

## Retained intraocular metallic foreign body causing retinal detachment

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### ABSTRACT

A 60 year old farmer presented on 4<sup>th</sup> Sept, 2015 with progressive diminution of vision in the right eye following trauma while hammering about a month previously. His vision was Hand Movement only in the right eye and 6/6 in left eye. The anterior segment showed normal findings, except mild anterior chamber reaction and an early cataract in the right eye. The left eye was normal except for an early age-related cataract. Fundoscopy revealed retained intra-ocular foreign body (RIOFB, subtotal RD with macula off in right eye. Interestingly, no entry wound was found. A B-scan and CT scan of the brain and orbit confirmed RIOFB and RD. On 9<sup>th</sup> September 23G PPV was done and RIOFB was removed. Fluid-air exchange, endolaser and silicon oil injection were done to attach the RD. On 6<sup>th</sup> February 2016 a cataract extraction with intraocular lens implantation and silicon oil removal was performed which improved the patient's vision to 6/18p.

**Keywords:** Rhegmatogenous retinal detachment; Silicon oil; Vitrectomy.

### INTRODUCTION

Ocular trauma is a common, yet avoidable cause of blindness. Recent trends show an increased incidence of mechanical trauma due to rapid industrialization and mechanised farming. Worldwide, there are approximately 1.60 million people who are blind from ocular injuries, 2.30 million with bilateral visual impairment and 19 million with unilateral visual loss<sup>1,2</sup>. Ocular injuries can be mechanical or non-mechanical, and mechanical injuries can be further classified as closed globe or open globe injuries<sup>3</sup>. Malik reported that 94.25% of ocular injuries were mechanical and 42.15% of these mechanical injuries were penetrating with 3.40% having retained intra-ocular foreign bodies<sup>4</sup>. 22% of all penetrating injuries were occupational as reported in the National Eye Trauma System Registry and 42% of occupational penetrating injuries were due to construction work associated with hammer and chisel<sup>5</sup>. Jain reported that among ocular injuries, 26% were perforating type, of which 47.40% had retained intra-ocular foreign bodies - 38.9% of the retained intra-ocular foreign bodies were magnetic<sup>6</sup>.

This case report is about a farmer who presented with retinal detachment in his right eye caused by a retained intraocular metallic foreign body from hammering work.

### CASE REPORT

A 60 years old male farmer from Mongar presented to the vitreo-retinal clinic at Jigme Dorji Wangchuk National Referral Hospital (JDWRH) on 4<sup>th</sup> September, 2015 with the complaint of progressive diminution of vision in right eye, pain and headache.

This was following trauma while doing hammering work about a month previously. Despite being treated at the Eastern Regional Referral Hospital in Mongar, his symptoms persisted and he decided to seek medical help at JDWRH.

The presenting vision in his right eye was Hand Movement with defective projection of light, while in the left eye his vision was 6/6. Examination of the anterior segment of the right eye showed anterior chamber reaction with 1+ cells, 2+ flare and an early age-related cataract. The eyelids, conjunctiva, sclera, cornea, iris and pupil were normal. The left eye was normal except for a nearly age-related cataract. Fundoscopy revealed a retained intra-ocular foreign body (RIOFB), subtotal retinal detachment with macula off and vitreous hemorrhage in the right eye. The RIOFB was located at 6 o'clock position, two disc diameters below the optic disc. The major portion of the RIOFB was sub-retinal with a small portion protruding into the vitreous cavity through the retinal tear. The fundus of the left eye was normal. The Intraocular pressure was recorded as 5 mm Hg and 13 mm Hg in right and left eyes respectively. Interestingly, no entry wound was found.

CT-scans of the brain and orbit also showed RIOFB measuring 3.8 mm by 3.3 mm with no bony abnormality (Figure 1a & 1b). B-scan of the right eye showed RIOFB with sub-total retinal detachment and vitreous hemorrhage (Figure 2a & 2b). A random blood sugar and complete blood count were done and were reported normal. Viral markers for HIV, hepatitis B and C, and syphilis (reactive protein reagent and tissue plasminogen haem agglutination) were done and all were reported to be non-reactive. An intra-dermal test dose of Lidocaine and Bupivacaine local anesthetic agents was given and found to be non-reactive. Informed written consent was taken both for operation and publication of the case report.

On 9<sup>th</sup> September 2015, 23-gauge Pars Plana Vitrectomy was performed on the right eye and a metallic foreign body was removed through the extended port with the help of intra-ocular forceps (Figure 3, 4, 5, & 6). A small infero-nasal retinotomy

