

## CASE REPORT

# Binocular Diplopia in Partial Unilateral Oculomotor Nerve (OCN) Palsy

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## ABSTRACT

**Background:** Binocular diplopia is mostly caused by oculomotor nerve (OCN) palsy. Acquired OCN palsy has varied etiologies, therefore managing OCN palsy depends on the cause and presence of amblyopia.

**Aim:** To report a case of binocular diplopia associated with unilateral OCN palsy.

**Case Illustration:** A 49-year-old male patient presented with the first episode of binocular diplopia. He had histories of cardiac catheterization and dyslipidemia. Ophthalmology examination showed exotropia of the left eye with no pupillary involvement, and isolated paresis of left OCN the medial rectus muscle. Laboratory studies showed high level of total cholesterol and low-density lipoprotein (LDL). We found his left OCN was in contact with left P2A posterior cerebral artery (PCA) segment, suggesting a neurovascular conflict during MRI. Steroid along with antiplatelet and statin were given. Each eye was occluded with patch every 3 hours alternately during hospital treatment. The symptoms improved and he had no complaint in the following 3 months after the event.

**Discussion:** The most common cause of partial third nerve palsy is microvascular. Vascular anomalies could compress the oculomotor nerve, inducing irritation of the nerve.

**Conclusion:** This case suggests neurovascular conflict as the cause of diplopia due to partial unilateral OCN palsy.

## KEY WORDS

diplopia, oculomotor nerve palsy, neurovascular conflict

## BACKGROUND

Diplopia (double vision) is a symptom resulting from the perception of double images of a single object, and classified as monocular and binocular diplopia. Binocular diplopia is more frequent (89%), characterized by the disappearance of the double images when one of the eyes is closed, while in monocular diplopia the symptom persists even when one eye is closed<sup>1)</sup>. Binocular diplopia is mostly caused by OCN palsy due to ischemia. Acquired OCN palsy has varied etiologies, therefore managing OCN palsy is challenging and requires step to step treatment<sup>1-3)</sup>.

## CASE REPORT

A 49-year-old male presented with the first episode of binocular diplopia since thirty minutes before admission. He had a history of cardiac catheterization and dyslipidemia, with clopidogrel 75 mg qd and rosuvastatin 20 mg qd as his routine medications. The visual acuity of both eyes was 20/30. Physical examination showed exotropia of the left eye with no pupillary involvement, and isolated paresis of left oculomotor nerve the medial rectus muscle. Slit-lamp and other ophthalmology

examination were unremarkable. Laboratory studies showed high level of total cholesterol and low-density lipoprotein (LDL). Magnetic resonance angiography showed that the left OCN was in contact with left P2A posterior cerebral artery (PCA) segment, suggesting a neurovascular conflict. Other neurological and hematological parameters were within normal ranges. He received methylprednisolone, clopidogrel, and rosuvastatin. Each eye was occluded with patch every 3 hours alternately. The diplopia and eye movement gradually improved during hospitalization. Patient was discharged 3 days later, and the symptoms had not recurred over the past 6 months.

## DISCUSSION

The most common cause of partial OCN palsy is microvascular, frequently associated with diabetes mellitus, hypertension and dyslipidemia, therefore potential vascular conflicts should be investigated appropriately<sup>4,5)</sup>. Other common causes of partial OCN palsy are trauma, tumor compression, post-neurosurgery, aneurysm compression, other causes, stroke, undetermined, pituitary apoplexy, Tolosa-Hunt syndrome, and giant cell arteritis<sup>6)</sup>. However, neurovascular conflicts should be suspected in cases of a non-pupillary sparing OCN palsy. OCN is in a close relationship with large arteries through the basal cisterns. It passes

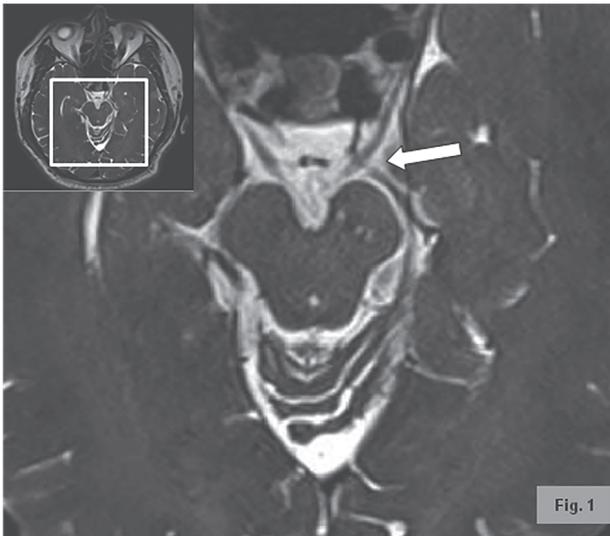
Received on September 27, 2020 and accepted on December 16, 2020

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**Figure 1: White arrow shows the neurovascular conflict between left oculomotor nerve (OCN) with left posterior cerebral artery (PCA) segment P2A**

between the superior cerebellar artery (SCA) and the PCA, both originating from the basilar artery (BA)<sup>9</sup>. Due to its position, the OCN could be compressed by vascular anomalies, inducing irritation of the nerve that results in a dysfunction and in the clinical manifestation of a non-pupillary sparing oculomotor palsy<sup>4,6</sup>. The neurovascular conflict found in this patient may be caused by his tendency for vascular problems, since the patient had histories of cardiac catheterization. Stockman *et al.*<sup>7</sup> administered carbamazepine, while Shimizu *et al.*<sup>8</sup> administered prednisolone. Bellotti *et al.*<sup>3</sup> recommend medical treatment as first therapeutic approach: steroids for acute onset persistent cases, related to an acute inflammatory state, and carbamazepine for intermittent cases. Microvascular decompression (MVD) can be pro-

posed if remission is not obtained after the pharmacological treatment or in case of chronic persistent presentation, considering the severity of symptoms must exceed surgical risks. We prefer the use of steroid since carbamazepine has more serious side effects.

## CONCLUSION

Binocular diplopia caused by oculomotor nerve (OCN) palsy has numerous etiologies. This case suggests neurovascular conflict as the cause of diplopia due to partial unilateral OCN palsy. Steroid was given and antiplatelet along with statin for underlying conditions was maintained. The patient remains under treatment for his dyslipidemia, and symptoms had not recurred in the following 6 months after the initial (and only) event.

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