

## Indirect Trauma Presenting as Post Traumatic Neuropathy Resulting in Decrease of Vision 4 Days Post Trauma: A Case Report

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### Abstract

Post Traumatic optic neuropathy occurs usually after a direct or indirect trauma leading to a visual pathway insult. This insult can cause vision loss due to various trauma sequelae along the visual pathway; either pre-chiasmal or post-chiasmal lesions. This case report documented a patient who complained of left sided decrease in vision 4 days post trauma. Patient was thoroughly investigated with regular neurologist consultations. CT Scans showed multiple fractures in various regions of the skull vault and orbit, as well as a bilateral frontal lobe hemorrhage with compression on the right optic nerve on an MRI. Patient was started on oral steroids and referred to a neurologist who kept him under observation with conservative treatment. This report highlights the significance of following up a trauma patient (especially of indirect trauma) and keeping them under strict observation with regular radiological intervention as soon as possible. It is very rare that a patient can present with diminution in vision more than 24 hours after trauma but it has never been reported that a patient presented with vision loss 4 days post trauma.

**Keywords:** Neuropathy; Hematoma; Contusion; Hemorrhagic & Traumatic

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### Introduction

The optic nerve is affected very easily due to trauma either direct or an indirect injury, usually occurring after road accidents or a blow to the head during a fall which leads to loss in vision. Direct injury occurs after piercing injuries for example in orbital fractures. The most common type of trauma is indirect the impact force which affects the optic nerve. Fronto-temporal injuries usually transmits forces of compression to the orbital apex and optic canal. [1] Due to the specific anatomy involving the optic nerve with the Dura and periosteum, compression of the nerve's vessels can lead to a compartment syndrome which aggravates the nerve's ischemia. [2] The aim of the study is to establish that this is very rare and never been reported that a patient presented with loss of vision 4 days post trauma. Our case highlights the significance of following up a trauma patient (especially of indirect trauma).

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### **Case Report**

The subject of this report is a 60 year old Asian, married, non-drinking, non-smoking man who was referred to the Ophthalmology Department of Khyber Teaching Hospital by a neurologist for evaluation. He was in a road traffic accident (RTA) which caused him to fall from his motorcycle and sustain injuries to the head in the left frontal region. 10 days Post RTA the patient presented to our unit with complaint of left sided loss of vision for the past 6 days. He had been examined by the neurologist who had ordered a CT Brain, an OPG and a 3D CT-scan of the head on the day of the accident. The scans confirmed multiple fractures of the orbit as well as of the anterior cranial fossa. After presentation to the Ophthalmology Department he was advised to get an MRI brain and orbits done to visualize the optic canal and any bony fragments. He was also advised to get his visual fields done which showed right visual field defects.

When the patient presented to the neurologist he did not suffer any vision loss. The neurologist had done a full neurophysical examination on presentation: his BP was 120/80 mm of hg, his GCS was 13/15. Dementia was not observed. He had no systemic disorders like hypertension, diabetes, cardiovascular disease or chronic obstructive pulmonary disease.

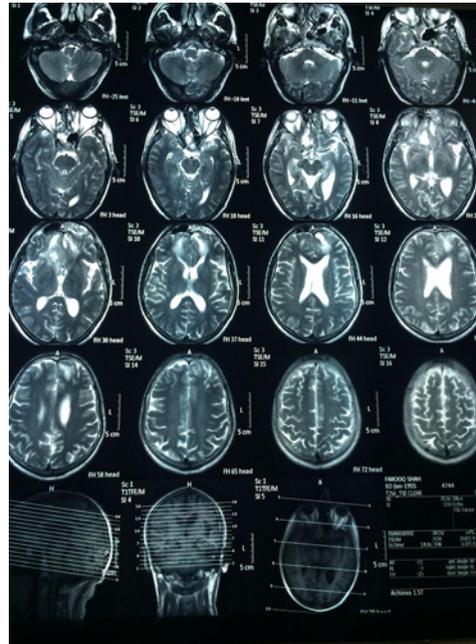
Her best corrected visual acuity was 6/36 in the left eye and counting fingers in the right eye with no improvement on pinhole. Pupil of the right eye was sluggish in reaction to light. A formal consent was obtained from the patient regarding reporting the case as a part of medical literature.

