Case Report

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The Challenge of Diagnosing Psoas Abscess

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Diagnosing psoas abscess in patients with low back pain might be hampered by their atypical symptoms. We describe a case in which a 39-year-old retired provost marshal presented to our emergency facility with acute onset of low back pain following an episode of lumbar strain during a flight. His initial computed tomography of lumbar spine and abdominal sonography were inconclusive. Two weeks later, he was admitted to our rehabilitation unit for similar symptoms. One day later, leukocytosis and elevated c-reactive protein following rising body temperature were found. Fever of unknown origin (FUO) was impressed after series of laboratory studies. However, an inflammatory gallium scan performed 2 weeks later due to persistent fever revealed active infection in the L4 vertebra and soft tissue of the L5 paraspinal region. MRI was then performed and demonstrated abnormal enhancement at the bodies of the L2 and L3 vertebrae, prevertebral soft tissue and bilateral psoas muscles. A CT-guided percutaneous aspiration of 10 cc yellowish pus was attained, which yielded no pathogens. His symptoms subsided 1 week after being given appropriate antibiotics. This case showed the importance of nuclear scanning and MRI in patients with low back pain and FUO. It also suggests that repeated imaging study and/or other modality should be considered when the initial imaging result is not compatible with the clinical presentation of psoas abscess, which was initially missed by image studies.

An uncommon clinical phenomenon, psoas muscle abscess is extremely difficult to diagnose and needs to be investigated with considerable thoroughness. A review of worldwide literatures published from 1881 through 1990 has revealed that the incidence of psoas abscesses is around 4 cases per year.[1] However, a recent endemic study in Taiwan reported that the rate of occurrence was 2.5 cases annually.[2] During the period of 1985 to 1991, the annual average increased to 12 cases in Taiwan.[1]

The 2 issues of the currently raised annual average of psoas abscess cases and the problem of slow diagnosis of the condition merit investigation. Firstly, the classic symptoms of psoas abscess: fever, flank pain and limitation of hip movement are in fact atypical and have presented in only 30 percent of patients.[3] Fortunately, modern imaging techniques such as ultrasonography, computed tomography (CT), magnetic resonance imaging (MRI) and radionuclide scans, allow more rapid diagnosis and decrease the morbidity and mortality of patients with psoas abscesses. However, at the initial stage of the disease, the negative results of image studies often make the physicians ignore the possibility of psoas pathology.

In this report, we present a case of psoas muscle abscess, which demonstrates the crucial importance of carrying out thorough physical examinations, close examinations of patient history and comprehensive analysis of imaging reports in order to diagnose this condition successfully. Misdiagnosis and potentially serious complications arising from psoas pathology can be prevented, provided that these procedures are properly undertaken.

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CASE REPORT

A 39-year-old man checked in at the emergency facility of Taipei Veterans General Hospital on 15 June, 1999, complaining of severe low back pain. He had been in his usual state of health until 2 days before the visit, when he began to suffer from a lumbar strain during a long distance flight. The patient's pain was recorded as sharp and of progressively mounting intensity. The patient had no history of recent infection and was free of medication. A complete blood count and comprehensive serum biochemical analysis revealed moderate bacteriuria. Plain radiographs of the KUB and lumbar spines also revealed unremarkable results. The patient was consequently discharged with oral antibiotics and nonsteroid anti-inflammatory drugs.

Two weeks later, the patient sought medical attention again for similar complaints, as well as for abdomen pain over the right quadrant. Further laboratory tests were administered, which revealed no useful information that might contribute to a diagnosis. An abdominal ultrasonography and CT of the lumbosacral spines without contrast medium administration (Fig. 1A) did not demonstrate any significant findings except bulging disks at multiple levels. The patient was admitted to the rehabilitation unit the following day with flank pain and a limp. At this point, the patient mentioned that he had suffered from a minor low back pain a month earlier.

