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CASE REPORT

Bilateral thigh pyomyositis in an otherwise healthy middle-aged woman: A case report

Min Cui, Gang Zhang, Na Zhang, Lei Han, Zai-Qi Ma

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Abstract

BACKGROUND

Pyomyositis generally occurs in otherwise healthy young men. Because this condition is unusual among otherwise healthy women in temperate climates, we present the following case.

CASE SUMMARY

An otherwise healthy 43-year-old woman presented with bilateral pain in her lower extremities and fever. Magnetic resonance imaging (MRI) findings were indicative of myositis with a possible abscess. We initiated empirical antibiotic therapy with ceftriaxone. However, the swelling and pain in her legs persisted even after 7 d of treatment. Contrast MRI revealed multiple pockets of pus in the vastus lateralis and gluteal muscles. We performed needle aspiration of these abscesses with ultrasound guidance and local anesthesia. Upon culturing, the purulent material was positive for *Staphylococcus aureus*. We diagnosed her with *S. aureus*-induced pyomyositis of the vastus lateralis muscle and gluteus region. Based on the antibiotic sensitivity report, ceftriaxone was administered for an additional 7 d. By day 15 post-drainage, the patient was able to start walking. Oral antibiotic therapy was continued for 1 wk following her discharge from hospital, after which her symptoms resolved completely.

CONCLUSION

Pyomyositis may present with muscle pain, swelling, and fever. Ultrasound-guided percutaneous puncture and drainage may enable timely diagnosis and treatment.

Key Words: Pyomyositis; Endoscopic ultrasound-guided fine-needle aspiration; Staphylococcus aureus; Climate; Magnetic resonance imaging; Case report

Core Tip: Pyomyositis generally occurs in otherwise healthy young men. We report a case where pyomyositis occurred in an otherwise healthy 43-year-old woman in a temperate climate. This case is unusual because, in temperate regions, pyomyositis usually occurs in immunocompromised patients, such as those with diabetes mellitus. Owing to its rarity in temperate climates and its presentation being characterized by non-specific signs and symptoms, its diagnosis and treatment can be delayed, which can lead to septic shock and death. We hope that our report will help raise awareness and guide the future treatment of patients with pyomyositis.

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INTRODUCTION

Pyomyositis is a bacterial infection of skeletal muscle, usually caused by hematogenous dissemination and often accompanied by abscess formation. Tropical myositis, a suppurative disease, mainly affects children aged 2–5 years and adults aged 20–45 years, whereas pyomyositis in temperate climates mainly affects adult men with coexisting conditions. The reported incidence of pyomyositis in temperate climates has been increasing, owing to the increased use of diagnostic imaging. Pyomyositis generally occurs in otherwise healthy young men, manifesting as muscle swelling, marked tenderness, and indurated muscle swelling that progresses to woody induration of the muscle and overlying tissues[1]. Because this condition is unusual among otherwise healthy women in temperate climates, we present the following case.

CASE PRESENTATION

Chief complaints

A 43-year-old woman, 156 cm in height and 69 kg in weight, who was employed as a cashier in a bakery, was admitted to the department of pain medicine for pain in both of her legs.

History of present illness

The pain had persisted for 3 d, with substantial movement restriction. The patient denied any history of trauma or vaccine injection. She had initially undergone an ultrasound examination of her lower limbs, which had ruled out arteriovenous thrombosis. Despite receiving therapy comprising non-steroidal anti-inflammatory drugs and rest, under the assumption that her pain was caused by muscle strain, the pain and swelling increased and the patient developed a fever and chills.

History of past illness

The patient had no history of diabetes.

Personal and family history

The patient did not report having experienced any injury or trauma, and had no recent history of infection, foreign travel, or immunosuppression.

