Retained Intraocular Foreign Body Presenting 19 Years after the Injury as Intraocular Inflammation

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ABSTRACT

The authors describe a case of retained metallic foreign body located in the posterior segment that stayed silent and undetected for years and presented as intraocular inflammation 19 years after the injury. A 43-year-old male patient presented to the emergency clinic with acute unilateral vision loss, pain and redness in his right eye. His corrected visual acuity was counting fingers from 2 meters in the right eye. Anterior segment examination demonstrated a cilliary injection with trace cells and flare on the right eye. A patent peripheral iridectomy and a well-functioning conjunctival bleb located superiorly were observed on biomicroscopy. On fundus examination, 2+ cells in anterior vitreous, vitreal opacities concentrated inferiorly and a dark coloured foreign body on distant inferior retina was observed. The patient revealed a history of trauma many years ago, while 5 years previously he underwent trabeculectomy for unilateral open angle glaucoma on the right eye. The patient underwent 23-gauge pars plana vitrectomy and foreign body extraction on his right eye. The visual acuity improved to 20/20 sixth months postoperatively. Hereby, in eyes with a history of injury a thorough and detailed examination and proper investigation should be performed even if no site of entry could be differentiated. Nevertheless, the IOFB can stay undetected and inflammatory reaction can take place years after the primary injury.

Keywords: Glaucoma, Intraocular foreign body, Inflammation.

INTRODUCTION

Intraocular foreign bodies (IOFB) accompany 18-41% of all open globe injuries.[1] Foreign bodies can be various in nature like metallic, organic, plastic, glass or porcelain. Among all types, metallic foreign bodies are the most common ones to be extracted from the eye. Men aged 20 to 40 years are mostly affected by IOFB (92-100%) usually at workplace injuries.[2]

The reaction of the eye to an IOFB depends on the chemical composition of the foreign body, sterility and location. While inactive and sterile objects such as sand, glass, or precious metals might be followed-up without being extracted, foreign bodies inducing high level of inflammatory reaction like copper should be promptly removed from the eye. Herein, we present a case with a metallic foreign body located in the posterior segment that stayed silent and undetected for years, and presented as intraocular inflammation 19 years after the injury.

Case description

A 43-year-old male presented to the emergency clinic with pain, redness, and blurry vision in his right eye. There was no remarkable systemic history. His visual acuity was counting fingers in the right eye and 20/20 in the left eye. Anterior segment examination demonstrated a cilliary injection with trace cells and flare on the right eye. A patent peripheral iridectomy and a well-functioning conjunctival bleb located superiorly were observed on biomicroscopy. No signs of infection of the bleb could be seen. Left eye was normal. Intraocular pressure was measured as 14 mm Hg in both eyes. On his fundus examination, a picture resembling uveitis with 2+ cells in anterior vitreous and vitreal opacities concentrated inferiorly was observed. A retinal scar temporal to the macula was observed. Further peripheral retinal examination by a quadraspheric lens revealed a dark coloured foreign body on the distant inferior retina, while the patient admitted to experience a trauma to his right eye many years previously. An orbital CT was ordered, on which a 3 mm hyperdense lesion localised inferiorly and compatible with a metallic foreign body was confirmed (Fig. 1).

The patient described a history of an injury to his right

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Received: 27.02.2021
Accepted: 23.05.2021
Ret-Vit 2022; 31: 180-182
DOİ:10.37845/ret.vit.2022.31.31

