ISOLATED PATHETICK NERVE PARESIS
BY COMPRESSION FROM A DOLICHOECTATIC BASILAR ARTERY

Case report

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ABSTRACT - The article describes a woman with 53 year-old that has presented diplopia when looking down and adopted a tilted head position in order to read for the last six months. The neuro-ophthalmic examination shows isolated right superior oblique muscle paresis. The magnetic resonance and the angiography show the dolicoectastic basilar artery compressing the right ventral lateral brainstem.

KEY WORDS: trochlear nerve, dolichoectasy, basilar artery, ophtalmoplegy, compression.

The term dolichoectasia is derived from “dolichos”, meaning elongation and “ectasia”, meaning dilatation¹. Dolichoectasia of the intracerebral vessels is a rare disorder that affects the large arteries at the base of the brain²-⁴, most commonly the basilar artery³,⁵. In 1.7% of the general population, that is the only affected artery⁶. In a retrospective study reviewing 1440 magnetic resonance angiographies with the radiological diagnosis of vertebrobasilar dolichoectasia, Obogu et al.³, suggested specific parameters for defining this condition. Those were: basilar artery (BA) or vertebral artery (VA) diameter > 4.5 mm or deviation of any portion >10 mm from the shortest expected course, and BA length >29.5 mm or intracranial VA length >23.5 mm. Compression by a dolichoectastic basilar artery (DBA) has already been involved in ocular motor nerve paresis⁷. Although it is less common than the compromising of the oculomotor or abducens nerves, the trochlear nerve may be involved by mechanical compression caused by dolichoectasia⁷.

The purpose of this case report is to present an unusual association of isolated paresis of the trochlear nerve with a DBA.

CASE

Six months ago, a 53 year-old hypertensive scholar group teacher started feeling persistent double vision when looking down. She started reading and writing with her head bent to the left. Even though she made orthoptic exercises for two months, her condition did not improve.

On clinical examination she was lucid, oriented, and helped with the examination. Blood pressure (checked in both arms) was 240x120 mmHg while seated. Neuro-ophthalmic examination shows that she had no ptosis, eyelid twitch, fluttering eye movements, or eyelid fatigue after...
sustained upgaze. Visual acuity, color vision, pupil size, and reactivity were normal. Except for a few Gunn’s crossing phenomena, the fundus oculi were normal. She complained about vertical diplopia when asked to read or write, and bent her head to the left (ear-shoulder position) in order to reduce visual discomfort. The extra ocular motility examination showed paresis of the right superior oblique muscle (Fig 1), confirmed by the Bielschowsky head-tilt test. Magnetic resonance image (MRI) and magnetic resonance angiography (MRA) showed DBA with brainstem compression (Fig 2A and B). The neurosurgery team discarded the possibility that microvascular decompression would eliminate the mild symptoms. Furthermore, the patient refused the risks of major surgery. She maintains her blood pressure under control with the aid of internal medical visits.

The patient has formally given authorization for the publication of this case report.

**DISCUSSION**

By 1664, Thomas Willis accurately described the fourth nerve: “We call these nerves the Pathetick nerves of the eyes . . . the proper office of these is to move the eyes pathetically, according to the force of the passions and instinct of nature.”

Isolated trochlear nerve palsy has been described as a result of the most diverse causes, such as: diabetes ischemic neuropathy, traumas, infectious diseases, including meningitis, tumors, demyelinating disease, aneurysm, strokes, and complication of intracranial surgery.

DBA may be asymptomatic, but in 6% of this patients it may cause clinical manifestations with
acute onset (stroke or subarachnoid hemorrhage) or with chronic progressive presentation (cranial nerve palsy, compression of the midbrain, or obstructive hydrocephalus).\textsuperscript{16}

Although rare, a possible site for vascular involvement of the fourth nerve would be mechanical compression as it courses towards the ventrolateral aspect of the pons, in the free border of \textit{tentorium cerebelli}, by a dolichoectatic dilatation of a sclerotic vessel or a congenital aneurysm.\textsuperscript{3} This was not found in larger series of pathetick paralysis, like in Rucker’s\textsuperscript{17} 67 cases, and in only one of Burger’s 33 cases\textsuperscript{7} when an aneurysm (not dolichoectastic artery) was found compressing the trochlear nerve.

The pathophysiology of DBA is unknown. On autopsy, the pathologic findings are rarefaction of the elastic tissue in the media with degeneration of the internal elastic lamina. Sometimes, there is an intraluminal thrombus or an atherosclerotic plaque in the ecstatic artery.\textsuperscript{5} The dolichoectastic arteries have an abnormally large external diameter with a thin arterial wall.\textsuperscript{16}

Some years ago, Keane\textsuperscript{8} published a study concerning 215 patients with uni or bilateral palsy of the trochlear nerve and made a review on this issue. Traumas were a cause in more than half of the patients, producing 90 (51\%) of the unilateral and 23 (59\%) of the bilateral fourth nerve palsies. Although there were many described causes, there is no mention of DBA being the causing agent.

Because of the unique visual symptom, vertical diplopia, which is worse on gaze down or near than up or distant, most of the patients look initially for an ophthalmologist’s office.\textsuperscript{8} The clinical diagnosis of superior oblique weakness is based on the presence of three main aspects: first, vertical diplopia is maximal when the affected (higher) eye is turned to right, and then to the left. There was greater separation of images when she tilted her head to the right.

We asked our patient to demonstrate, using her finger, the distance between two images when her head was tilted to right, and then to the left. There was greater separation of images when she tilted her head to the right.

In conclusion, isolated paresis of the trochlear nerve is a rare condition, and even rarer when resulting from DBA compression. The neuro-ophthalmic examination is characteristic, and the combination of MRI and MRA is an effective and noninvasive means of identifying a vascular loop as the cause of the ophthalmic paresis.

Acknowledgment – The authors are in debt with Miss Iracema Breves dos Santos for passing on to us the patient and Mr. Péricles Maranhão Neto for his technical assistance and the revision of the English.

REFERENCES