

Exploring Causes and Outcomes in Delayed Extraction of Intraocular Foreign Bodies: A Case Series

Mohamed Bondok BSc² Ψ ; Abdullah Al-Ani MD, PhD^{1,2} Ψ ; Kian Madjedi MS, MD^{1,2} ; Shellina Kherani RN, BScN³ ; Amin Kherani MD, FRCSC^{1,2,3}

Ψ These authors have contributed equally to this work

¹Department of Surgery, Section of Ophthalmology, University of Calgary, Calgary, AB, ²Cumming School of Medicine, University of Calgary, Calgary, AB, Canada

³Calgary Retina Consultants, Southern Alberta Eye Center, Calgary, AB

INTRODUCTION

Intraocular foreign bodies (IOFB) can enter the eye and cause vision loss, pain and permanent damage. Immediate removal of an IOFB may not be indicated if it poses a risk to the patient's vision or health. However, retaining an IOFB can lead to complications such as infection, inflammation, cataract, glaucoma, scarring and toxicity. The decision to remove an IOFB depends on the specific circumstances of each case based on a thorough evaluation of the patient's condition. Commonly used imaging modalities includes X-rays, CT scans, and ultrasounds, while MRI is contraindicated in cases of metallic IOFB. This case series reviews causes and complexities associated with delayed IOFB extraction.

METHODOLOGY

Study Design: Retrospective chart review of patients who underwent IOFB removal by a single surgeon at least 3 months after injury from 2002-2022. The data collected included patient demographics, IOFB characteristics, related injuries/complications, and initial and final best corrected visual acuity (BCVA).

RESULTS OVERVIEW

Five patients who underwent IOFB extraction 3 months to 53 years following the initial injury were identified, with a mean age of 41.03 ±10.95 years. IOFBs were 1.5 to 3 mm in diameter, with 4/5 being metallic. B-scan was performed as the initial imaging in 4/5 cases and CT scan was used in the other case. IOFBs were surgically extracted within one year in 3/5 of cases, while the IOFB was extracted 4 and 53 years after the initial injury in the other two cases. Traumatic cataract (TC) and retinal tear (RT) or detachment (RD) were the most common complication (5/5), followed by epiretinal membrane (ERM) (3/5), secondary glaucoma (SG) (2/5), Vitreous hemorrhage (VH) (1/5), and siderosis (1/5).

CONCLUSIONS & RECOMMENDATIONS

- ❖ **Clinical Assessment** – Careful history and physical exam of the anterior and posterior segments are critical in determining diagnosis and management options
- ❖ **Imaging Modalities** – CT scans are highly sensitive for metallic IOFB but may not identify wood or glass. B-scans ultrasound are also helpful in identification, cost-effective but their sensitivity relies on their operator's expertise. X-rays are useful for identifying metallic IOFB in a resource limited setting.
- ❖ **Complications** – The complications can be varied, but the most common complications encountered in this series includes traumatic cataract, retinal tears/detachments, epiretinal membranes, and secondary glaucoma. Having a retained IOFB can also have other serious long-term consequences such as siderosis and resultant vision loss
- ❖ **Surgical Approach** – Surgical approach and management strategies should be holistic and account for the timing, location, size, composition and degree of damage caused by the IOFB as well as anterior and posterior segments repairs as required
- ❖ **Final Recommendation** – When surgically feasible, and tolerable by the patient, the IOFB should be removed to avoid long-term complications and improve patient vision. Most patients in this study showed improvement following prompt IOFB removal

CASE - ONE

Demographics & Characterization



Chief Complaint: Decreased vision
Associated Injuries : TC, RT
Time Following Injury: 3 months
Imaging: IOFB Identified on B-Scan

