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Case Report / *Olgu Sunumu*

Spontaneous otogenic epidural pneumocephalus

Spontan otojenik epidural pnömosefalus

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ABSTRACT

Pneumocephalus is defined as the presence of air in the epidural, subdural, subarachnoid, intraparenchymal or intraventricular region. There are many reasons in the etiology of pneumocephalus. Trauma, tumor, infection, nasosinusal or mastoid surgeries are some of these etiologies. However, the progress of spontaneous epidural pneumocephalus is rare. In this article, we report a 32-year-old female patient admitted with headache aggravated by Valsalva's maneuver for 10 days, sudden pain in the left ear, fullness in the ears and vomiting, who had spontaneous epidural pneumocephalus arising from mastoid air cells associated with mastoid hyper-pneumatization. There was no history of head injury, ear infections or operations. Cranial non-enhanced computed tomography showed epidural air in the left parietal convexity and retro-cerebellum. There were connections between left mastoid cavity and epidural air. Additionally, pyramidal bone thinning and erosion with mastoid hyper-pneumatization were observed. Spontaneous pneumocephalus of mastoidal origin should be considered as a possible diagnosis in patients with headache aggravated by the Valsalva's maneuver.

Keywords: Epidural; otogenic pneumocephalus; spontaneous.

ÖZ

Pnömosefalus epidural, subdural, subaraknoid, intraparenkimal veya intraventriküler bölgede hava varlığı olarak tanımlanır. Pnömosefalus etyolojisinin pek çok nedeni vardır. Travma, tümör, enfeksiyon, nasosinuzal veya mastoid ameliyatları bu etyolojilerden bazılarıdır. Ancak, spontan epidural pnömosefalus gelişimi nadirdir. Bu yazıda, 10 gündür Valsalva manevrası ile belirginleşen baş ağrısı, kulaklarda dolgunluk, kusma ve ani gelişen sol kulak ağrısı ile başvuran, mastoid hiper-pnömatizasyon ile ilişkili mastoid hava hücrelerinden kaynaklanan spontan epidural pnömosefalusu olan 32 yaşında bir kadın olgu sunuldu. Olgunun kafa yaralanması, kulak enfeksiyonu veya geçirilmiş ameliyat öyküsü yoktu. Kraniyal kontrastsız bilgisayarlı tomografide sol parietal konveksitede ve retro-serebellumda epidural hava olduğu görüldü. Epidural havanın sol mastoid kavite ile bağlantısı vardı. Ek olarak piramidal kemik incelmesi ve mastoid hiper-pnömatizasyon nedeniyle erozyon gözlendi. Valsalva manevrası ile şiddetlenen baş ağrısı olan hastalarda mastoid kökenli spontan pnömosefalus olası bir tanı olarak düşünülmelidir.

Anahtar sözcükler: Epidural; otojenik pnömosefalus; spontan.

Pneumocephalus is the presence of intracranial air caused by trauma, ear infection, or surgical interventions. Spontaneous pneumocephalus from mastoid hyper-pneumatization aggravated by a Valsalva maneuver is very rare and has only been described in a small number of cases.[1,2] We report a patient with a large spontaneous epidural pneumocephalus in the left parietal lobe that manifested with headache and pain in the left ear.

CASE REPORT

A 32-year-old woman who had headache for 10 days, sudden pain in the left ear, ear fullness and vomiting was admitted to our emergency room. She did not have tinnitus, hearing loss, dizziness, otorrhea or rhinorrhea. She pointed out the increasing nature of these symptoms after coughing, laughing and Valsalva maneuvers. There was no history of head injury, ear infections or operations.

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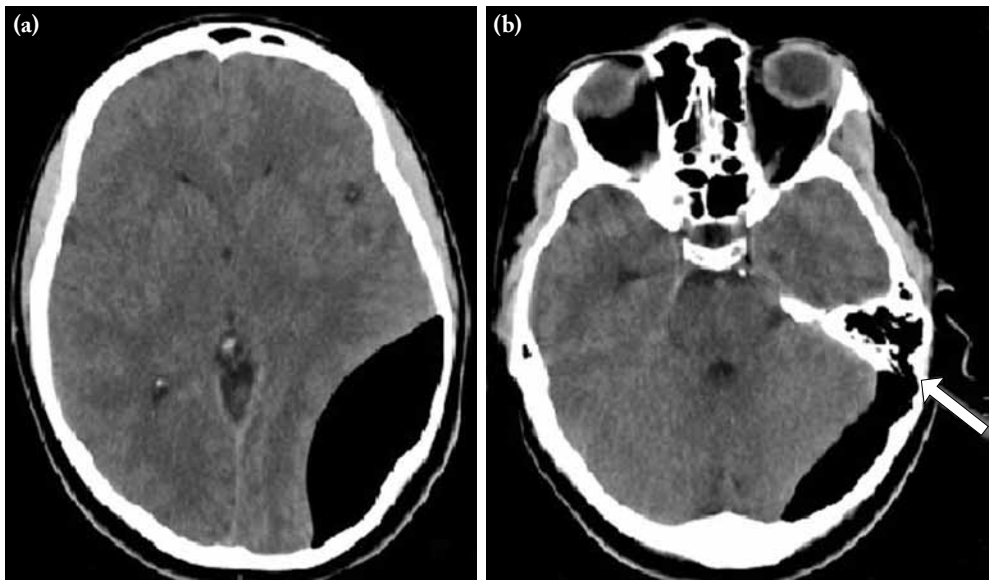

Figure 1. (a, b) Cranial non-enhanced computed tomography shows epidural air in the left parietal convexity and retro-cerebellum. There are connections between the left mastoid cavity and epidural air (arrow).

