Case Report

A peculiar case of a retained inert piece of fireworks as an intraocular foreign body in the anterior chamber

Elham R. Al-Tamimi, MD

Abstract

This is a descriptive case report of a seven-year-old boy presented in January 2007 with decreased vision in the right eye, for 2 months after sustaining a trauma while he was playing with fireworks during the Eid holiday. He was treated in a suburban hospital for corneal laceration and was prescribed a topical antibiotic and a topical steroid. When the child presented to us, a slit lamp examination revealed a thread in the anterior chamber, his un-aided visual acuity was 6/60 on a Snellen chart. Surgery to remove the foreign body was scheduled, but the patient never attended. The patient was lost to follow-up and returned in January 2011 with an un-aided visual acuity of 6/12, although the foreign body was retained in the anterior chamber (AC) with a quiet eye and good vision. At that time, we decided to follow the patient without any surgical intervention. Again, the patient was lost to follow-up and returned with almost full vision in September 2012, with a visual acuity of 6/6 without correction. Thus, we concluded that thread like IOFBs in the AC can be considered inert materials that may not need any surgical intervention in a quiet eye that does not show any signs of inflammation and where the IOFB is non-mobile and located away from the endothelium.

Keywords: Conservaive management, Firework, Intraocular foreign body, Trauma

Introduction

Trauma with foreign bodies in the eye are not uncommon and may trigger a wide range of complications, including hyphema, cataract, vitreous hemorrhage, and retinal tears and detachment. Missed IOFBs may present with different clinical aspects that may limit their detection and symptoms may only become apparent after a prolonged time period. Certain metallic foreign bodies within the eye may produce retinotoxic ions. Ferrous ions can destroy retinal photoreceptors and pigment epithelial cells leading to siderosis, on the other hand copper containing intraocular foreign body can induce chalcosis. Thus, most metallic IOFBs should be removed promptly to prevent these reactions and minimize intraocular inflammation. Other indication to remove intraocular foreign body is to prevent endophthalmitis, which commonly causes a destructive fibro-vascular response that may ultimately result in blindness. A good patient history and a thorough ocular examination are still the most important factors for diagnosing IOFB. Radiological investigations such as plain X-rays, ocular ultrasonography, computed tomography and magnetic resonance imaging can be used to detect and localize IOFBs. Most intraocular metallic foreign bodies are composed of iron, steel or one of their alloys. We report on a case of a thread-like IOFB in the AC of the right eye that was observed over a five-year period in which the patient first presented with decreased vision.

© 2013 Production and hosting by Elsevier B.V. on behalf of Saudi Ophthalmological Society, King Saud University.
Case report

In January 2007, a seven-year-old boy presented with decreased vision in his right eye after sustaining a trauma while playing with fireworks 2 months prior to presentation. He was managed in a suburban hospital with a topical antibiotic and a topical steroid. No surgical intervention was performed at that time. In an examination of the right eye: the un-aided visual acuity was 6/60 on a Snellen chart. A slit lamp examination revealed central horizontal corneal scaring approximately 6 mm in length, with the iris adherent to the nasal edge of the scar, which caused a slight irregularity in the AC. A whitish thread that was approximately 5 mm in length, was lying obliquely over the iris superiorly at 11 o’clock, and its superior end was hidden at an angle. The inferior end of the thread was embedded within the iris away from the pupil, without touching the endothelium, non-mobile, and with a quiet AC (Fig. 1). It seemed that the trauma caused a full thickness corneal laceration nasally and allowed the foreign body to enter into the AC, which was then sealed by the iris. The iris was adherent to the corneal laceration and caused a slight irregularity of the pupil but maintained the AC form. The pupil was reactive and the intra-ocular pressure was 16 mmHg. The lens was clear. Examination of the left eye was normal. A fundus examination showed flat retinas in both eyes. The initial management plan was to remove the IOFB under general anesthesia. The patient did not appear for his appointment and was lost to follow-up. He returned in January 2011, and at that time, the examination of the right eye was as follows: the un-aided visual acuity of 6/12, unchanged findings on the slit lamp examination. A cycloplegic refraction was performed which returned the following results: right eye: +1.75/−2.25 × 30, left eye was: +0.50/−0.50 × 165. The patient’s sight was clear with subjective refraction, the visual acuity of the left eye was 6/6 with normal anterior and posterior segments. The patient was orthophoric and had full extra-ocular muscle movement in both eyes. No further investigations were requested. The patient was again lost to follow-up but returned in September 2012 complaining of headaches after lengthy reading. The right eye vision was 6/6 without correction with the same slit lamp examination. The right eye had an IOP of 16 mmHg with a normal fundus, and the left eye was normal and had an IOP of 16 mmHg. The cycloplegic refraction of the right eye was: +0.25/−4.00 × 15, the left eye was: +0.50/−0.75 × 175. By subjective refraction, the vision of the right eye was 6/6 with −3.25 × 15, the left eye was 6/6 with-0.50 × 175. The patient’s sight was clear with spectacles.

