Case Report

Septicemia of Unknown Origin Causing by *Streptococcus agalactiae* Primary Psoas Abscess: A Case Report

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Staphylococcus aureus is the commonest organism resulting in primary psoas abscesses. However, non-staphylococcal primary psoas abscesses have increasingly been published in the literature. Here, the author reports a case of primary psoas abscess in a type II diabetic woman previously diagnosed Streptococcus agalactiae septicemia of unknown origin, which rapidly responded to penicillin plus clindamycin and prompt surgical drainage. Diabetic patients are not only susceptible to soft tissue infection but also primary psoas abscess caused by Streptococcus agalactiae.

Keywords: *Primary psoas abscess, Streptococcus agalactiae, Group B Streptococcus*

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Psoas abscess is considered a rare but potentially fatal disease in the literature. Diagnosis is often delayed due to vague and occult clinical presentations. It may be classified as primary or secondary depending on the identifiable existence of the underlying disease. In Asia and Africa, 99.5% of psoas abscesses are primary compared to 61% in North America and 18.7% in Europe[1,2]. Most of primary psoas abscesses (PPA), 87.5% of cases, are caused by a single organism. *Staphylococcus aureus* is the most commonly isolated pathogen up to 88%, followed by *Streptococcus spp. (*4.9%) and *Escherichia coli* (2.8%)[2]. Certain streptococcal species, including *Streptococcus agalactiae*[3-6], *Streptococcus pneumoniae*[7], *Streptococcus milleri*[8], group A beta-hemolytic streptococcus[9], and *Streptococcus viridans*[6] have been published to cause PPA. The author reports a case of PPA caused by *Streptococcus agalactiae* in a type II diabetic woman previously diagnosed as septicemia of unknown origin.

Case Report

A 46-year-old woman was referred to Srisangworn Sukhothai Hospital from the nearby general hospital with the provisional diagnosis of streptococcal septicemia of unknown origin and underlying including type 2 diabetes mellitus and hypertension. Apart from left-sided low back pain radiating to the ipsilateral foot for 8 days, she complained about high grade fever, left-sided low back pain and difficulty in walking over 2 days. Furthermore, she also experienced malaise, loss of appetite, weight loss (from 59 to 55 kg), urinary frequency without a history of any trauma or excessive strenuous activity at the same time. Therefore, she was admitted and investigated by the afore-mentioned hospital lasting 6 days before arrival. Blood and urine tests were normal except marked leucocytosis and mildly pale (white blood count of $28.82*10^9$/L with a differential of neutrophils, and lymphocytes of 89 and 8%, respectively and hematocrit of 30%). Normal blood urea nitrogen and serum creatitine as well as urinary analysis were reported. Two specimens of hemoculture showed *Streptococcus agalactiae* sensitive to penicillin and clindamycin. Penicillin G was administered 2 days previously for streptococcal septicemia of unknown origin but no improvement. Initial presentation at Srisangworn Sukhothai Hospital, vital signs were abnormal as follows: temperature 38.7°C, pulse rate 110 beats/minute, respiratory rate 20 breaths/minute, blood pressure 113/67 mmHg. On physical examination, she looked sick and always flexed her left hip in supine position. The markedly tenderness at left lower back was observed. The pain was aggravated by psoas test in the affected limb. The laboratory investigations still elicited markedly leucocytosis and mildly pale (white blood count of $22.48*10^9$/L and hematocrit of 28.4%).

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The pre-meal blood sugar was elevated to 275 mg/dL, otherwise was in normal limit. Urine culture was negative for pathogen. Plain films of thoracolumbar spine revealed lumbar scoliosis, convexity to the right. No evidence of osteolytic or osteoblastic lesion. Abdominal ultrasound depicted a heterogeneous hypoechoic lesion at the left psoas muscle, measuring 5.7*3.4*10.1 cm in size (Fig. 1). As correlated to clinical setting, primary left psoas abscess was diagnosed. Surgical drainage was performed due to lack of percutaneous drainage resource. One-hundred mL of frank pus was drained and penrose drain was kept in situ. Gram stain demonstrated gram positive cocci in single, pair and short chain, Microbiology reported pure growth of *Streptococcus agalactiae*, sensitive to penicillin and clindamycin, the same pathogen in previous hemoculture as a causative organism. Periopertive penicillin G and clindamycin were administered. Within 24 hours, postoperatively, the patient became afebrile and looked well. The general condition was gradually improving. The drain was removed whereas intravenous antibiotics were switched to oral form and continued for 14 days. Subsequently, she was discharged at day 14 of admission without morbidity. She had done well on the 2 week follow-up day.

