Isolated Vertıcal Ophtalmoplegıa and Mydrıasıs Due to Bılateral Mıdbraın Infarctıon

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Abstract: Partial fascicular oculomotor palsy, the combination of bilateral midriasis with loss of vertical gaze movements, is rarely a consequence of midbrain infarction. We describe a patient with acute ischemic infarcts involving both upper most part of the midbrain, presenting with marked vertical gaze palsy and mydriasis bilaterally as the only neurological abnormality. These features are suggestive of partial fascicular oculomotor palsies involving the pupil, inferior rectus(IR), superior rectus(SR), inferior oblique(IO) muscles and sparing medial rectus(ML), levator palpebrae(LP) muscles. These neuro-ophthalmological and radiological findings in our case support the model that the fibers to medial rectus and levator palpebrae muscles might be located in the more caudal portion of the oculomotor fascicles.

Keywords: Midbrain, oculomotornerve.

1. INTRODUCTION

The artery of Percheron is an uncommon anatomic variant in which a solitary arterial trunk originates from one of the proximal segments of a posterior cerebral artery and provides arterial supply to bilateral paramedian thalami and the rostral midbrain. When bilateral medial thalamic and midbrain infarcts are found, occlusion of the artery of Percheron should be considered. Midbrain infarctions may cause the partial fascicular oculomotor palsies. Partial fascicular oculomotor palsy, the combination of bilateral midriasis with loss of vertical gaze movements, is rarely a consequence of midbrain infarction.

2. CASE

A 34 year-old man presented with acute oscillopsia.Two weeks before admission, he suddenly developed lethargy and was slightly disoriented. The neurological examination showed complete downward and upward gaze palsy. Pupils were round at 5mm and reacted sluggishly to light (Figure **1**). The oculocephalic reflex in both vertical directions and Bell's phenomenon were absent bilaterally. No ptosis, nystagmus and diplopia was noted. Horizontal eye movement was intact for both saccades and smooth pursuit. Findings from there mainder of the neurological examination were unremarkable. Laboratory investigations (full blood counts, bloodurea, creatinine, electrolytes, thyroid screen, blood sugar and liver functio ntests) were normal. Brain MR demonstrated acute bilateral infarction in the upper most part of the midbrain

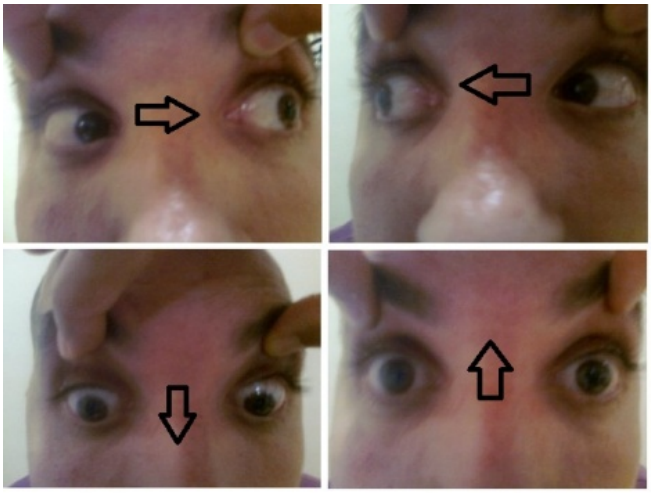

Figure 1: Downward and upward gaze palsy. Pupils reacted sluggishly to light.

(Figure **2**). Digital Substraction Angiography revealed no marked stenosis or aneurysm of main arteries.

3. DISCUSSION

Several cases of partial oculomotor palsies caused by small lesions of the oculomotor fascicles in the midbrain have been reported, on the basis of which, models of the spatial arrangement of oculomotor nevre fascicles have been proposed [1-7].

Castro *et al*. [1] proposeda planar distribution of oculomotor fascicles in the midbrain, in which the fascicles innervatin the pupil, inferior rectus, levator palpebrae, medial rectus, superior rectus, and inferior oblique muscles lie from medial to lateral.

