Concomitant scleral rupture with optic nerve transaction after trivial trauma- A case report

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ABSTRACT

Optic nerve carries visual stimulus from retina to visual cortex in visual pathway. Injury to optic nerve is not common but the outcome is devastating. It gets damaged either due to direct entry of projectile objects, injury by sharp bony fragments or indirectly due to torsional force damaging the lamina cribrosa. We present an unusual case of optic nerve transaction following a fall on concrete floor caused by a combined mechanism associated with scleral rupture.

Key words: optic nerve, ocular trauma, optic nerve transaction, scleral rupture

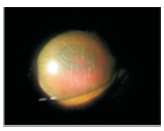
INTRODUCTION

The optic nerve is composed of axons of ganglion cell layer of retina. The axons pierce lamina cribrosa to form bundles of myelinated nerve fiber bundles. This nerve is covered by three meningeal layers. Presentation of traumatic optic neuropathy is varied one. We present a rare association of post traumatic optic nerve transaction with concurrent sclera rupture.

Case Report

A 22 year normotensive, nondiabetic man reported to emergency department of our hospital with complete loss of vision in left eye after a fall on cemented floor. Initial examination shows no perception of light in left eye and normal (6/6) vision in right eye. His mental status and systemic survey revealed no abnormality. Ocular examination of left eye showed sectoral conjunctival congestation about 2mm from limbus extending from 10 o'clock to3 o'clock. There was generalized chemosis with black eye on the left side in addition to diffuse subconjunctival hemorrhage with ill-defined posterior border. Slitlamp examination showed diffuse stromal edema with generalized desmet's folds.

Fig.1.Anterior segment photograph showing hyphema with diffuse corneal edema and desmet's folds



Detailed anterior segment examination and fundal evaluation was not possible due to presence of grade 3 hyphema. Applanation tonometry showed only 6mm Hg of intraocular pressure. Findings in the fellow eye were normal. Immediate ultrasonography (B scan) of involved eye showed dense mid and posterior vitreous echoes suggestive of intragel haemorrhage. Retina was attached. The patient was evaluated and shifted to operation theatre for exploration under general anesthesia where a full thickness sclera rupture with uveovitreal prolapse was noted on total peritomy. The sclera rupture was repaired with 8 interrupted 6:0 vicryl sutures and the resected conjunctiva was cauterized. A sideport entry was attempted at 110'clock of limbus to wash out hyphaema. The patient was put on systemic steroid(1mg/kg of body weight),topical prednisolone acetate(1%) 6 times a day, atropine sulphate eye drop(1%) three times a day, timolol maleate eye drop(0.5%) twice a day and ciprofloxacillin eye drop(0.3%) three times a day. The next day CT scan was performed which showed fracture of lateral wall and floor of left orbit with optic nerve transaction on the same side. The patient was subsequently referred to department of neurosurgery for further management.

Fig.2.CT Scan showing optic nerve transaction on the left side

DISCUSSION

The optic nerve is covered by three meningeal layers which carries major inputs from retina to primary visual cortex.[1] Each optic nerve consists of about 1.2 million of nerve fibers which are axons of retinal ganglion cells of retina. Potential sites of optic nerve injury are intraocular, intraorbital, intracanalicular and chiasmal.[2]Damage to the optic nerve can be caused by a host of hereditary (like leber's optic neuropathy) and acquired conditions including trauma. Traumatic optic neuropathy can be a result of indirect impact or direct trauma such as direct entry of projectile into orbit or even may be due to fractured bony fragment impinging on the optic nerve. Anterior indirect optic nerve injury can occur when the globe is suddenly rotated or anteriorly displaced which tears the margins of lamina cribrosa.[3] This case is unique in the sense that the mechanism of optic nerve transaction after a trivial fall appears to be mixed(both direct and indirect).

CONCLUSION

Even a trivial fall may cause vision threatening consequences like sclera rupture and optic nerve transaction.Standard literature search did not mention simultaneous presentation of sclera rupture and optic nerve transaction. It emphasizes the need to search for traumatic optic neuropathy in all cases of sclera rupture especially with profound loss of vision in the involved eye.

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REFERENCES

1. Visual Pathway. In Nema HV,Singh VP,Nema N:Anatomy of the Eye and Its Adnexa ,New Delhi,1999,Jaypee Brothers,81.
2. Simmons Lessell. Traumatic optic neuropathy and visual system injury. In Bradford J. Shingleton,Peter S. Hersh and KennethRr. Kenyon,editors:Eye Trauma,USA,1991,Mosby-year book,374.
3. Park JH, Frenkel M, Dobbie JG, Choromokos E. Evulsion of the optic nerve. *Am J Ophthalmol.* 1971 Nov;72(5):969-71.