Branch retinal artery occlusion post-penetrating globe injury with intraocular foreign body

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Intraocular foreign body (IOFB) in cases of penetrating eye injury accounts for an important indication of vitreoretinal intervention following ocular trauma. Vascular occlusion as a complication of IOFB is rare. Here we present a case of a 34-year-old male with post-traumatic cataract and an intraocular metallic foreign body (IOFB) lodged in the superficial layers of the retina inferotemporal to the disc, causing an inferotemporal branch retinal artery occlusion. The case was managed by lensectomy with pars plana vitrectomy and IOFB removal followed by a second procedure of secondary IOL implantation. Final best-corrected visual acuity improved to 6/24. This case highlights an unusual sequelae following penetrating ocular trauma.

Key words: Branch retinal artery occlusion, intraocular foreign body, penetrating globe injury

Intraocular foreign body (IOFB) is seen in 8%–41% cases of penetrating eye injuries.[1] IOFB may induce infection or mechanically cause trauma to the intraocular structures. Vitreoretinal complications are second to the cornea in open globe injuries.[1]

Branch retinal artery occlusion (BRAO) is an ocular emergency resulting from embolic or inflammatory disorders causing visual impairment. Visual outcomes in BRAO depend on the presenting visual acuity, which likely represents the initial severity of retinal ischemia and the presence of a perfused cilioretinal artery.[2]

Here, we present a case of IOFB leading to an inferotemporal BRAO as sequelae.

Case Report

A 34-year-old male presented with sudden-onset pain and diminution of vision in the right eye after sustaining trauma at work. The visual acuity at presentation was perception of light. On slit lamp examination, a full thickness corneal tear, para central in the inferotemporal quadrant with pupillary sphincteric tear, and a traumatic cataract with breach in the anterior capsule with a tract extending up to the posterior capsule was noted.

X-ray orbit showed a radiodense object more radio-opaque than bone in the posterior segment, suggestive of a metallic foreign body. Ultrasound examination of the right orbit revealed vitreous hemorrhage. Hyperechoic signals with acoustic shadowing near the optic disc suggested the presence of an IOFB. Computerized tomography confirmed the ultrasound findings [Fig. 1].

Primary closure of the corneal wound with pars plana lensectomy and vitrectomy with the removal of the IOFB was planned. Corneal wound was sealed with two interrupted 10-0 nylon sutures. Twenty-five gauge pars plana lensectomy followed by core vitrectomy was performed. Intraoperatively, after clearing the vitreous hemorrhage, a wedge-shaped metallic foreign body was seen lodged in the superficial layers of the retina inferotemporal to the disc [Fig. 2a]. Posterior vitreous detachment was created using high vacuum. White discoloration of the retina was noted inferotemporal to the foreign body extending along the inferior arcade and suggestive of a BRAO [Fig. 2b]. The foreign body was gradually dislodged with the help of the cutter. A pars plana sclerotomy was made using a microvitreoretinal blade in the superotemporal quadrant. The IOFB was removed through the incision using an intraocular magnet. Subsequent to IOFB removal, the sclerotomy was sutured with interrupted 8-0 vicryl sutures. Residual vitreous and hemorrhage was

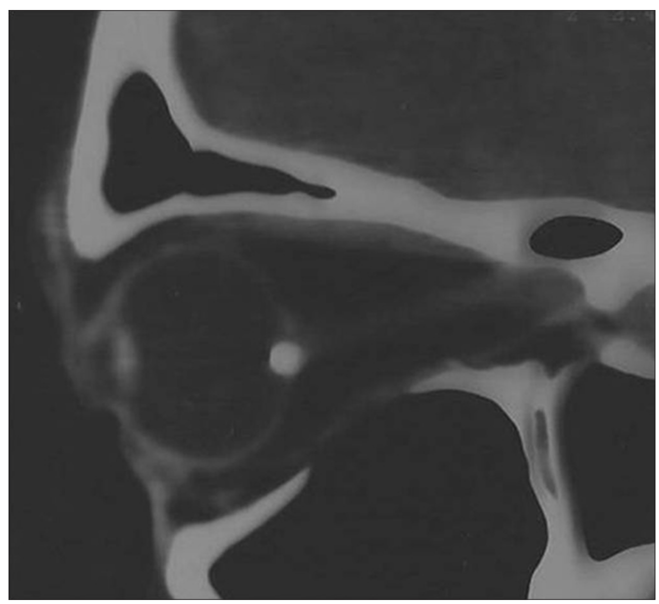

Figure 1: Computerized tomography of the right orbit confirming location of the intraocular foreign body near the optic disc

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cleared at this stage. Fluid air exchange was carried out and a thorough screening of the peripheral fundus was done with the help of external indentation.

