Neonatal psoas abscess simulating septic arthritis of the hip: a case report and review of the literature

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We report a newborn infant with psoas abscess caused by methicillin-sensitive *Staphylococcus aureus*. He was referred to our hospital with a history of hospital admission for hip septic arthritis without clinical improvement, and presented limited left hip motion, swelling on the groin and pain. A magnetic resonance imaging study revealed an abscess of the left psoas muscle. Surgical drainage and antibiotic treatment resulted in full recovery.

Key words: neonate, psoas abscess, septic arthritis.

Psoas abscess is unusual in children and exceptional in neonates. It is a difficult diagnosis, as clinical findings are suggestive of hip septic arthritis or osteomyelitis of the proximal femur. In a neonate with pseudoparalysis, soft tissue swelling and limited motion, septic arthritis and/or osteomyelitis is the first clinical diagnosis to be ruled out. However, a suppurative process in the retroperitoneal tissues should be kept in mind, especially if the joint fluid analysis is normal. In this report, we describe a case of neonatal psoas abscess with emphasis on early imaging to clarify the diagnosis.

Case Report

A 26-day-old male infant was referred to our neonatal unit because of unilateral hip septic arthritis and persistence of clinical and laboratory symptoms after parenteral antibiotic therapy. He was born by cesarean section at 35 weeks gestation with a birth weight of 2220 g. Prenatal and natal history was unremarkable; there was no history of premature rupture of membranes or maternal fever. After birth, the infant was hospitalized with a diagnosis of transient tachypnea and discharged on the 6th day of life. During the hospital stay, he received one dose intramuscular vitamin K and intravenous fluids. The femoral triangle was not used as a phlebotomy site. On the 9th postnatal day, several pustular lesions were noted on his body, and local therapy with antibiotics was initiated by his pediatrician. After one week, a flexion posture and swelling and pain on his left groin developed. His laboratory evaluation showed a white blood cell count of 33.0 x 10^9 /L, with 80% segmented neutrophils, 18% lymphocytes and 2% monocytes, and a C-reactive protein (CRP) level of 22 mg/dl. He was hospitalized for evaluation of possible suppurative arthritis, at which time minimal effusion was seen in ultrasonographic examination of the hip; however, an arthrosynthesis was not performed. The patient was started on parenteral vancomycin and amikacin with a diagnosis of hip septic arthritis. One week later, the clinical findings persisted with a white blood cell count of 45 x 10^9/L and an erythrocyte sedimentation rate of 45 mm/hour. Because of the persisting symptoms, he was referred to our hospital.

On admission, the infant was afebrile; swelling on the left groin and medial thigh without local fever, limited range of motion, and pseudoparalysis were noted. The left leg was held in flexion and the infant became irritable when the hip joint was moved. Examination of the right leg and hip was unremarkable. The white blood cell was 36 x 10^9/L with 72% segmented neutrophils and 28% lymphocytes; hemoglobin was 10.5 g/dl, and CRP level was 34 mg/dl. Radiographs of the left hip and femur were normal, and ultrasonography of the left

hip showed minimal fluid collection in the joint. However, analysis of joint fluid revealed no evidence of infection, and -for definitive diagnosis- a magnetic resonance imaging (MRI) was performed. The result showed an abscess formation in the left psoas region with edema of the proximal thigh and gluteal muscles (Fig. 1). Therapy was initiated with nafcillin and ceftriaxone. He underwent open drainage, and 5 ml of green purulent fluid was drained from the abscess cavity in the left psoas muscle. The blood and pus culture subsequently grew *Staphylococus aureus*, resistant to penicillin and susceptible to methicillin. Ceftriaxone was discontinued, and the patient improved rapidly. He was dicharged from the hospital after three weeks of intravenous antibiotic therapy. At the time of discharge, he had regained full range of motion of the left hip, and ultrasonography and radiography of the left hip and femur were found to be normal.