Physical examination

We admitted the patient to investigate the etiology of her fever and pain. Upon physical examination her temperature was 39.1°C, pulse rate was 90 beats/min, and blood pressure was 100/65 mmHg. Her visual analog scale score was 8 cm. No wounds or breaks in the skin were noted on her lower extremities. She had tenderness in both her thighs and left knee joint, as well as in her bilateral gluteus media and small gluteus muscles. Both of the patient's thighs were swollen and had a sensation of warmth, although no erythema, ecchymosis, or fluctuance were noted in these areas. Respiratory, neurological, and cardiovascular examination results were all normal.

Laboratory examinations

A hematological examination conducted upon the patient's admission to hospital revealed leukocytosis [white blood cell (WBC) = 19.67 × 10^9/L] and neutrophilia (neutrophils = 17.92 × 10^9/L; 91.1%). Her hemoglobin concentration was 83 g/L, C-reactive protein (CRP) concentration was 192 mg/L (normal value: < 7 mg/L), erythrocyte sedimentation rate (ESR) was 96 mm/h (normal value: < 20 mm/h), and her creatine kinase concentration was 306 IU/L (normal value = 24–170

IU/L). Routine urine and stool cultures, liver and kidney function, electrolyte levels, and myocardial enzyme profile were all within the normal range. Tests for autoantibodies associated with rheumatic diseases were negative.

Imaging examinations

Plain radiographs revealed no bony abnormalities of the knee joint. A lower limb venous ultrasonography excluded phlebothrombosis. A computed tomography (CT) scan of the thorax, abdomen, and pelvis revealed no abnormalities. As we suspected that the patient might have pyomyositis, magnetic resonance imaging (MRI) was performed, which revealed widespread infiltrative edema within the vastus lateralis muscle, indicative of myositis with a possible abscess. We observed no signs or symptoms of knee joint effusion, osteomyelitis, or infiltration.

Initial treatment, responses, and further examinations

After obtaining blood cultures, we started the patient on empirical antibiotic therapy with ceftriaxone. She remained febrile during her first 3 d of hospitalization, and after 4 d of antibiotic treatment her temperature decreased to normal levels. Blood cultures taken upon presentation revealed no growth after 3 d. Subsequent laboratory tests revealed improvements in leukocyte (11.31 × 10^9/L) and neutrophil (9.06 × 10^9/L) concentrations.

Because we suspected that the patient might have pyomyositis and as 7 d of antibiotic treatment alone did not significantly relieve the swelling or pain in her legs, a repeat MRI of the thighs and hip joint was performed with enhanced contrast. This revealed multiple pockets of pus in the vastus lateralis and gluteal muscles (Figure 1). We performed needle aspiration of these abscesses with ultrasound guidance and local anesthesia, draining about 40 mL (30 mL from the left leg and 10 mL from the right) of purulent material. The purulent content was sent for culturing. The patient's condition improved after aspiration. Physical examination revealed a reduction in muscle tenderness and localized indurations. A follow-up ultrasound done 3 d after aspiration revealed the accumulation of residual fluid measuring 1.5 cm × 1.2 cm. The patient declined a second round of aspiration. *Staphylococcus aureus* was observed in the aspiration culture.

FINAL DIAGNOSIS

In the end, the patient was diagnosed with *S. aureus*-induced pyomyositis of the vastus lateralis muscle and gluteus region.

TREATMENT

Based on the antibiotic sensitivity report, ceftriaxone was administered for an additional 7 d.

OUTCOME AND FOLLOW-UP

By day 15 post drainage, the patient was able to start walking. Laboratory tests revealed a decrease in her WBCs (within the normal range), ESR (59 mm/h), and CRP concentration (6.2 mg/L). Oral antibiotic therapy was continued for 1 wk after the patient was discharged. The total duration of therapy was 3 wk. Subsequent follow-up visits revealed a gradual relief of her symptoms. By her 4-mo follow-up visit, her ESR and CRP concentration had normalized. The patient experienced complete resolution of her symptoms and had no further complaints.

