

Isolated abducens nerve palsy caused by contralateral vertebral artery dolichoectasia

Sir,

Several diseases present with isolated sixth nerve palsy in adults. The causes of actual sixth nerve palsy include aneurysms of the vertebral artery (VA), tumor, head trauma, diabetes mellitus, arteriosclerosis, multiple sclerosis, meningitis, increased intracranial pressure, and lumbar puncture.^{[1],[2]} Elongation, widening, and tortuosity (dolichoectasia) of the vertebrobasilar system occasionally causes facial nerve palsy or trigeminal nerve disturbance by compression.^{[3],[4]} Isolated abducens nerve palsy related to dolichoectatic vertebral artery (DVA) compression is very rare. We describe a patient with isolated right abducens nerve palsy due to vascular compression of left DVA. A 53-year-old man had a 3-year history of horizontal diplopia with no associated symptoms. He complained of horizontal diplopia during rightward gaze. Blood pressure was recorded as 120/80 mm Hg in left arm whilst seated. In the primary position, there was a secondary deviation in the left eye. Neuro-ophthalmologic examinations disclosed right abduction palsy. In contrast to right ward gaze, no problem was found in left ward gaze. All the other cranial nerves examinations were normal. He had no papilledema or nystagmus. Neostigmin testing was performed twice and the results of each test were negative. The blood count, serum glucose (fasting and following glucose load), erythrocyte sedimentation rate, thyroid function studies, and the other

hematological investigations were all within normal limits. Magnetic resonance (MR) imaging and MR angiography of the brain and orbit demonstrated compression of the right abducens nerve superiorly and laterally by dolichoectatic left VA. No other abnormal signals were seen in brainstem [Figure 1]. Owing to the fact that the right abducens nerve palsy was mild and the patient showed no diplopia in the primary position, no treatment was administered. Six months after the first examination, no changes in neurological findings had been detected.

The dolichoectatic VA is the site of marked pathological elongation, widening, and tortuosity. The etiology of dolichoectasia is unclear. Severe arteriosclerotic changes associated with hypertension had been reported as a cause of dolichoectasia of vertebrobasilar system. On the other hand, because of its occurrence in some young people, several congenital factors may contribute to its development.^[5] When VA is dolichoectatic, it deviates from its course ventral to the brainstem and may compress the cranial nerves, most frequently as they emerge from the brain stem (root entry zone). The facial and trigeminal nerves are the mostly affected ones.^{[3],[4]} In addition DVA can produce ischemic stroke, transient ischemic attacks, and intracerebral hemorrhage.^[1] The abducens nerve is one of the longest nerves in its peripheral course that predisposes this cranial nerve to involvement at all levels, from the brain stem and base of the skull, through the petrous tip and cavernous sinus, to the superior orbital fissure and orbit. Because of this, the sixth nerve is more liable to injury by some conditions such as trauma or inflammatory lesions. Abducens nerve palsy usually results from brainstem ischemia, hemorrhage, infiltration of tumor or vascular compression, and is always associated with facial weakness and pyramidal signs in the central lesions. After emerging from the brainstem, occasionally, the abducens nerve may be compressed by vascular structures such as an enlarged ec-

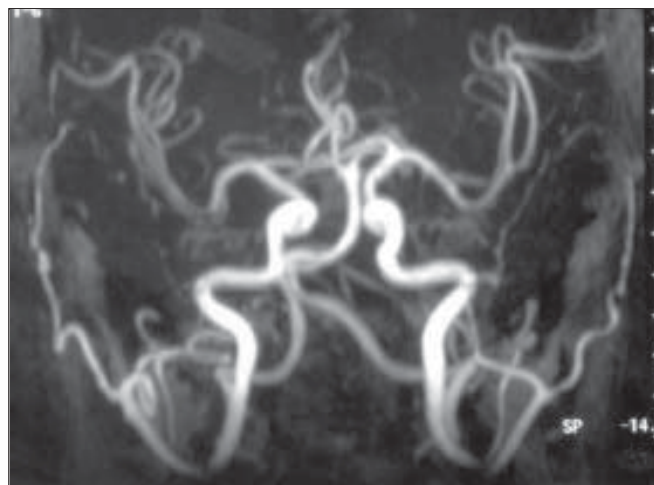


Figure 1: Coronal magnetic resonance angiography image demonstrates the dolichoectatic left vertebral artery (VA), compression and displacement of right sixth nerve at the root exit zone

tatic vertebrobasilar artery.^[2]

In our case, MR imaging revealed dolichoectasia of the left VA and compression of the right abducens nerve by the left VA in the root exit zone. Narai *et al.* and Ohtsuka *et al.* reported cases with isolated abducens nerve palsy caused by compression of contralateral DVA similar to our case but present case differs from those of cases with having no hypertension.^{[2],[4]} Microvascular decompression is often recommended for patients with a cranial mononeuropathy that is caused by dolichoectasia of the vertebrobasilar system, refractory to medical treatment.^[3] Our findings suggest that dolichoectasia of contralateral vertebral artery causes isolated abducens nerve palsy and thin MR imaging scans can be helpful to detect such compression. The contralateral VA dolichoectasia should be considered as a very rare cause of the isolated abducens nerve palsy.

**Semih Giray, Aysel Pelit¹, Osman Kizilkilic²,
Mehmet Karatas**

Departments of Neurology, ¹Ophthalmology, and ²Radiology, Adana Teaching and Research Hospital, Baskent University, Adana, Turkey. E-mail: sgiray72@hotmail.com

References

1. Miller NR. The ocular motor nerves. *Curr Opin Neurol* 1996;9:21-25.
2. Narai H, Manabe Y, Deguchi K, Iwatsuki K, Sakai K, Abe K. Isolated abducens nerve palsy caused by vascular compression. *Neurology* 2000;55:453-454.
3. Cohen NG, Miller NR. Noninvasive neuroimaging of basilar artery dolichoectasia in a patient with an isolated abducens nerve paresis. *Am J Ophthalmol* 2004;137:365-367.
4. Ohtsuka K, Sone A, Igarashi Y, Akiba H, Sakata M. Vascular compressive abducens nerve palsy disclosed by magnetic resonance imaging. *Am J Ophthalmol* 1996;122:416-419.
5. Panda S, Goyal V, Gupta V, *et al.* Vertebrobasilar dolichoectasia presenting as lower cranial nerve palsy. *Neurol India* 2004;52:279.

Accepted on 08-01-2005