

An unusual case of hip pain in a keen runner

Introduction

Pyomyositis is a rare condition most commonly seen in tropical climates and within immunocompromised groups in more temperate climates. It is a suppurative condition of skeletal muscle associated with transient bacteraemia and a mechanism of host tissue vulnerability.

This case report highlights that this disease can present in an otherwise well individual with no background immunocompromise. It demonstrates the difficulty in diagnosis as well as the effectiveness of multimodality imaging.

Discussion

Primary pyomyositis frequently occurs in tropical climates, causing a sub-acute, deep bacterial infection of skeletal muscle. Although it commonly presents as a local abscess it is not unknown to present as a diffuse inflammatory process. A review of all English language papers since 1960 by Bickels et al (2002) concluded that diagnosis was often delayed as a result of the vague presentation and because collections were often too deep to be palpable.

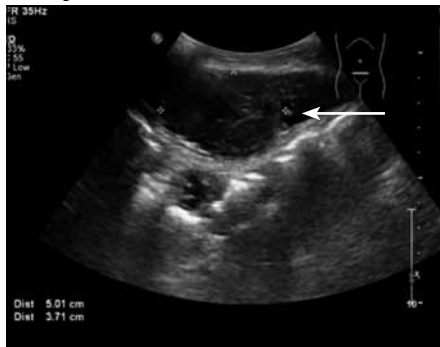
Pyomyositis has three distinct phases as described by Crum (2004):

1. Non-specific myalgia, malaise and low grade fever
2. Formation of abscess within skeletal muscle causing local tenderness, impaired function and a septic profile
3. Toxic or septic shock leading to multi-organ failure.

The literature suggests that a transient bacteraemia in combination with damaged muscles, which can be induced via vigorous exercise (Lopez et al, 2012),

creates a medium susceptible to the development of pyomyositis. Hypoxia within exercising muscles was suggested by Olson et al (2011) to contribute to the muscle susceptibility. *Staphylococcus*

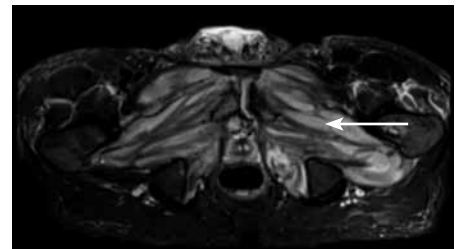
Figure 1. Ultrasound scan demonstrating heterogenous fluid collection.



aureus is estimated to cause 70% of non-tropical cases (Fox et al, 2004). Lemonick (2012) suggested that this figure includes community-acquired meticillin-resistant *Staph. aureus* cases.

Different imaging modalities are useful at differing stages of the disease. Ultrasound

Figure 2. Magnetic resonance image showing muscle oedema surrounding an abscess within the adductor muscles.



Case Report

A 46-year-old male runner presented to the acute orthopaedic take complaining of sudden onset left hip pain, with no obvious exacerbating factors. His examination was essentially normal except for restricted flexion (90°) and adduction past neutral caused pain. He was otherwise systemically well with no pyrexia and had mildly raised levels of C-reactive protein 48 mg/litre and white blood cells 12×10^9 /litre. A diagnosis of muscle strain was made, but because of the ongoing pain and slight elevation in inflammatory markers, a computed tomography scan was arranged to rule out infective processes (e.g. psoas abscess). The computed tomography was negative and the patient's symptoms improved; he was sent home after 2 days.

The patient was re-admitted 5 days later with rigors, diarrhoea, suprapubic and bilateral groin pain. On examination he was pyrexial, with erythema over the suprapubic area and tenderness of the abdomen. His inflammatory markers were grossly deranged (white blood cells 23.2×10^9 /litre, C-reactive protein 326 mg/litre) and thus acute cholecystitis was diagnosed and treatment commenced.

Ultrasound examination, however, demonstrated a heterogeneous fluid collection within the lower rectus abdominis muscle (Figure 1); an urgent computed tomography scan highlighted further collections within the left obturator muscles and bilateral adductors. Ultrasound-guided drainage of the rectus collection allowed for pus culture. A heavy growth of *Staphylococcus aureus* (not meticillin-resistant *Staph. aureus* or Pantone-Valentine leukocidin) was found and thus antibiotics were changed to flucloxacillin and clindamycin.

