

Compartment Syndrome of the Lateral Leg Secondary to Pyomyositis: A Case Report

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Abstract

Introduction: Pyomyositis is a rare condition in temperate climates with approximately 15 cases reported annually in the United States. Predisposing factors include immunodeficiency, trauma, intravenous drug use, and bacteremia. We report a case not yet seen in the literature due to involvement of the lateral leg compartment, no history of predisposing factors, and clinical presentation with elevated compartment pressures.

Case Report: We present a case of a 45 year old male who presented with worsening lower left leg pain for one week. The area felt firm and was exquisitely tender to palpation. Initial laboratory studies showed normal white blood cell counts and a slightly elevated erythrocyte sedimentation rate. Compartment pressures were elevated and imaging revealed evidence of pyomyositis in the lateral compartment. Fasciotomy was avoided with prompt broad-spectrum antibiotics. At follow-up, the patient's symptoms were resolved and no further treatment was needed.

Conclusion: While pyomyositis is rare in nontropical countries, patients presenting with elevated compartment pressures and no history of trauma or surgery should warrant further investigation of the etiology with pyomyositis being included in the differential diagnosis.

Keywords: Compartment Syndrome; Lateral Leg; Myositis, Pyomyositis

Introduction

Pyomyositis is a rare bacterial infection of one or more skeletal muscles of the body. Risk factors include immunodeficiency, trauma, intravenous drug use, and bacteremia [1]. While pyomyositis is relatively rare due to the musculature's unique protection against infection, it is far more common in tropical climates and is responsible for 1-4% of all hospital admissions in some tropical countries [2]. Symptoms include local muscle pain, tenderness to palpation, swelling, and weakness. Interestingly, muscle enzymes such as creatine kinase are usually normal and blood cultures are only positive in 5-35% of cases. Diagnosis therefore relies on imaging with magnetic resonance imaging (MRI) being the most sensitive test at detecting muscle inflammation [3]. We present a rare case of myositis-induced compartment syndrome in an otherwise healthy patient.

Case Presentation

A 45 year old male with a past medical history of well-controlled type-II diabetes presented to the emergency department (ED) with worsening left leg pain for one week. The pain was initially minimal and gradually worsened to becoming unbearable prior to arriving to the ED. The pain was described as a 10/10 pressure-type pain that worsened with movement of the ankle joint and weight bearing. He endorsed one episode of chills the previous day but denied any fevers, trauma, limb compression, puncture wounds, insect bites, intravenous drug use, or recent steroid use.

Upon initial presentation to the ED, the patient's temperature was 37.8 C and all other vital signs were stable. On physical exam, the lower left leg was nonerythematous, nonindurated, and felt firm to palpation. The lateral aspect of leg was exquisitely tender to light palpation and passive movement, particularly dorsiflexion of the ankle. Dorsalis pedis and posterior tibial pulses were intact. Initial laboratory studies showed no elevation in white blood cell count, lactic acid, or creatine kinase. The erythrocyte sedimentation rate (ESR) was slightly elevated at 26 mm/h (normal male: 0-22 mm/hr). Blood cultures were also negative. Venous duplex ultrasound showed no evidence of deep vein thrombosis.

Following the results of initial laboratory tests, the patient was reassessed. The firmness of the tissue and exquisite tenderness upon light palpation prompted the consideration of an acute compartment syndrome. Compartment pressures of the lateral and anterior compartments were measured using a Stryker Device. The anterior compartment pressure was checked as a control. Anterior compartment pressure was 13 mm Hg and lateral compartment pressure was 78 mm Hg (normal < 10 mm Hg). Orthopedic surgery was consulted due to the elevated pressure of the lateral compartment and recommended computed tomography angiogram (CTA) of the leg along with monitoring of compartment pressures every 2-3 hours.

The CTA revealed significant edema, loss of intramuscular fat planes, and an abscess within the peroneus longus muscle. There was also edema and small gas pockets in the subcutaneous fat. Pyomyositis was determined to be the most likely cause and the patient was started on intravenous Ceftriaxone. Recheck of pressures six hours after initial measurement yielded 13 in the anterior compartment and 49 in the lateral compartment, and it was decided that fasciotomy was not necessary at this time due to improvement of compartment pressure following initiation of antibiotics. The following morning, the patient's pain worsened and physical exam revealed more extensive edema extending to the dorsum of the foot. Despite no organism being isolated from aspiration, vancomycin was added for broader spectrum coverage and the patient's painful symptoms stabilized the following day.