Final Visual Outcomes

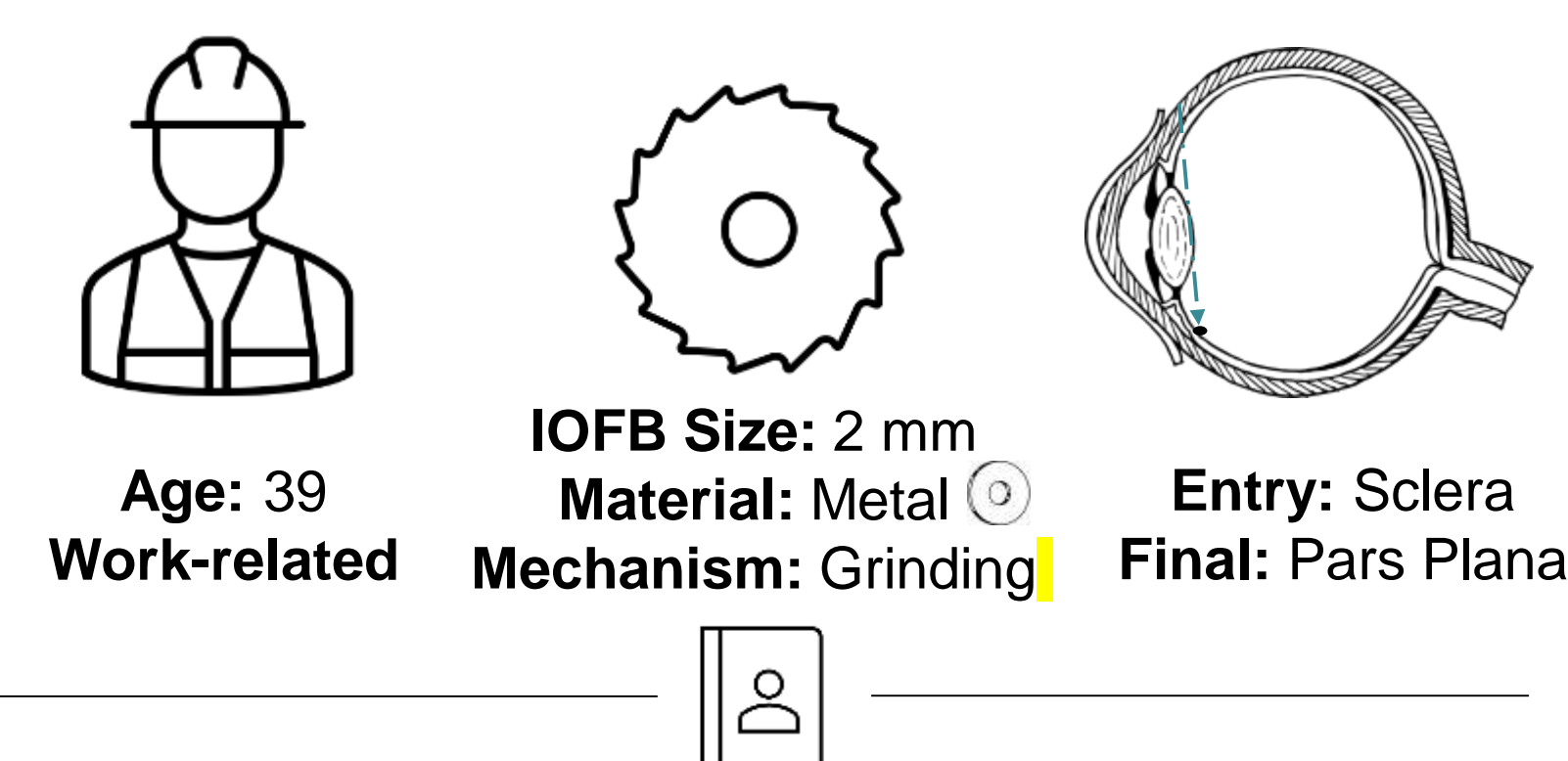
Initial BCVA: 20/50 → Final BCVA:20/30

Case Overview

The IOFB resulted in a traumatic cataract and retinal break. The initial injury occurred 3 months earlier while the patient was travelling abroad. Phacovitrectomy surgery was performed to remove the cataract, insert a posterior chamber intraocular lens (PCIOL) within the capsular bag, extract the IOFB, and secure the retinal break/impact site with laser retinopexy and 10% C3F8.

CASE - TWO

Demographics & Characterization



Chief Complaint: Decreased vision
Associated Injuries : TC, RT/RD, ERM
Time Following Injury: 6 months
Imaging: IOFB not Identified on B-Scan

