Case Report

Hip abductors pyomyositis: a case report and review of the literature

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Abstract

Pyomyositis, an acute hematogenous intramuscular bacterial infection, is an unusual disease in temperate climates. We present the case of a 15-year-old girl who was referred to our centre with pain, fever, and limping. Magnetic resonance imaging and surgery showed diffuse pus collection in the hip abductor muscles. With increased incidence of this disease in immunocompromised patients in temperate areas, physicians must become familiar with its signs and symptoms to facilitate early diagnosis.

Key words: pyomyositis; hip abductors

J Infect Dev Ctries 2012; 6(2):184-187.

(Received 26 December 2010 – Accepted 27 April 2011)

Introduction

Pyomyositis is defined as an acute intramuscular bacterial infection that is secondary to hematogenous spread of a microorganism, usually *Staphylococcus aureus*, into a skeletal muscle, and which is neither result of infection of adjacent skin, soft tissue, or bone, nor due to penetrating trauma [1,2]. Pyomyositis is a disease of tropical regions and seen more in healthy children. However, during the past 30 years, its incidence in temperate climates has been increasing due to large numbers of immunocompromised patients who are susceptible to infection [3,4]. Typically most pyomyositis cases involve only a single muscle group especially around the hip [1].

Delay in diagnosis, particularly in temperate areas, occurs frequently as a result of ambiguous presentation, non-specific differential diagnosis, a variety of clinical presentations, its relative rarity, and the unfamiliarity of physicians with the disease [5].

According to our knowledge, this report describes the first documented case of pyomyositis in Iran. Also, we were unable to find any report in the literature that observed involvement of the hip abductor muscles, as is documented in this case.

Case report

A15-year-old girl with a limp and inability to walk was referred to our centre. She had a history of pain in her right hip and fever which began three weeks prior to admission.

Physical examination revealed body temperature of 38.8 C°, local swelling, and hotness of the proximal right thigh region with limited motion in the hip joint. Laboratory data indicated leukocytosis (18300 / μL), high sedimentation rate (84 mm/hr), positive C-reactive protein (96 mg/L), and normal creatine phosphokinase levels. Viral markers including Hbs Ag, anti HCV Ab, and anti HIV Ab were also negative. Plain radiographs were normal. Magnetic resonance images of the proximal right thigh and hip showed an enlarged lobulated mass with hyperintense changes in T2-weighted images in the area of abductor muscles; these observations were consistent with an abscess, muscle infarction, or a soft tissue tumor (Figures 1 and 2).

During hospitalization, intravenous antibiotics (ceftazidime plus vancomycin) were started and the patient was scheduled for surgical debridement and biopsy. After making a true lateral incision above the swollen area of the right thigh, pus (about 500cc) was drained diffusely from the fascia of the hip abductor muscles. Debridement of necrotic parts of the abductor muscles and irrigation were performed. *S. aureus* was cultured from the pus; the microbe was sensitive to vancomycin and cefixime by disk diffusion. Intravenous antibiotic therapy was continued for 14 days. Muscle rehabilitation exercises and ambulation were started the day after

the operation. The patient became well with negative C-reactive protein levels resulting post-surgically. Patient history as well as work-ups performed by a pediatric immunologist indicated that she was not immunocompromised. We could not find the exact source of the infection; however, occult hematogenous bacteremia was suspected. She was prescribed cefixime and clindamycin as oral antibiotics for one month. At a six-month follow-up visit, the patient was healthy, but residual limp was evident.

Discussion

Pyomyositis is an endemic disease in tropical regions; hence the name "tropical pyomyositis". Reports of cases from temperate climates have been increasing over the past decades, [6]. Patients in these regions usually are immunocompromised or have an underlying chronic disease.

Typically a single muscle group is involved, especially in deep layers of the thigh, the hip, and the pelvis. More diffuse patterns are reported in 10 to 20% of cases [1,3]. Literature reports differ on the most common site of pyomyositis. Bickels *et al*. noted that the quadriceps are the most usual place (26.3%) followed by iliopsoas (14%) [7]. The quadriceps and gluteus muscle groups are the most commonly affected according to Crum-Cianflone [1]. Theodorou *et al*. documented that a solitary abscess in the quadriceps musculature is the most common pattern of the disease [8]; however, others have shown that the obturator internus is the most commonly affected (62% of patients) muscle group [9].