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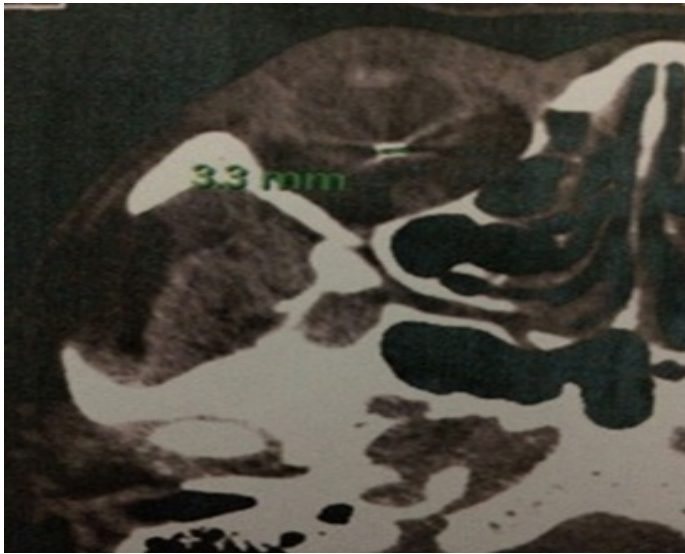


Figure 1a. CT scan showing RIOFB

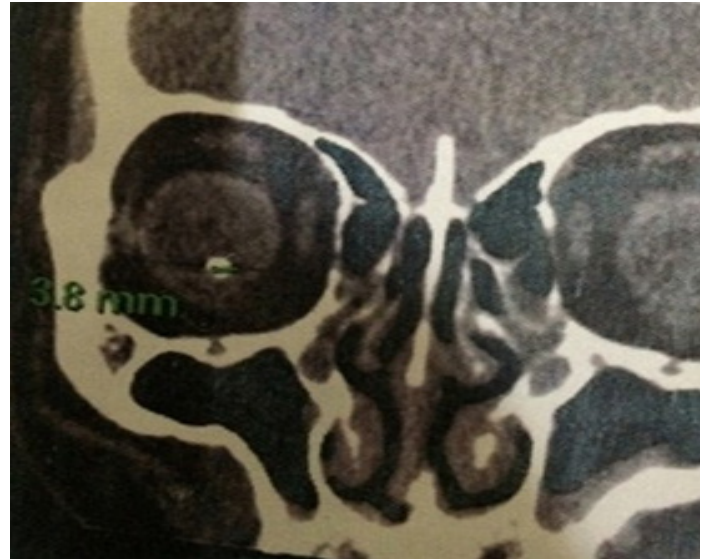


Figure 1b. CT scan showing RIOFB



Figure 2a. B-scan showing metallic RIOFB

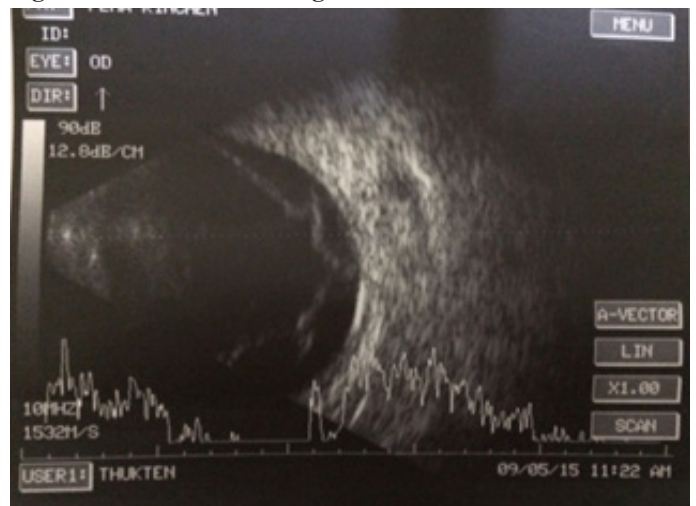


Figure 2b. B-scan showing retinal detachment



Figure 3. VR set up

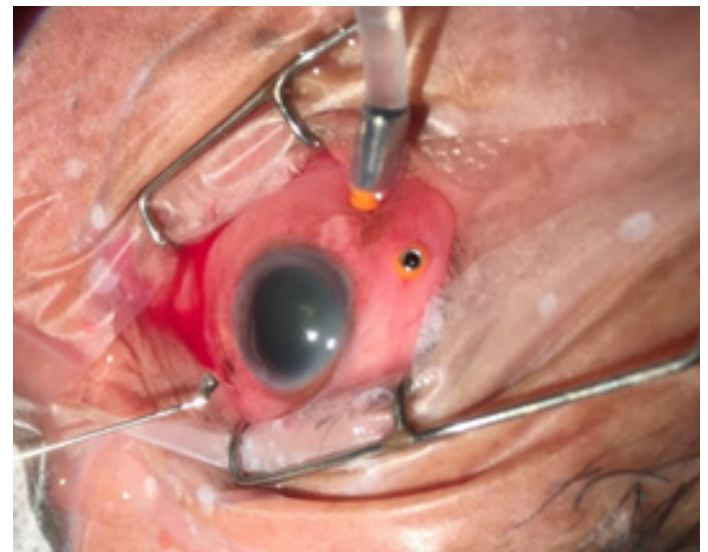
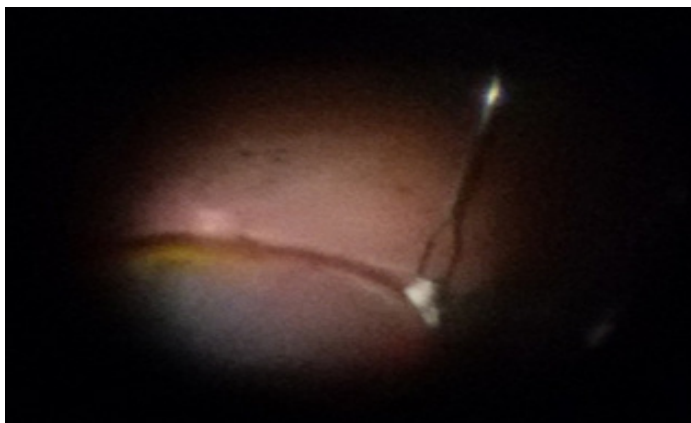