At 1-month follow-up, visual acuity had improved to 6/36 with aphakic correction. Fundus evaluation showed a chorioretinal scar at the impact site and the retina within the inferior arcade showed whitish discoloration [Fig. 3a]. A deep retinal tear inferior to disc and retinal striae extending across the papillomacular bundle from the optic disc toward the fovea were seen. Spectral-domain optical coherence tomography (SD-OCT) revealed corrugation of the inner retinal layers with loss of differentiation of the retinal layers inferiorly [Fig. 3b].

A secondary intraocular lens implantation was planned 3 months postoperatively. On the 7th day after lens implantation, the best-corrected visual acuity improved to an unaided 6/24. Fundus examination revealed decreased pallor of the previously whitish retina [Fig. 4a] and better differentiation of the retinal layers on SD-OCT [Fig. 4b]. Fluorescein angiography was performed which showed normal foveal avascular zone with dipping of the vessels into the chorioretinal scar with mild delayed filling of the inferior retinal artery [Fig. 4c].

Discussion

Globe injuries associated with IOFB can result in devastating tissue disruption and severe visual loss. Media opacities may obscure the view of the fundus, making imaging modalities a vital part of preoperative evaluation. However, exact localization and characterization of the IOFB and posterior segment status may be difficult, based on the limited information provided by imaging, making the prognosis unpredictable.[3]

Retinal arterial occlusions, occurring secondary to thromboembolic phenomena, are associated with an underlying systemic disorder. In macula involving BRAO, visual outcomes depend on multiple factors such as presenting visual acuity, presence of a perfused cilioretinal artery, and SD-OCT features such as loss of layer by layer integrity, inner retinal thickening, and inner retinal hyper reflectivity.[2,4]

Lee *et al*. reported a case of combined superior retinal artery and venous occlusion following laceration of the optic nerve as a result of impaction of a IOFB. Despite surgical intervention and postoperative FA showing reperfusion, the patient did not gain useful vision due to concurrent optic nerve injury and retinal artery occlusion.[5] Bypareddy