We found some reports in the literature with hip abductor involvement such as those described by Poujois *et al*. [10] and Unnikrishnan *et al*. [9]. Hip abductors in these reports are involved as a diffuse muscle pattern, but the presented case is unique due to its single muscle group involvement.

S. aureus is most often the causative pathogen, affecting 90% of the patients in tropical areas and 60% to 70% of cases in temperate regions. Beta hemolytic group A Streptococcus is the next most common cause (*Streptococcus pyogenes*), followed by *Escherichia coli* [1,2,9]. Methicillin-resistant *S. aureus* species have been increasing in frequency recently [5] after its first detection in Singapore in 1996 [11]. We considered it in our treatment plan.

A variety of predisposing factors were described, including residence in a tropical area, immunocompromising conditions (human immunodeficiency virus infection, diabetes, cancer, rheumatologic diseases), intensive exercises, local trauma, intravenous drug abuser, concurrent viral or parasitic infections, atopic dermatitis, malaria, nutritional deficiency, and even hepatitis B carrier status [1,2,5,12,13].

Limping and the inability to bear weight are the first clinical presentations of pyomyosistis [9]. The clinical course of disease can be divided into three stages [14]. The first stage or invasive phase occurs during the first two or three weeks after infection, with subacute presentation such as local swelling, mild pain, variable fever, and anorexia. Diagnosis in this stage is difficult due to multiple differential diagnoses. During the second or suppurative phase, definitive abscess and pus are clearly evident. High fever, chills, local tenderness, swelling, and myalgia are frequent findings. It should be noted that local erythema and regional adenitis are usually absent in pyomyositis [1]. The third stage of the disease is so severe that even toxic shock syndrome has been reported [15].

Laboratory data are not specific for pyomyositis. Leukocytosis and an increase in the erythrocyte sedimentation rate are often seen. Neither may be observed in patients with neutropenia or end stage acquired immunodeficiency syndrome. Eosinophilia is reported only in tropical cases and may be due to a parasitic cause of infection [1,2]. Interestingly, creatine phosphokinase and aldolase levels remain normal. Blood cultures are positive in only 5% to 30% of patients and culture of aspirated pus has been reported as negative in 15% to30% of cases [2,16].

Magnetic resonance imaging is the most precise technique to use in determining the exact location and defining the extent of the disease [17] and it plays a pivotal role in early diagnosis. MRI findings range from muscle swelling, enlargement, and edema with hyperintense signal on T2-weighted images in the early stages to abscess formation with rim enhancement after injection of contrast in late stages. Subcutaneous edema and unorganized phlegmonous collections may be seen in soft tissues around the infection site [8].

One of the main causes of delayed diagnosis is that several differential diagnoses are possible, including tumors, osteomyelitis, muscle infarction, hematoma, muscle strain, thrombophlebitis, cellulites, septic arthritis, transient synovitis, sciatica, and epidural abscess [1,9,18-20]. MRI can help in differentiating some of them; therefore, it can be

