Asian Journal of Research and Reports in Ophthalmology

4(1): 33-36, 2021; Article no.AJRROP.63806

Optic Nerve Transection Following a Penetrating Ocular Trauma: A Rare Case Report

Obaid Ashraf[1] and Rakib Ahmad Wani[1*]

[1]Department of Radio-diagnosis and Imaging, Government Medical College Srinagar, Pin- 190010, India.

Authors' contributions

This work was carried out in collaboration between all authors. Author OA designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author RAW managed the analyses of the study and managed the literature searches. Both the authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Dr. Panagiotis Tsikripis, University of Athens, Greece.
Reviewers:
(1) Faruk Ozturk, Hacettepe University, Turkey.
(2) María Gómez-Valcárcel, Hospital Angeles del Pedregal, Mexico.
(3) Omotoye Olusola Joseph, Ekiti State University Teaching Hospital Ado Ekiti, Nigeria.
Complete Peer review History: http://www.sdiarticle4.com/review-history/63806

Case Study

Received 25 December 2020
Accepted 05 January 2021
Published 01 April 2021

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 transaction; traumatic optic neuropathy.

1. 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.

2. 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

**Corresponding author: E-mail: Waniraqib606@gmail.com;*

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 1.7 cm 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.

3. DISCUSSION

Major cause of mono-ocular blindness throughout world is ocular trauma [1]. 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 consequences [3]. The intracanalicular segment is most commonly injured part of optic nerve [4] 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 neuropathy [5].

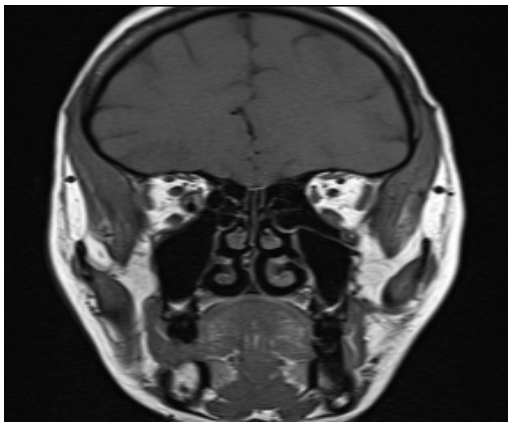

Fig. 1. Coronal T1W image reveals a hypointense area in the intra-orbital part of Right optic nerve suggesting a foreign body

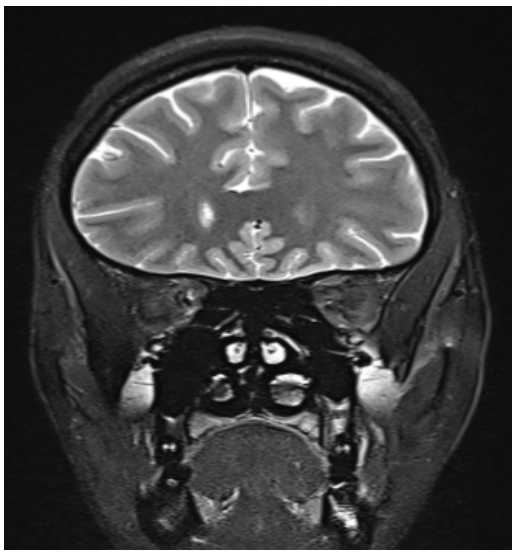

Fig. 2. Coronal T2W image shows a hypointense foreign body in intra-orbital foreign body lodged in right optic nerve

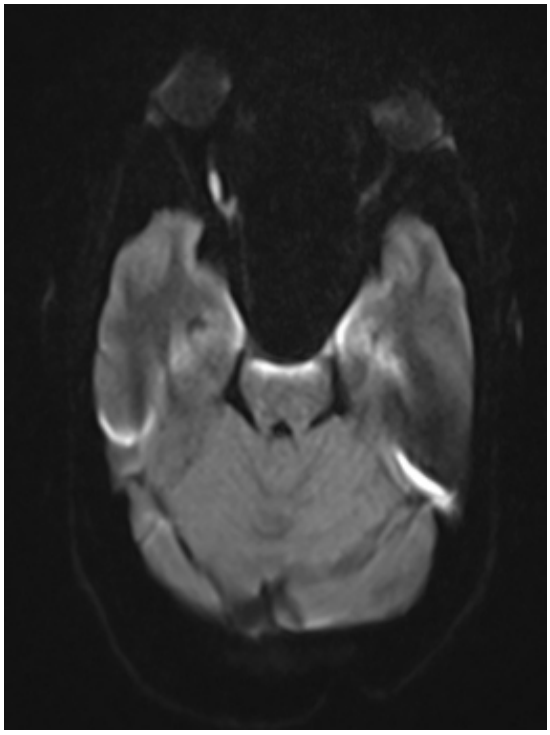

Fig. 3. Diffusion weighted image with b=400 shows hyperintense signal in Right optic nerve in the intra-orbital part suggesting traumatic optic neuropathy

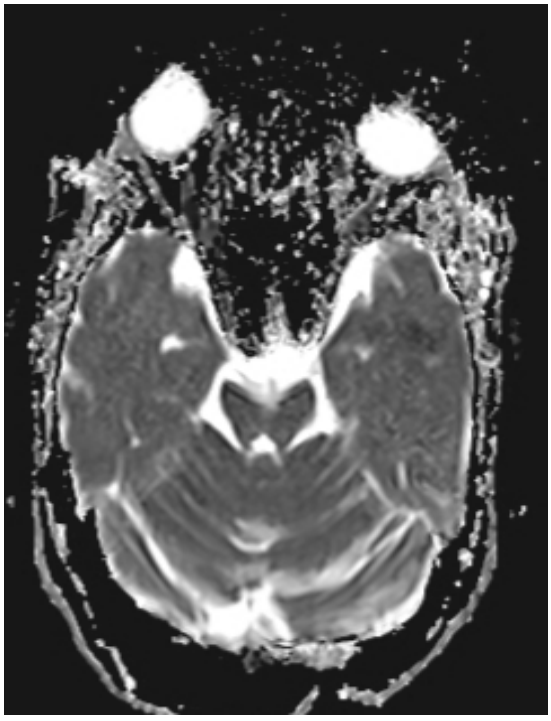

Fig. 4. Apparent diffusion coefficient shows corresponding drop of signal in the right optic nerve demonstrating true diffusion restriction

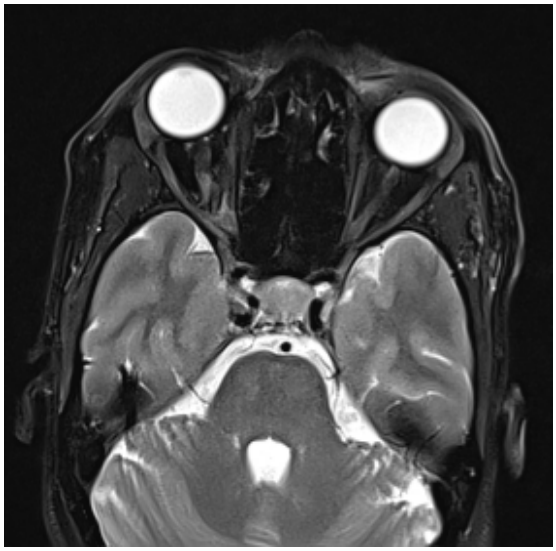

Fig. 5. Axial T2W images shows altered signal intensity of right optic nerve with transection of nerve fibers

4. 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.

CONSENT

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

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/63806