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Mount Fuji Sign: A Rare Complication of Meningitis

Menenjitin Nadir Bir Komplikasyonu: Fuji Dağı Belirtisi

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Abstract

Acute bacterial meningitis is a critical condition also because of associated complications and sequelae besides being a life-threatening infection. The complications may develop due to disease itself, diagnostic procedures or treatment. Pneumocephaly is defined as the presence of air in the cranial cavity. Pneumocephalus of spinal origin may be associated with spinal trauma, penetrating injury, tumors, and infections resulting from iatrogenic causes such as lumbar puncture. Here, we present a case of a 22-year-old male with the diagnosis of acute bacterial meningitis in whom pneumocephalus occurred after lumbar puncture. In this study, we aimed to draw attention to a rare complication of lumbar puncture.

Keywords: Mount Fuji sign, lumbar puncture, meningitis, pneumocephalus

Öz

Akut bakteriyel menenjit; hayatı tehdit eden bir enfeksiyon olmasının yanı sıra komplikasyonları ve sekelleri nedeniyle de önemlidir. Komplikasyonlar; hastalığın kendine, tanı için kullanılan işlemlere ya da tedaviye bağlı olabilir. Pnömoşefali, kranial boşluklarda hava bulunması olarak tanımlanır. Pnömoşefalinin spinal nedenleri arasında; spinal travmalar, penetran yaralanmalar, tümörler, enfeksiyonlar ile lomber ponksiyon gibi iyatrojenik sebepler yer almaktadır. Bu çalışma ile menenjit tanısı ile izlenen 22 yaşındaki erkek hastada lomber ponksiyon sonrası gelişen pnömoşefali sunulmuş ve lomber ponksiyonun nadir bir komplikasyonuna dikkat çekilmiştir.

Anahtar Sözcükler: Fuji dağı belirtisi, lomber ponksiyon, menenjit, pnömoşefali

Introduction

Acute bacterial meningitis is a critical condition also because of associated complications and sequelae besides being a life-threatening infection. The complications may develop due to disease itself, diagnostic procedures or treatment. In this study, we aimed to draw attention to a rare complication of lumbar puncture (LP). Pneumocephaly is defined as the presence of air in the cranial cavity. Pneumocephalus of spinal origin may be associated with spinal trauma, penetrating injury, and tumors, infections resulting from iatrogenic causes such as LP (1).

Case

Family consent was obtained for publication of this case report. A 22-year-old male patient presented to our clinic due to the complaints of sudden-onset fever, headache and clouded consciousness. The examination

of the patient with a history of previous meningitis two years ago revealed neck stiffness. Blood tests revealed a white blood cell (WBC) count of 20740 (93% neutrophils) and C-reactive protein (CRP) level of 186 mg/dL (60-fold increased). Cranial computed tomography (CT) showed normal findings (Figure A). LP revealed an increased cerebrospinal fluid (CSF) pressure, blurry CSF, leukocyte count of 4800/mm³ (90% neutrophils), erythrocyte count of 80/mm³, protein level of 475 mg/dL, and glucose level level of 53 mg/dL (simultaneous blood glucose level: 136). The patient was initiated ceftriaxone and vancomycin treatment for acute bacterial meningitis. Latex agglutination test was negative, no CSF or blood culture grew. He regained consciousness and had no fever. Neck stiffness disappeared on the 3rd treatment day. On the 6th treatment day, the complaint of headache started and progressively exacerbated. Neurosurgery consultation was obtained. His examination revealed clear consciousness,

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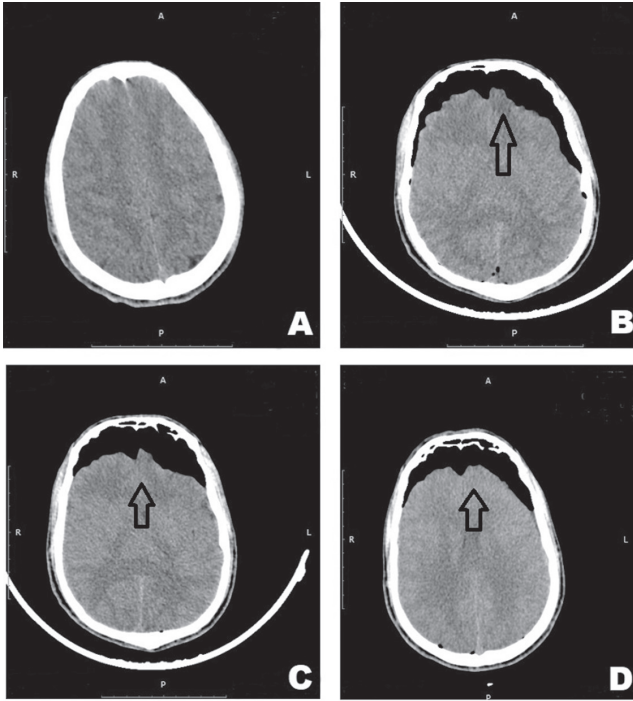


Figure. **A)** The first reference images. **B)** Treatment 6th day, extra-axial pneumocephalus. **C)** Treatment 8th day. **D)** Treatment 18th day. The tips of the frontal lobes forming the characteristic silhouette of Mount Fuji

no neck stiffness or neurological deficit. His WBC was 8920 and CRP level was 13 mg/dL (4-fold increased). Cranial CT (Figure B-6th treatment day) showed a widened air space was in the bilateral cerebral hemispheres, more remarkably in the frontoparietal region, in the extra-axial CSF space (pneumocephalus) (Figure).

Discussion

Monitoring, antiepileptic medication and fluid replacement were recommended as treatment. No emergency neurosurgical intervention was considered and no other complication developed (Figure C, 8th treatment day, Figure D, 18th treatment day). The patient was administered contrast agent via intrathecal route and imaging procedure was repeated. Air space levels compatible with pneumocephalus which reached 2 cm at the widest location were encountered at the levels

of bilateral frontal lobes. Air images compatible with pneumocephalus were detected also in the subdural space at the levels of bilateral parietal convexities and cerebral falx. No osseous defect or CSF leakage was detected.

Pneumocephalus was first identified by Chiari in 1884. It has been named as Mount Fuji sign because of radiological appearance. Trauma, tumors, infections, congenital cranial abnormalities and iatrogenic factors are important in the etiology. Development of pneumocephalus following diagnostic LP has been rarely reported. Pneumocephalus after LP was associated with mechanisms, such as (1) high pressure difference between intrathecal space and the environment during LP performed in the lateral decubitus position, (2) development of pressure difference between intrathecal space and the environment caused by excessive CSF drainage and (3) development of negative pressure due to deep breathing or a sudden move during procedure (2-5).

Authorship Contributions

Surgical and Medical Practices: G.Ş., F.P., M.A.A. Concept: G.Ş. Design: G.Ş. Data Collection or Processing: G.Ş., F.P., M.A.A. Analysis or Interpretation: G.Ş. Literature Search: G.Ş. Writing: G.Ş.

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