Figure 1. Mass-like lobulated lesion in superolateral part of right femoral neck

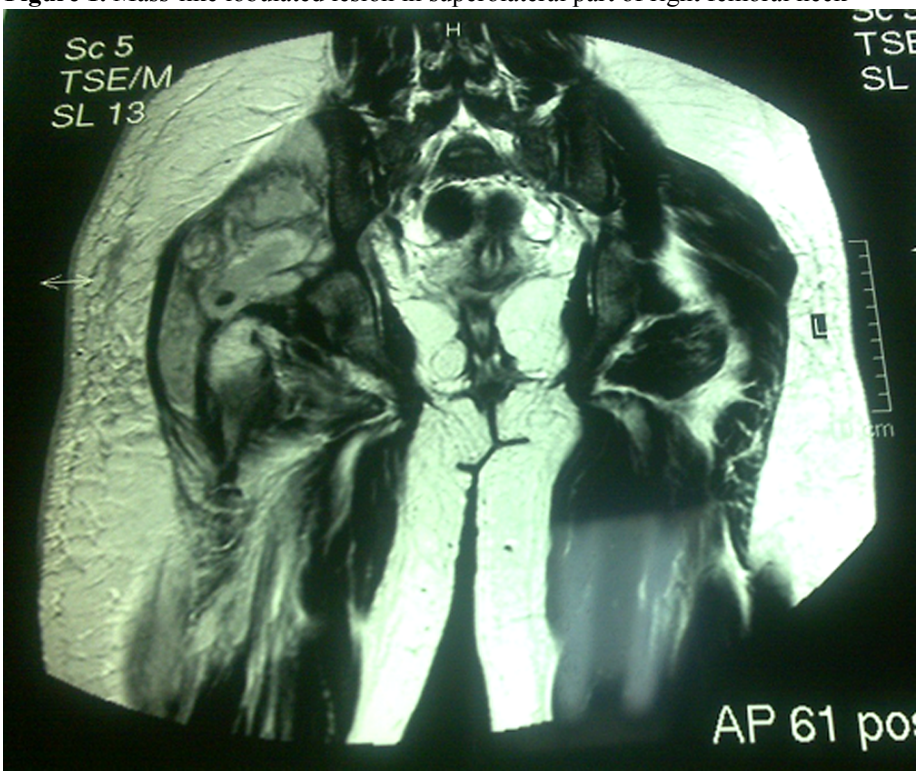
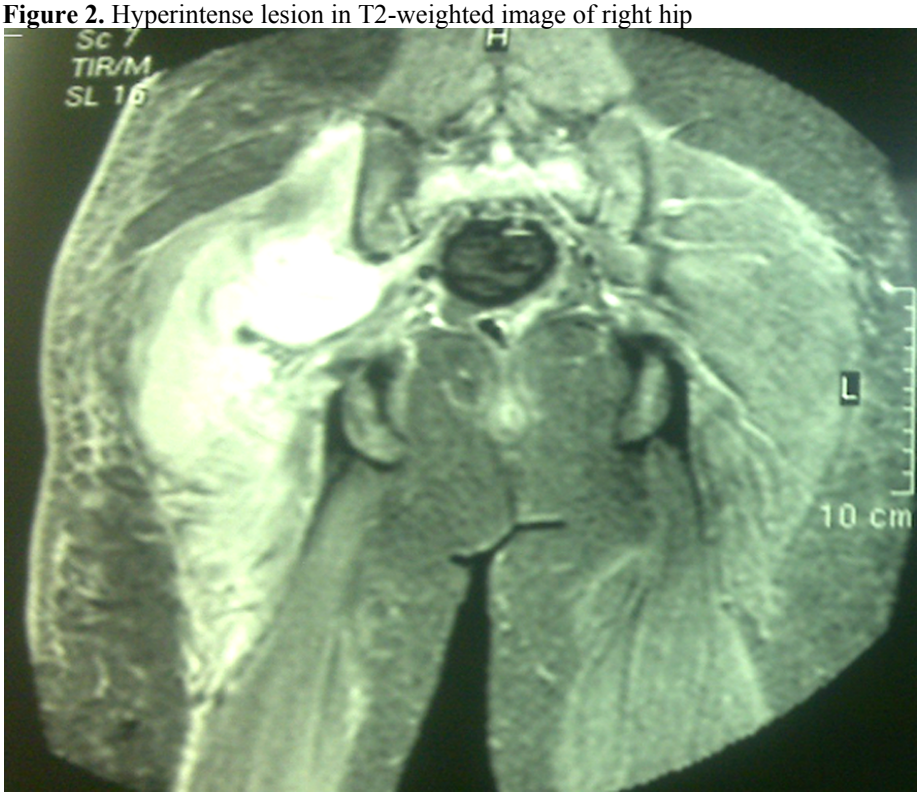


Figure 2. Hyperintense lesion in T2-weighted image of right hip



recommended for any patient presenting with these symptoms.

Pyomyositis can be effectively treated by antibiotic therapy in the first stage of disease, but during the later stages, drainage should be initiated early and serve as the main component of therapy, either by percutaneous computed tomography (CT) or ultrasound-guided drainage or by open surgery. Due to the risk of methicillin-resistant *S. aureus* in some countries, vancomycin should be prescribed as the first choice of antibiotic therapy. Broad spectrum antibiotics for targeting a wide-range of gram-negative and anaerobic pathogens should be added to the vancomycin regimen for immunocompromised patients. Intravenous antibiotics should be injected for the first one to two weeks, then substituted by oral antibiotics for a total of four to six weeks [1,2,4,7].

Prognosis is good after early treatment with mortality rates ranging from < 1% to 4%. Recurrences may occur in immunocompromised patients or those with atypical infections such as mycobacterium or *Salmonella* [1,3].

Conclusion

Pyomyositis is a rare infection in Iran, although its incidence in temperate climates is becoming more common. Physicians in these regions should be familiar with this disease to better recognize and manage patients and prevent major complications.

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Conflict of interests: No conflict of interests is declared.