Central retinal artery occlusion: a manifestation of blunt trauma

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DESCRIPTION

A 12-year-old boy presented to our emergency department with a complaint of sudden onset diminution of vision associated with pain in the right eye following blunt trauma with a wooden stick 3 days back. The vision at presentation was a perception of light with an inaccurate projection of rays in all quadrants. Ocular motility was restricted in all gazes. On gross examination, there was axial proptosis with lid oedema and abrasions over the lower lid (figure 1A). The right eye showed a relative afferent pupillary defect. Intraocular pressure and anterior segment examination with a slit lamp were unremarkable in both the eyes. Dilated fundus examination revealed peripapillary and preretinal haemorrhages obscuring the optic nerve head with minimal vitreous haemorrhage. A cherry-red spot at the fovea, cattle tracking of the vessels and diffuse retinal oedema extending beyond the arcades was present (figure 1B). Ophthalmological examination of the left eye was unremarkable.

Ultrasound B-scan of the right eye showed the presence of moderate amplitude dot echoes in the mid and posterior vitreous cavity suggestive of vitreous haemorrhage with a normal optic nerve shadow. Visual evoked potential (VEP) showed extinguished responses in the right eye (figure 2C). CT scan of the orbits and brain revealed right medial orbital wall fracture with haemosinus and pneumo-orbit (figure 2A,B) and ruled out the presence of any optic nerve head avulsion. A working diagnosis of central retinal artery occlusion (CRAO) with probable traumatic optic neuropathy (TON) was made and a trial of intravenous methylprednisolone (IVMP) and oral steroids was given. Surgical intervention was deferred in view of late presentation and poor prognosis. At 3-week follow-up, there was no improvement in visual acuity and final diagnosis of CRAO with TON was made.

Figure 1 (A) Clinical photograph (Worm's eye view): Axial proptosis of lower lid abrasion of the right eye. (B) Right eye colour fundus photo shows a cherry-red spot with retinal whitening (red arrow) at the posterior pole and beyond the arcades suggestive of central retinal artery occlusion. Large preretinal haemorrhage seen in front of the optic disc (blue arrow).

Figure 2 (A) CT scan of orbits (axial scan) shows the right medial orbital wall fracture (red star) with the intact right optic nerve. (B) CT scan of orbits (coronal scan) shows right pneumo-orbit (red arrow) and haemosinus (blue arrow). (C) Visual evoked potential of the right eye shows extinguished response suggestive of optic nerve pathology.

Ocular trauma as a sole causative factor for CRAO has rarely been reported in the literature.¹ Most cases of CRAO occur in elderly and presentation in young is rare except in association with coagulopathies.² Our patient had complete vision loss with flat VEP responses at presentation indicating that optic nerve head trauma was present at the initial visit and was not a result of prolonged ischaemia. Hence, a trial of IVMP and oral steroids were given.^{3,4} As there was no radiological evidence of optic nerve damage, we hypothesise that this was due to indirect trauma at the level of lamina cribrosa and mechanical compression of the small nutrient vessels supplying the optic nerve.⁵

In our case, the exact cause of CRAO could not be ascertained. We postulate that, the mechanism

Patient's perspective

I consulted for emergency services following sudden diminution of vision in the right eye following trauma with a stick. I was told the condition in the right eye was acute in nature. The poor visual prognosis was explained before the trial of treatment. I was also told that my left eye was normal and was advised protective glass wear considering my one-eyed status.

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Learning points

- It is necessary to identify central retinal artery occlusion (CRAO) in a setting of traumatic optic neuropathy following blunt trauma as timely management would lead to better visual prognosis.
- Mechanisms for CRAO in blunt trauma are focal endothelial damage, compartment syndrome causing mechanical compression, optic nerve head ischaemia and pre-existing haemoglobinopathies.
- Optic nerve head avulsion should be ruled out with imaging modalities in case of poor view of the optic nerve head.

for CRAO was multifactorial, being initiated by mechanical compression from orbital haematoma and pneumo-orbit along with focal vasospasm and endothelial damage due to sudden compression of the globe.⁶ It would have further been facilitated by mechanical compression by the swollen optic nerve on the central retinal artery.⁷

In conclusion, retinal vascular occlusions in a setting of blunt trauma are rare.⁸ Clinicians should be aware of the possibility of vascular occlusion along with optic nerve damage following blunt trauma.

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