

Primary psoas abscess confused with hip pathology

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A healthy, 14-year-old boy presented with right hip pain and consequent fever after falling out of bed while sleeping. The patient could not walk and complained of severe pain with active and passive motion, which consisted mainly in extension and internal rotation of the right hip. Laboratory analysis of the peripheral blood identified leukocytosis and increased levels of acute phase reactants. Magnetic resonance imaging of the hip, which was performed with the expectation of right hip pathology, revealed cellulitis and abscess in the right psoas muscle and associated inflammatory changes in the adjacent presacral fat plane but showed no abnormal lesions in the adjacent pelvic bone and spine. *Staphylococcus hominis* was cultured from the blood. With empirical antibiotic therapy, the patient recovered fully. We report a case of primary psoas abscess confused with hip pathology in an immunocompetent child without underlying disease. (**Korean J Pediatr 2006;49:570-573**)

Key Words : Psoas abscess

Introduction

The psoas major, which arises from the lateral borders of the T12 to L5 vertebrae, is innervated by the L2, L3, and L4 branches and is the primary flexor of the hip joint¹⁾. The psoas muscle is susceptible to infection¹⁾, due to the abundant blood supply (primary abscess as the result of hematogenous spread from occult sites of infection) and its close proximity to internal organs, such as the sigmoid colon, kidneys, spine, and iliac lymph nodes (secondary abscess as the result of infection spreading from these organs). In general, primary iliopsoas abscesses occur in patients with diabetes mellitus, intravenous drug abusers, and immunocompromised patients¹⁾. Secondary psoas abscesses are associated with a variety of intra-abdominal or retroperitoneal infections, and most commonly with Crohn's disease²⁾.

Compared with secondary abscesses in adults, psoas abscesses in children are almost always of the primary type³⁾. In children, psoas abscesses are observed frequently between 10 and 17 years of age, while they are uncommon

in infants and young children³⁾.

We report a case of primary psoas abscess, which was confused with hip pathology, in an immunocompetent child without underlying disease.

Case Report

A 14-year-old boy presented with a 6-day history of right hip pain and recent two-day fever. Six days previously, the subject had fallen out of bed while sleeping and had complained of pain in the right hip and thigh, although he felt no pain on the following day. Two days after the fall, the subject could not sit upright and limped due to severe pain in the right hip. The subject was admitted to a local clinic, where magnetic resonance imaging of the lumbar spine revealed mild disc herniation of the L4 and L5 vertebrae. Four days after the fall, the subject experienced fever of $>38^{\circ}\text{C}$ and could not rise unaided. Two days later, he was transferred to Chonnam National University Hospital (CNUH, Gwangju, Korea) with sustained fever, pain, limited motion of the right hip joint, and suspected hip pathology.

On admission to CNUH, the subject was 168 cm tall (75th percentile) and weighed 77 kg (above the 97th percentile). His past medical history was non-contributory. Vital signs were normal, except that his body temperature rose

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to 39°C within 6 hours. A general physical examination of the chest, abdomen, and pelvis showed no abnormalities. The musculoskeletal system was normal, with the exception of the right hip. The subject could not walk and complained of severe pain on active and passive motion, especially extension and internal rotation of the right hip. However, there was no swelling, abnormal warmth or palpable tender mass in the right hip. The subject had a white blood cell count of $14.4 \times 10^3/\text{mm}^3$ (85.3% neutrophils, 10.8% lymphocytes), hemoglobin level of 12.4 g/dL, and platelet count of $269 \times 10^3/\text{mm}^3$. The erythrocyte sedimentation rate and level of C-reactive protein were elevated at 71 mm/h and >20.0 mg/dL, respectively. Chest and plain abdominal radiographs showed no abnormal findings. Although the radiographs of the hip and lumbar spine revealed no abnormalities, magnetic resonance imaging (MRI) of the hip was performed, with the expectation of right hip pathology. MRI revealed cellulitis and an abscess of approximately 3×1.5 cm in the right iliopsoas muscle as well as associated inflammatory changes in the adjacent presacral fat plane, but showed no abnormal lesions in the adjacent pelvic bone and spine (Fig. 1).