An MRI the next day showed extensive pyomyositis involving the peroneus longus, peroneus brevis, and portions of flexor hallucis longus, anterior soleus, and extensor hallucis muscles. There was also moderate subcutaneous edema in the lateral dorsal forefoot and medial ankle. No osteomyelitis was visualized. Although no organism grew on cultures from the aspirate, the infection was presumed to be bacterial due to findings on CTA and MRI, including the abscess along with the patient's rapid clinical response to antibiotics. The patient's clinical condition improved over the following 24-hours hospital course and was discharged on oral Vancomycin.



Follow-up one week later showed complete resolution of the infection with no pain or edema of the lower leg. Further follow-up four weeks later with the primary care physician demonstrated no neurologic deficits of the lower extremity and no overlying dermatologic complications. The patient reported normal use of the leg and a return to baseline functional status.

Discussion

Clinically, pyomyositis can be divided into three stages. The first stage is characterized by muscle pain, swelling, and low-grade fever. Patients in this stage generally do not exhibit fluctuation in the area, and aspiration typically does not yield any purulent fluid. Stage two occurs 2-3 weeks after initial symptoms and includes fever, muscle tenderness, and edema. Leukocytosis is usually present during this stage. The third stage involves a systemic response and can include septic shock, septic emboli, pericarditis, and acute kidney injury. Approximately 90% of patients present during the second stage [4]. Treatment of pyomyositis involves antibiotics targeted against staphylococci and streptococci bacteria including methicillin-resistant staphylococcus aureus (MRSA) in patients found to be at risk. Treatment of immunodeficient patients involves broader spectrum coverage against gram-positive, gram-negative, and anaerobic organisms. In one study that reviewed 98 cases of pyomyositis in North America, approximately 50% of the patients were found to be human immunodeficiency virus (HIV) positive on serology [5]. Therefore, it is imperative that clinicians take a thorough medical and social history and consider HIV testing in patients found to have pyomyositis.

Both pyomyositis and acute compartment syndrome (ACS) have considerable overlap in symptomatology, particularly when the infection involves muscles of the lower extremities. In addition, myositis has been documented in the literature as a rare cause of elevated compartment pressures and ACS [6]. Since the treatment approach is different for each, it is imperative that clinicians promptly rule out pyomyositis as an etiology of a patient's elevated compartment pressures, especially if the elevated pressures are in the absence of any trauma or prior surgery. A hastened diagnosis of ACS without further investigation can lead to unnecessary invasive interventions causing the patient both physical and emotional harm.

This unique case demonstrates increased compartment pressures in a patient eventually determined to have pyomyositis on CTA and MRI. Because trauma accounts for 75% of ACS cases, patients with increased compartment pressures and no history suggestive of trauma should prompt clinicians to consider other possible etiologies of ACS [7]. In addition, the slow progression of symptoms during the week prior to the patient presenting to the ED was another indication that classic ACS was less likely. A fasciotomy was avoided in our patient despite elevated pressures due to prompt recognition of infection and subsequent treatment. Recent studies have found notable variability (2-24%) in the incidence of fasciotomy among patients with elevated compartment pressures (8). This variability highlights the importance of ruling out pyomyositis as a cause of elevated compartment pressures in order to correctly treat the etiology of the elevated pressures.

Conclusion

Patients presenting with symptoms suggestive of acute compartment syndrome with no history of trauma or recent surgery should prompt clinicians to rule out other etiologies including pyomyositis as a possible etiology. A fasciotomy was not necessary in our patient due to early identification of pyomyositis as the underlying cause of the elevated pressures followed by broad-spectrum antibiotic treatment.

Clinical Message

While pyomyositis is rare in nontropical countries, patients presenting with elevated compartment pressures and no history of trauma or surgery should warrant further investigation into possible etiologies with pyomyositis included in the differential diagnosis. A fasciotomy was avoided in this case due to prompt antibiotic treatment.

Competing Interests

The authors confirm there are no conflicts of interest.

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