Delayed tension pneumocephalus: A rare complication of shunt surgery

Sir,

We report an unusual case of congenital hydrocephalus that developed acute tension pneumocephalus six months after the ventriculo-peritoneal shunt surgery. Delayed and symptomatic pneumocephalus following shunt placement is rare and has been described in only 11 cases so far.

A 19-year-old female had undergone ventriculo-peritoneal shunt surgery for obstructive hydrocephalus secondary to congenital aqueduct stenosis. Six months later, she presented with sudden onset of severe headache followed by altered sensorium. A computed tomographic (CT) scan of brain showed large pneumocephalus involving the right frontal lobe, basal cisterns, and the lateral and third ventricles (Figure 1). Further assessment with high-resolution coronal CT and MRI did not demonstrate any defect at the skull base but an area of gliosis and porencephalic cyst was discovered in the right frontal lobe adjacent to the suspected site of leakage in the right frontal air sinus (Figure 2). On exploration with a right frontal craniotomy, a fistulous opening was identified in the posterior wall of the right frontal air sinus and in the adjacent dura of the frontal region. A watertight dural repair was performed using a pericranial graft and the right frontal sinus was exenterated, packed with adipose tissue, and covered with the pericranium of the frontal base. Her postoperative recovery was uneventful, and she was asymptomatic at a follow-up after 24 months.

The mechanism of development of pneumocephalus is mainly based on two factors - a reduction in intracranial pressure (ICP), and the presence of a defect in the dura and skull. A long-standing elevation in ICP due to hydrocephalus has been reported to cause erosion of the skull base. It appears that patients can remain asymptomatic as long as the defect is completely plugged by meningeal scarring or gliosed brain tissue that acts as a ball-valve. Significant lowering of intracranial pressure following shunting, causes unplugging of the defect that results in the opening up of the fistula.

The clinical management is essentially based on the treatment of acute intracranial hypertension, therapy or prophylaxis of meningitis, shunt management, and repair of the fistula. Although, intracranial air often resolves spontaneously, tension pneumocephalus causing acute elevation of ICP requires immediate measures to release the entrapped air by simple aspiration or continuous external drainage. There is general agreement that externalization of the shunt should be done if infection is present or a viscus is perforated. Shunt management in the presence of a sterile and well functioning shunt is controversial. Although, successful management of pneumocephalus has been reported with modifications in the shunt system alone, most believe that the treatment should mainly be aimed at direct surgical closure of the site of air entry, and that any change in a normally functioning shunt is unnecessary. Smaller and multiple fistulous tracts at the skull base are difficult to diagnose and are frequently associated with recurrent pneumocephalus or meningitis. When a porencephalic cyst is present, as in our case, the identification of a fistulous defect is relatively easier because of its close proximity with the cyst. Recent techniques with three-dimensional CT scan are more accurate and useful to locate the skull base defects.

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References

Figure 1a and b: CT scan demonstrates air in the frontal and temporal horns of both lateral ventricles and the right frontal lobe. Arrow indicates the possible site of communication with the right frontal air sinus.

Figure 2: Follow-up CT scan after 2 weeks shows a porencephalic cyst in the right frontal lobe (arrow) adjacent to the suspected site of the fistula in the right frontal air sinus.


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**Recurrent oculomotor nerve palsy: A rare presentation of neurocysticercosis**

Sir,

A non-diabetic, non-hypertensive, 34-year-old male presented with sudden onset of complete ptosis of left eye and partial ptosis of right eye of one day duration. He denied diplopia, headache, orbital pain, visual impairment or any weakness of body. Three months ago, he had similar symptoms, which recovered spontaneously by the fourth day. On examination, there was complete ptosis on the left side and partial ptosis on the right side. There was no nystagmus. The left pupil was larger (5.5mm) than the right (3.5mm) and both pupils were non-reacting to light and accommodation. No afferent pupillary defect was present. Fundoscopy revealed no abnormality. Left eye movement was limited to abduction and intortion on attempted down gaze. The right eye was moving fully except in the direction of the superior rectus muscle. The rest of the neurological examination was also normal. Magnetic resonance imaging (MRI) of the brain revealed single ring enhancing lesion (11.6x9.7 x 11.11mm) with perifocal edema and the central part of the lesion containing fluid (hypointense on T1W1 and hyperintense on T2W2) at the tegmentum of the left midbrain (Figure 1). The rest of the brain parenchyma, ventricular system and subarachnoid space was normal. The biochemical and cytological examination of CSF revealed protein of 50mg%, sugar of 40mg%, and 9 cells, all lymphocytes. Polymerase chain reaction (PCR) analysis of mycobacterium DNA was negative both in CSF and serum. Enzyme-linked immunosorbent assay (ELISA) for cysticercus was positive both in CSF and serum. X-Ray chest, thigh and arm were normal. The patient was treated only with edema-lowering agents and he recovered in his symptoms on the sixth day. Follow-up CT scan at four months revealed complete resolution of the granuloma. At one-year follow-up, the patient was completely asymptomatic.

The case demonstrates that midbrain cysticercosis may present with recurrent episodes of unilateral or bilateral third cranial nerve affection.


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**Thoracic neurenteric cyst in a 60 year old male**

Sir,

Neurenteric cysts are congenital intraspinal cysts. They are rare, particularly in the sixth decade of life. The cyst may remain undiagnosed for a long time or may be misdiagnosed.1 A case of isolated high thoracic neurenteric cyst in a 60-year-old male is discussed. The patient presented with a thoracic back pain, which worsened in the last two years. The pain was located in mid-scapular region and it radiated anteriorly and...