

Optic nerve transection following a penetrating ocular trauma: A rare case report

Abstract

A patient with penetrating orbital trauma with complete transection of optic nerve is presented. MRI revealed extra-ocular intraconal foreign body with transection of optic nerve.

Keywords

Optic nerve

Penetrating trauma

Optic nerve transection

Traumatic optic neuropathy

Introduction

We describe MRI findings of a rare case of right eye blindness due to a wooden foreign body penetrating through the nasal aspect of right orbit. MRI orbit of the patient revealed valuable information about the status of optic nerve.

Case History

A young male of 12 years age presented to ER with a history of trauma to right eye due to a wooden piece. On clinical examination a penetrating wound was seen on the nasal aspect of right eye. Further examination revealed complete loss of vision with relative afferent pupillary defect which were suggestive of optic nerve injury. Patient was referred to Department Of Radio-diagnosis for X ray skull which does not reveal any metallic foreign body. Then MRI orbit was done. MR imaging revealed a well-defined linear intra-conal extra-ocular foreign body approximately 1.7cm in length just medial to rectus muscle. Posterior end of the foreign body was seen transecting the intra-conal segment of optic nerve. Focal Hyperintense signal on T2-weighted imaging and restricted diffusion on DWI was seen in the anterior cut end of intra-conal segment of optic nerve consistent with traumatic optic neuropathy. Patient was taken for surgery and wooden foreign body was retrieved.

Discussion

Major cause of mono-ocular blindness throughout world is ocular trauma¹. However visual loss caused by traumatic optic neuropathy whether blunt or penetrating is very uncommon with incidence of 0.7-2.5%², but once occurred, is associated with deleterious consequences³. The intracanalicular segment is most commonly injured part of optic nerve⁴ due to tight adherence of dural sheath to periosteum but in our case intra-orbital segment is transected as

the trauma is penetrating. In our case diffusion restriction was seen in right optic nerve which is important clue in making the diagnosis of traumatic optic neuropathy⁵.

Conclusion: This is a very rare case report where in penetrating trauma caused the optic nerve transection and MRI serves as a valuable investigation in evaluating such patients. It gives information about the type and extent of injury because of its excellent soft tissue resolution.

Conflicts of interest: Nil

Images of the case

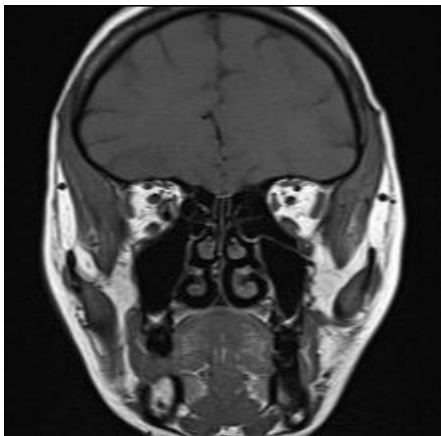


Fig 1. Coronal T1W image reveals a hypointense area in the intra-orbital part of Right optic nerve suggesting a foreign body.

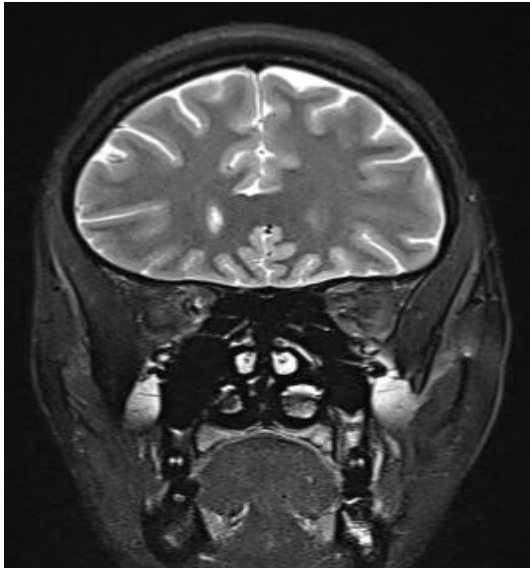


Fig 2. Coronal T2W image shows a hypointense foreign body in intra-orbital foreign body lodged in right optic nerve.

