Think pyomyositis!

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Abstract
Uncontrolled diabetes is associated with increased risk of infections. An uncommon but rather serious infection is pyomyositis which is a purulent infection of the skeletal muscle. Delay in recognition and diagnosis can lead to serious complications.

We report the case of a 44-year-old male patient with a background of uncontrolled diabetes who presented with bilateral thigh pain and progressive leg weakness over three weeks. He had no other comorbidities and he denied any recent trauma or foreign travel. On examination he had multiple hard lumps in both thighs and blood results showed leucocytosis and raised inflammatory markers. Magnetic resonance imaging (MRI) showed multiple bilateral thigh abscesses. The diagnosis of pyomyositis was made and drains were inserted into the two largest abscesses. Simultaneously, he was started on antibiotics based on the drained fluid culture and sensitivity. On drainage of the abscesses and completion of eight weeks of antibiotics, he gradually regained the lower limbs’ power and the thigh pain resolved. His recovery was aided by the better control of diabetes with insulin therapy.

Pyomyositis is mainly encountered in tropical areas. Non-tropical pyomyositis is more common in immunocompromised patients and patients with uncontrolled diabetes. It requires a high index of suspicion because of its indolent presentation that may mimic other pathologies like cellulitis, diabetic amyotrophy, septic arthritis and deep vein thrombosis. MRI is the best diagnostic tool to differentiate pyomyositis from these disorders. Early diagnosis and intervention with drainage of the abscesses and appropriate antibiotics prevent serious complications and improve the outcome. Copyright © 2017 John Wiley & Sons.

Key words
abscess; infection; pyomyositis; myositis

Introduction
Uncontrolled diabetes is associated with increased risk of infectious complications. An uncommon but rather serious complication is pyomyositis. Pyomyositis is a purulent infection of the skeletal muscle. It can lead to septic shock and therefore early recognition and management are vital to improve prognosis.1

We report the case of a patient with uncontrolled diabetes presenting with painful legs and who was diagnosed with pyomyositis.

Case history
A 44-year-old Caucasian male presented to the emergency department with bilateral thigh pain and leg weakness. This was preceded by a three-week history of malaise and flu-like symptoms. Initially, he was walking slowly with crutches, but later on he was even unable to weight bear and became confined to bed. His past medical history was of type 2 diabetes mellitus for 10 years with suboptimal compliance to diabetes medications because of his busy job. His medications included gliclazide 80mg twice-daily, exenatide 10μg twice-daily, Lantus and insulin Apidra. He had no other known diabetes comorbidities. He works as a salesman, with no particular hobbies which potentially expose him to recurrent injuries. He was not injecting insulin in his thighs. He denied any recent trauma or foreign travel. He has a good socio-economic status with very good housing conditions.

At the time of presentation, his observations were normal and he was afebrile. He had multiple hard lumps in both thighs and blood results showed leucocytosis and raised inflammatory markers. Magnetic resonance imaging (MRI) showed multiple bilateral thigh abscesses. The diagnosis of pyomyositis was made and drains were inserted into the two largest abscesses. Simultaneously, he was started on antibiotics based on the drained fluid culture and sensitivity. On drainage of the abscesses and completion of eight weeks of antibiotics, he gradually regained the lower limbs’ power and the thigh pain resolved. His recovery was aided by the better control of diabetes with insulin therapy.

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ruled out staphylococcal carriage. Doppler ultrasound of the lower limbs was normal and HIV test was negative. Most usefully, magnetic resonance imaging (MRI) showed multiple abscesses, the largest one in the right thigh measuring 12cm and one on the left side measuring 9cm with smaller abscesses also present in the posterior thigh bilaterally. (See Figure 1.)