DISCUSSION

Pyomyositis affects the skeletal muscles, manifesting as high-grade fever with pain in the affected limbs. It is generally considered a tropical infectious disease that affects otherwise healthy children and adults, but it has also been diagnosed with increasing frequency in other parts of the world since the 1970s, with the spread of routine diagnostic imaging tests [2]. The pathogenesis of tropical myositis remains unclear, although it may be related to trauma, parasites, nutritional deficiencies, and viruses.

As this disease is relatively rare in temperate regions and its early presentation is characterized by signs and symptoms that are not very specific, pyomyositis is usually not added to differential diagnoses of muscle pain and swelling until patients fail to respond to treatments of the alternative diagnoses. The case we report here is unusual, as the patient was an otherwise healthy, middle-aged woman with an unremarkable medical history. The muscles involved in pyomyositis are usually deep, so typical inflammatory manifestations may not be visible on the surface. Therefore, pyomyositis should be differentiated from osteomyelitis, malignant tumors, hematoma, septic arthritis, deep vein thrombosis, and thrombotic phlebitis. When pyomyositis is not promptly and properly treated, serious complications such as muscle abscesses, cerebral abscesses, renal failure, septicemia, and death may occur[3,4].

Pyomyositis is characterized by fever, local swelling, and pain. In severe cases, it can lead to shock and death. The large muscle groups of the pelvic girdle and lower extremities are the most common sites of infection. The thigh muscles,

