International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

In the Spotlight: A Case Report on Recovery of Visual Loss Following Endoscopic Endonasal Surgery for Ossifying Fibroma

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Abstract: ***Optic nerve injury is a rare but devastating complication of endoscopic endonasal surgery. This case report describes sudden visual loss after excision of an ossifying fibroma in a 22-year-old patient. The study aims to assess the cause and recovery of postoperative optic nerve. Immediately after surgery, examination showed no light perception, afferent pupillary defect and a flat visual evoked potential while MRI revealed optic nerve compression. The patient was treated with orbital decompression and corticosteroids, leading to marked improvement in visual acuity from no light perception to 6/9 over 3 months although visual field defects and optic disc pallor persisted. The findings suggest that optic nerve injury during endoscopic sinus surgery may result from direct trauma or indirect ischemic /compressive mechanisms. The case shows that early diagnosis and prompt treatment may improve vision but complete recovery may not occur.***

Keywords: Optic nerve injury, Orbital decompression, MRI orbit, Endoscopic endonasal surgery, Visual field defect

1. Introduction

Optic nerve injury resulting from endoscopic sinus surgery is fortunately very rare but the complications may be extremely serious. It has also rarely been reported in public forum. Here we evaluate the prognosis of sudden visual loss following endoscopic endonasal surgery for Ossifying Fibroma.

After establishment of endoscopic sinus surgery (ESS), ESS has become the mainstay surgical treatment for chronic sinusitis with polyp. The introduction of endoscopy for sinus surgery provided improved visualization and has gained enormous popularity in the diagnosis and treatment of paranasal sinus disease [1]. Complications associated with ESS are mainly temporary and reversible but the major complications may cause serious disability.

Despite an understanding of the anatomy of the sinus by using preoperative physical examination and computerized tomography, the proximity of the orbit to the ethmoid sinuses, misorientation of direction due to ethmoid septa, poor visual field due to bleeding and a poor surgical technique place the orbital soft tissues at risk during sinus surgery.

2. Case Presentation

This case involved a 22-year-old who underwent endoscopic sinus surgery for ossifying fibroma excision under general anesthesia at another medical center 2 weeks prior to being admitted in our department with complaints of loss of vision in right eye. Immediately after the surgery, on eye examination of the right eye:

- There was no perception of light
- Relative afferent pupillary defect observed
- No deficits in ocular motility
- Hyperemic right optic disc and
- A flat visual evoked potential seen.

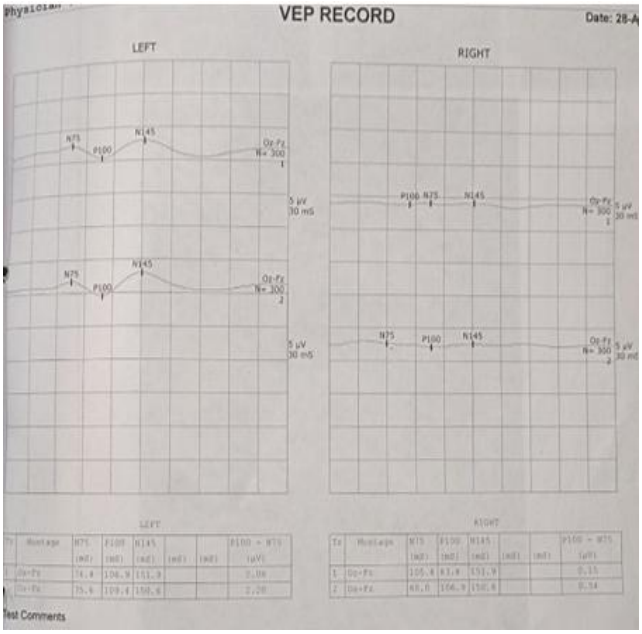

Figure 1: Right eye with a flat VEP

MRI of orbit post-surgery revealed compression, thickening of intracanalicular segment of optic nerve with focal area of obliteration of optic nerve sheath suggesting optic neuritis.

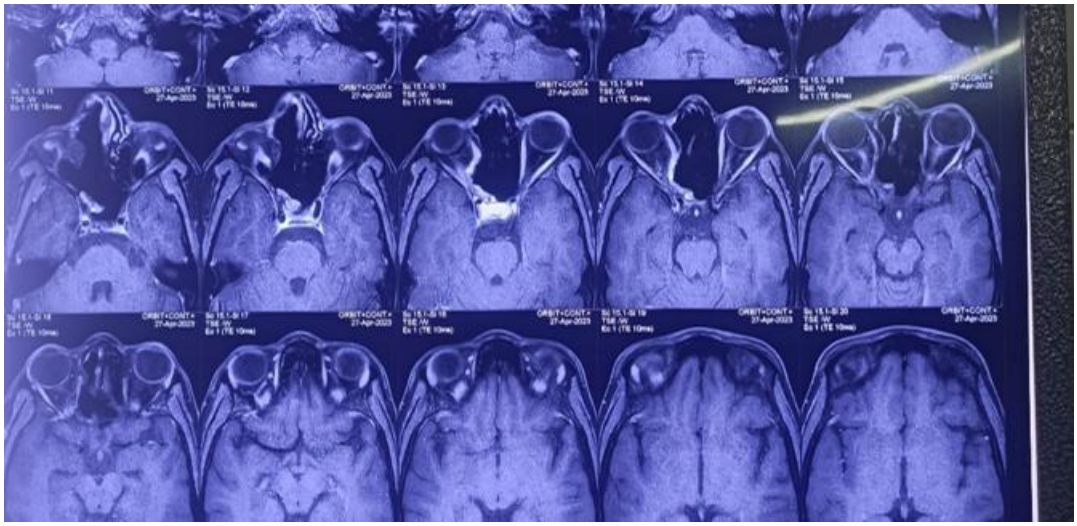

Figure 2: Compression and thickening of intracanalicular segment of optic nerve

Orbital decompression was then performed followed with intravenous methylprednisolone for 8 days and oral steroids 1mg/kg for next 10 days which was started from the previous center and continued at our hospital.

