Bilateral abducens and facial nerve palsies as a localizing sign due to reduction in intracranial pressure after fourth ventriculoperitoneal shunting

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Abstract

A trapped fourth ventricle often requires fourth ventriculoperitoneal shunting (4VP). Complications of this procedure include shunt blockage, infection, shunt migration, and overdrainage. Cranial nerve palsies are very rare after 4VP shunting and have been described with over drainage and brainstem distortion. We present an unusual case of bilateral abducens and facial nerve palsies after 4VP shunting after normalization of 4th ventricular parameters. Measurement of various brainstem angles presented us with a plausible hypothesis to explain the cranial nerve dysfunction.

Key Words

Bilateral abducens and facial nerve palsy, cranial nerve palsy, fourth ventriculoperitoneal shunting, postshunting cranial nerve palsy, postshunting palsy

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Introduction

"False localizing signs" (FLS) reflect dysfunction distant or remote from the expected anatomical locus of pathology often in the context of raised intracranial pressure (ICP) or spinal cord lesions.[1] Abducens nerve palsies are the most common intracranial FLS followed by facial nerve palsies. These occur due to nerve traction or brainstem displacement by intracranial lesions.[2] We present an unusual case where bilateral abducens and facial nerve palsies and Parinaud's syndrome occurred due to brainstem shift after the fourth ventriculoperitoneal (4VP) shunting.

A 16-year-old girl presented to us 1 month after 4VP shunting with decreased facial expressions. Her symptoms had started 1 week postoperatively but were slowly improving. She had a history of postmeningitic hydrocephalus with multiple revisions of VP shunting and a recent trapped fourth ventricle.

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On examination, she had upgaze and convergence restriction, normal pupil reactions and bilateral 6th and 7th lower motor neuron palsies. Facial nerve conductions were normal, but blink reflexes were absent bilaterally. A magnetic resonance imaging brain showed normalization of 4th ventricular size and change in brainstem angles[3,4] [Figure 1]. After 4VP shunting, the posterior translocation of the brainstem was greatest at the level of the pons (1.13 cm). As she was clinically improving, shunt revision was deferred.

Surgical treatment of a trapped fourth ventricle usually involves 4VP shunting. Shunt complications include shunt malfunction, infection, shunt dislocation, and over drainage. There are only a few reports of cranial nerve palsies following

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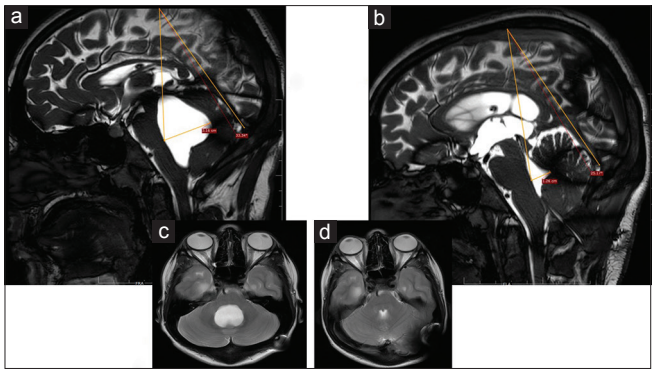

Figure 1: (a and b) Sagittal magnetic resonance imaging T2-weighted images. The brainstem tentorial angle change from 33° (preoperative) to 25° (postoperative). (c and d) Axial T2-weighted magnetic resonance imaging images at the mid-pontine level

4VP shunting with collapsed 4th ventricles, and distortion of the brain stem and all cases have required revision surgery.[5,6]

Clinically, our child had a partial Parinaud's syndrome and bilateral 6th and 7th nerve palsies. The Parinaud's syndrome was likely secondary to mesencephalic distortion. The 6th and 7th nerve palsies were most likely due to traction as the brainstem abruptly moved backward after 4VP as there was no pontine injury or 4th ventricular collapse and the shunt position was adequate. The brainstem angles in our patient demonstrated a significant brainstem correction with the greatest posterior displacement of the pontine portion of the brainstem. It is known that slow-growing tumors can greatly distort the facial nerve without any clinical manifestations. However, in our child, the abrupt change in intracranial dynamics and sudden traction of the cranial nerves are the most likely causative of the cranial palsies. The abnormal blink reflex studies also corroborate a proximal facial nerve injury. The spontaneous improvement is a testament to the remarkable cranial nerve plasticity.

Our case is a queer example of a localizing sign due to paradoxical normalization of ICP, rather than an FLS of raised ICP.

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Conflicts of interest
There are no conflicts of interest.

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