Magnetic resonance imaging was performed to further quantify the extent of the collection. Fluid sensitive sequences demonstrated the abscesses to be connected (Figures 2 and 3). Primary pyomyositis was then diagnosed.

After 22 days of intravenous antibiotics and a formal incision and drainage of the rectus abscess, the patient was discharged with near normal inflammatory markers, oral antibiotics and regular clinical follow up. In view of the abnormal presentation of pyomyositis, the patient was carefully questioned and tested for a potential source. No underlying immunocompromise was found, nor an endocrine disorder. Human immunodeficiency virus and tuberculosis testing was negative. Echocardiogram and magnetic resonance imaging spine showed no site of spread.

Follow up magnetic resonance imaging 6 months post discharge showed complete resolution of the abscess and muscle oedema. Blood tests were all normal. The patient was able to return to work and participate in family life fully. At telephone follow up after 10 months he reported that he was entering his first competitive running race post infection.

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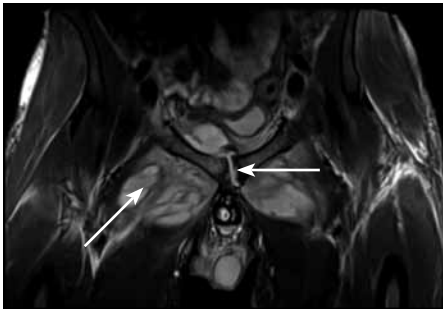


Figure 3. Magnetic resonance image demonstrating congruence between rectus and adductor abscesses.

reveals diffuse muscle swelling and oedema, even in the early phases (Chau and Griffith, 2005). Computed tomography is useful, but less accurate in the early stages and also in children (Peckett et al, 2001). Magnetic resonance imaging is the preferred modality for imaging pyomyositis, showing muscle oedema and deep collections; it also allows assessment of any subperiosteal or osseous involvement (fluid sensitive sequences or T1-weighted post gadolinium) (Long et al 1999).

Conclusions

This case highlights the vague presentation of an infrequently seen disease and demonstrates the difficulty of detection in an otherwise well man within stage 1 of the disease. The multidisciplinary team and use of multiple medical specialties is essential, as treatment within the early stages increases the possibility of a good recovery for the patient. **BJHM**

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LEARNING POINTS

- Pyomyositis should be considered diagnosis in both immunocompromised and otherwise well individuals.
- Vigorous exercise could make an individual susceptible to pyomyositis if a bacteraemia is also present.
- Early identification of a causative organism is essential to halt progression of the disease.
- Magnetic resonance imaging is the imaging modality of choice, but both computed tomography and ultrasound have a role.
- Surgical drainage of peripheral abscesses is essential (both for treatment and to allow culture of organisms).

IMAGES IN MEDICINE

Brown bowel syndrome

Brown bowel syndrome, as described by Stamp and Evans (1987), is a rare disorder of lipofuscin accumulation in intestinal smooth muscle which has been described in association with vitamin E deficiency. *Figures 1 and 2* are from a case of brown bowel syndrome occurring as a consequence of malnutrition in an alcoholic patient. They are duodenal biopsies showing smooth muscle with excessive perinuclear lipofuscin deposition, consistent with the diagnosis.

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The identification of lipofuscin deposition in a patient warrants evaluation of the nutritional status and specifically vitamin E levels.

Vitamin E provides membrane stability for mitochondria, protecting against free radical exposure during the process of oxidative phosphorylation. In its deficiency, free radicals interact with mitochondrial lipid membranes, which

degrade and allow lipofuscin accumulation in place of the membranes. This process impairs mitochondrial functioning, culminating in a loss of energy supply and leading to smooth muscle mitochondrial myopathy. **BJHM**

Stamp GW, Evans DJ (1987) Accumulation of ceroid in smooth muscle indicates severe malabsorption and vitamin E deficiency. *J Clin Pathol* **40**: 798–802

Figure 1. Brown perinuclear lipofuscin granules within smooth muscle.

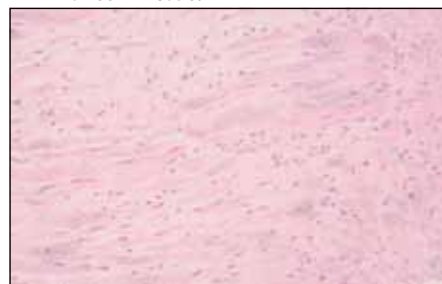


Figure 2. Lipofuscin granules seen at higher resolution.