Final Visual Outcomes

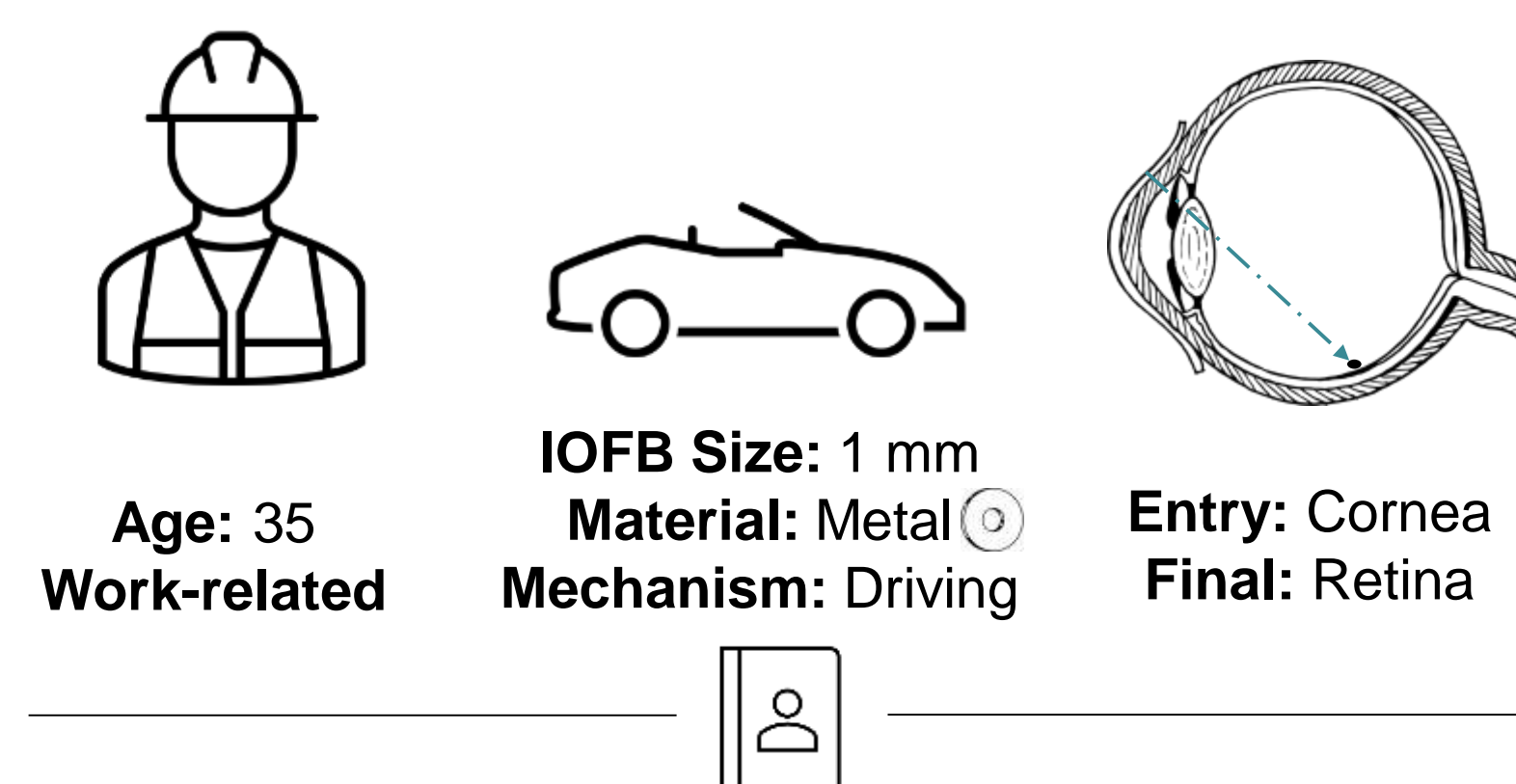
Initial BCVA: 20/50 → Final BCVA:20/25

Case Overview

Following the initial trauma, B-scan imaging did not identify the IOFB. The patient was initially treated for a traumatic cataract with vitrectomy, lensectomy and a sulcus, captured PCIOL. Six months later, a retinal detachment developed requiring a vitrectomy, cryoretinopexy and 25% SF6. During the second surgery, the occult IOFB was discovered in the pars plana and removed.

CASE - THREE

Demographics & Characterization



Chief Complaint: Decreased vision
Associated Injuries : TC, RT, ERM
Time Following Injury: 1 year
Imaging: IOFB Identified on B-Scan

