

## Splenic Abscess Associated with Endocarditis in a Patient on Hemodialysis : A Case Report

Splenic abscess is an unusual condition usually seen in immunocompromised patients or associated with intravenous drug abuses. Several conditions including trauma, immunodeficiency, corticosteroid and/or immunosuppressive therapy and diabetes mellitus have been listed under the predisposing factors for a splenic abscess. Splenic abscess in a patient on hemodialysis is a rare but life-threatening condition if not corrected. We describe a case of splenic abscess with bacterial endocarditis on maintenance hemodialysis. He had staphylococcal septicemia secondary to bacterial endocarditis at the mitral valve from the dialysis access-site infection. Although hematologic seeding from endocarditis has been the predisposing factor for splenic abscess, we postulate that access-site infections may predispose hemodialysis patients to splenic abscess. Splenic abscess may be considered as one of the causes when patients on hemodialysis develop unexplained fever.

Key Words : Spleen; Abscess; Dialysis; Renal Dialysis

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### INTRODUCTION

Splenic abscess is an unusual condition usually seen in immunocompromised patients or associated with intravenous drug abuses (1). Several conditions including trauma, immunodeficiency, corticosteroid and/or immunosuppressive therapy and diabetes mellitus have been listed under the predisposing factors for a splenic abscess (1). Splenic abscess in a patient on hemodialysis is rare but life-threatening conditions if not corrected (2).

During the early years of the 20th century, frequent causes of splenic abscess were typhoid fever; the mortality rates approximated 100% (3, 4). More recently, hematogenous seeding from septic foci has been the most common cause of a splenic abscess, whereas the predisposing factors have been endocarditis, closed splenic trauma, and sickle-anemia (3, 5, 6). But splenic abscess in hemodialysis patients has not been well described.

We describe a case of splenic abscess with bacterial endocarditis on maintenance hemodialysis, in which case the primary infection was probably acquired through the dialysis access site.

### CASE REPORT

A 65-yr-old male patient was admitted to Chonnam Nation-

al University Hospital because of fever and chills with drowsy mental status after hemodialysis. His symptoms and signs were acute onset. Fifteen years earlier, he was found to have diabetes and well controlled by insulin and oral hypoglycemics, and to have hypertension. Five years earlier, he had developed chronic renal failure due to diabetic complication. Three years earlier, he was operated native brachiocephalic arteriovenous fistula formation on his left arm and has been taken maintenance hemodialysis with 3 sessions in each week. Other past medical history including tuberculosis, hepatitis or abdominal surgery had not been known. He was non-smoker, and non-alcoholics. There was no history of trauma. His blood pressure was 130/80 mmHg and his body temperature was 38.1°C on admission. On physical examination, there was diffuse tenderness on the abdomen, especially on the left hypochondrium. There was ecchymosis around the left brachiocephalic arteriovenous fistula area with tenderness and swelling. Auscultation of his chest revealed diastolic cardiac murmurs on apex.

On chest radiography and electrocardiogram, there was cardiomegaly. Biochemical analysis revealed that hemoglobin level was 8.2 g/dL, white blood cell count 11,500/ $\mu$ L, platelet count 84,000/ $\mu$ L, blood urea nitrogen level 25.0 mg/dL, and serum creatinine level 4.6 mg/dL, sodium 140 mEq/L, potassium 4.7 mEq/L, chloride 97 mEq/L, aspartate aminotransferase 28 IU/L, alkaline phosphatase 81 IU/L, serum albumin 3.4 g/dL, C-reactive protein 25.97 mg/dL, erythrocyte sedi-



Fig. 1. Abdominal sonography reveals two hypoechoic space occupying lesions and one cystic lesion in the spleen.



Fig. 2. Abdominal CT reveals multiple septated cystic lesion in the spleen, the largest 4.3 cm, compatible with multiple splenic abscesses.



Fig. 3. Gross finding of removed spleen shows abscess pockets.

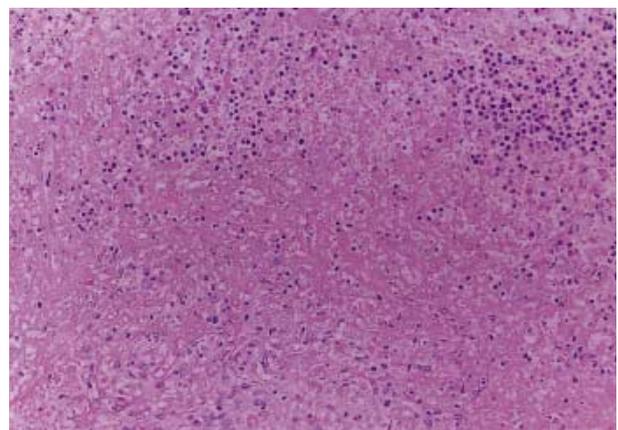


Fig. 4. Pathologic findings showed the splenic abscess (H&E,  $\times 100$ ).

mentation rate 31 mm/hr, fibrinogen degradation product  $< 5 \mu\text{g/mL}$ , D-dimer 0.4 mg/L (reference value 0-0.3), aPTT 37.3 sec, PT 13.1 sec/INR 1.08, and fibrinogen 716 mg/dL.

