CASE REPORT

Intraocular metallic foreign body causing branch retinal vein occlusion

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SUMMARY

We report a case of a 40-year-old man with post-traumatic cataract and an intraocular metallic foreign body (IOFB) lying on the retinal surface causing a superotemporal branch retinal vein occlusion. The case was managed using lens aspiration with pars plana vitrectomy and IOFB removal. We only found two previous reports of such a foreign body causing a vascular occlusion. The possibility of a vascular occlusion occurring due to a foreign body within or close to the optic disc is highlighted.

BACKGROUND

An intraocular foreign body (IOFB) is an important indication for vitreoretinal intervention after ocular trauma. Retained IOFBs account for 18–40% of all open-globe injuries.^{1 2} Posterior segment complications of IOFBs that limit postoperative visual gain include retinal detachment³ and direct injury to the optic nerve⁴ or macula.⁵ Vascular occlusion as a complication of IOFB is rare. The following case report illustrates a rare case of branch retinal vein occlusion due to direct impact of a metallic foreign body on the retinal blood vessel.

CASE PRESENTATION

A 40-year-old man presented to the outpatient department of our centre, with sudden onset diminution of vision in his left eye after sustaining trauma with a projectile while hammering an iron nail, 10 days prior. On examination, visual acuity was noted to be finger counting at 1 m in the left eye. Intraocular pressure measured with Goldmann applanation tonometer was 18 mm Hg. Slit-lamp examination revealed an oblique linear self-sealed corneal laceration in the para central superonasal quadrant measuring 2.8 mm×0.3 mm. Minimal anterior chamber inflammation with 0.5+ cells was noted. Anterior capsular rupture in the superonasal quadrant was seen with a tract extending from the anterior capsular tear to the posterior pole of the lens. Fundus details were seen hazily due to the presence of cataract. The fellow eye was normal.

INVESTIGATIONS

X-ray orbit (anteroposterior and lateral view) showed a radio dense object darker than bone in the left orbit suggestive of a metallic foreign body. Combined vector ultrasound scan of the eyeball revealed mild amplitude spikes in anterior vitreous suggestive of dispersed posteriorly dislocated cortical lens matter (figure 1A). A hyperechoic signal with high amplitude spike on A-scan with acoustic

shadowing was noted in the inner coats of globe adjacent to the optic disc, suggestive of an IOFB.

TREATMENT

A plan for simultaneous lens aspiration with intraocular lens (IOL) implantation, and pars plana vitrectomy and foreign body removal was made. Visualisation of the fundus after lens aspiration revealed a black coloured, pyramidal-shaped foreign body located a half disc diameter superotemporal to the disc along the course of the superotemporal branch retinal vessels and measuring a half disc area in size. Intraretinal haemorrhages in a sectoral distribution were noted along the superotemporal quadrant distal to the foreign body, suggestive of branch retinal vein occlusion (figure 1B). After completion of vitrectomy, the foreign body was retrieved through a superior limbal incision using an intraocular magnet. Laser photocoagulation was performed around the foreign body impact site, as there was an underlying full thickness retinal break. A three piece hydrophobic acrylic IOL was implanted in the ciliary sulcus and fluid–air exchange carried out.

OUTCOME AND FOLLOW-UP

On the first postoperative day the patient was able to appreciate hand movements close to the face as the vitreous cavity was filled with air. The anterior chamber showed evidence of minimal inflammation; the IOL was stable and the retina attached. The patient had a stable postoperative course. Best-corrected visual acuity at 3, 6 and 9 months was 6/12. Fundus evaluation at all follow-up visits showed a chorioretinal scar at the impact site with laser reaction surrounding the scar with a sclerosed superotemporal branch retinal vein. At 3 months follow-up, fundus evaluation showed partial resolution of the haemorrhages, and fundus fluorescein angiography revealed a normal foveal avascular zone without any evidence of capillary non-perfusion areas or neovascularisation (figure 2A, B).

DISCUSSION

IOFB following penetrating injury can lead to vision loss as a result of the foreign body's mechanical effect or toxicity due to its possible metallic content. Early loss of vision occurs mainly due to direct injury to the eyeball by a high-velocity object leading to corneal laceration, hyphaema, vitreous haemorrhage, development of lens opacities or direct impact on the optic nerve head⁴ and endophthalmitis. Late-onset vision loss can be due to toxicity (siderosis⁶ and chalcosis⁷) and secondary

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Figure 1 (A) Ultrasound scan of the left eye showing mild amplitude spikes in the anterior vitreous (dashed arrow) and an intraocular foreign body (arrow) adjacent to the optic disc. (B) Intraoperative clinical photograph of the fundus showing a foreign body (arrow) on the retinal surface with intraretinal haemorrhages distal to the foreign body.

glaucoma.⁸ IOFB can lead to early onset of cataract as a result of rupture of the lens capsule. Development of cataract results in poor visualisation of the fundus during preoperative work up and the evaluation of posterior segment is dependent mostly on the limited information provided by ultrasonography, making the prognostication difficult.

Figure 2 (A) Fundus photography at 3-month follow-up showing resolving intraretinal haemorrhages, chorioretinal scar at impact site and a sclerosed branch retinal vein. (B) Fundus fluorescein angiography at 3-month follow-up showing window defect due to a laser photocoagulation scar. There is no evidence of retinal non-perfusion.

Vascular occlusion as a complication of an IOFB is unusual. Lee *et al*⁴ reported a case of combined central retinal artery and central retinal vein occlusion with laceration of the optic nerve as a result of impaction of a metallic foreign body in the optic nerve head. Despite surgical intervention, the patient did not gain useful vision due to concurrent optic nerve injury and central retinal artery occlusion. Zinn⁹ reported a case of infero-temporal branch retinal artery occlusion with characteristic opaque inner retinal layers due to impact of a metallic foreign body on the optic nerve head causing direct compression of the inferotemporal branch retinal artery.

In our case, the exact location of the foreign body and fundus details could only be appreciated intraoperatively due to the presence of a significant post-traumatic cataract. Intraoperatively, a foreign body was seen superotemporal to the disc along the course of the superotemporal branch retinal vessels. Intraretinal haemorrhages in a sectoral distribution were noted beyond the foreign body along the superotemporal quadrant, suggestive of branch retinal vein occlusion. The vascular occlusion would probably have occurred due to the mechanical compression by the foreign body. In the two cases reported in the literature, the foreign body was located over the disc, however, in our case, the foreign body was located within a one disc diameter from the disc. As the larger retinal vessels in close proximity to the disc are located superficially in the nerve fibre layer beneath the internal limiting membrane itself, a foreign body located within or close to the optic disc is more likely to lead to a vascular occlusion. So possibility of vascular occlusion should be considered in cases where imaging studies are suggestive of an IOFB located on or near the optic disc.

Learning points

- ▶ Vascular occlusion following penetrating injury with an intraocular foreign body is a rare event.
- ▶ The possibility of such an occurrence should be kept in mind while managing cases of a foreign body located close to the disc.

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