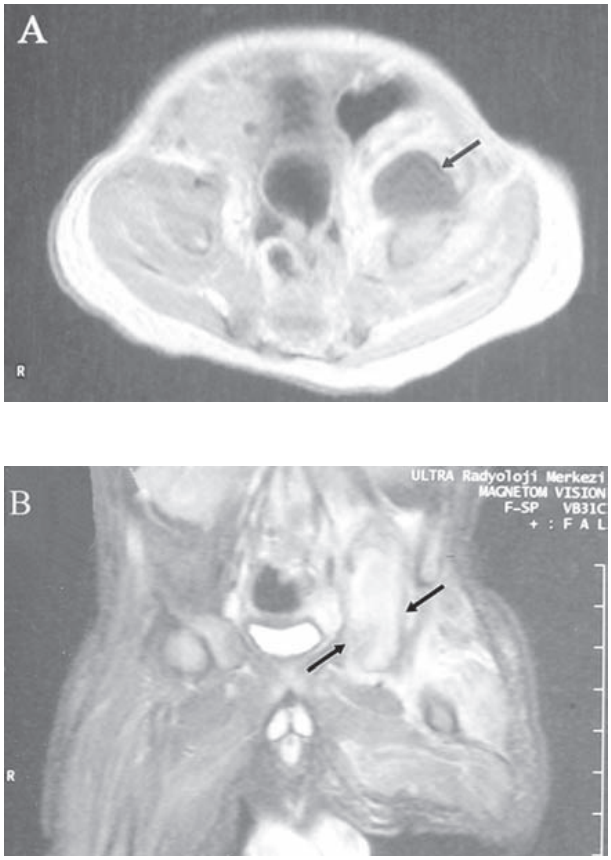

Fig. 1. a) Axial T1-weighted contrast enhanced magnetic resonance (MR) image shows a hypointense lesion (14 mm in diameter) in the left psoas muscle (arrow). **b)** Coronal T2-weighted MR image demonstrates a hyperintense lesion (32 mm x 16 mm) in the left psoas muscle (arrows) and edema of the surrounding tissues.

Discussion

The pathogenetic mechanism for retroperitoneal abscess is different in adults than in children. The non-tuberculous retroperitoneal abscess emphasized secondary spread to the structures from the contagious infectious process in adults[1]. Vertebral bodies, posterior mediastinum, lung, kidney, ureter, gallbladder, pancreas, and large and small bowel are the possible primary sources of infection[2]. However, extension from the adjacent structures is extremely rare, and primary psoas abscesses account for the vast majority of the cases in children[3]. Neonates and children may have an antecedant or incurrent distant cutaneous infection and become bacteriemic, seeding the retroperitoneum. This is the possible mechanism in our case, where pustular lesions preceded the clinical findings of psoas abscess.

Although the age distribution has not been established for this disease, in a review of psoas abscess in children, the largest clustering of patients was in the 10-17-year-old group, with a range of 18 days to 17 years[4]. Psoas abcess is extremely uncommon in neonates. We found only 15 neonatal cases reported in the English literature[4-8]. Gestational ages of most of the patients were term or near-term and there was no gender difference. In a recent review by Yano et al.[5] on psoas abscess in neonates, the organisms isolated in 13 infants were described. *Staphylococus aureus* was the most frequently isolated organism (11 in 13 neonatal cases). *Staphylococcus hominis* and *Klebsiella pneumoniae* were also reported as pathogens in two newborn infants.

The triad of the psoas abscess in the neonatal period is swelling of the leg or groin, limitation of leg motion and pain. A palpable mass in the inguinal fossa and medial thigh and tenderness in the lower ipsilateral quadrant of the abdomen may be present. Because of the infrequency and nonspecific clinical features, clinical diagnosis is difficult, and treatment is usually delayed. An interval of 1 to 14 days (mean: 3.8 days) between onset of symptoms and diagnosis of abscess is reported in neonatal cases[5]. Since hip septic arthritis or osteomyelitis of the proximal femur may both present with swelling and a guarded hip, patients with a suggestive examination for pyarthrosis of the hip, but with normal joint fluid analysis,

should be subjected to further diagnostic interventions, and attention should be drawn to the retroperitoneal tissues and bone. Ultrasonography is useful in demonstrating effusions in the arthritis, and it is also accurate in distinguishing arthritis from psoas abscesses. Computed tomography and MRI are helpful in diagnosis and in demonstrating the extent of the abscess.

Appropriate antibiotic administration with open or percutaneous surgical drainage is the recommended method of the treatment. There have been numerous case reports of successful ultrasonography-guided percutaneous drainage of psoas abscesses[8]. Antibiotics alone may be successful in treating small abscess. An antibiotic choice should be guided by knowledge of the most frequent causative organisms as well as results of Gram-stained smears of material; thus, a neonate suspected of psoas abscess should be given antibiotics for *S. aureus*. Antimicrobial therapy of musculoskelatal infections caused by *S. aureus* or coliform organisms should be continued for approximately three weeks and in some patients for a longer period[9].

In our case, hip septic arthritis was the initial leading diagnosis on the basis of limited hip motion, pain and swelling on the groin and laboratory findings. However, persistence of symptoms after antibiotic therapy and normal hip joint fluid findings swayed our thinking toward psoas abscess, and MRI findings confirmed the diagnosis. This case report emphasizes that psoas abscess may simulate hip septic arthritis in the newborn and should be included in the differential diagnosis. In conclusion, an awareness of this exceptional infection in neonates and timely use of imaging studies will help in prompt diagnosis and treatment, preventing complications caused by a delay.

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