Abdominal sonography revealed two hypoechoic space occupying lesions and one cystic lesion in the spleen (Fig. 1). To differentiate splenic abscess or infarction, abdominal computed tomography (CT) was performed. Abdominal CT revealed multiple septated cystic lesions in the spleen, the largest 4.3 cm, and 2 cm low attenuated lesion in the left buttock area, compatible with multiple splenic abscesses and an abscess in the left buttock area (Fig. 2). We performed 2D-echocardiography, and found mobile hyperechoic mass on posterior mitral valve leaflet tip with calcified valve. His brain CT was normal. We obtained blood samples at two different sites for bacteriologic culture and then started empirical antibiotics with ceftriaxone and aminoglycoside. He had continuous fever and left hypochondrial pain. Blood culture revealed methicillin sensitive *Staphylococcus aureus* (MSSA). We changed the antibiotics with cefazoline based on the drug sensitivity

test. Inflammatory signs and hypoechoic lesions in the spleen did not respond to antibiotic therapy. On the 4th hospital day, emergency splenectomy was performed for the splenic abscess based on blood culture and abdominal CT. We aspirated blood from the evacuated spleen for bacteriologic culture and sent the evacuated spleen to pathologist for histologic diagnosis (Fig. 3). MSSA was cultured from the evacuated splenic blood, too. The pathologic findings showed splenic abscesses and infarction (Fig. 4). Antibiotic therapy was continued and he became afebrile. CBC findings and other chemical laboratory findings were returned to normal.

## DISCUSSION

Splenic abscess in hemodialysis patient was rarely reported. In a report published in 2002, Chuang et al. analyzed the clinical characteristics of extra-renal abscess in chronic hemodialysis patients. Among sixteen patients who had extra-renal abscess, the most common site of extra-renal abscess were

liver (8/16) and lung (5/16), and one patient had concurrent liver and spleen abscess (7). We could identify only three additional reports of splenic abscess in hemodialysis patients by medline and KoreaMed search (2, 8, 9).

Trauma, immunodeficiency, corticosteroid and/or immunosuppressive therapy and diabetes mellitus had been reported as risk factors of splenic abscess (1). In the present patient, he had diabetes as a known risk factor, but no history of trauma or immunosuppressive therapy. Since ultrasound scan was easy to apply, ultrasound scan was first employed and revealed two hypoechoic space occupying lesions and one cystic lesion in the spleen. Computed tomography is reported to be superior to ultrasonography in diagnosing splenic abscess (1). And computed tomography was checked to confirm the presence of the two hypoechoic space occupying lesions and one cystic lesion in the spleen and showed that there were multiple septated cystic lesions in spleen, largest 4.3 cm, and 2 cm low attenuated lesion in the left buttock area, compatible with multiple splenic abscesses and abscess in the left buttock area. Inflammatory signs and hypoechoic lesions in spleen did not respond to antibiotic therapy. So this patient underwent emergency splenectomy and was diagnosed as having splenic abscesses and infarction.

Untreated splenic abscesses are fatal, and there is no consensus regarding treatment. Treatment of a splenic abscess varies according to the response to antibiotics. Especially when there is a splenic defect on an abdominal computed tomography in patients who are refractory to antibiotic therapy, total splenectomy is the mainstay of the treatment (10). Splenectomy eliminates the source of sepsis and circumvents problems with drainage from the subphrenic area. Splenectomy is superior than medical treatment and percutaneous drainage (11). Needle aspiration under radiological guidance can be used, but infection of neighboring organs is a known complication, which includes infection of the lung and the peritoneal cavity, or formation of a fistula (1, 2).

In a report, the most common cause of bacteremia in hemodialysis patients was *Staphylococcus aureus*, and the most frequent focus of infection was the access site for hemodialysis (12). Splenic abscess in hemodialysis patients was reported to be due to *Staphylococcus* from access-site infection (2).

Hemodialysis patients have been reported to have an impaired immune system (13) and a tendency to develop various infectious diseases (14). Infections of fistulae and dialy-

sis catheters are not uncommon. We conclude that splenic abscess in hemodialysis patients is a rare disorder but infection of the dialysis access site may predispose to splenic abscess. Clinical features may be subtle and early radiological investigation with treatment of the lesion may be essential in dialysis-treated patients who develop an otherwise unexplained fever.

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