Actinomycotic Meningitis : Report of a Case

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Abstract

A 73-year-old man who presented with acute fever, drowsiness and confusion was reported. Two weeks prior to admission, he attended the Outpatient Department with symptoms of fever and headache for 2 weeks. Eosiophilic meningitis was initially diagnosed, which, in fact, was lymphocytic CSF pleocytosis. He was treated with a high dose of prednisolone. His symptoms improved for 1 week, then he experienced symptoms of fever and headache again. On admission, he had stiffness of the neck. Lumbar puncture showed purulent CSF with Gram-positive branching filamentous organisms. CSF grew *Actinomyces israelii.* The patient died from brain herniation.

Key word : Meningitis, Actinomycosis, Case Report

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Actinomycosis is a chronic, localized, suppurative infection characterized by abscess formation, tissue fibrosis and draining sinuses. It is caused by non-spore-forming, anaerobic or microaerophilic bacterial species of the genus *Actinomyces*, that colonize the mouth, colon and vagina. Mucosal disruption may lead to infection at virtually any site in the body. The common clinical forms of the disease are cervicofacial, thoracic and abdominopelvic diseases (1). Actinomycosis of the central nervous system is

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rare. The usual manifestation of CNS disease is brain abscess. Meningitis rarely occurs[2,3]. An additional case of actinomycotic meningitis is reported.

CASE REPORT

A 73-year-old previously healthy man was admitted to Srinagarind Hospital in November 2001 with the chief complaint of fever, drowsiness and confusion for 1 day. Two weeks earlier, he visited the Outpatient Department with symptoms of low-grade fever and headache for 2 weeks. Physical examination was unremarkable. Complete blood count (CBC) showed a peripheral white blood cell count (WBC) of 11,500 cells/mm^3 with 76 per cent polymorphonuclear (PMN) cells and 9 per cent eosinophils. Eosinophilic meningitis was initially diagnosed and lumbar puncture was performed. Cerebrospinal fluid (CSF) revealed an opening pressure of 140 mmH_2O. The WBC count was 1,760 cells/mm^3 with 50 per cent eosinophils. A protein level was 160 mg/dl and a glucose level was 44 mg/dl (simultaneous serum glucose level of 154 mg/dl). No bacteria were seen with Gram' s stain and cryptococcal antigen was negative. The patient was treated with prednisolone 60 mg/d and albendazole 15 mg/kg/d for 2 weeks. His symptoms markedly improved. However, 1 week prior to admission, he developed fever and headache again. There was no history of recent common cold, sinus, ear, or genitourinary infection.

Physical examination showed an elderly man with a body temperature of 38.2°C and stiffness of the neck. The Glasgow coma score was $E_4V_1M_5$. Oral examination revealed poor oral hygiene. Other findings were unremarkable.

The peripheral WBC was 32,100 cells/mm^3 with 92 per cent PMNs. Serum glucose, BUN and creatinine, electrolytes, liver function test, urinary analysis, chest X-ray and abdominal sonographic findings were within normal limits. CT scan of the brain demonstrated basal meningitis with moderate hydrocephalus. A lumbar puncture showed a yellowish, cloudy CSF with an opening pressure of more than 600 mmH_2O. The WBC count was more than 20,000 cells/mm^3 with 100 per cent PMNs. The protein level was 260 mg/dl and glucose level was 10 mg/dl (simultaneous serum glucose level of 186 mg/dl). Gram's stain demonstrated moderate Gram-positive branching filamentous organisms. Modified AFB stain was negative. The result of the previous CSF culture was negative and re-evaluation of the Wright's stain of the previous CSF revealed predominant lymphocytes.

Nocardial meningitis was diagnosed. The patient was treated with intravenous trimethoprim-sulfamethoxazole and ventriculostomy was also performed. His condition was stable. Three days later, the result of the CSF culture grew Gram-positive, filamentous rod with foul smell, suggestive of anaerobic bacteria. Antibacterial therapy was then switched to intravenous penicillin G 24 million units/day. However, the next day, he developed left hemiparesis with deterioration of consciousness. CT scan of the brain revealed areas of large infarction at the right temporo-parietal region and the left cerebellar region. Finally, he died from brain herniation. The final result of the CSF culture grew *Actinomyces israelii.*

DISCUSSION

Actinomycosis of the central nervous system is rare. The source may be hematogenous or through extension of oral-cervicofacial disease. Involvement of the meninges results in basilar meningitis. Isolated cases of either meningitis alone or meningitis occurring in conjunction with brain abscess have been described. Because of the indolent nature of the infection, it usually presents with chronic meningitis. Signs and symptoms mimic those of other chronic lymphocytic meningitis, such as tuberculous meningitis (lymphocytic pleocytosis of the CSF with low glucose level, elevated protein and negative culture) or present with persistent neutrophilic meningitis[3]. Manifestation of the disease may be acute, particularly with rupture of an abscess into the subarachnoid space. Diagnosis can be made by microscopic examination or rarely by culture of CSF. Microscopic examination of actinomycosis reveals Gram-positive, non-acid-fast, branching filamentous organisms. Clinically, nocardiosis is the infection most often confused with actinomycosis. *Nocardia* species are morphologically indistinguishable from *Actinomyces* on Gram stain and clinically resemble *Actinomyces* in producing infection of the CNS. *Nocardia* species are differentiated by their aerobic growth and acid-fast when assessed by a modified Kinyoun staining technique.

In this patient, because of the mis-interpretation of the differentiation of the WBC of the

initial CSF, eosinophilic meningitis was diagnosed. High dose of prednisolone was given to relieve headache[4] which aggravated the actinomycotic infection. The reason for the diagnosis of nocardial meningitis, although having a negative result of the modified AFB stain, was from the authors' previous experience of nocardial meningitis[5].

In the presented patient, the predisposing factor could bave been from poor oral hygiene. Because *Actinomyces* is a mouth organism, transient bacteremia with seeding into the subarachnoid space may be the possible mechanism of infection. From experience with this patient, actinomycotic meningitis should be looked for in this clinical setting.

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เยื่อหุ้มสมองอักเสบจากเชื้อแอกติโนมัยโคซิส : รายงานผู้ป่วย 1 ราย

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รายงานผู้ป่วยชายไทย อายุ 73 ปี มีอาการของเยื่อหุ้มสมองอักเสบเฉียบพลันชนิดเป็นหนอง โดยมีประวัติว่า 2 สัปดาห์ก่อน ผู้ป่วยได้มาตรวจที่โรงพยาบาลด้วยอาการไข้ ปวดศีรษะนาน 2 สัปดาห์ และได้รับการวินิจฉัยผิดว่าเป็นเยื่อหุ้มสมองอักเสบชนิดอีโอซิโนฟิลิก จึงได้รับยาเพรดนิโซโลนรักษาอาการปวดศีรษะ ผู้ป่วยมีอาการดีขึ้นในช่วงสัปดาห์แรกแล้วกลับมีอาการไข้ปวดศีรษะอีก ผลการตรวจน้ำไขสันหลังครั้งนี้พบเป็นลักษณะเป็นหนอง และการย้อมสีกรัมของน้ำไขสันหลังพบเชื้อแบคทีเรียติดสีกรัมบวก รูปร่างเป็นเส้นยาวและมีการแตกแขนง ผลการเพาะเชื้อของน้ำไขสันหลังขึ้น *แอกติโนมัยซิส อิสราเอลลิไอ* ผู้ป่วยเสียชีวิตจากภาวะสมองบวม

คำสำคัญ : แอกติโนมัยโคซิส, เยื่อหุ้มสมองอักเสบ, รายงานผู้ป่วย

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