Discussion

An IOFB is any material (organic or inorganic) that penetrates into the ocular tissue. Intraocular foreign bodies can be classified according to: Anatomical zone (Entry and Exit), Position of IOFB, Nature of IOFB and Zones of ocular injury. Zone 1: Isolated to the cornea (including the limbus). Zone 2: From limbus to a point 5 mm posterior in sclera. Zone 3: Posterior to the anterior 5 mm of the Sclera. Position of the IOFB: IOFBs can be found in the anterior segment, in the cornea, in the anterior chamber, in the anterior chamber angle, intraocular, in the posterior segment, in the vitreous cavity, floating into the vitreous after causing retinal trauma or the IOFB can be embedded in the retina/sclera. The nature of the IOFB, can either be: Metallic e.g. copper and iron, glass, plastic, organic e.g. wood or stone. The vast majority of patients with IOFBs are males and relatively young, and most are in the working-age group. IOFBs can cause mechanical and chemical injuries if they contain iron (siderosis) or copper (chalcosis). Majority of the patients with retained intraocular foreign body develop cataract formation which causes diminution of vision requiring surgery. In addition to cataract formation, uveitis, glaucoma, endophthalmitis and intraocular metallosis have been reported in 4.

The most serious complication of retained intraocular iron containing foreign body is the development of siderosis bulla. For these reasons, IOFBs require prompt evaluation and management; as they may quickly lead to sight-threatening complications.

CT scan with thin slices is currently considered the gold standard for the detection, localization and characterization of both metallic and non-metallic IOFBs. Ultrasonography can be used to detect metallic IOFB but sensitivity is user dependent. It is contraindicated in globes suspected of rupture. Plain X-ray may be used as a screening modality for IOFBs but localization of IOFBs without limbal ring may pose diagnostic problems. MRI is contraindicated in the detection of suspected metallic IOFB. It may be considered when there is a strong suspicion of a non-metallic foreign body not seen with CT scan or ultrasonography. The management of intraocular foreign body involves initial assessment of its size, site, material, potential for infection, and degree of lenticular and other intraocular damage. Small and minute metallic foreign bodies which do not affect the visual axis, with clear lens and no signs of intraocular damage or inflammation may be observed after initial treatment with topical antibiotic and steroids. If any complication develops, then the removal of the foreign body should be done. Medium to large metallic foreign bodies in the lens should be removed as soon as possible, as the risk of complication is much higher. The surgery for patients with IOFB include primary repair (required in most cases) and removal of IOFB. The wound should be closed as soon as possible. Delay in closure could increase not just the risk of infection but also the opportunity for an

Figure 1. A slit lamp view of the right eye showing central horizontal corneal scaring, with the iris adherent to the nasal edge of the scar and a whitish thread (approximately 5 mm in length) lying obliquely over the iris.
expulsive hemorrhage and extrusion of intraocular contents. If the FB is present in the anterior segment then it may be removed at the time of primary repair. Removal of IOFB from the posterior segment may be done at the time of primary repair or at an interval (surgeon’s clinical assessment). The timing of intervention is primarily determined by the risk of endophthalmitis and the nature of the IOFB. However, some IOFBs can be retained without any symptoms. Ahn suggested that the reason some IOFBs can be retained for an unusually long period of time is that these IOFBs are encapsulated by a thin membrane. Lin et al. reported on occult plastic intravitreal foreign body that was retained for 30 years before being removed by chance during a cataract operation. Dhawahir-Scala and Kamal reported on an intralenticular foreign body that had been retained for 60 years. Ahn also reported on a case of noninfectious endophthalmitis that was caused by an IOFB that had been retained in the posterior wall of the left eye for 16 years.

Threads can be considered inert materials if there is no evidence of any reaction in the anterior chamber and the injury does not need surgical intervention in a quiet eye unless the vision deteriorates or causes inflammatory reaction, or the IOFB is mobile and touching the endothelium. The explanation for the vision improvement in this patient remains unclear to us; despite the presence of a central corneal scar, the vision was not greatly affected.

In our case, after more than five years and in the presence of a non-mobile IOFB in the AC that was away from the endothelium and with no evidence of inflammation (Figs. 1 and 2), and with improved vision in the eye, the decision was made not to interfere surgically and to follow the patient regularly (see Fig. 3).

Conclusion

Thread like IOFBs in the AC can be considered inert materials that may not need any surgical intervention in a quiet eye that does not show any signs of inflammation and where the IOFB is non-mobile and located away from the endothelium.

Conflict of interest

The authors declared that there is no conflict of interest.

References


Figure 2. A slit lamp view of the right eye showing central horizontal corneal scaring, with the iris adherent to the nasal edge of the scar and a whitish thread (approximately 5 mm in length) lying obliquely over the iris.

Figure 3. An external view of the right eye showing a quiet eye.