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Case Report

Psoas abscess caused by actinomycete together with Escherichia coli infection: a case report and literature review

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Abstract: Psoas abscesses are classified into primary or secondary according to infectious etiology. However, the psoas abscess caused by actinomycete together with Escherichia coli infection is very rare. Here we report a case of psoas abscess caused by actinomycete together with Escherichia coli infection in a young woman. The disease was treated successfully. A literature review of psoas abscess in relation to its etiology, identification, and difficulties in the treatment is also presented.

Keywords: Psoas abscess, actinomycete, Escherichia coli

Introduction

Psoas abscess is a rare and potentially life-threatening suppurative myositis occurred in the iliopsoas compartment [1]. Typical symptoms includes fever, flank pain and limp. However, these three symptoms are rarely presented simultaneously, which makes the diagnosis of psoas abscess difficult [2]. Psoas abscesses are classified into primary or secondary infection according to infectious etiology. Primary psoas abscess is most common in developing and tropical countries. About 83% of primary abscesses occur in patients younger than 30 years old. In contrast, secondary psoas abscess is more common in Europe and the United States, usually caused by infective spndylitis, mycobacterium tuberculosis, Crohn's disease and diverticulitis. Elder patients are more predisposed to secondary psoas abscess due to increased incidence of age-related diseases such as diverticulitis [3]. However, the psoas abscess caused by actinomycete together with Escherichia coli infection is rare. Here we report a case of primary psoas abscess caused by actinomycete together with Escherichia coli infection in a young woman.

Case report

A 28-year-old woman presented right lower quadrant pain for 3 months. Episode began with no significant disposing factors, for which the patient was treated with ceftriaxone for 1 week. The right lower quadrant pain became worse for 20 days, and the patient sought further medical treatment. Vital signs were stable on presentation. In physical examination, the patient had left flank pain. On passive flexion of the right hip joint, the strength of right lower extremity muscles was graded IV. WBC count was 13,950/μL with the percentage of neutrophils, lymphocytes, eosinophils and basophils as 80.42, 12.16, 0.23 and 0.32, respectively. Erythrocyte sedimentation rate (ESR) was 108 mm/h. Contrast-enhanced magnetic resonance imaging (MRI) demonstrated a psoas abscess (**Figure 1**). Computed tomography (CT) scan showed enlarged and thickened psoas (**Figure 2**). Ultrasound of the bilateral psoas demonstrated a hypo-echoic mass sized of 11.3 × 4.4 × 6.2 cm in the right psoas. Pathological examination confirmed psoas abscess (**Figure 3**).

The patient was treated by a five-day cefazolin *IV* and later by an anterior abscess debridement.

Figure 1. Computed tomography scan demonstrated an enlarged and inhomogeneous left psoas muscle as thick as three times.

Figure 2. Contrast-enhanced Magnetic resonance images before surgery showed that left psoas abscess was about 40.6 × 81.0 × 117.9 mm. A: Coronary view. B: Axial view.

Pathologic results showed actinomycete infection. The patient was treated with anti-actinomycete drugs at high dose (1200 U penicillin) for 8 days. Due to infection of the surgical site, a re-operation was carried out 9 days later. During the second surgery, a needle-aspirated specimen of pus was sent to the lab

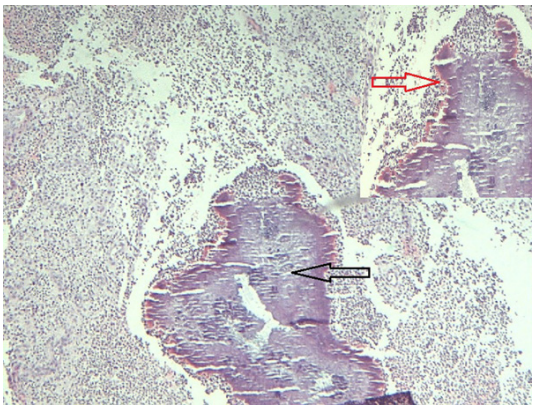

Figure 3. Hematoxylin and Eosin staining. Pus contained sulfur granules (black arrow) in form of lumps. Eosinophilic rod body spread around (red arrow), which was named Splendore-Hoeppli phenomenon.

and subjected to culture and drug sensitivity test. Based on the results of the test, we added levofloxacin in the treatment (0.4 g per day). The culture yielded growth of actinomycete and *Escherichia coli*. Immunological test showed CK8 (-), CAM5.2 (-), CD68 (+), KI-67 (sporadic+). Human immunodeficiency virus test was negative. The patient was discharged and continued treatment with 3-week course of penicillin and 2-week course of levofloxacin. There was no recurrence during the 12-month follow-up.

Discussion

Traditionally, Psoas abscess can be either primary or secondary infection. A primary abscess lacks obvious focus of infection, as shown by the current case. This patient belonged to this category. Secondary psoas abscess originates from infected adjacent tissues. The etiology of psoas abscess is unclear. In the early stage of last century, extrapulmonary mycobacterium tuberculosis was the main pathogen [4, 5].

However, with the development of Directly-Observed Treatment Strategy (DOTS) other pathogens such as *Staphylococcus aureus* account for 88.4% of primary iliopsoas abscess [6]. In a study of 142 children with psoas abscess, 57%, 40%, and 3% of patients showed right, left and bilateral abscess, respectively [7]. Recently, risk factors of psoas abscess include immunocompromise due to intravenous drug use and HIV infection [8].

Actinomycete infection is characterized by local diffusion, suppuration, granulomatous inflam-

mation, multiple abscess and fistula. It is reported that the prevalence of actinomycete infection was 2.8% (10 of 350 cases) among the intrauterine device (IUD) users [9]. In this patient, encapsulated empyema was found in the right psoas. The first pathologic examination demonstrated actinomycete, and the second culture yielded the growth of actinomycete and *Escherichia coli*. As the patient did not use IUD, the origin of the actinomycete was probably due to infection following cesarean section. As the patient was healthy before this disease occurred, it might be associated with weakened immune postpartum. Penicillin is the first line medication to treat actinomycete infection, and the treatment course up to 3-6 months is necessary to avoid recurrence of actinomycete infection.

Actinomycete infection commonly occurred as mixed infection. Pathogenic bacteria (*Escherichia coli* in this case) created anaerobic environment for actinomycete. Thus we included another antibiotics (levofloxacin) in the treatment based on bacterial culture and drug sensitivity tests. Due to the thick fibrous formed around the abscess, the local infected area cannot reach an effective antibiotic concentration. Therefore, we performed anterior abscess debridement twice. As the lesion tends to form fistula with the surrounding tissues, the operation has the risk to spread the infection. Therefore, the operations should be performed in a strict sterile condition and the treatment should be guided by bacterial culture and drug sensitivity tests. The best treatment approach for psoas abscess is therefore the combination of medical and surgical management.

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