In the rehabilitation unit, a physical examination confirmed that the patient was apyrexial. He had normal blood pressure and a heart, lung and abdomen examination which revealed nothing unusual. We found that spine extension, bending and supine straight leg raising caused the patient significant pain. A knocking pain over the right lower back and tenderness over the lower abdomen were also disclosed. The patient also had difficulty in putting a foot forward. His temperature rose to 38.3° 1 day after admission. A complete blood examination showed a white blood cell

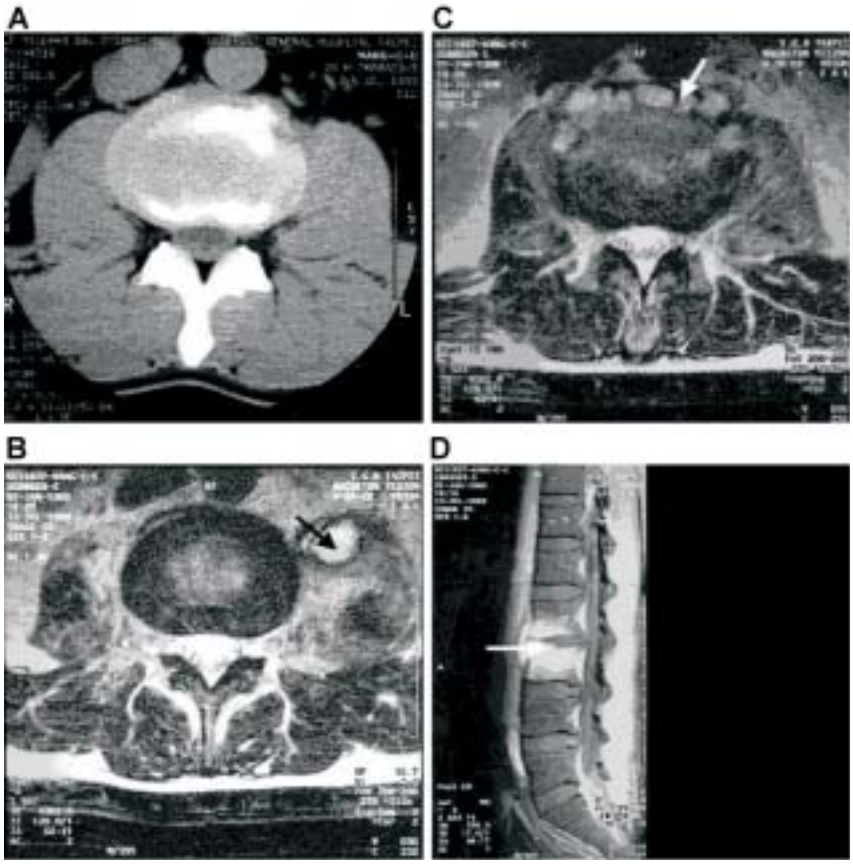

Fig. 1. (**A**) Isodense infective tissue might be merged with disc on the initial unenhanced CT at L2/3. (**B**) T2-weighted images shows L2-3 disc (arrow) and (**C**) psoas abscesses (arrow). (**D**) Sagittal T1-weighted image following contrast administration demonstrates hyperintense vertebral bodies along the L2/L3 segment (arrow).

count of 13,700/mm^3 (89% neutrophils), C-reactive protein (CRP) of 11.0 mg/dL and normal hemoglobin. A urine analysis and other routine biochemical test results were within normal limits. A Widal test, Well-Felix test, Anti-HIV and blood culture all produced negative results. An electrodiagnostic test revealed normal findings. Repeat ultrasonography of the abdomen and back was unremarkable. Broad-spectrum antimicrobial therapy (cefmetazole 1gm iv q6h) was administered under the impression of fever of unknown origin (FUO). A follow-up white blood cell count revealed 11,100/mm^3 (85% neutrophils) on the tenth day after admission.

After 2 weeks of hospitalization, back pain and low-grade fever persisted; therefore, an inflammatory gallium scan was performed, which revealed active infection at the L2 vertebra and soft tissue of the L3 paraspinal region. In order to confirm the diagnosis, MRI was then performed. This showed abnormal enhancement at the vbodies of the L2 and L3 vertebrae, prevertebral soft tissue and bilateral psoas muscles (Figs. 1B, 1C, 1D). A CT-guided percutaneous aspiration revealed 10 cc yellowish pus, but yielded no micro-organisms, including acid-fast stain, bacteria and fungus culture. However, oxacillin iv 500 mg q6h was initiated, owing to a suspicious psoas muscle abscess and lumbar osteomyelitis. The fever abated and white cell counts recovered to normal values. The back pain diminished after 7 days of antibiotic therapy.

Two weeks later, the antibiotic was shifted to teicoplanine iv 400 gm qd because of elevated AST. After 3 weeks of antibiotic therapy, the follow-up MRI post Gd-DTPA administration revealed a resolution of the psoas abscess. However, there still remained abnormal enhancement in the L2-3 disc, the lower part of the L2 vertebral body, the upper part of the L3 vertebral body, the prevertebral area and at the bilateral paraspinal region. The patient recovered well with mild low back pain and was discharged after 2 months of hospitalization. He completed an outpatient antibiotic course afterwards, and an examination 8 months later confirmed that he had remained well.

