Case report

Hip adductor pyomyositis from *Streptococcus mitis* in a four-year-old child Metin Tolga Buldu*, Raghu Raman¹

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ABSTRACT

The unique aspect of this case study is the unusual history, presentation, ultrasonography, MRI and blood culture results, which lead to the diagnosis and treatment of adductor pyomyositis with a rare organism in a temperate country. The patient presented with a one-day history of malaise, fever, left groin pain and inability to weight bear on the left leg. There was no history of any trauma, predisposing infections or recent travel. Plain radiograph and ultrasound of the hip was normal with no effusion. Two consecutive blood cultures suggested *Streptococcus mitis* bacteraemia and MRI scan confirmed pyomyositis of the left hip adductors that was too small to drain. *S. mitis* is a normal commensal organism however it can lead to opportunistic infections particularly endocarditis. Echocardiogram revealed no cardiac complications, in particular no endocarditic vegetation. Patient was treated with intravenous benzylpenicillin for a week followed by oral phenoxymethylpenicillin for a week. Adductor pyomyositis must be considered as a differential diagnosis in a child with unusual presentation of hip pain. When an ultrasound is normal, MRI scan is warranted to confirm diagnosis. Septic screen should include blood cultures. The commonest causative organisms are the Staphylococcus family. However if *S. mitis* is isolated, cardiac sources of infection resulting in septic emboli must be investigated. Repeated MRI scans are required particularly if the patient does not respond to medical management.

Level of evidence: IV.

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1. Introduction

Primary pyomyositis is a rare deep subacute haematogenous intramuscular pyogenic infection of striated skeletal muscle, not secondary to contagious infection from adjacent skin, bone, soft tissue, neighbouring tissue or direct penetrating injury.^{1–7} Pyomyositis is endemically seen in countries with a tropical climate.^{3,4} Cases of pyomyositis was seen rarely in temperate countries but has shown an emerging incidence.^{3,8} It is unclear if there is a true increase in the incidence of pyomyositis in temperate countries or it is due to the pathology being recognised more often with modern imaging techniques such as MRI.^{3,7} Early diagnosis is challenging with reasons including late presentation, physicians' unfamiliarity with this rare disease and mimicry to other irritable hip syndromes.

2. Case report

A four-year-old boy with a one-day history of left groin pain, inability to weight bare, limping and fever. He had prodromal symptoms of nausea and vomiting a day prior admission. There was no history of trauma and was otherwise fit and well.

Upon examination, he was pyrexial at 39°, there was neither lymphadenopathy nor any other signs of infection. His left hip was held in flexion, with a range of motion between 10° and 90° beyond which it was painful. Extremes of abduction beyond 40°, adduction beyond 15° caused hip pain as did both internal and external rotation that was only possible to the first few degrees. There was no swelling or redness externally of the hip joint. Knee examination was unremarkable. There was no distal neurovascular deficit in the limb.

Blood tests revealed a white cell count (WCC) of $13.1 \times 10^9/L$, neutrophil count (NC) of $9.06 \times 10^9/L$ and C-reactive protein (CRP) of 69 mg/L indicative of an acute infection. Two consecutive independent blood cultures were positive for growth of *Streptococcus mitis* (*S. mitis*) sensitive to penicillin.

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Fig. 1. MRI – axial T1 fat sat post gadolinium.

A plain anterior-posterior (AP) X-ray of the pelvis showed no pathology. A musculoskeletal radiologist performed targeted ultrasonography (US) of the left hip and knee joints, which showed no effusion or any evidence of sepsis. Due to the persistence of patient's symptoms the following magnetic resonance imaging (MRI) techniques of the pelvis and knee were performed; sagittal T1, short T1 inversion recovery (STIR), post gadolinium T1 fat saturated Axial (Fig. 1) and coronal sections (Fig. 2), axial T2 (Fig. 3) and T2 FFE (Fast Field Echo) (Fig. 4). Results indicated there was a prominent oedema in the left adductor muscles with a non-enhancing area, which was very likely to be a small abscess at its widest point no larger than 1 cm in diameter, but was too small to be drained percutaneously.

Since *S. mitis* is commonly associated with infective endocarditis, the patient was reviewed by the paediatric cardiologist and echocardiogram was performed. There was no evidence of infective vegetations on the heart valves as a source of embolic spread and no other cardiac concerns.

Patient was managed with intravenous (IV) benzylpenicillin 50 mg/kg QDS for 7 days. Patient was discharged on the 8th day of admission and antibiotic treatment was then switched to oral phenoxymethylpenicillin 125 mg QDS for a further 7 days, following which he made a full recovery with no complications.