On admission he was started on an intravenous insulin infusion then changed to a twice-a-day pre-mixed insulin regimen, and his blood glucose came down gradually to an acceptable range. Initially, he was put on intravenous fluoroxacillin for about two weeks. A repeat MRI then showed no change in abscess size and clinically the patient was not getting better. An ultrasound guided drain was inserted into the largest abscess on the right thigh first and then a second drain inserted into the abscess in his left leg. Culture of the drained fluid showed Staphylococcus aureus sensitive to penicillin, clindamycin and rifampicin. Since his symptoms and inflammatory markers were not improving, our microbiologist advised to change his antibiotics to dapтомycin, rifampicin and clindamycin. The patient then started to improve and mobilise with two crutches. Two days after the drains were removed, he was well enough to be discharged after staying in hospital for 24 days. He was prescribed oral clindamycin and rifampicin to complete eight weeks of total antibiotics treatment.

Repeat MRI two months after discharge showed complete resolution of the abscesses (see Figure 2). His mobility was improving gradually and the leg pain had resolved. During his subsequent outpatient visit, his capillary glucose reading was improving, suggesting better adherence to treatment.

**Differential diagnosis**

The diagnosis of pyomyositis can be difficult due to its rarity, indolent presentation and often with findings comparable to deep vein thrombosis, septic arthritis, avascular necrosis, diabetic amyotrophy and cellulitis. A literature review of diabetic patients who developed pyomyositis showed increased incidence from 8% of cases in 1971–1991 to 31% in the latest reports.²

**Discussion**

Pyomyositis is an acute bacterial infection occurring in skeletal muscle with no obvious source that can lead to abscess formation.³ It is mainly found in tropical climates but is also found in temperate climates in patients who are immunocompromised – HIV, drug abuse, diabetes and trauma being the main predisposing factors.¹,⁴,⁵–⁸ Diabetes is an important contributing factor to pyomyositis by predisposing the skeletal muscle to damage and increasing susceptibility to infections.³–¹¹ Muscle compromise associated with diabetes includes muscle infarction, myositis, pyomyositis, and abscess formation.⁶ Recognition of these pathologies is important, since management approaches vary depending on the aetiology of the muscle involvement and the overall status of the patient.⁶

Several potential pathogenic mechanisms may play a role in the occurrence of pyomyositis in patients with diabetes. Microangiopathy may lead to local vascular insufficiency, with or without spontaneous muscle infarction, as well as altered neutrophil migration into muscle. Cellular and humoral immunity defects are also well documented in patients with diabetes. Additionally, these patients tend to have increased skin and mucosal colonisation by S. aureus.¹⁰

Magnetic resonance imaging is considered to be the gold standard to diagnose pyomyositis as MRI differentiates it from other pathological processes (e.g. muscle infarction), outlines the extent of involvement and shows any localised fluid collection.¹,³,⁻¹³⁻¹⁵

The majority of pyomyositis occurring in temperate climates is due to S. aureus but Group A Streptococcus, Pneumococcus, Pseudomonas, Neisseria, Haemophilus and Escherichia coli may be a potential but less common responsible cause.³ The most commonly affected muscle groups are that of the thigh but other less commonly affected parts of the body are back, buttock, arm and chest wall.³,⁷

Treatment depends on the stage of the patient’s presentation; early presentation often needs intravenous antibiotics only. As S. aureus is the most common pathogen, fluoroxacillin is usually the most appropriate; however, the patient in our case did not show clinical improvement until the largest abscess had been drained and antibiotics had been changed. With abscess formation, drainage of the collection with concurrent use of antibiotic therapy may be required, often under radiological guidance, otherwise surgical debridement may be necessary.¹,⁷ Culture of the purulent material helps aid antibiotic selection.

The prognosis of this condition is relatively good with early antibiotics and drainage. Mortality is significantly higher in advanced stages due to delayed diagnosis or inappropriate management.³ The long-term effects may include osteomyelitis of adjacent bone, muscle scarring, prolonged hospitalisation and significant functional impairment.⁴
Key points

- Pyomyositis is an uncommon complication of poorly-controlled diabetes that needs a high index of suspicion at the time of presentation with painful or weak legs
- MRI is the diagnostic modality of choice to differentiate pyomyositis from other significant complications affecting the lower limbs
- Robust treatment involves early recognition, appropriate antibiotics and drainage of the abscess

Declaration of interests

There are no conflicts of interest declared.

References