



Extensive pyogenic myositis of the hip in an immuno-competent patient

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Richard Hull

This case report highlights the clinical features, work-up and management of pyogenic myositis of the hip – a rare condition that appears to be on the rise in temperate climates.

Introduction

Pyogenic myositis is a primary subacute deep bacterial infection of the skeletal muscle. It is a rare condition that is usually regarded as a tropical disease being common in parts of Africa and the South Pacific.¹ It has been reported in patients of all ages but is predominantly a condition afflicting children and young adults.^{1,2} The development of pyogenic myositis is thought to arise from a transient bacteraemia³ associated with risk factors such as recent trauma^{4,5} and immunocompromise.^{3,6,7} Pyogenic myositis is associated with serious complications if not treated promptly. These include septic arthritis, lung and brain abscess formation, pericarditis, endocarditis, septicaemia and death.³ Long-term sequelae such as osteomyelitis, muscle-scarring and residual muscle weakness³ can be prevented by early diagnosis and treatment of this condition.

Three stages in the pathogenesis of pyogenic myositis have been proposed by Bickels *et al.*³ In the first stage, patients present with a low grade fever, general malaise and muscle ache. As the inflammatory process is sealed within enveloping muscle fascia, the presence of local signs of inflammation may be absent, with only systemic signs of infection/inflammation present. In stage 2, muscle abscess formation is seen, associated with local and systemic signs of infection/inflammation. If pyogenic myositis is subsequently not treated, patients may progress to stage 3, where they

develop septicaemia and require urgent intervention.

We report a case of spontaneous extensive pyogenic myositis of the hip musculature in an immuno-competent patient with no identifiable risk or triggering factors.

Case report

A 46-year-old Caucasian non-smoking woman with no previous medical history presented with a three-day history of severe right buttock and hip pain and fluctuating pyrexia. The pain was constant and exacerbated by any movement to the right hip. At presentation, the pain had become excruciating and she was unable to weight-bear. She was otherwise fit and well, with no evidence of trauma or history of recent foreign travel and she was not taking any regular medicines. Her social history revealed that she worked as a professional musician. She also denied any illicit drug use.

On presentation she was tachycardic with a pyrexia of 38.1°C. General physical examination was unremarkable. Clinical evaluation of the hip revealed tenderness over the right ischial tuberosity and general restricted movement, flexion 60°, extension 15°, abduction 30°, adduction 30°, internal rotation 20° and external rotation 30°. Active straight leg raise was limited by pain to 20°. Examination of the spine and contralateral hip was unremarkable. She was also reviewed by the general surgeons and gynaecologists who felt that there was no intra-abdominal pathology.

Initial investigations revealed a normal leucocyte count at $9.3 \times 10^9/L$ (normal differential) with a markedly raised CRP result of 433 mg/L. Repeat blood tests on day 2 of admission showed

a raised leucocyte count of $15.3 \times 10^9/L$ (neutrophil count 10.7) and a CRP over 500 mg/L. Plain radiographs of the pelvis and hips were unremarkable. Subsequently the patient was admitted to hospital for a comprehensive diagnostic work-up, bed rest and analgesia.

An initial ultrasound scan of the abdomen and hip was unremarkable (performed by an experienced ultrasound radiographer). An urgent MRI scan was performed and revealed abnormalities consistent with diffuse infective myositis (Figure 1a and b). There was no evidence of a fluid collection or other abnormal pathology. The patient was referred to a specialist unit for further investigation. A CT-guided biopsy demonstrated non-specific chronic inflammation of skeletal muscle with degenerative and reparative features involving synovial-lined tissue, in keeping with the clinical/radiological suggestion of myositis. An immunological screen performed did not reveal a diagnosis of HIV or the presence of an auto-immune disorder. Intravenous antibiotics were commenced (flucloxacillin and metronidazole) after blood cultures were taken following discussion with microbiology.

The patient made a spontaneous recovery and was subsequently discharged from hospital after seven days of antibiotics. No organisms were isolated from blood cultures or from samples from the tissue biopsy. A six-week follow-up for the patient revealed no residual weakness or pain to the affected joint.

Discussion

Our patient was a 46-year-old immuno-competent woman who developed the condition in a temperate climate, with no history of recent foreign travel. Our patient developed extensive pyogenic myositis affecting multiple muscles (obturator internus, pectineus, gluteus medius and maximus). Particular involvement of the obturator internus muscle is exceptionally rare with only three previous cases in the UK involving this muscle previously reported.^{5,8,9} However our case is different from those previously reported with no preceding trauma/risk factors, no identifiable infective agent and presented in an immuno-competent patient.

Pyogenic myositis typically has a subacute clinical course and therefore patients typically do

not present until 5–6 days after the onset of symptoms.^{5,10} The most common physical findings of pyogenic myositis involving the obturator internus and surrounding muscles which are restriction of all hip movements and tenderness over the hip and groin regions.^{4,11,12} These typical findings were present in our case.