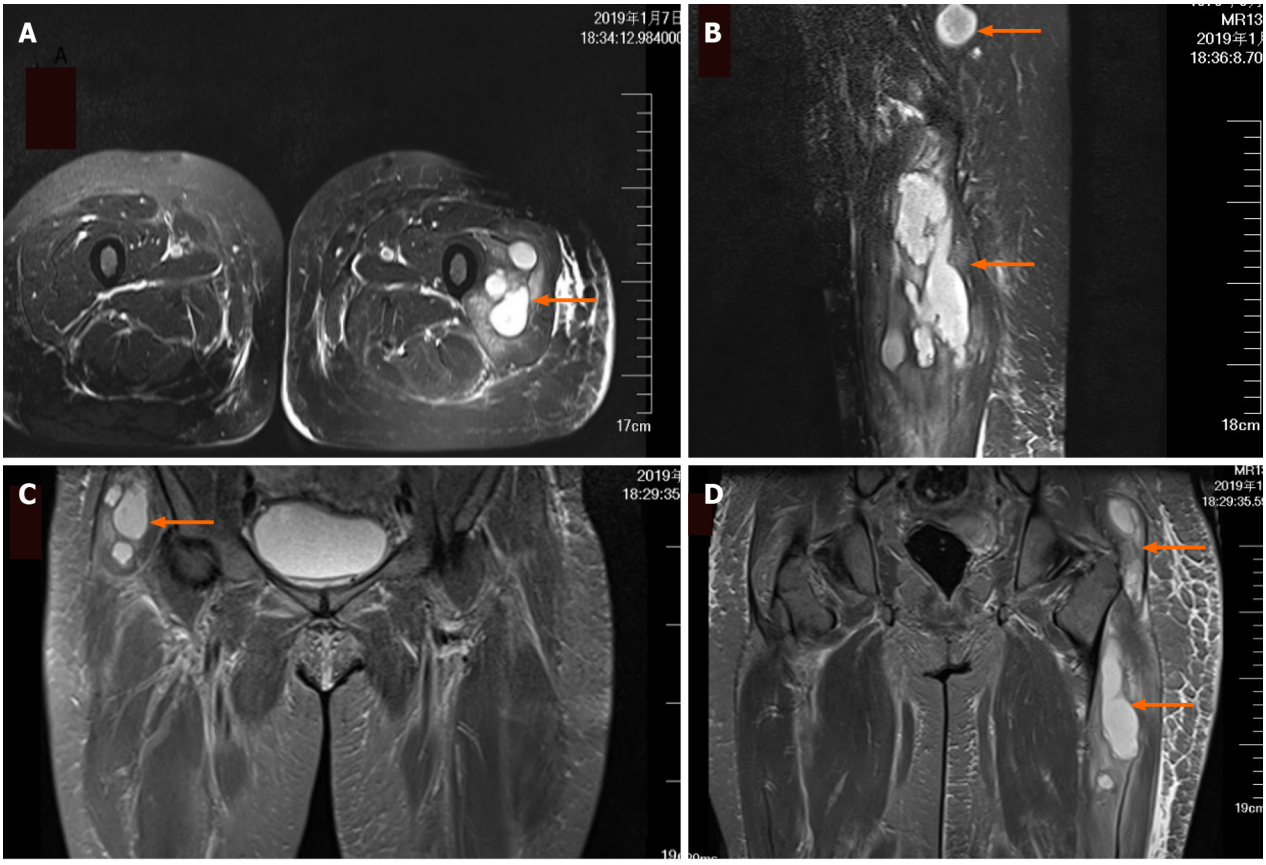

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Figure 1 Abscess (arrow) in the gluteal and quadriceps muscles as visualized by T2-weighted magnetic resonance imaging. A: Axillary view; B: Sagittal view; C and D: Coronal view.

particularly the quadriceps (26%), are the most commonly affected muscles, followed by the iliopsoas (14%) and gluteal (10%) muscles[2,5]. The gold standard for the diagnosis of pyomyositis is MRI[6]. In the present case, the patient exhibited swelling and warmth in her thighs, and the final diagnosis was *S. aureus*-induced pyomyositis, based on the results of an MRI and aspirated fluid cultures. In patients with pyomyositis, blood cultures are usually negative, whereas aspirated fluid cultures are usually positive. In > 85% of cases, *S. aureus* is the causative organism[3,7].

The principle treatment for suppurative pyomyositis is surgical incision and drainage combined with intravenous antibiotic administration for 2–3 wk. Such drainage can be performed *via* open surgery, aspiration under ultrasound or CT guidance, or percutaneously. Pyomyositis has been described as having three stages: Invasive, suppurative, and septic, representing a gradual progression from diffuse inflammation to focal abscess formation to a septic state[8]. By the time the disease has progressed for 2–3 wk, suppuration becomes apparent. At that stage, puncture aspiration of the local abscess can be performed. Percutaneous abscess drainage combined with antibiotic therapy is an effective method for the treatment of tropical pyomyositis (also in the suppurative phase). Such drainage can shorten the duration of antibiotic use and hospital stay[9].

The patient in this case was treated with 2 wk of intravenous ceftriaxone, followed by oral antibiotic therapy for 1 wk. As the infection was rather advanced, we performed needle aspiration with ultrasound guidance of the vastus lateralis muscle and gluteus abscess, under local anesthesia. The patient's condition improved following aspiration. No clear guidelines exist for the duration of such antibiotic treatment, but most experts recommend a combination of intravenous and oral antibiotics for 3-8 wk, regardless of whether the abscess is drained[10]. The duration of therapy for our patient was 3 wk. Surprisingly, pyomyositis rarely requires amputation compared to necrotizing fasciitis and myonecrosis. Even when muscle damage is severe, residual deformities and dysfunction are rarely observed. At the 4-month follow-up visit, our patient exhibited complete resolution of her symptoms and had no further complaints.

A preprint of this report was previously published (Min *et al*[11], 2022).

CONCLUSION

The clinical manifestations of pyomyositis, such as muscle pain, swelling, fever, and leukocytosis, can be treated *via* ultrasound-guided percutaneous puncture and drainage. This can aid its diagnosis, facilitating timely treatment and improving the prognosis. We hope that this report will help guide the future treatment of patients with pyomyositis.

FOOTNOTES

Author contributions: Cui M contributed to manuscript writing (original draft preparation); Zhang G contributed to conceptualization; Zhang N contributed to visualization; Han L contributed to investigation; Ma ZQ contributed to manuscript writing (reviewing and editing); all authors have read and approved the final manuscript.

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