Initial blood biochemistry, complete blood count, erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) levels were within normal limits. The otorhinolaryngologic and neurological examinations, including visual field and fundus examinations were also normal. Cranial non-enhanced computed tomography (CT) showed epidural air in the left parietal convexity and retro-cerebellum (Figure 1a, b). There were connections between the left mastoid cavity and epidural air (Figure 2a, b). Additionally, pyramidal bone thinning and erosion with mastoid hyperpneumatization were observed. The left parietal sulcus was pushed due to the mass effect of epidural air. There was no evidence of fracture, acute or chronic autogenic infections on CT. The patient was referred to neurosurgery.

DISCUSSION

Spontaneous otogenic pneumocephalus is very infrequent. It is defined as spontaneous rupture of the

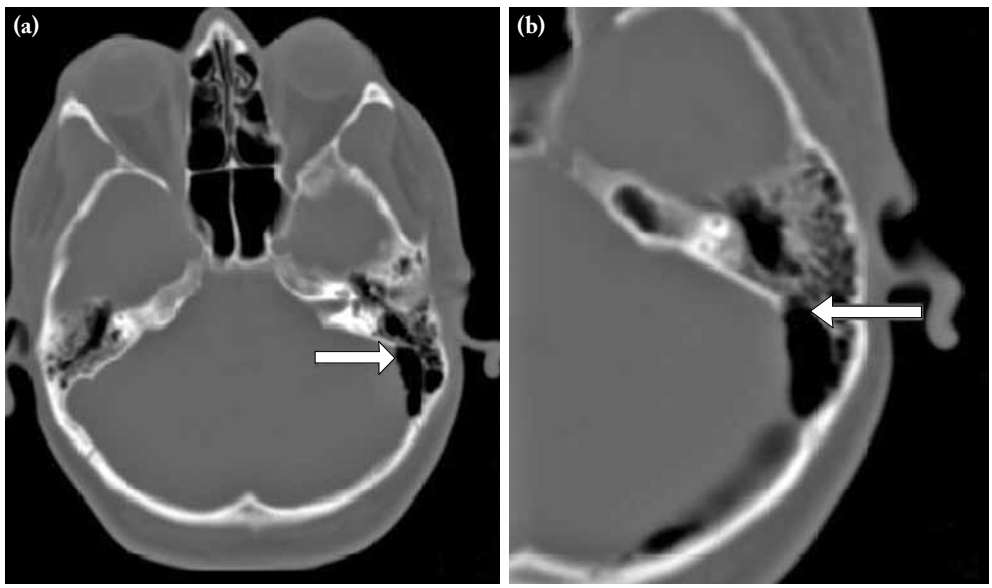

Figure 2. (a, b) Pyramidal bone thinning and erosion with mastoid hyperpneumatization are observed (arrows).

mastoid air cells into the intracranial cavity. About a dozen cases of spontaneous pneumocephalus associated with mastoid hyperpneumatization have been reported in the literature.[1,2] As far as we know, this is the 15th case of pneumocephalus with increased middle ear pressure after repeated coughing, laughing or Valsalva maneuver described in the literature.

A persistent negative intracranial or positive extracranial pressure gradient is necessary for pneumocephalus to occur.[1,3] In this case, we think that a gradient of pressure between the middle ear and the intracranial region caused by Valsalva maneuvers developed the air fistula into the epidural space, by means of a "ball valve" effect.[3] For this effect to occur, there should be a congenital temporal bone defect or chronic microfracture due to positive air pressure or Eustachian tube dysfunction.[1] Mastoid hyper-pneumatization is also associated with the second reason.[4] Subdural, subarachnoid, intraparenchymal, or intraventricular pneumocephalus needs a dural defect in addition to the bony defect.

According to previous reports, headache is the most common symptom for pneumocephalus, similar to our patient who also had left ear pain.[2,4] Otorrhea, meningeal signs, aphasia, vertigo, facial paralysis, visual changes, vomiting, fainting, paralysis and seizures are other symptoms.[5]

The treatment of spontaneous pneumocephalus is surgical drainage of the air collection when it causes intracranial hypertension and repairing defects of the temporal bone.[1,2,5] It is recommended that patients avoid conditions like coughing, laughing or Valsalva maneuvers that can cause intracranial hypertension.

In conclusion, spontaneous pneumocephalus of mastoid origin should be considered as a possible diagnosis in patients with headache aggravated by a Valsalva maneuver. Cranial nonenhanced CT can show air, air localization and bone defects.

Declaration of conflicting interests

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REFERENCES

1. Abbati SG, Torino RR. Spontaneous intraparenchymal otogenic pneumocephalus: A case report and review of literature. Surg Neurol Int 2012;3:32.
2. Rabello FA, Massuda ET, Oliveira JA, Hyppolito MA. Otogenic spontaneous pneumocephalus: case report. Braz J Otorhinolaryngol 2013;79:643.
3. Singh A, Alvarez J. Spontaneous otogenic intracerebral pneumocephalus. West J Emerg Med 2010;11:107.
4. Mohammed el R, Profant M. Spontaneous otogenic pneumocephalus. Acta Otolaryngol 2011;131:670-4.
5. Soenen O, Casselman JW, Lerut B. Spontaneous otogenic pneumocephalus and pneumatocoele. JBR-BTR 2012;95:363-5.