Online Case Report

Pyomyositis of the piriformis muscle in a juvenile

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The authors present a case of pyomyositis of the piriformis muscle. This case, the first in the English speaking literature of piriformis involvement in a juvenile, serves to illustrate the need for a high index of suspicion when treating children with symptoms related to impalpable pathology deep in the pelvis and the usefulness of MRI in early diagnosis and treatment before abscess formation. It also shows the potentially wide differential diagnosis in which the signs and symptoms may be misleading due to the close relationship of the pelvic muscles with the hip joint and adjacent viscera.

Key words: Pyomyositis – Piriformis muscle – Juvenile

Pyomyositis was once considered a tropical disease; although it is still rare in temperate climates, the incidence appears to be increasing.¹ Infection is by haematogenous spread during transient bacteraemia, the most common organism isolated is *Staphylococcus aureus*, though an organism may never be identified. Deep infection in the pelvic muscles makes diagnosis more difficult than when located in the more commonly affected quadriceps and buttock muscles. The signs and symptoms may also be suggestive of other conditions such as septic arthritis of the hip or appendicitis, which may potentially delay diagnosis.²

Pyomyositis of the obturator internus muscle in children has been described in the English speaking literature;³ it has not, to our knowledge, been reported in the piriformis muscle.

Case report

A 14-year-old Caucasian boy was admitted with an 8-day history of intermittent fever, right buttock and thigh pain, made worse on walking and bending, lower abdominal pain with loose stools and general malaise.

There was no history of foreign travel or trauma and he was previously fit and well. His general practitioner had prescribed oral co-amoxycylav on an empirical basis.

On admission, he had a swinging pyrexia up to 40°C with tachycardia. There was no tenderness around the right hip or buttock and a full range of movement in the hip, which beyond 60° flexion was very painful. Abdominal examination revealed only vague lower abdominal tenderness, worst in the right iliac fossa. Rectal examination was normal. There was no neurological deficit in the lower limbs and straight leg raise testing led to increasing posterior thigh pain, to the level of the popliteal fossa.

Pelvic radiographs were normal, white cell count was $15.9 \times 10^3 \text{ mm}^{-3}$ and C reactive protein (CRP) 79 mg/l (normal < 3 mg/l); blood culture was sterile.

The initial working diagnosis was of intrapelvic abscess and a computed tomography (CT) scan was performed. This showed a large, ill-defined mass at the right greater sciatic notch, extending up to the sacral alar and abutting the rectum and bladder (**Fig. 1**) The mass extended into the first sacral foramen, obscuring the first sacral nerve root.

Magnetic resonance imaging (MRI) revealed abnormal high signal on the T2 weighted images (**Fig. 2**) and

Figure 1 Computed tomography scan of the pelvis showing the piriformis mass passing through the right greater sciatic notch, abutting the rectum and bladder.

Figure 2 T2 weighted coronal MRI scan of the pelvis and abdomen showing abnormal increased signal in the infected right piriformis muscle.

Figure 3 T1 fat-saturated MRI scan with gadolinium of the pelvis in the coronal plane illustrating the extension of infective process around the right lumbar nerve roots and erector spinae musculature.

peripheral enhancement with gadolinium of the piriformis muscle on fat-saturated T1 weighted images (Figs. 3 and 4). These features are diagnostic of pyomyositis of the piriformis muscle, in this case extending up to the erector spinae muscles and around the right lumbar nerve roots, accounting for the radicular type symptoms. There was associated bone marrow oedema of the sacral alar though no signs of frank pus or osteomyelitis.

In the absence of a collection requiring drainage, intravenous flucloxacillin and ampicillin were initiated. Intravenous antibiotics were continued for 7 days during which the pyrexia resolved, white cell count and CRP levels returned to normal and the patient improved clinically, allowing comfortable mobilisation. He was discharged 17 days after admission and remains well, with an entirely normal repeat MRI scan at 3 months.

Figure 4 T1 fat-saturated MRI scan with gadolinium of the pelvis in the axial plane showing relationship of the infected right piriformis mass to the pelvic viscera.

Discussion

Pyomyositis is rarely seen in temperate climates, although its incidence is increasing,¹ being seen frequently in Africa and the South Pacific. It most commonly affects the quadriceps (26.3%), iliopsoas (14%) and buttock (10.8%) muscles. *S. aureus* and *Streptococcus* spp. are the most commonly isolated organisms.² Transient bacteraemia is the usual source although haematogenous spread from a remote infection has been reported.⁴ In the English speaking literature, there are reports of childhood pelvic pyomyositis of the obturator internus³ and iliacus muscles,⁵ though no reports of pyomyositis of the piriformis muscle. There are two reports of piriformis involvement in adulthood, one of which followed childbirth with epidural anaesthesia.^{6,7}

An early diagnosis is desirable to prevent progression from the initial inflammatory stage of the infection to abscess formation and then to systemic sepsis and septic shock. Unfortunately, diagnosis is often delayed due to the rather non-specific physical signs and the suggestion of rather more common pathologies, such as septic arthritis of the hip joint⁸ or appendicitis.^{9,10} In this case, we surmise that the loose stool and right iliac fossa pain was due to irritation of the rectum by the encroaching inflamed muscle, mimicking appendicitis. The free movement of the hip joint in all positions except flexion and the predominance of buttock and posterior thigh pain made septic arthritis unlikely. Irritation of the exiting sacral nerve roots or the sciatic nerve at the greater sciatic notch may have accounted

for the posterior thigh pain. This was not extension from osteomyelitis as the clinical history was too short and there was no evidence of bony destruction.

As in this case, the aetiology of primary pyomyositis is usually unclear, it has been suggested that minor trauma to a muscle and the subsequent hyperaemia of inflammation may predispose, producing a locus for implantation after unrelated bacteraemia.¹¹ This patient was a sportsman but did not report any preceding 'sprains' around the right hip prior to his illness.

In keeping with other reports of deep pelvic muscle pyomyositis,⁵ despite presentation of this case over a week following the onset of symptoms, no abscess formation had occurred. There appears to be a tendency against abscess formation despite the prolonged symptoms prior to presentation when compared to the clinical course of more superficial infections that more readily form pus; the reason for this is not known.

MRI scanning proved invaluable in making the final diagnosis and accurately locating the anatomical extent of the infection, looking for associated abscess formation, osteomyelitis and septic arthritis. We were thus able to avoid surgical treatment. CT scanning was useful as the initial investigation; however, the full extent of the infective process is more difficult to appreciate, and, as children have less body fat, planes are not as easily seen. Ultrasonography may be helpful in the diagnosis; it may also be used to guide percutaneous drainage of a collection, although it would not have helped in this particular case.

In the absence of an abscess, both the paediatric and adult literature hold antibiotic treatment as first line.² Given that the most common infecting organisms isolated are *S. aureus* and *Streptococcus* spp., antibiotics should be appropriate to these organisms and adjusted on the basis of cultures from the blood or muscle itself. If an abscess is present, then drainage either at open operation or by the percutaneous route is recommended.

Conclusions

This case highlights pelvic muscle pyomyositis as a cause of fever, deep pain around the hip and sciatic nerve irritation which may mimic other conditions and produce rather non-specific symptoms. Its successful treatment depends on early diagnosis, which requires a high index of suspicion and the use of advanced imaging techniques, particularly MRI. This is in keeping with the advice of McNicol¹² in his review of the treatment of musculoskeletal infection in childhood. Treatment is non-operative in the absence of an abscess which, despite presentation several days after the onset of symptoms, is often the case.

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