DISCUSSION

Psoas abscess is classified as primary or secondary, depending on its underlying causes. Primary psoas abscess is most prevalent in older patients. In Taiwan, 2 retrospective reviews were carried out, and 20 percent (8 out of 40 patients) were classified as having primary abscesses.[2,3]

Several points deserve discussion with respect to the disease course and image studies of our young patient. Firstly, he walked to the emergency facility independently and stressed his ascendant lumbar strain during the flight. On examination, there were no fever and no long tract signs, and he demonstrated normal reflexes. Both the plain films of L-spine and abdomen were unremarkable. The only abnormal finding was a moderate bacteriuria. After receiving a diagnosis of urinary tract infection, the patient was discharged. As with this case, patients do not necessarily display the classic combination symptoms of fever, flank/abdominal pain and back pain. Other signs - a heightened sedimentation rate, limitation in the flexing and external rotation of the ipsilateral hip, leukocytosis and anemia - may appear only slightly or not at all, as was the case with our patient. Few physicians, confronted with circumstances such as these, would consider psoas abscess and lumbar osteomyelitis at the first examination.

Secondly, if a lesion were too small to reveal soft tissue gas, spinal destruction, mass effects or unusual iliopsoas, plain films would only reveal negative findings. Ultrasound has been recognized as the fastest, least expensive and safe diagnostic imaging. It can also differentiate between solids and fluids.[4-6] Unfortunately, ultrasound is less sensitive, as it can not penetrate gas or bone situated in the suspicious area. In this case, we postulated that the source of the psoas abscess might arise from contiguous structures of L2-3 disc infection and osteomyelitis and spread directly. At the initial stage, the abscess would be small and/or limited at the vertebrae. This may explain in part the negative results of the radiograph, ultrasound and the CT scan. MRI is more effective than CT in displaying much clearer tissue contrast resolution and in screening out bone interference. It also provides superior multiplanar images. An alternative possibility for the negative CT results is that unenhanced CT is incapable of showing positive findings.

Thirdly, according to the experience of Simon *et al.*,

plain films should be made before other imaging modalities for patients who have a suspected psoas abscess or osteomyelitis.[5] Findings on plain abdominal films include mass effect, abnormal iliopsoas margin, soft tissue gas, bony destruction of the spine and scoliosis.[5] Bone scans should be carried out if plain films show negative or unverifiable results. Furthermore, bone scans are useful and important for detecting unexpected concomitant infectious foci, especially in patients with FUO.[3,7,9] Our case also illustrates the value of Ga-67 scanning for identifying pyogenic foci.

When patients suffering from primary pyogenic vertebral osteomyelitis succumb to genitourinary instrumentation, skin and visceral infections, hematogenous seeding may follow. The lumbar spine is most commonly affected, and the *Staphylococcus aureus* bacterium is the most recurrently cultured organism. The average age of patients is between 30 and 40 years, and male patients are affected more than females, at a ratio of 2:1.[10]

In our case, the patient's osteomyelitis could be accounted for by the presence of a urinary tract infection, which was detected in the ER 2 weeks before admission. Indeed, an endemic study in Taiwan revealed that most psoas abscess patients had urinary tract infections.[2]

Because all the cultures in this case were sterile, the real pathogen was still in question. According to the treatment effect of oxacillin, *Staphylococcus* was the most possible pathogen. Moreover, the patient's age, gender and lesion location were compatible with the distribution of primary osteomyelitis.

At the time of this case, he refused surgical drainage, and we decided that the most appropriate treatment was a complete course of antibiotic therapy. In addition to antibiotics, the patient was monitored through CT-guided aspirations and a series of MR images. 3 weeks after the patient began taking the antibiotics, the MRI revealed that the bilateral psoas abscess had been completely cleared. The patient fully recovered after this successful treatment.

Confirming a diagnosis of psoas abscess and lumbar osteomyelitis is often delayed owing to its low incidence, insidious course and non-specific symptoms. This case illustrated that we might have missed the diagnosis of psoas abscess had we not investigated beyond the initial normal findings of plain film, ultrasound and CT without the aid of radionuclide scanning and MRI. As evidenced in this case, we may consider the bone scan as an imperative examination while a patient presents with low back pain and FUO or other infectious signs. Moreover, MRI might be further relied upon to increase diagnostic accuracy and decrease the morbidity and mortality of patients suffering from psoas abscesses.

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