL)	15.2	
Platelets (150-410 x 10^9/L)	486	
HCT (40.0-50.0%)	45.9	
Urea (2.78-8.07 mmol/L)	5.7	4.6
Sodium (135-145 mmol/L)	133	133
Potassium (3.5-5.1 mmol/L)	4.4	3.7
Creatinine (62-106 umol/L)	49	35
ALT (<=50 U/L)	59.9	92.4
AST (<=50 U/L)	8.9	
Total bilirubin (0.0-21.0 umol/L)	12.0	12.8
pH (7.32-7.43)	7.44	
HCO3 (20-28 mmol/L)	28	
Lactate (0.4-0.8 mmol/L)	1.6	
CRP (<5 mg/L)	181.1	
HbA1C		14.9%

Table 1: Blood investigations

Culture	Result
Blood culture	No growth
Pus and tissue culture	Methicillin-resistant *Staphylococcus aureus* (MRSA) isolated

Table 2: Culture

Definitive imaging with ultrasound revealed extensive hypoechoic intramuscular collection with moving echogenic debris at the posteromedial aspect of the calf, measuring approximately 6.1 × 8.1 × 15.6 cm. Another hypoechoic collection, measuring 2.5 × 7.5 cm, was observed at the proximal lateral calf. A small subcutaneous collection was noted at the mid-shin, measuring 0.3 × 1.2 × 1.3 cm.

The patient was diagnosed with a left calf abscess with transaminitis and was treated with intravenous vancomycin. Incision and drainage were performed, followed by vacuum-assisted closure (VAC) dressing.

DISCUSSION

Pyomyositis is increasingly reported in nontropical regions, making terms such as "primary pyomyositis" or "infective pyomyositis" more appropriate. It accounts for 1–4% of hospital admissions in parts of Africa, Southeast Asia, and Latin America [2,7] with peak incidence in children aged 5–9 years and young adults aged 10–30 years. Primary pyomyositis accounts for approximately 80% of cases, with a male predominance of 63%. This is possibly due to increased physical activity and the associated risk of muscle microtrauma.[8] Pyomyositis is also more prevalent among individuals with obesity and those who are immunocompromised.[5,9,10]

The most common organism is staphylococcus aureus, which is responsible for 90% of cases, with a growing prevalence of MRSA.[6,11-13] Other pathogens include streptococcus species, E. coli, klebsiella, salmonella, anaerobes, candida, and mycobacterium species.[6,14,15]

Pyomyositis progresses through three stages:[2,16]

1. **Invasive stage**: Dull, crampy pain and swelling, often without systemic symptoms. Fever may be absent, leading to misdiagnosis as musculoskeletal pain.
2. **Suppurative stage** (10–21 days later): Fever, leukocytosis, and fluctuant swelling.
3. **Late Stage**: Systemic toxicity with high-grade fever, tachycardia, and organ dysfunction.

In this case, the patient presented during the first stage but was misdiagnosed and discharged. He returned during the second stage with worsening symptoms. Early antibiotics may lead to blunted systemic signs such as fever.

MRI is the gold standard for diagnosis.[1] However, POCUS can differentiate between subcutaneous abscesses and intramuscular abscesses on the basis of depth and muscle architecture. Several case reports have emphasised the utilisation of POCUS for the identification of soft tissue infections.[17-19] The features of pyomyositis include loss of normal striation, hypoechoic collections, and posterior acoustic enhancement without vascular flow.[19-21] In cellulitis, "cobblestoning" is observed, but the muscle remains unaffected.[22]

POCUS can assist clinical decisions in up to 10% of cases.[23,24] Several studies have reported that POCUS is 94.6% sensitive and 85.4% specific for the diagnosis of subcutaneous abscesses.[23] The mortality rate of pyomyositis ranges from 0.8% to 10%, depending on the stage. Patients with advanced-stage disease with systemic complications have the worst prognosis.[25] In contrast, cellulitis mortality varies by Dundee severity class, from 1% (Class I) to 33% (Class IV), with an increasing need for treatment and increased risk of undertreatment.[26]

Delayed diagnosis of pyomyositis can lead to abscess, sepsis, and multiorgan failure.[25] Delays in cellulitis management can cause serious complications, including endocarditis, glomerulonephritis, osteomyelitis, and toxic shock syndrome.[27]

Initial treatment for pyomyositis includes IV antibiotics (1–2 weeks), followed by oral antibiotics for a total of 4 weeks. Surgical drainage is indicated for abscesses.[1,25] This patient was misdiagnosed during a prior admission. However, during the current visit, appropriate investigations were conducted, and treatment was promptly initiated.

CONCLUSION

A high index of suspicion and thorough clinical evaluation are essential to diagnose pyomyositis, especially in immunocompromised patients. Although MRI is the diagnostic gold standard, access is often constrained by limited availability and prioritisation for other critically ill patients. Consequently, POCUS remains a valuable diagnostic adjunct, especially during the initial clinical encounter.

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