An MRI of Brain and Orbits with contrast was ordered which showed post traumatic hemorrhagic contusion in frontal lobes with hematoma in right frontal lobe compressing right optic nerve having high signals in right optic nerve. The 3D CT Face was done which revealed blow out fracture right orbit with medial deviation of lamina papyracea was appreciated. Both the nasal and frontal bones were fractured. Blood was present in the frontal sinus and multiple fractures of the floor of anterior cranial fossa were seen.

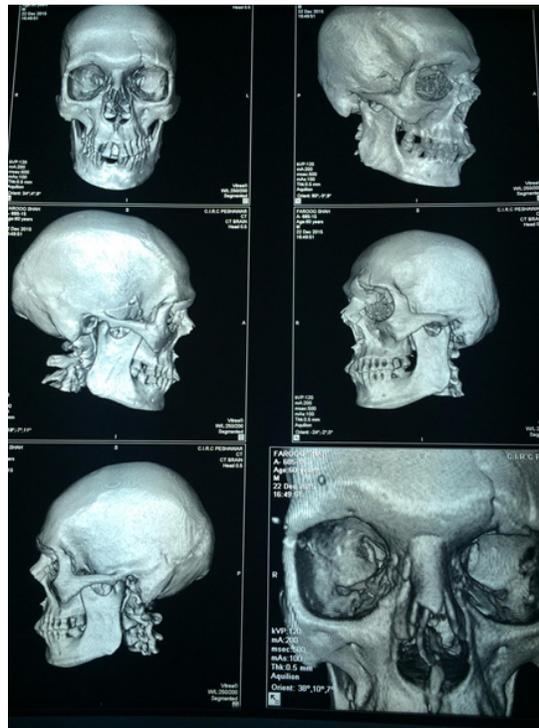
The patient was started on oral Deltacortril 5 mg, 13 Tablets tapered off in 15 days, reducing 3 tablets every 5 days and was required to follow up with both Neurology and Ophthalmology Departments. At four Months follow up there was no focal or general neurological deficits but the overall ocular defect had not improved considerably. The visual Field index had improved from 18% to 24% with a permanent visual deficit. There was mild improvement in the Visual Field but no significant improvement in vision.



**Figure 1:** Peripapillary cotton wool spots with hemorrhages were seen in the right eye.



**Figure 2:** MRI of brain and orbits with contrast shows post traumatic hemorrhagic contusion in frontal lobes with hematoma in right frontal lobe compressing right optic nerve having high signals in right optic nerve.



**Figure 3:** The 3D CT Face was done which revealed blow out fracture right orbit with medial deviation of lamina papyracea was appreciated. Both the nasal and frontal bones were fractured. Blood was present in the frontal sinus and multiple fractures of the floor of anterior cranial fossa are seen.

### Discussion

An Indian case report reported that the loss of vision in a post trauma patient can occur due to a frontal contusion that leads to an optic nerve compression consequently because of gyrus rectus herniation into the suprasellar cistern. [3] The second national acute spinal cord injury study (NASCIS 2) which was a multicentre, randomised, double-blind, placebo-controlled study of patients with acute spinal cord injury was conducted. The result of this study highlighted a major motor and sensory progress with methylprednisolone within 8 hours of the trauma as compared with placebo treated patients. [4]

Traditionally, traumatic optic neuropathy (TON) is divided into direct and indirect TON. In direct TON the insult to the optic nerve is direct which leads to functional and structural loss in the integrity of the optic nerve. In indirect TON is the transmission of force away from the optic nerve. [5,6]

Experiments suggest that the use of high dose steroid therapy in TON seems to have minimal effect. Rather, in cases of optic nerve crush injuries it has harmful effects. Surprisingly no specific treatment is in fashion in cases of indirect TON. [7] Even in cases of direct TON there has been no good evidence of treatment vs no treatment getting the desired results. [8]

This report highlights the significance of following up a trauma patient (especially of indirect trauma).

### Conclusion

Further research is needed to support the evidence of treatment in direct/indirect TON. Our case highlights the significance of following up a trauma patient and keeping them under strict observation with regular radiological intervention as soon as possible. It is very rare that a patient can present with decrease in vision more than 24 hours after trauma but it has never been reported that a patient presented with vision loss 4 days post trauma.

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