

Unusually located metallic foreign body in posterior chamber of eyeball: role of multimodal ocular imaging in its diagnosis and management

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DESCRIPTION

Intraocular foreign bodies (FBs) are extraneous objects usually detected in the eyeball after trauma with metallic objects. As these can cause sight-threatening complications such as endophthalmitis and siderosis bulbi, early diagnosis and removal are essential for favourable outcome. However, sometimes, despite the presence of a characteristic history, it may be difficult to visualise FBs located in unusual location making their diagnosis and management challenging.¹

A 24-year-old systemically healthy male, welder by occupation and having characteristic history of hammer and chisel injury to right eye 30 days back, was referred for removal of radio-opaque FB appreciated on X-ray orbit. Visual acuity was 20/20 in both eyes and right eye showed a 1.5 mm linear corneal scar at 7'O clock position with a patch of underlying iris fibrosis (figure 1A). The patient was visually asymptomatic and there was no cataract or other signs of iris damage suggestive of additional iris penetration by a FB. Slit-lamp biomicroscopy even with the aid of Goldmann 2-mirror gonioprism (figure 1B,C) or anterior segment optical coherence tomography (ASOCT) did not demonstrate any FB. Non-contrast computerised tomography (NCCT) scan of head and orbits (2 mm slice thickness) revealed a 4×4 mm radio-opaque FB localised to the inferotemporal region of eyeball near the ciliary body (figure 1D,E). High-frequency ultrasound biomicroscopy (UBM) localised the FB to posterior chamber (figure 1F). A normal electroretinogram ruled out any siderotic changes (figure 1G). The reason for his delayed presentation to our centre was his geographically distant location, good visual acuity and frequent visits to multiple private practitioners for removal of radiologically visible but clinically hidden FB. After obtaining written informed consent, a 1.5×2 mm FB was successfully removed from the anterior route using 23-gauge microvitrectomy forceps after dissection of overlying iris with Sinsky hook. The extracted FB was identified as metallic by a magnet and iron containing on forensic examination (figure 2A). Repeat CT scan did not show any residual FB (figure 2B). The patient was prescribed antibiotics-steroid-cycloplegic for 7 days and at 3 months follow-up, visual acuity was well-maintained with no signs of siderosis.

Various investigations used to localise FBs in the ciliary body region include gonioscopy, NCCT, ASOCT and UBM.¹⁻⁴ Grafii had reported an iron FB in the zonular area, which was primarily hidden

in inferior chamber angle, and slipped there during surgical manipulation.¹ In the presently discussed first reported case of primary presentation of FB in the zonular area, while X-ray could detect presence of a radio-opaque FB, slit lamp biomicroscopy, gonioscopy and ASOCT all failed to recognise it due to its uncommon location and overlying fibrotic iris. Though NCCT played an indispensable role in determining the site and type (metallic vs non-metallic) of FB, it failed to provide finer details for surgical removal and UBM served as an extremely helpful modality by providing a magnified view of the intraocular structures and localising the FB to posterior chamber in the present case. While all these provided anatomical details, electroretinogram quantified its functional effects.

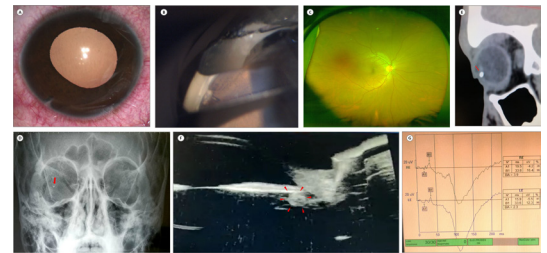


Figure 1 FB hidden from view by corneal scar and fibrotic iris on slit-lamp biomicroscopy (A) and on gonioscopy (B); normal fundus (C); FB (red arrows) as seen on X-ray (D); NCCT scan (E) and UBM (F), respectively; normal photopic and scotopic electroretinogram (G). FB, foreign body; NCCT, non-contrast computerised tomography; UBM, ultrasound biomicroscopy.

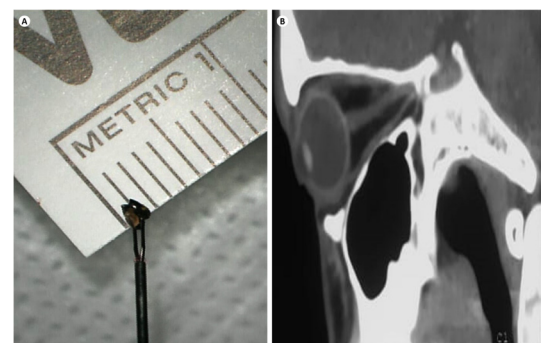


Figure 2 Extracted metallic FB (A); and postoperative absence of FB on NCCT scan (B). FB, foreign body; NCCT, non-contrast computerised tomography.



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Images in...

In such complex cases of FBs hidden in unusual location like posterior chamber of eyeball, multimodal ocular imaging plays a pivotal role in diagnosing, prognosticating and surgical planning of the case. As seen presently, delay in presentation may allow healing of iris defects, if any, which may make localisation of FB even more challenging. As characteristic history and radiographic examination suggested the metallic nature of FB in our case, we planned its removal to prevent subsequent ocular siderosis, a grave complication seen with retained intraocular metallic FBs. Ocular siderosis may be seen in around 83.33% patients with metallic FBs and the period between the ocular injury and its diagnosis may range from 1 to 240 months. The condition progresses slowly over years and the visual outcome is usually unpredictable. However, surgical treatment can improve the

visual rehabilitation in 63% cases and therefore early removal of iron-containing FBs, as undertaken in our case, is recommended.⁵

To conclude, if a similar situation is encountered at a primary eye-care centre, it is advisable to perform a baseline X-ray and immediately refer the patient to higher centre to prevent siderosis and subsequent visual loss, particularly if the patient's history is characteristic of metallic FB trauma.

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Learning points

- ▶ Foreign bodies (FBs) present in posterior chamber of eyeball are challenging to diagnose despite a characteristic history of metallic FB trauma.
- ▶ Various investigations such as gonioscopy, non-contrast CT, anteriorsegment optical coherence tomography and ultrasound biomicroscopy (UBM) must all be used in combination for best results.
- ▶ UBM can serve as an extremely helpful modality in such cases by providing a magnified view of the intraocular structures and localising the FB to posterior chamber.

REFERENCES

- 1 Graffi S, Tiosano B, Ben Cnaan R, *et al.* Foreign body embedded in anterior chamber angle. *Case Rep Ophthalmol Med* 2012;2012:1–3.
- 2 Dass AB, Ferrone PJ, Chu YR, *et al.* Sensitivity of spiral computed tomography scanning for detecting intraocular foreign bodies. *Ophthalmology* 2001;108:2326–8.
- 3 Mahmoud A, Messaoud R, Abid F, *et al.* Anterior segment optical coherence tomography and retained vegetal intraocular foreign body masquerading as chronic anterior uveitis. *J Ophthalmic Inflamm Infect* 2017;7:13.
- 4 Kaushik S, Ichhpujani P, Ramasubramanian A, *et al.* Occult intraocular foreign body: ultrasound biomicroscopy holds the key. *Int Ophthalmol* 2008;28:71–3.
- 5 Zhu L, Shen P, Lu H, *et al.* Ocular trauma score in siderosis bulbi with retained intraocular foreign body. *Medicine* 2015;94:e1533.

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