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Case Report

Neurovascular Conflict Causing Isolated 6th Nerve Palsy

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Abstract: There are many intracranial pathologies of isolated 6th nerve palsy but neurovascular conflicts causing isolated 6th nerve palsy is very rare condition. We present a case of isolated abducens nerve palsy due to neurovascular conflicts caused by indentation and mass effect from left vertebral artery and left anterior inferior cerebellar artery (AICA) loop on the left VI cranial nerve.

Key words: Abducent nerve, 6th nerve, neurovascular conflicts, neuroradiology.

INTRODUCTION

Sixth cranial nerve also known as abducent nerve. Abducent nerve originates from abducent nucleus in the caudal dorsal pons and exits ventrally forming abducens fascicle in the brain stem, and leaves brainstem at the ponto-medullary junction to enter the subarachnoid space and courses via cavernous sinus through superior orbital fissure to innervate lateral rectus muscle. It is a purely motor nerve which helps in abduction movement of eye. Haemorrhage, meningitis, inflammation and tumor infiltration are various causes reported in literature affecting the cisternal portion of the nerve causing palsy. However a neurovascular conflict causing palsy is very rare occurrence. We present a case of isolated abducens nerve palsy due to neurovascular conflicts caused by indentation and mass effect from left vertebral artery and left anterior inferior cerebellar artery (AICA) loop on the left VI cranial nerve.

CASE REPORT

A 56-year-old female patient presented with complaints of headache and impaired movement of the left eyeball for 2 days. Patient had no ocular pain. There was no previous history of trauma, limb weakness or jaw claudication. There was no family history of diabetes, hypertension or ischemic heart disease. Her blood pressure was 110/70 mm Hg and pulse was 87 beats per minute. Neurological examination revealed left abducens nerve palsy without signs of impairment of any other cranial nerves (Image A). Laboratory test results were within normal limits HbA1c-5% (normal value- & lt; 5.7%), C-reactive protein - 0.3 (normal range-0-5.0 mg/L), and erythrocyte sedimentation rate (ESR) 15 mm/hr. MRI with T2 weighted fast imaging employing steady state acquisition (FIESTA) showed neurovascular conflict with distal V4 segment of left vertebral artery and left AICA loop indenting and exerting mass effect on the cisternal segment of left VI cranial nerve (Image

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B). MRI showed no abnormal findings in the brainstem, cavernous sinus, or orbits. Patient was advised to undergo neurovascular decompression surgery. She was not willing for surgery and is on follow up.

Image

Figure 1: (A) Photograph demonstrating left 6th nerve palsy. On attempting left gaze, the patient's left eye is unable to abduct. All other fields of gaze were normal. (B) MRI with T2 weighted (FIESTA) shows distal V4 segment of left vertebral artery (arrow head) and left AICA loop (white arrow) indenting and exerting mass effect on the cisternal segment of left VI cranial nerve (black arrow)

DISCUSSION

The sixth cranial nerve also known as the abducens or abducent nerve (CN VI) is a purely motor nerve which helps the eyes into abduction. Though weakness of CN VI is the most common cause of ocular motor cranial nerve palsy with annual incidence of ~11.3/100,000, neurovascular conflicts causing abducens nerve palsy is extremely rare [1]. The patient who demonstrates only lateral rectus weakness and no other historical data to implicate a specific etiology is categorized as having "isolated sixth nerve palsy". There are often vascular risk factors such as hypertension, diabetes mellitus or history of a recent viral infection [2]. Common causes of abducens palsy include infarction, tumor, demyelination, head trauma, meningitis and either high or low intracranial pressure. Aneurysm, neoplastic infiltration, cavernous-carotid fistulas in the cavernous sinus may also result in abducens palsy [1]. Spontaneous recovery rate for isolated abducens nerve palsy due to neurovascular compression is quite low. Therefore, treatment intervention is worth considering for cases of isolated abducens nerve palsy due to neurovascular compression [3].

Compliance with ethical standards

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Conflict of interest: Author declares that they have no conflict of interest.

Ethical approval (animals)

This article does not contain any studies with animals performed by any of the author(s).

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from individual participant included in the study.

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