Discussion

Psoas abscess is considered a rare infection with vague and occult clinical presentations. Serious complications such as septicemia and mortality may be a consequence if initial diagnosis and prompt treatment are delayed. It is classified as primary or secondary, depending on the existence of the underlying disease. PPA occurs probably as a result of hematogenous dissemination from an occult primary infectious focus or secondary to local trauma with intramuscular hematoma formation predisposing to abscess formation[10]. Worldwide differences in its etiology were observed[1,2]. Most psoas abscesses (70%) occur in patients under the age of thirty, with a male preponderance of 3:1[1,2,11]. Fifty seven percent of the psoas abscesses occur on the right side, 40% on the left side, and 3% bilaterally[11]. The most common cause of secondary psoas abscesses is Crohn's disease (60%). The remainder belong to appendicitis (16%), ulcerative colitis, diverticulitis, colon cancer (all together 11%), and vertebral osteomyelitis (10%)[2]. A 2.4% mortality rate of PPA is shifted to 19% of secondary abscesses relating to its co-morbidity. The mortality rate is 100% if the patient is not treated[12].

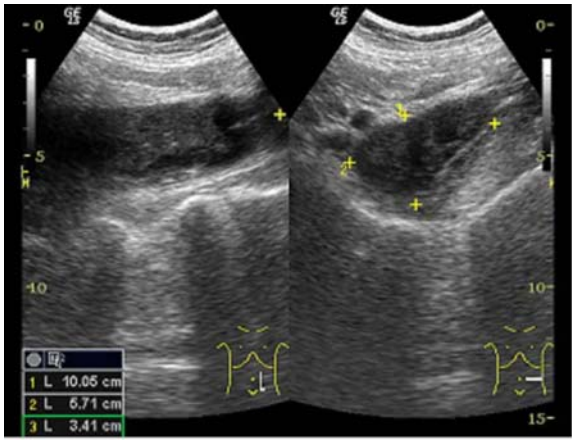

Fig. 1 Abdominal ultrasound depicts a heterogeneous hypoechoic mass at the left psoas muscle, measuring 5.7*3.4*10.1 cm in size

The high risk factors of PPA include diabetes mellitus, intravenous abuse, AIDS, renal failure and immunosuppression[12]. PPA are caused by a single pathogen in 87.5% of cases. The most commonly causative organism is *Staphylococcus aureus* (88%), followed by streptococcus (4.9%) and *Escherichia coli* (2.8%). Other reported pathogens are *Pasteurella spp.*, *Proteus spp., Staphylococcus epidermidis,* and *Salmonella spp*. Several streptococcal species have been reported causing psoas abscess, including *Streptococcus agalactiae*, *Streptococcus pneumoniae*, and *Streptococcus milleri*, group A beta-hemolytic streptococcus and *Streptococcus viridans*[2-9]. Positive blood cultures, usually for *Staphylococcus* aureus, are reported in 41.7% of cases[2].

Streptococcus agalactiae or group B streptococcus is not only an infrequent organism to cause PPA but a common cause of sepsis and meningitis in newborns and pregnant women[13]. Group B streptococcal bacteremia usually occurs in the elderly and those with a medical underlying condition. In the study of Huang et al, at least 1 underlying systemic disease was found in 81% of patients, with the most frequent being malignancy (43.6%), diabetes mellitus (42.6%), and liver cirrhosis (16%). The 2 major clinical syndromes were primary bacteremia (34%) and soft tissue infection (31.9%). The clinical diagnoses of *Streptococcus agalactiae* soft tissue infections included cellulitis, diabetic foot infections, subcutaneous abscess, infected wound, pyomyositis and necrotizing fasciitis. The overall mortality rate of group B streptococcal bacteremia

in non-pregnant adults was 20.2%. Polymicrobial bacteremia, thrombocytopenia, and shock were independent risk factors of mortality[13,14].

On average, a 6-week delay was observed to achieve diagnosis[7]. The classical clinical triad including fever, back pain and limp is present in only 30%. As the psoas muscle is innervated by L2-L4, radiating pain to hip, thigh, and calf can be noticed. Additional symptoms are discomfort, malaise, nausea, weight loss, anorexia, vague abdominal pain, palpable mass in iliac or inguinal area[1,2,11,12]. A physical examination may reveal the typical supine position with moderate knee flex and mild external hip rotation. Psoas sign may be positive, as well as active flexion of the affected hip against the pressure aggravates pain. A tender mass may be palpable in the iliac or inguinal region. Laboratory studies may disclose a leucocytosis, anemia, raised C reactive protein and erythrocyte sedimentation rate[12]. Hemocultures, usually for *Staphylococcus aureus*, are positive in 41.7% of cases[2].