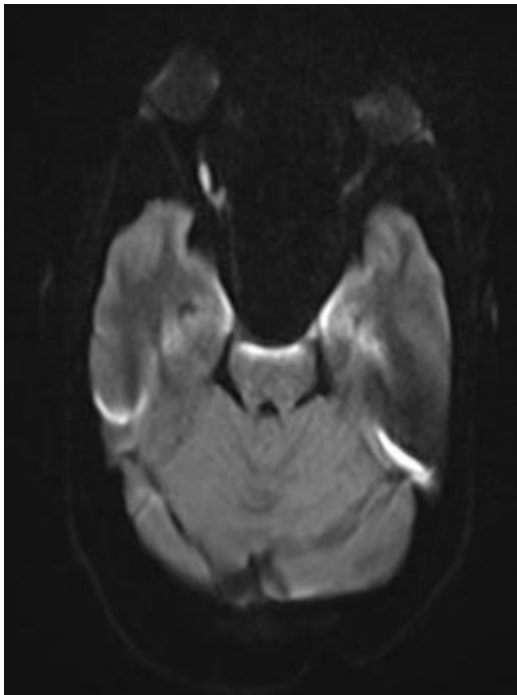


Fig 3. Diffusion weighted image with $b=400$ shows hyperintense signal in Right optic nerve in the intra-orbital part suggesting traumatic optic neuropathy.

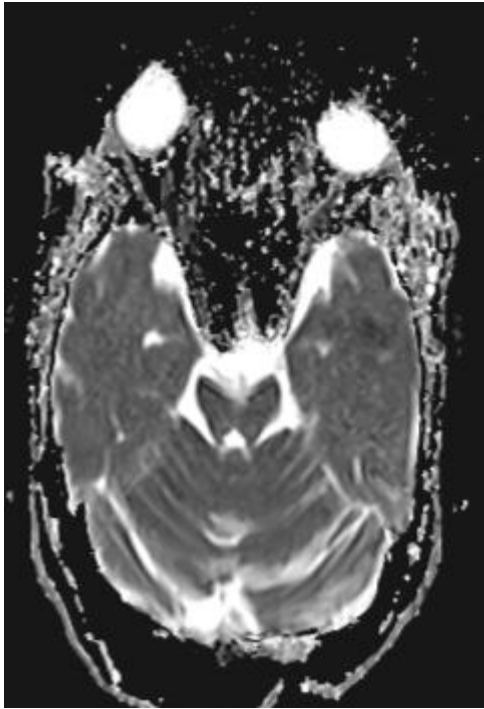


Fig 4. Apparent diffusion coefficient shows corresponding drop of signal in the right optic nerve demonstrating true diffusion restriction.



Fig 5. Axial T2W images shows altered signal intensity of right optic nerve with transection of nerve fibers.

Consent

As per international standard or university standard, patient's parents' written consent has been collected and preserved by the author(s).

REFERENCES

1. American academy of ophthalmology. Basic and clinical sciences course. Section 13. International ophthalmology. Ocular trauma epidemiology and prevention.2003-2004; 11:115-129.
2. Cockerham GC ,Goodrich GL, Weichel ED et al.Eye and visual function in traumatic brain injury.JRehabil Res Dev.2009;46:811-818.
3. Yu-Wai-Man P. Traumatic optic neuropathy-clinical features and management issues.Taiwan j Ophthalmol.2015 Mar;5(1):3-8
4. Anderson RL ,Panje WR , Gross CE . Optic nerve blindness following blunt forehead trauma. Ophthalmology.1982; 89:445-455
5. Bodanapally UK, Shanmuganathan k, Shin RK, et al. Hyperintense optic nerve due to diffusion restriction: Diffusion weighted Imaging in traumatic optic neuropathy. American journal of neuroradiology.2015;36(8):1536-1541.

