Siderotic Cataract

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Siderosis bulbi is a sight threatening complication of a retained intraocular iron containing foreign body and may occur 8 years to 18 years after ocular injury. The clinical findings include iris heterochromia, pupillary mydriasis, cataract formation, and retinal pigmentary degeneration. Progression is likely to occur more when the intraocular iron containing foreign body is localized in the posterior segment of the eye. Delay in foreign body removal may cause disintegration of the foreign body with oxidized ferrous particles deposited throughout the eye. Hence even after a thorough parsplana vitrectomy and foreign body removal, siderotic changes can still progress.

In this case report we present a young man who had progression of siderotic changes following intraocular foreign body removal and presented after a year with a siderotic cataract.

A 30 year old Gulf employee sustained injury to his right eye 8 months prior to presentation. Injury was sustained while heating ball bearings of iron, which burst and struck the white of his right eye. He was given first aid and topical antibiotic drops for the injured eye. This conservative approach was continued till he returned home after 8 months. He had noticed progressive diminution of vision in the right eye. At presentation he had a vision of counting fingers at 2 meters improving to 6/36 with pin hole in his right eye.

Applanation tonometry was 13 and 15 mm in his right and left eyes respectively. The right eye showed features of ocular inflammation in the form of + flare and cells as well as plenty of vitreous cells. The pupil was mid dilated and reacting sluggishly. Fundus examination showed a grade III media haze and a whitish encapsulated foreign body was observed in the inferior periphery. A Scan USG was performed which confirmed the presence of a retained intraocular foreign body located on the retinal surface inferiorly. Plain X-ray orbit showed a radio opaque shadow suggestive of a retained intraocular foreign body in right eye.

The patient underwent pars plana vitrectomy with REM magnetic foreign body removal under local anesthesia. He had an uneventful post operative period and was discharged with a quiet eye, clear lens and good fundus view. There was also significant visual improvement to 6/12 (R) on the 15th postoperative day.

The patient next reported for review after a year. He complained of blurring of vision in the right eye which occurred 6 months after a satisfactory visual gain post operatively. Ocular examination revealed a visual acuity of 6/36 NIG and NIP N24 (RE), good mydriasis, Grade II nuclear sclerosis, pigment on corneal endothelium and anterior vitreous face as well as anterior sub capsular rust staining. Specular microscopy showed an adequate endothelial cell count with normal morphology (right eye: 2552/ mm² and 2565/ mm² in the left eye).

The patient underwent a temporal clear corneal phacoemulsification by the phaco- chop technique with good visual recovery of 6/6 on the first post operative visit.
Fig. 1. Fundus picture showing the foreign body impact site, yellowish capsule and the metallic foreign body in the vitreous

Fig. 2. B-Scan ultrasonography demonstrating a high reflectivity shadow with orbital shadowing suggestive of a retained intraocular foreign body

Fig. 3. Post vitrectomy anterior segment imaging

Fig. 4. Post vitrectomy fundus photography showing residual triamcinolone acetonide crystals and laser marks around the foreign body impact site

Fig. 5. Anterior segment picture taken a year after vitrectomy and foreign body removal. Note the subcapsular rust staining and cataract formation

Fig. 6. Anterior segment images after phacoemulsification and IOL implantation

Fig. 7. Fundus picture after PE-IOL implantation. Note the clear media and healed laser marks around the site of foreign body impact

Discussion

Siderosis bulbi is defined as a coloration of the eye by fine rust particles in suspension or in solution in the fluids of the eye. The condition is associated with a mild but progressive ocular inflammation of the uveal tract with degeneration resulting in a gradual destruction of sight. Iron is deposited in the epithelial tissues of iris, ciliary body, lens, retina and RPE. Deposition of ferric ions causes production of oxidants, resulting primarily in damage to the photoreceptors and RPE.

A variety of ocular manifestations may be associated with siderosis bulbi such as Adies pupil, pupillary
mydriasis, constricted visual fields, night blindness, corneal staining, iris heterochromia, sub epithelial rust deposits on anterior lens capsule, cataract, retinal pigmentation, optic atrophy and secondary open angle glaucoma 4.

In patients with retained intraocular foreign body in whom the foreign body removal is delayed, siderosis bulbi can manifest after surgery 8. Hence it is necessary to follow up all patients with delayed intraocular foreign body removal with serial ERG.

ERG monitoring will help record various stages in the development of siderosis 9,10. There is an initial stage in which both positive and negative components of ERG can increase and this stage is too early to be recognized clinically. Later the ERG becomes negative and, finally extinct even though the retina may function reasonably well. These two changes are irreversible.

Electroretinography can be used to follow-up the course of developing siderosis and provides useful information as to when a decision has to be made as to the advisability of undertaking a foreign body removal 11,12.

References