Ksiazek *et al*. [3] proposed an additional rostrocaudal arrangement of the fascicle in which the pupil is most rostral (abutting the red nucleus) whilst the levatoris most caudal, with the fibers for the extra

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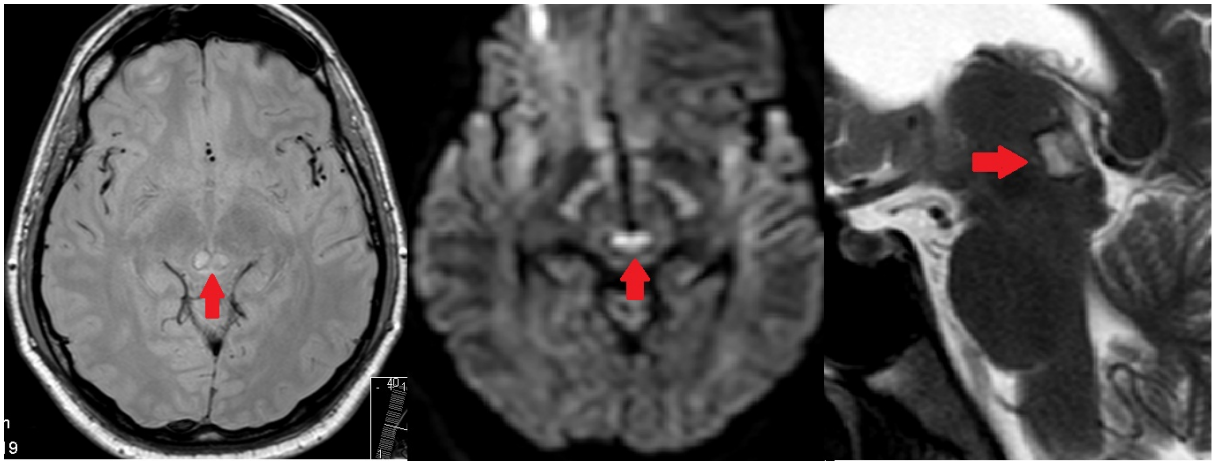

Figure 2: T2, diffusion weighted MRI and apparent diffusion coefficient map demonstrate acute infarction in the upper most part of the midbrain.

ocular muscles arranged in a medial-lateral fashion and occupying the Middle portion of the fascicle. Schwartz *et al*. [6] proposed a corrected model of the three-dimensional arrangement of the oculomotor fascicles. Lee and Kim [4] reported a case with isolated inferior rectus palsy due to a tiny infarct in the right paramedian rostral midbrain. They consider that a lesion selectively involving the most rostral part of the midbrain may cause isolated inferior rectus palsy. Tsuda and Tanaka [7] describe two cases of pupil sparing partial fascicular oculomotor paresis and emphasize that the fibers to the inferior rectus muscle (IR) may be located in the most rostral portion of the oculomotor fascicles. Chen *et al*. [2] reported a case with unilateral ptosis and mydriasis and stated that the fibers to LP and SP might be adjacent in the oculomotor fascicles. Naruse *et al.* [5] report a case of isolated vertical ophthalmoplegia and pupillary abnormality caused by bilateral rostroventral midbrain infarction.

These neuro-ophthalmological findings in these cases [2, 4, 5, 7] would not compatible with previously proposed models of the oculomotor fascicles [1-3]. Our patient presented with vertical gaze palsy and mydriasis on both eyes due to bilateral infarction in the upper most part of the midbrain. These features are suggestive of partial fascicular oculomotor palsies involving SR, IR, IQ, SP muscles and sparing MR, LP muscles. These neuro-ophthalmological and radiological findings in our case support the model that the fibers to medial rectus and levator palpebrae muscles might be located in the more caudal portion of the oculomotor fascicles, which was previously proposed by Naruse *et al*. [5].

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