Pyogenic myositis is usually regarded as a rare tropical disease. This condition has been seen in all age groups but is most common in the first and second decades of life.^{1,2} A slight male predominance also appears to exist,¹ unlike our patient. Patients with pyogenic myositis, older than 30 years of age, commonly have an underlying disease or condition that might impair the immune system such as HIV,⁶ diabetes,⁷ rheumatoid arthritis¹³ and chronic liver diseases.³ Our case had no evidence of immunocompromise.

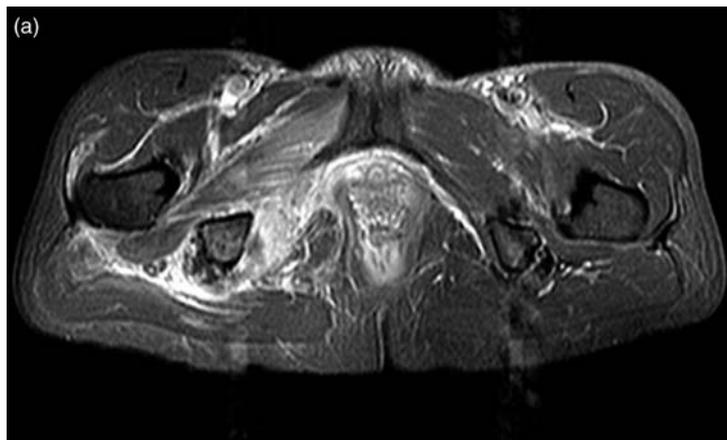
The condition can involve any muscle groups in the body but the most frequently affected muscles are the quadriceps, hamstrings, gluteal muscles and iliopsoas.^{4,12} A single muscle is usually affected in this condition. Involvement of two or more muscles occurs in as few as 11% of cases.³ Our case does not conform to any of these typical epidemiological features.

The aetiology of pyogenic myositis in our patient remains unclear. The infection is believed to arise from a transient bacteraemia as reported by Bickels,³ Chen¹⁴ and Malhotra,¹⁵ but in this case the patient denies any obvious penetrating injury or transient infection. In all previous cases reported in the UK an organism has been identified; *Staph. Aureus* was isolated by blood culture in two reported cases,^{5,9} one of which was thought to arise from broken skin to the leg following a flare-up of eczema.⁵ *Neisseria gonococcus* was the causative organism in the other case which was found in a pyomyositis abscess.⁸

Trauma is a recognized initiating factor for the development of pyogenic myositis^{3,5} and has been documented in between 21% and 66% of cases.⁵ It has been suggested that trauma may lead to the development of a muscle haematoma which becomes colonized during an episode of bacteraemia.^{5,16} Again our case is unusual as there was no history of trauma or recent strenuous exercise and no obvious source of bacteraemia was ever identified (negative blood cultures, negative urine cultures, no growth of organism following biopsy). The usual causative organisms for

Figure 1

(a) Axial and (b) coronal T2-weighted MRI images of the right hip. T2-weighted MRI images show extensive swelling and oedema associated with the right obturator internus, gluteal medius, gluteal maximus and pectineus muscles without abscess formation. The findings are consistent with a diagnosis of pyogenic myositis



pyogenic myositis are *Staph. Aureus* and *Streptococcus pyogenes* (accounting for more than 81% of cases).^{2,3} Rarer causative organisms include *Salmonella*,⁷ *Escherichia Coli*³ and *Neisseria gonococcus*.¹⁷

Biochemical studies for our patient revealed an elevated WCC and CRP, however neither of these tests are specific for pyogenic myositis. Blood cultures in our patient failed to reveal a causative organism and have only been useful for isolating

a causative pathogen in only 31% of cases of pyogenic myositis.³ Plain radiography and ultrasonography are appropriate initial investigations for the affected joint and help to exclude other causes of a painful hip.

As highlighted in our case, MRI is the gold standard investigation for diagnosing pyogenic myositis. Mazur *et al.*¹⁸ found MRI to be 97% sensitive for acute musculoskeletal infections in children. CT allows the diagnosis of muscle abscess and allows the use of aspiration and/or biopsy as illustrated in this case presentation. However CT may fail to demonstrate muscle inflammation particularly in the early stages of the infection.³

Treatment for pyogenic myositis depends on the stage of presentation. During the early stages of inflammation, the condition can be treated effectively with antibiotics based on the most likely pathogen.^{3,5,10} Despite rather extensive pyogenic myositis, we were able to discharge our patient after seven days of intravenous antibiotics. Progression to the second stage of the disease requires surgical intervention in the form of abscess drainage followed by antibiotic administration.

Conclusions

The case presented here highlights many features of pyogenic myositis in terms of clinical presentation, diagnosis with MRI, and rapid recovery with intravenous antibiotics. However our case is extremely unusual in that the patient was a fit and healthy 46-year-old woman with no medical problems, with no obvious initiating factors or risk factors for developing the condition and no source of bacteraemia. Pyogenic myositis affecting the hip muscles appears to be on the rise in temperate climates and should be considered as part of the differential diagnosis of a patient presenting with fever and a painful hip. Prevention of complications of the condition can be ensured by rapid diagnosis and early treatment.

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