Empirical antibiotic therapy was started immediately after admission, with the result that the fever abated within two days. Blood cultures on the first and second days after admission identified *Staphylococcus hominis*, while the blood culture on the third day was sterile. Although a dis-

crete abscess was identified, fine needle aspiration with imaging guidance was not performed. An abdominal computed tomography scan (CT) performed 14 days after admission showed marked improvement in the previously identified abscess in the right iliac muscle, with a residual abscess of 2×1 cm. During the third week post-admission, the patient became ambulatory and was discharged to complete an outpatient antibiotic course. In the follow-up at 20-months post-admission, there was no evidence of either abnormal general condition or relapse of the psoas abscess.

Discussion

The prevalence of primary psoas abscess varies worldwide, as reported by Ricci et al⁴⁾. In Asia and Africa, primary psoas abscesses represent $>99\%$ of all psoas abscesses, whereas the corresponding percentages in Europe and North America are 17% and 61%, respectively⁴⁾. Primary psoas abscess is reported to be more common in males than in females⁵⁾. Bresee and colleagues³⁾ studied 142 pediatric cases and found that 57% of the patients had psoas abscesses on the right side, 40% had abscesses on the left side, and 3% had bilateral abscesses.

The cause of primary psoas abscess remains unclear. Proposed mechanisms for psoas abscess formation include local trauma with intramuscular hematoma formation that predisposes to abscess development⁶⁾ and suppurative lym-

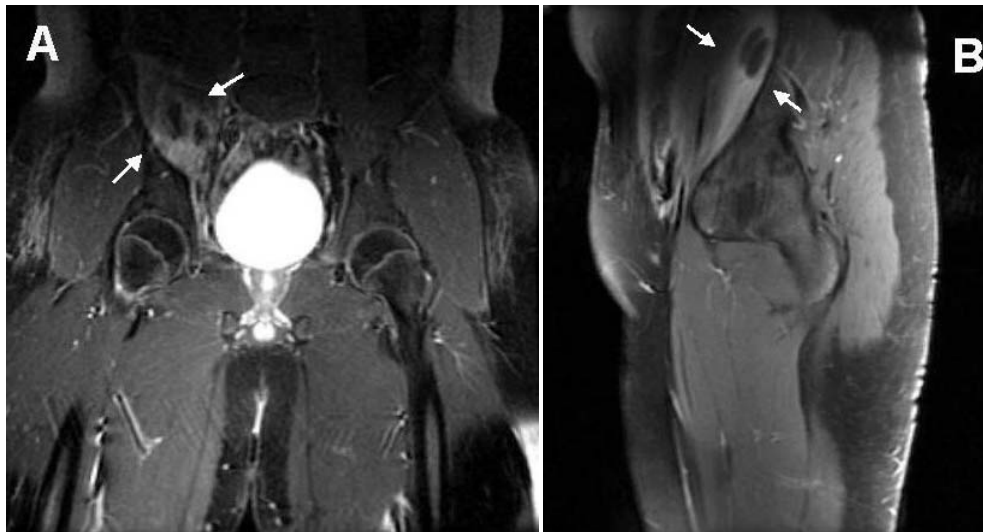


Fig. 1. Magnetic resonance imaging of the hip (enhanced) showing swelling of the right psoas muscle with heterogeneous enhancement and multifocal non-enhanced abscesses of approximately 3×1.5 cm (arrows). The MRI is consistent with cellulitis and abscess in the right iliopsoas muscle and associated inflammatory changes in the adjacent presacral fat plane. (A) coronal image, (B) sagittal image.

phadenitis⁷). In 87.5% of cases, primary psoas abscess is associated with infection by a single organism, i.e., *Staphylococcus aureus* (88.4%), streptococci (4.9%) or *Escherichia coli* (2.8%)⁴. *Staphylococcus hominis*, which was identified in blood cultures from our patient, is a rarely reported pathogen⁸.

The symptoms and signs of a psoas abscess are often variable and non-specific, especially in children. Pain, which is the most common complaint, is mainly localized to the ipsilateral hip, although it occasionally radiates to the abdominal wall, back, thigh, inguinal area, flank, knee, and calf⁴. Other commonly presented symptoms are limping or decreased use of the leg, fever, malaise, anorexia, weight loss, and a lump in the groin³. Flexion deformity of the hip, such as the supine position with the knee moderately flexed and the hip externally rotated to a mild degree⁹, results from spasm of the psoas muscle¹⁰. Internal rotation and extension of the hip stretches the psoas muscle and causes pain (the psoas sign)¹¹, although this is not a specific symptom of this condition¹. A tender palpable mass may be found in the iliac fossa and inguinal area^{3, 4}. Up to 50% of patients experience abdominal tenderness, although guarding and rebound tenderness are uncommon³.