Fig. 2. MRI – coronal T1 fat sat post gadolinium.

Fig. 3. MRI – axial T2.

To the best of our knowledge this is the first case of pyomyositis of the hip adductors caused by *S. mitis* in a 4-year-old boy.

3. Discussion

Clinical history and examination findings are key to confirming diagnosis. This case was of particular interest since the pathology, organism, and site of infection were all rare. Previously pyomyositis of the adductor muscle have been reported in a child the age of 8⁹ and Hasemi et al. reported pyomyositis in the hip abductors of a 15-year-old girl.² Chen et al. reported the occurrence of bilateral hip adductors in a 17-year-old child suffering from chronic myeloid leukaemia.¹ But none were due to a *S. mitis* infection.

The most common causative organism of primary pyomyositis is *Staphylococcus aureus*,^{1,6–8} followed by Beta Haemolytic Group A Streptococcus,^{2,3,7} *Escherichia coli*,^{2,3,7} *Neisseria gonorrhoeae*^{2,8} and *Streptococcus pyogenes*.^{2,8} *S. mitis* is a commensal bacteria that normally resides in the oropharynx, upper respiratory tract, skin, gastrointestinal and the urogenital tracts.¹⁰ *S. mitis* is a member of the viridians group of streptococcus that are gram positive, catalase negative, form chains upon microscopic inspection and are an alpha hemolytic strain.¹⁰ Virulence and pathogenicity of *S. mitis* is low but can cause opportunistic infections^{4,10} and is most commonly associated with infective community acquired endocarditis.¹⁰ Hence cardiology input and an echocardiogram must be requested to rule out cardiac vegetations.

Diagnostic tests which include raised C-reactive protein (CRP),^{6,8} raised erythrocyte sedimentation rate (ESR),^{2,6} leukocytosis,^{2,3} neutrocytosis⁴ and positive blood cultures.^{4,6}

The imaging sequence is plain radiographs followed by US and then an MRI if US is negative.⁷ Although the gold standard for diagnosis is aspiration of pus from the muscle affected.⁵ It is usually diagnosed using contrast (gadolinium) MRI,⁷ which is the

Fig. 4. MRI – axial T2 fast field echo.

imaging gold standard for the radiological diagnosis of pyomyositis as fluid collections can be identified,⁷ as seen in this case. Images can reveal anatomical site, extent of disease and stage of illness.^{2,3} Furthermore, MRI also aids to rule out other differential diagnosis, early diagnosis can help to avoid unnecessary surgical intervention or assist with it when required.⁷

Treatment recommendation depends on the stage of infection.^{1–5} When diagnosed at the early diffuse inflammatory phase these infections respond well to conservative antibiotic treatment⁷ and may negate the need for surgical debridement and drainage.⁸ Systemic aggressive antibiotic treatment should be continued regardless of surgical input, to prevent further dissemination of the infection until symptoms clear.³ Due to the mimicry between pyomyositis and septic arthritis in the hip, Weinberg et al., warns surgeons with respect to hip aspiration and arthroscopy.³ Since penetration through an area of infected pyomyositis will lead to iatrogenic spread to a previously sterile joint.³

Once the abscess is formed it may need incision, irrigation and debridement alongside antibiotic treatment.⁶ Surgical drainage can be performed via CT or US guidance.^{1–5} Open surgery is reserved for abscess inaccessible to percutaneous drainage.⁷ Unfortunately if the infection reaches the extensive muscle necrosis and septic shock phase, management will require surgical drainage, debridement, aggressive antibiotic treatment and intensive care input.⁶

Broad spectrum antibiotics should be started until specific bacterial cultures and sensitivity is available^{2,8} from aspiration or blood cultures,⁴ similar to this case. If the patient does not respond to surgical or antibiotic treatment then a complete reassessment must be performed to identify the source of infection and the diagnosis.⁴ There is usually a complete recovery with no long term complications with early and appropriate treatment.

4. Conclusion

Learning points from this case are that *S. mitis* can lead to pyomyositis. If *S. mitis* is isolated cardiac complications must be ruled out. Lastly, if there is a high clinical suspicion of an infection despite US, an MRI is warranted.

Ethical approval

This is a case study and did not require ethical approval.

Informed consent

Informed consent was obtained from the responsible parent of the individual participant included in this case study.

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Conflicts of interest

The authors have none to declare.

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