Ultrasound is a noninvasive, safe, cost effective, and available diagnostic investigation with sensitivity 40-60% of the cases[2,7,12]. The heterogeneous hypoechoic mass reflects the abscess. A computed tomography (CT) scan is now considered as the gold standard for definitive diagnosis, having a 91-100% sensitivity[7]. Furthermore, it is also employed to identify the etiology in the case of secondary psoas abscess is suspected[8]. A CT-guided aspiration of the abscess for diagnostic purpose is advocated by most authors.

Differential diagnoses of psoas abscess include hip arthritis, hip avascular necrosis, irritable hip, necrotizing fasciitis of psoas muscle, inflammatory bowel diseas, retrocecal appendicitis, pyelonephritis, pelvic inflammatory disease, herniated S1 disc, vertebral or pelvic osteomyelitis and epidural abscess[7,11].

Treatments consist of appropriate antibiotics and early drainage of the abscess. Empirical antibiotic treatment is guided by a knowledge of local causative pathogens and susceptibility test, varying to global geography. In the past, antistaphylococcal antibiotic is suggested as empirical treatment for PPA due to the commonest[1]. However, because of an increasing incidence of non-staphylococcal PPA such as the presented case and an identification of staphylococcus in secondary psoas abscess, some authors recommend broad spectrum antibiotics like cephalosporins, quinolones, imipenem and clindamycin in all cases of psoas abscess[8]. Specific antibiotics are formulated according to gram stain and microbiological report. For streptococcal soft tissue infection or bacteremia, penicillin still remains the drug of choice[13,14]. Furthermore, Infectious Diseases Society of America (IDSA) guidelines for the diagnosis and management of skin and soft tissue infections recommended penicillin plus clindamycin in necrotizing infections of the muscle for additive effects[15]. Durations of antibiotic therapy, ranging from 2 to 6 weeks after complete drainage of the abscess were advised[8,12].

Percutaneous drainage, even encounters complex, multiloculated abscess, should be considered as initial procedure of choice[12]. However, the surgical drainage can shorten the hospital stay and recovery time[16]. Indications of surgical drainage are (1) failure of percutaneous drainage, (2) relative contraindication of percutaneous drainage such as coagulopathy, (3) second pathology necessitates operation, for example, simultaneous resection of the diseased bowel and drainage of the abscess in the patient with Crohn's disease. High mortality and morbidity rate are associated with inadequate or delayed drainage of abscess, or both[2].

Conclusion

Primary psoas abscess is infrequent disease usually causing mis- or delayed diagnosis. To reduce morbidity and mortality of PPA, the strategy comprises appropriate empirical antibiotics and prompt drainage either percutaneously or surgically followed by a course of proper antimicrobial agents regarding further identified causative pathogens.

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โรคฝีในกล้ามเนื้อโซแอสชนิดปฐมภูมิจากเชื้อ Streptococcus agalactiae ที่มาแสดงด้วยโรคติดเชื้อในกระแสโลหิตโดยไม่ทราบแหล่งต้นกำเนิด: รายงานผู้ป่วย

สมชาย มีศิริ

Staphylococcus aureus เป็นเชื้อก่อโรคฝีในกล้ามเนื้อโซแอส ชนิดปฐมภูมิ ซึ่งพบได้บ่อยที่สุดแต่อย่างไรก็ดี โรคฝีในกล้ามเนื้อโซแอส ชนิดปฐมภูมิซึ่งเชื้อก่อโรคมิใช่ Staphylococcus ก็ได้รับการรายงานในวรรณกรรมมากขึ้นเรื่อย ๆ ผู้นิพนธ์รายงานผลสำเร็จของการรักษากรณีศึกษาหนึ่งราย ซึ่งเป็นผู้ป่วยหญิงไทย อายุ 46 ปี ที่มีโรคฝีในกล้ามเนื้อโซแอสชนิดปฐมภูมิ เป็นโรคเบาหวานชนิดที่ 2 และได้รับการวินิจฉัยก่อนหน้านี้ว่า เป็นโรคติดเชื้อในกระแสโลหิตโดยไม่ทราบแหล่งต้นกำเนิดจากเชื้อ Streptococcus agalactiae ที่ตอบสนองอย่างรวดเร็วกับยาเพนนิซิลลิน ร่วมกับยาคลินดามัยซิน และการระบายหนองออกด้วยวิธีผ่าตัดโดยพลัน ผู้ป่วยเบาหวานไม่เพียงแต่จะเสี่ยงต่อการเป็นโรคติดเชื้อที่เนื้อเยื่ออ่อนจากเชื้อ Streptococcus agalactiae แล้วยังเสี่ยงต่อการเป็นโรคฝีในกล้ามเนื้อโซแอสชนิดปฐมภูมิอีกด้วย