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CASE REPORT

Vision Loss and RNFL Thinning after Internal Carotid Arter Occlusion and Middle Cerebral Artery Infarction

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ABSTRACT

Introduction: Ischaemic, traumatic or neoplastic damage to the optic chiasm, optic tract or lateral geniculate nucleus affects the retinal ganglion cell (RGC) axons, detected as reduced retinal nerve fiber layer (RNFL) thickness around the optic nerve head. We report a case of vision loss and reduced RNFL thickness after internal carotid artery (ICA) occlusion and middle cerebral artery (MCA) infarction. **Case report:** A 33-year-old woman with a 3-month history of vision loss in right eye and left hemiplegia. The best corrected visual acuity was 1.0 in left eye and there was no light perception in the right eye. Ocular motility, intra-ocular pressure, anterior segments were normal in the both eyes. Her fundus examinations were normal except optic atrophy in the right eye. Visual field test was not performed because of cooperation difficulties. Magnetic resonance imaging (MRI) revealed an infarction of the right MCA. Computed tomographic angiography showed right ICA occlusion. Optical coherence tomography (OCT) demonstrated 6 clock hours of RNFL thinning in the right eye. Average RNFL thickness of the right and left eyes were 53µm, 96 µm respectively. **Conclusions:** Our findings show that a relatively short period of ICA occlusion and MCA infarction can cause vision loss and thinning of the RNFL.

Keywords: Retinal nerve fiber layer; internal carotid arter occlusion; middle cerebral artery infarction.

1. INTRODUCTION

The retinal nerve fiber layer (RNFL) is comprised of the axons of retinal ganglion cells (RGCs). The majority of these axons synapse in the lateral geniculate nucleus. Ischaemic, traumatic or neoplastic damage to the optic chiasm, optic tract or lateral geniculate nucleus affects the RGC axons, determined as reduced RNFL thickness around the optic nerve head (1, 2). The blood supply to the ocular and orbital circulation is mostly provided by the ophthalmic artery which is a branch of the internal carotid artery (ICA). So, ipsilateral visual symptoms may occur in many patients with cerebral ischemia in the ICA (3).

We report a case of vision loss and reduced RNFL thickness after ICA occlusion and middle cerebral artery (MCA) infarction.

2. CASE REPORT

A 33-year-old woman with a 3-month history of vision loss in right eye and left hemiplegia due to right ICA occlusion and MCA infarction. The best corrected visual acuity was 20/20 in the left eye and there was no light perception in the right eye. Ocular motility, intra-ocular pressure, anterior segments were normal in the both eyes. Her fundus examinations were normal except optic atrophy in the right eye. Visual field test was not performed because of cooperation difficulties. Magnetic resonance imaging (MRI) revealed an infarction of the

right MCA (Figure 1). Computed tomographic angiography showed right ICA occlusion (Figure 2). Optical coherence tomography (OCT) demonstrated 6 clock hours of RNFL thinning in the right eye (Figure 3). Average RNFL thickness of the right and left eyes were 53µm, 96 µm respectively.

Figure 1. Magnetic resonance imaging showed an infarction of the right middle cerebral artery

Figure 2. Computed tomographic angiography showed right internal carotid artery occlusion

3. DISCUSSION

Ocular ischaemic syndrome (OIS) is a rare condition, but its complications may cause to severe visual impairment. OIS occurs usually in patients with poor collateral circulation between the internal and external carotid arteries or between the two internal carotid arteries. Patients with well-developed collateral circulation may not advance OIS in spite of total occlusion of the ICA. Conversely, in patients without well-developed collateral circulation, stenosis of the ICA by even if 50% may lead to the development of OIS (3).

Patients with ICA stenosis or occlusion may develop visual impairment because of the hemodynamic reduction of ocular circulation (4). Visual loss occurs gradually over a few weeks

Figure 3. Optical coherence tomography demonstrated 6 clock hours of RNFL thinning in the right eye

or months in 67% of patients, it occurs over a period of days in 12%, and the loss is sudden over a period of minutes or seconds in another 12% (3). Vazirani et al. (5) reported a 47-year-old male who presented with acute mono-ocular vision loss. The researchers detected no flow in the right ICA and a 35–40% stenosis on the left side. Similarly, our patient had no light perception in the right eye. In addition, Optical coherence tomography demonstrated severe RNFL thinning in the right eye. RNFL changes may be observed as a result of ischemia and atrophy of retina after ICA occlusion.

Our findings show that ICA occlusion can cause total vision loss and severe thinning of the RNFL.

CONFLICT OF INTEREST: NONE DECLARED

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