Final Visual Outcomes

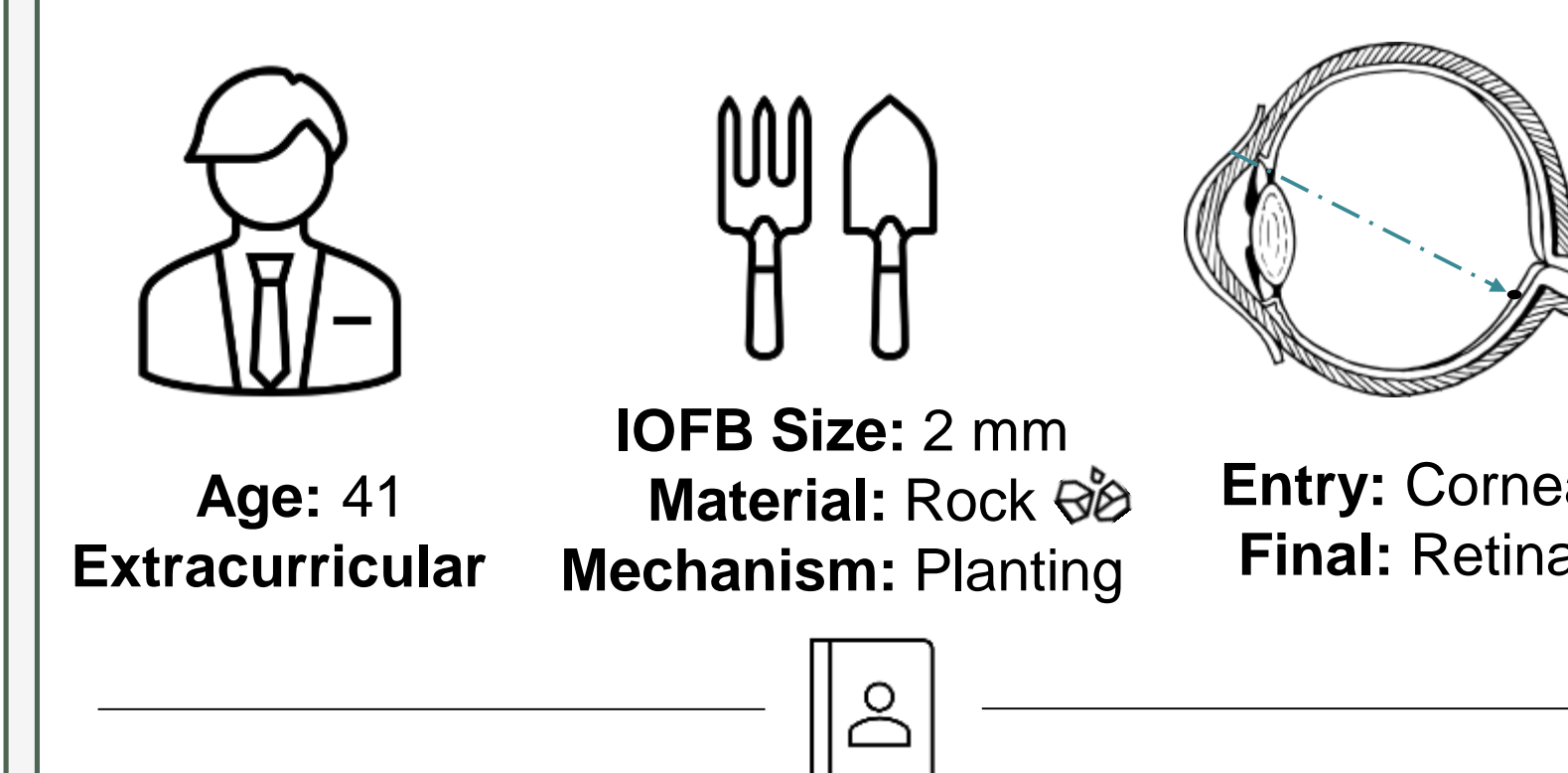
Initial BCVA: 20/50 → Final BCVA:20/25

Case Overview

The IOFB was extracted 1 year following the incident due to delayed presentation. Phacovitrectomy surgery was performed to remove the cataract, insert a PCIOL within the capsular bag, extract the IOFB, and secure the retinal tear with endolaser demarcation and 15% C3F8. Nine months later, the patient was found to have a minimal epiretinal membrane, which was monitored for progression.

CASE - FOUR

Demographics & Characterization



Chief Complaint: Decreased Vision
Associated Injuries: TC, RT/RD, ERM, VH, SG,
Time Following Injury: 4 years
Imaging: IOFB Identified on B-Scan