In children, differentiation from primary hip disease may be difficult¹¹, as most patients present with subtle or non-specific symptoms that often simulate hip disease³. In the current case, we expected to see hip pathology rather than psoas abscess. Typically, in cases of abscess in the psoas muscle, posterior hip joint tenderness is absent and the fully flexed hip can be rotated without pain¹⁰, whereas in cases of hip pathology, pain is usually elicited³.

Non-specific laboratory studies show leukocytosis, anemia, and raised levels of acute phase reactants^{3, 4}, while blood cultures may be positive for the causative organism of the abscess¹. Radiological features include a raised dome of the diaphragm on chest radiography and loss of definition or enlargement of the psoas muscle shadow in a plain abdominal film¹⁰, although the latter feature may also be observed in normal persons¹². Although ultrasonography can be of value in early diagnosis and in monitoring the response to conservative therapy, is inexpensive, does not involve radiation, and is easy to perform, its success is extremely operator-dependent¹ and it is less accurate than CT or MRI. CT with contrast enhancement is recommended as the standard diagnostic tool for measurements of lesion size and extent of inflammation, although the ap-

plication of CT in children is hindered by the lower fat content of these patients¹⁰. Although it is expensive, MRI, particularly in the coronal plane, is superior to CT in depicting the extent of involvement and the anatomical relationships of the lesion and in excluding primary hip abnormalities⁸. Gallium-67 scanning may also be useful in the detection of concomitant infectious foci¹³. However, definitive diagnosis requires fine needle aspiration under imaging guidance and culturing of the causative organism¹⁴.

Treatment for psoas abscesses, which involves the use of appropriate antibiotics together with drainage of the abscess, usually results in immediate defervescence and pain relief¹⁰. In patients with suspected primary psoas abscess, anti-staphylococcal antibiotics should be started before the blood culture results become available¹⁵. The duration of antibiotic usage has not been widely discussed but a course of at least two to three weeks after the patient becomes afebrile or after drainage appears to be appropriate¹⁶. Drainage of the abscess may be carried out by CT-guided percutaneous drainage (PCD) or surgical drainage. CT-guided percutaneous drainage is often performed initially because it is less destructive¹¹. Surgical drainage is preferred for patients in whom the psoas abscess is associated with underlying bowel disease³. With adequate treatment, the mortality rate for primary psoas abscess is 2.4%⁴.

Due to the rare occurrence and non-specific features of psoas abscess, diagnosis is frequently delayed, as happened in the case presented here. Our study should alert physicians to cases of primary psoas abscess, thereby leading to earlier diagnosis and effective treatment.

한글 요약

고관절 이상으로 오인된 일차성 요근 농양 1례

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김영옥 · 우영중

대요근은 12번 흉추의 외연면에서 5번 요추까지의 외연면에 걸쳐 기시하여 대퇴골의 소전자에 부착되는 근육으로 고관절의 굴곡에 관여한다. 이는 후복막 기관으로 여러 혈관에서 풍부한 혈류 공급을 받으며, S자 결장, 공장, 충수 돌기, 요관, 대동맥, 신장, 췌장, 척추, 림프선 등 여러 장기와 인접하고 있어 감염의 호발 부위가 된다. 그러나, 요근 농양 발생시, 그 증상이 비특이적이고 건강한 소아에서 드물게 발병하는 이유로 고관절 질환으로 혼동되기도 하여, 진단과 치료가 지연되는 예가 많다. 저자들은 평소 건강하던 14세 남아가 침대에서 떨어져 경한 우측 둔부

좌상을 입은 이후, 우측 둔부 통증과 발열 및 보행 불능을 호소하여 고관절 이상을 의심해 시행한 자기 공명 영상에서 우연히 우측 요근내 농양을 발견해 항생제 치료를 시행하였던 증례를 경험하였기에 보고하는 바이다.

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