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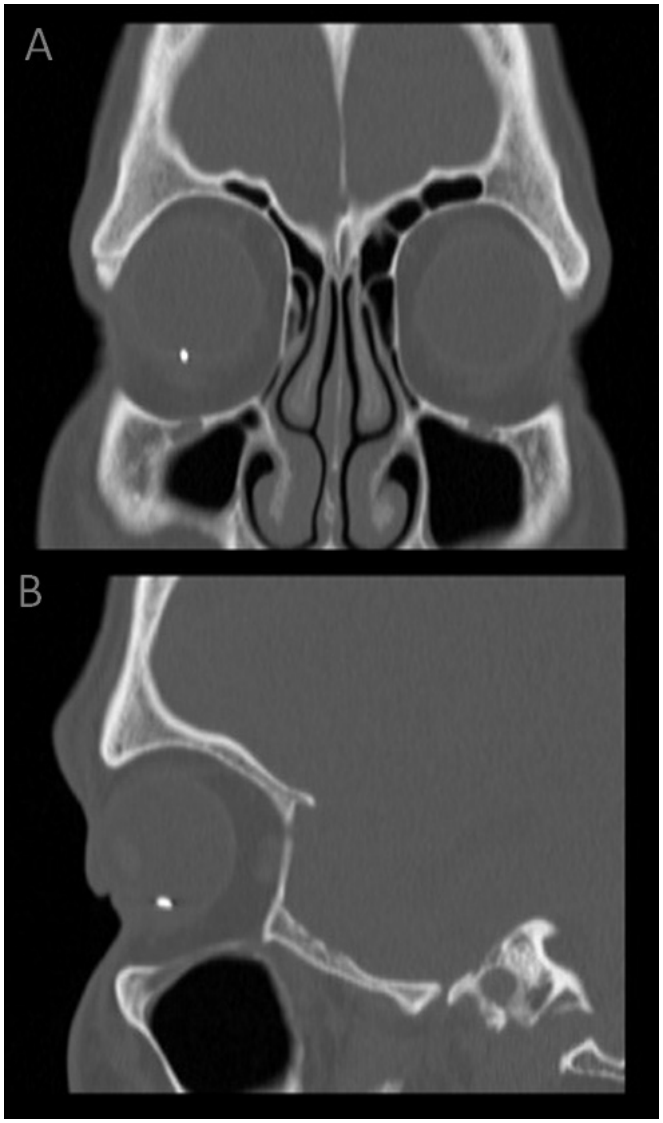

Figure 1: *An orbital noncontrast CT of the right eye. A 3 mm hyperdense lesion localised inferiorly and compatible with a metallic foreign body was seen on coronal plane* **(A)** *and sagittal plane* **(B)**.

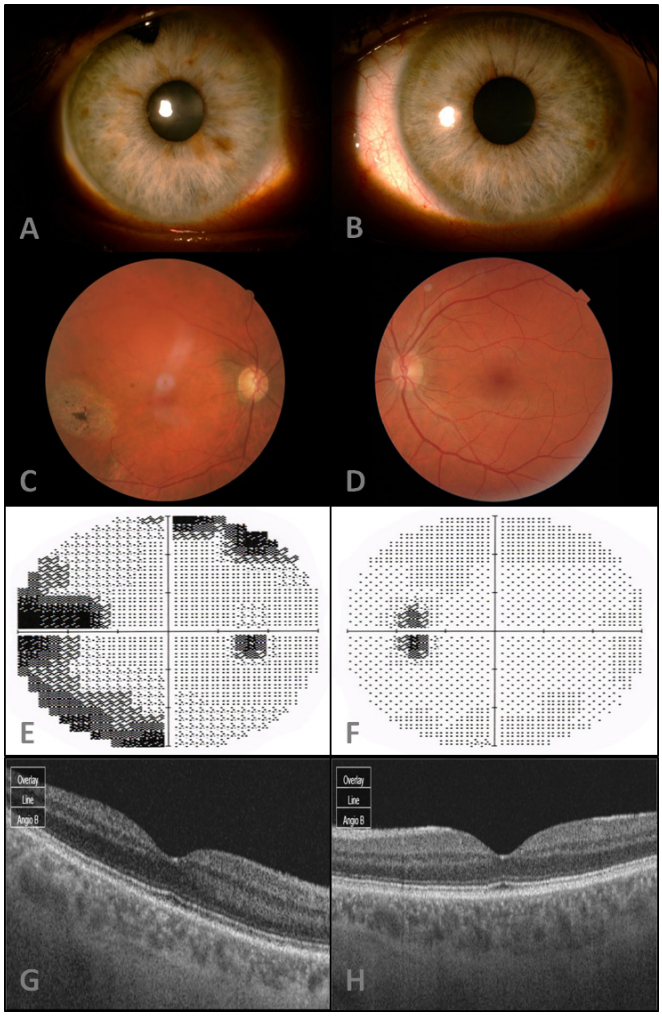

Figure 2: *Anterior segment photography demonstrating a clear cornea and lens, and a peripheral iridectomy on 11 o'clock position, while no heterochromia was present* **(A,B)**. *In colour fundus photography, a hyper-pigmented scar in the temporal region of the right eye was seen while there was no obvious pigmentation or retinal pigment epithelial atrophy. A cup/disc asymmetry of 0.7 in the right eye* **(C)** *and 0.2 in the left eye* **(D)** *was noted. In visual field analysis, a significant glaucomatous field defect was present on the right eye* **(E)** *and a normal field on the left eye* **(F)**. *Optical coherence tomography examination revealed a normal macular morphology and thickness in both eyes* **(G,H)**.

