Primary multifocal pyomyositis due to Staphylococcus aureus

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A 20-year-old man was referred to our institution with complaints of a 2-week prodrome of myalgia, rigors, drenching sweats and general malaise. There was no history of recent trauma, viral illness, extreme exercise or intravenous drug use. He had no other comorbidities. His only contact with doctors was a year prior to this presentation, when he had a gunshot to his back, with the bullet fragment still lodged in his thoracic spine. Clinically, he was pyrexial with a temperature of 39.8°C. His pulse was 124 beats per minute, with a blood pressure of 130/70 mmHg. His muscles were diffusely swollen, with fluctuance and exquisite tenderness particularly over his pelvic girdle, the shoulders and back, and his forearms. In these areas, the overlying skin was oedematous, erythematous and warm, with the underlying muscles having a firm, wooden texture (Figure 1).

Urinalysis was normal, and urine microscopy and culture were negative. His chest radiograph was unremarkable, and sputum microscopy and culture were negative for tuberculosis. His leucocyte count was 17.4 x 10^9/L, with a left shift. Both the random and fasting blood sugars were normal. The serum creatine kinase level was 169 IU/L. Serology for human immunodeficiency virus (HIV) was negative. A screen for autoimmune disease was negative. Two serial blood cultures were positive for Staphylococcus aureus sensitive to cloxacillin. Furthermore, needle aspiration of the intramuscular abscesses in his quadriceps, trapezium and forearm muscles all grew Staphylococcus aureus with the same sensitivity as in the blood. Ultrasonography of the various muscle groups confirmed multiple abscesses within the muscles. Echocardiography was normal. He was diagnosed with primary multifocal pyomyositis occurring in an immunocompetent host, with the previous gunshot from a year ago being a likely source of his sepsis. Due to the bullet still lodged in his spine, he could not be sent for magnetic resonance imaging (MRI). However, computerised tomography (CT) revealed multiple abscesses deep in his muscle groups (Figure 2). He was treated with percutaneous drainage of the abscesses and intravenous cloxacillin. His clinical course was uneventful and his infection resolved completely.

Pyomyositis is a rare clinical entity, due to primary infection of skeletal muscle, occurring most commonly in young men and reported with high frequency in the tropics. However, the non-tropical pyomyositis is reported with increasing frequency in temperate regions, particularly in immunocompromised hosts. Typically, patients present with pain and swelling of the involved muscle groups, which may evolve into a firm wooden texture on palpation, with or without associated fluctuance. Any muscle can be involved, but the large muscles of the lower extremity are most commonly affected. Multiple intramuscular abscesses occur in >60% of affected patients. Dissemination of the infection may result in multi-organ complications.
The diagnosis is often missed, particularly in the early stages, which may reverse completely with early introduction of appropriate antibiotics. Risk factors for development of pyomyositis include HIV infection, malignancy, diabetes mellitus, autoimmune disease, transplantation and other chronic debilitating disorders.\(^1,^3\) *Staphylococcus aureus* is responsible for 80–95% of cases, though other causative organisms have also been described.\(^4\) Recent trauma, exercise, hypoxia and intravenous drug use result in altered muscle structure, metabolism and viability, and are considered important to the pathophysiology of pyomyositis.\(^1,^3\) Our patient is unique in that the likely predisposing trauma pre-dated his presentation by a year.

MRI is the modality of choice for the diagnosis of pyomyositis, as it clearly defines the anatomic extent of the infection and differentiates between the early stage of diffuse muscle inflammation and oedema and the subsequent stage of abscess formation. CT, ultrasonography and radioisotope imaging will demonstrate an already formed intramuscular abscess and are useful for guiding percutaneous needle drainage.\(^3,^5\) Over 20% of pyomyositis patients from non-tropical areas are HIV infected.\(^6\) We report on this case to make clinicians aware of
the condition, particularly in the context of a high burden of HIV infection.

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References