Figure 4. 23 G PPV ports and RIOFB





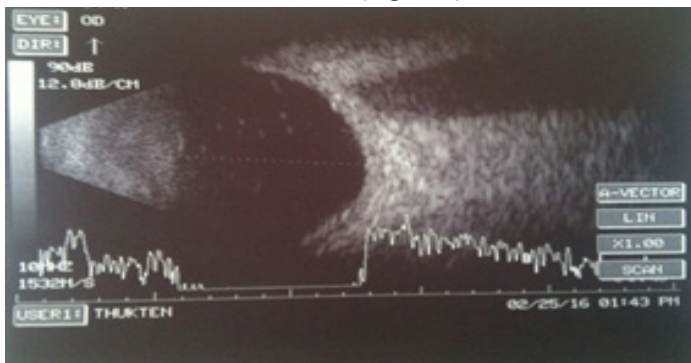
**Figure 5. RIOFB in vitreous cavity**



**Figure 6. Metallic IOFB on intraocular magnet**

was done to remove the sub-retinal fluid. Fluid-air exchange, endolaser, and silicon oil injection were done to attach the detached retina successfully.

The post-operative period was uneventful. The patient was advised to maintain a prone position for two weeks and other routine post-operative medications were given. After one week the vision improved to 6/36 with +7.0D, the retina was attached and the intra-ocular pressure was normal. Cataract extraction with intraocular lens implantation and silicon oil removal was performed on 6<sup>th</sup> February 2016. Post-operatively the vision improved to 6/36. After three weeks the vision improved to 6/18P and the retina remained attached (Figure 7).



**Figure 7. Normal B scan in post-operative period**

## DISCUSSION

Sofat et al reported that stone chipping and dynamite blasting of rocks accounted for 29.60% of eye injuries in his study<sup>7</sup>. Hammer and chisel injury was reported as a common source of injury accounting to 20.44%<sup>8</sup>. My case report also shows that the hammer and chisel related eye injury is not uncommon. Rai BB et al also reported that among open globe injuries, RIOFB ranked second at 24.72%, next only to penetrating injury which accounted for 61.80%<sup>8</sup>. Aleksandra et al reported that both adult and pediatric patients may delay seeking care due to lack of symptoms and might not even be aware that there is a RIOFB, as in this case<sup>9</sup>. RIOFB with open globe injuries can be associated with retinal tears, retinal detachments, choroidal detachment, choroidal rupture, scleroperetaria, and a posterior exit wound<sup>9</sup>. The reported case had associated retinal detachment. CT scan of the brain and orbit is the most useful and commonly utilized imaging modality to confirm the presence of RIOFB. MRI should be avoided in open globe injury if a metallic or magnetic RIOFB is suspected. Metal, glass and stone are the most easily detected materials. Plastics and wood show variable findings in a CT scan<sup>9</sup>.

A patient with a RIOFB should be operated as soon as possible because delaying surgery by more than 24 hours from the injury could result in higher rates of endophthalmitis and proliferative vitreoretinopathies<sup>10</sup>. In the management of RIOFB with retinal detachment, the prognostic factors are variable and it is important to explain to the patient that they may require multiple surgeries<sup>11</sup>. In this vitrectomy era, most vitreo-retinal surgeons prefer Pars Plana Vitrectomy to the use of an external electromagnet in the management of posterior segment RIOFB<sup>11</sup>. The choice of instrument size is determined by the surgeon's preference but commonly 23 or 25gauge PPV is used with extension of the sclerotomy site for removal of the RIOFB<sup>12</sup>. After the posterior vitreous detachment is created, the RIOFB can be removed with different intra-ocular forceps through the sclerotomy, which if needed is extended. The patients treated for RIOFB should be closely followed up for complications like endophthalmitis, retinal detachment, proliferative vitreoretinopathy and cataract formation. With metallic RIOFBs, 40% of patients require secondary interventions, including surgery for retinal detachment or cataract<sup>13</sup>.

## CONCLUSIONS

Retained intraocular foreign bodies (RIOFB) are a known cause of retinal detachment and are an avoidable cause of blindness<sup>14</sup>. However, now with improved technique and vitreo-retinal equipment, the condition can be managed well with a good visual outcome. Another aspect is to create awareness and implement the routine usage of safety measures while working with hammer and chisel, grinding and welding processes. Associated endophthalmitis and retinal detachment are important risk factors for poor prognosis in cases of RIOFBs<sup>15</sup>.

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