eye with a hot iron particle 19 years previously in the year 2000. He was working as a press operator in a steel factory. His first presentation to our institution was 14 years after the injury with a complain of pain in the right eye. His past medical files were retrieved and he was found to be referred to glaucoma clinic in 2014 with a diagnosis of unilateral open angle glaucoma on the right eye. His visual acuity on right eye was 20/20 and the intraocular pressure 42 mm Hg. Further examination with the aim of revealing any signs related to the trauma was performed. Cornea was clear and no signs of entry could be observed. Anterior segment of the right eye was totally normal (Fig. 2A,B). Neither iris transillumination defect nor any lens opacity was present. On gonioscopic examination, the iridocorneal angle was wide-open, while no recession or peripheral anterior sinechia was present bilaterally. On fundus examination, a hyperpigmented scar in the temporal region of the right eye was recorded and a cup/disc asymmetry was noted (Fig. 2C,D). The patient was followed-up for one year by medical anti-glaucoma treatment and finally underwent trabeculectomy on the right eye in 2015. Thereafter, the patient was examined regularly in glaucoma clinic and had a stable vision and well-regulated IOP with stable OCT and perimetric findings (Fig. 2E,F).

Following the confirmation of a metallic IOFB, the patient underwent 23-gauge pars plana vitrectomy on right eye

in 2019. The foreign body was extracted from the retina. No capsular material was found surrounding the object. His visual acuity improved to 20/20 postoperatively. At his final examination, a well functioning bleb and a clear cornea and lens was apparent on biomicroscopic examination on the right eye, while the temporal retinal scar in addition to less conceivable laser spots on distant inferior retina were present on fundoscopic examination. Optical coherence tomography examination revealed a normal macular morphology and thickness (Fig. 2G,H).

DISCUSSION

Iron-containing foreign bodies can cause siderosis. However the degree of toxicity and reaction depends on the amount of iron in the particle.[3] Because photoreceptor cells and retinal pigment epithelium are highly vulnerable to damage, Electroretinography (ERG) can be used for monitoring the retinal toxicity. In a series including 10 patients with metallic IOFBs, the authors followed-up the cases for 9 to 46 years.[4] Among those, only one patient demonstrated reduction in visual acuity and changes on ERG. Lim et al.[5] reported a case having an iron-containing foreign body for 58 years in whom ocular siderosis was not detected. The authors concluded that the encapsulation of the foreign body might have prevented the iron related toxicity.

In the present case, a metallic IOFB lodged on the distal retina resulted primarily on inflammatory reaction after being silent of many years. Interestingly, the intraocular inflammation resembling pan-uveitis occurred 19 years after the injury. During surgery, a fibrotic capsule was not noticed around the object. We do not know exactly whether there had been a capsule previously that has eroded by time exposing the particle, which might explain the late clinical signs of ocular inflammation.

In ocular siderosis, siderotic glaucoma also may develop as a result of deposition of iron in the trabecular meshwork.[6, 7] The iron deposition has been histologically demonstrated in a patient that had secondary glaucoma and brownish pigment deposits on gonioscopic examination.[8] In the present case, any unusual finding on gonioscopy like pigment deposits or angle recession and on biomicroscopy was not obvious in the initial examination of the patient having been referred for high IOP in the right eye. Unlike other cases with siderotic glaucoma reported in the literature, iris heterochromia also lacked. Low-grade of inflammation might have contributed to the malfunctioning of the trabecular meshwork in this case. After the patient underwent incisional surgery for medically uncontrolled glaucoma, the IOP ranged in the low-teens and the clinical findings were stable until the obvious inflammatory reaction occurred.

In conclusion, in eyes with a history of injury a thorough and detailed examination and proper investigation should be performed even if no site of entry could be differentiated. Nevertheless, the IOFB can stay undetected and inflammatory reaction can take place years after the primary injury.

Declaration of conflicting interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The authors received no financial support for the research, authorship, and/or publication of this article.

Informed consent: Written informed consent for publication of the article and medical photographs was obtained from the patient.

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