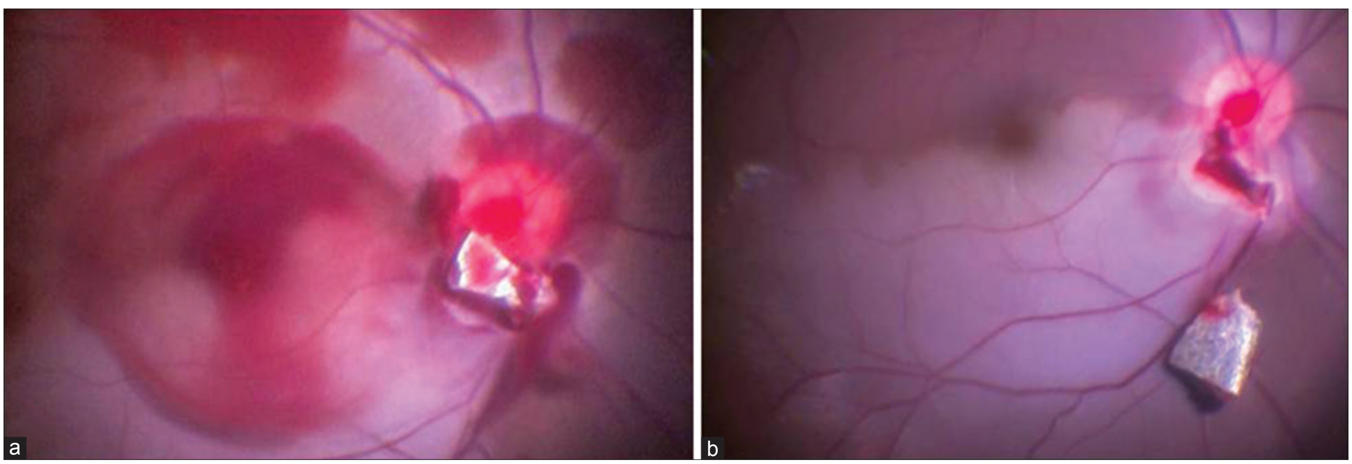

Figure 2: (a) A wedge-shaped metallic intraocular foreign body lodged in the superficial layers of the retina inferotemporal to the disc, (b) whitish discoloration of the retina noted inferotemporal to the foreign body extending along the inferior arcade suggestive of a branch artery occlusion

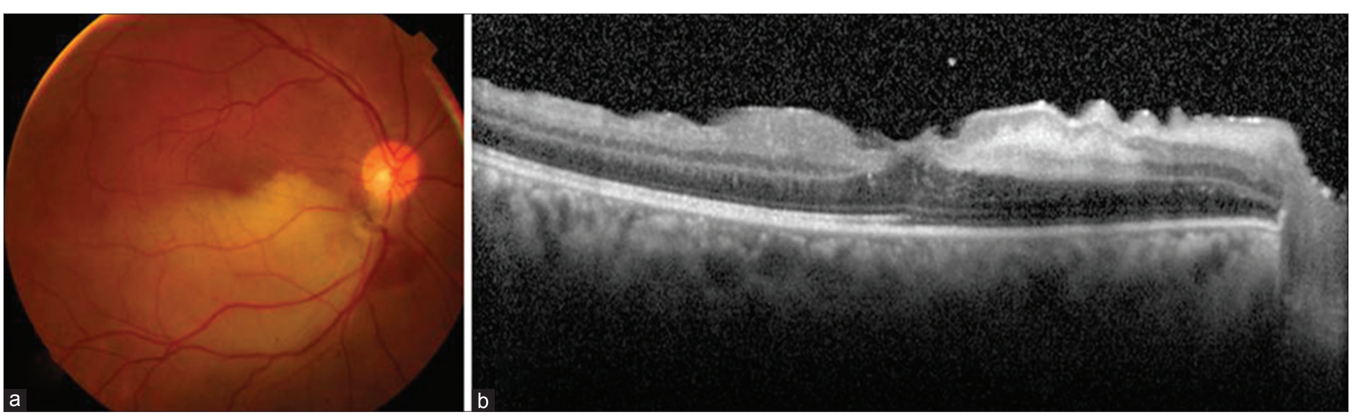

Figure 3: (a) Color fundus photograph showing a chorioretinal scar at the impact site, inferotemporal to optic disc, and the opaque retina within the inferior arcade. A deep retinal bleed inferior to disc and retinal striae extending across the papillomacular bundle from the optic disc toward the fovea are seen. (b) Spectral-domain optical coherence tomography revealing corrugation of the inner retinal layers with loss of differentiation of the retinal layers inferiorly

Figure 4: (a) Color fundus photograph revealing decreased pallor of the previously opaque retina. (b) Fluorescein angiography showing normal foveal avascular zone with dipping of the vessels into the chorioretinal scar with mild delayed filling of the inferior retinal arteriole. (c) Spectral-domain optical coherence tomography showing better differentiation of the retinal layers

et al. described a case of superotemporal branch retinal vein occlusion secondary to IOFB. The hemorrhages gradually resolved over 3 months and the patient's visual acuity improved to 6/12.[6]

In our case, the exact location of the IOFB and preoperative fundus evaluation was precluded due to posttraumatic cataract and vitreous hemorrhage. The IOFB caused a mechanical occlusion of the vessels upon its impact site inferotemporal to the disc. Following its dislodgement, the retinal vessels reperfused which could be seen clinically by decreased opaqueness of the retinal area supplied by the vessel as also the almost normal filling of the vessels on FA.

Conclusion

We report a case of BRAO as sequelae of IOFB. Hence, the possibility of vascular occlusions could be considered while prognosticating in cases where imaging studies suggest location of the IOFB near the optic disc.

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Conflicts of interest

There are no conflicts of interest.

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