Final Visual Outcomes

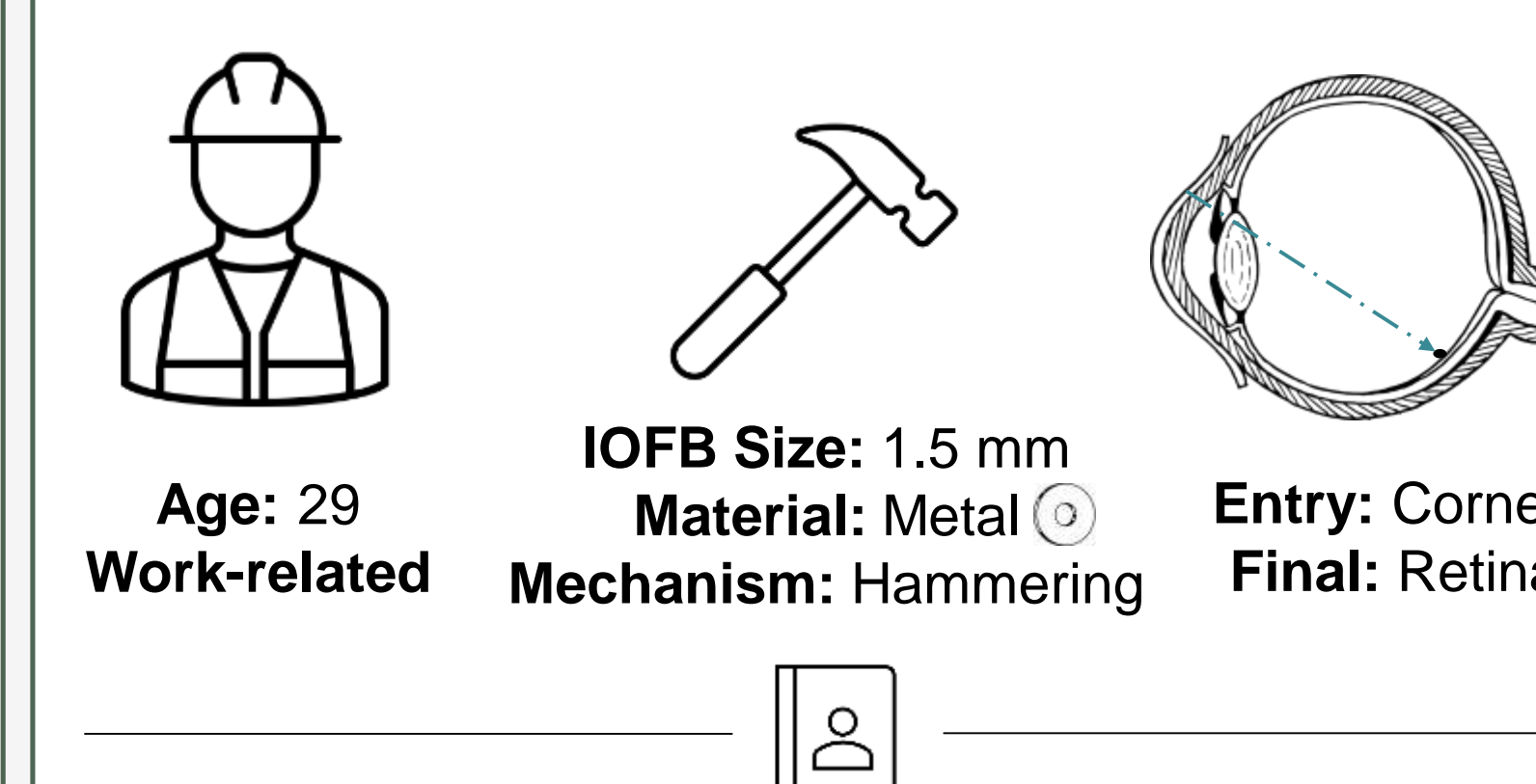
Initial BCVA: 20/50 → Final BCVA:20/250

Case Overview

The IOFB led to a traumatic cataract, glaucoma, and subsequent retinal detachment, necessitating multiple surgeries. An initial phacovitrectomy was performed with sulcus PCIOL, IOFB removal, laser and Densiron oil. The oil required expedited removal due to glaucoma. A subsequent retinal detachment with vitreal bleeding developed requiring repeat vitrectomy, scleral buckle, retinopexy and 5700 oil; the oil was subsequently removed along with an epiretinal membrane.

CASE - FIVE

Demographics & Characterization



Chief Complaint: Decreased Vision
Associated Injuries: TC, RT, SG
Time Following Injury: 53 Years
Imaging: IOFB Identified on CT Scan

Final Visual Outcomes

Initial BCVA: 20/200 → Final BCVA:20/200

Case Overview

The IOFB was extracted 53 years after the incident trauma; the initial injury did not cause any symptoms or acute vision loss at the time. The lens in the affected eye developed a cataract which was removed over 20 years prior to presentation. The patient presented with evidence of siderosis secondary to an encapsulated IOFB embedded in the inferior temporal retina. Vitrectomy, IOFB extraction, endolaser demarcation to the impact site and a 16% C3F8 gas tamponade were performed.

REFERENCES