Visual acuity, intraocular pressure, perimetry and OCT were regularly performed and monitored on out-patient basis

Figure 3: Snellen Chart, Henson 9000 perimeter, Topcon Maestro OCT

3. Results

After 16 days post -surgery, the right eye's best corrected visual acuity (BCVA) showed improvement reaching 6/24 on Snellen's chart.

However, raised intraocular pressure, disc pallor and visual field defects were observed.

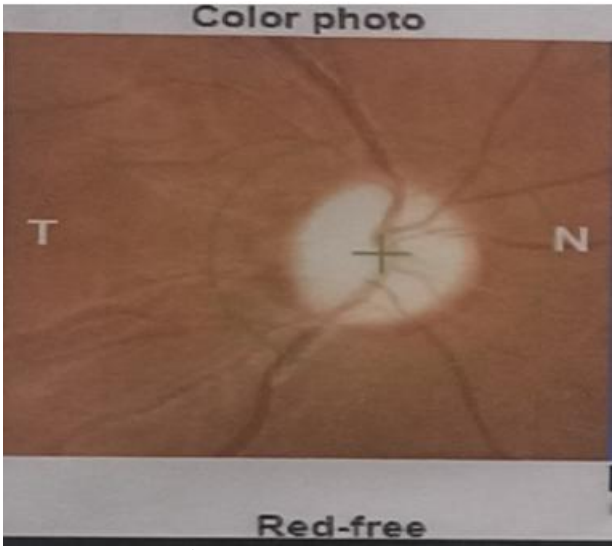

Figure 4: 16th day Post Surgery with disc pallor

- By the 2nd month, BCVA enhanced to 6/9 with normalized intraocular pressure post-beta blocker eye drop use. Although inferotemporal quadrant vision persisted,

glaucoma hemifield test (GHT) indicated abnormalities beyond normal limits, with a median deviation (MD) of -25.42 dB($p<0.5\%$). Temporal optic disc pallor was noted and the average retinal nerve fiber layer (RNFL) measured 61 µm.

- At the 3rd month mark, BCVA stood at 6/9 with regular intraocular pressure range. The right eye's visual field exhibited restricted vision with a small temporal island, GHT outside normal limits, MD of -18.75 dB ($p<0.5\%$), optic disc pallor with average RNFL of 44 µm.

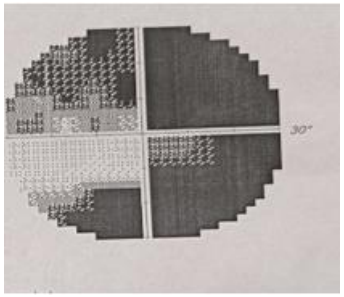

Figure 5: 2nd month post-surgery Visual field

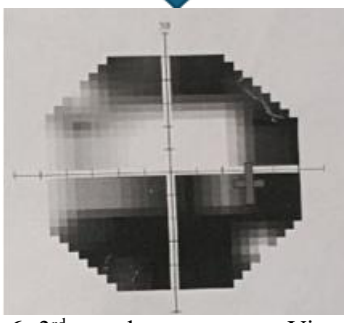

Figure 6: 3rd month post-surgery Visual Field

4. Discussion

It is not easy to determine whether blindness has been caused by direct or indirect damage. The reason why direct damage to the optic nerve occurs especially around the posterior ethmoid sinus, may be explained by the proximity of the lamina papyracea and the optic nerve and the fact that it is difficult for the surgeon to be aware of the break through the lamina papyracea because of the thin fat layer at the site [2,3,4].

The mechanism of blindness caused by indirect injury are a loss of blood supply to the retina or optic nerve compression. Retina blood supply is sustained by branches of the internal ophthalmic artery, namely the posterior ciliary artery and central retinal artery [5]. Since the central retinal artery and medial posterior ciliary artery run along the inferolateral and medial portions of the optic nerve respectively, they can be easily injured during ESS [5,6,7].

5. Conclusion

This case underscores the rarity and severity of optic nerve injury following endoscopic endonasal surgery for Ossifying fibroma. Serious vision threatening complications should be avoided during FESS operation. The surgeon should be aware of all the signs that indicate any threat to the optic nerve and other vital structures in the orbit. Ophthalmologist on-call should be involved if any unusual ophthalmic signs are present to prevent any inadvertent visual threatening incidences.

Vigilant postoperative management including orbital decompression and corticosteroid treatment led to notable visual acuity improvement and intraocular pressure normalization. Improved yet persistent visual field defects highlight the intricate challenges in restoring complete visual function.

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