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**CASE STUDY**

# IRON INSIDE EYE

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**ABSTRACT**

Siderosis oculi is recognized as a severe emanation of retained, iron made, intraocular foreign body. The injury quintessentially results while battering or pounding metal and most of the times presents in males. Outcome and clinical findings vary depending on time, course and anatomic site within the eye. The prognosis is related to size, position, chemical composition of foreign body. The presence of encapsulated foreign bodies and retention time of foreign bodies also predicts the development of complications.

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## INTRODUCTION

Siderosis bulbi is assumed to be result of retention and oxidation of an iron-containing intraocular foreign body. Iron atoms or ions, disassociate from the foreign body and tend to diffuse to the retina causing irreparable cellular insult (Hope-Ross *et al*., 1993). Prominent Clinical features comprise lenticular opacity, rust-colored anterior subcapsular deposits, iris heterochromia (affected side is darker), pupillary mydriasis, iron deposition on the corneal endothelium and beneath the anterior lens capsule, lens opacification and retinal pigmentary change with a related subnormal electroretinogram (ERG). Other possible complications include retinal detachment, retinal microangiopathy, and open-angle glaucoma. (O'Duffy and Salmon, 1999) Hence, prompt removal of an impacted iron foreign body is warranted and in case the risks of surgical intervention surpasses the danger of siderosis, the patient is repeatedly followed up in order to identify the initial signs of siderosis as early as possible. These complications are usually known to occur between two months and two years after the primary injury, but may occur within several days. They are severe enough to warrant major surgical attempts to extract the foreign body as early as possible.An antecedent history of trauma is not, however, invariable. Usually patient presents with complaints of reduced visual acuity. Bivalent iron (ferrous) is more toxic to ocular tissue than the trivalent ion (ferric). The toxicity is the result of interference with the essential enzyme system. (Shivanand C Bubanale *et al*., 2015) Studies of the pathologic features of eyes with siderosis have revealed iron deposits accumulated in the regions of ocular pumps i.e., corneal endothelium and Descemet's membrane, trabecular meshwork, pupillary constrictor muscles, dilator muscle, non-pigmented ciliary epithelium, lens epithelium, retinal pigment epithelium, and internal limiting membrane (Albert & Jakobiec's Principles & Practice of Ophthalmology, 1997). Histologically, Prussian blue is found to stain the iron blue and demonstrate its presence in all ocular epithelial structures and in areas of trabecular meshwork scarring and retinal gliosis. By electron microscopy, intracellular sideromes are present in the lens epithelium and in corneal keratocytes. (Zhen Yang *et al*., 2014)

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### Case report

A 32 yr old male welder by profession presented to eye OPD with a complaint of reduced vision right eye and FBS both eyes. He gave the history of being hit by multiple small iron particles during welding three years back since he was working without safety glasses. The iron particles were removed from the eye by attending ophthalmologist at that time. he complained of progressively diminished vision dating back to 4months after primary incidence. On SLE examination endothelial iron deposits and stromal scarring was noticed OD >>OS. The Pupil was irregular, sluggish to react (OD). Pupil was regular in size, shape and reacting normal to light (OS). Corneal endothelium dusting was present OD>>OS. The vision was 6/18 OD and 6/6 OS. EOM full OU. Intraocular pressure was normal OU. No history of hypertension, DM or use of traditional eye medicines could be elicited. No history of eye surgery could be elicited. Dilated fundus examination in both eyes revealed no abnormality. Lens was clear, vitreous and AC

revealed no abnormality in both eyes. Scarring was presumed as a result of mechanical impact due to iron particle. Though the surgical removal was done, the siderosis progressed, resulting in corneal involvement and leading to irregular pupil in due time course.

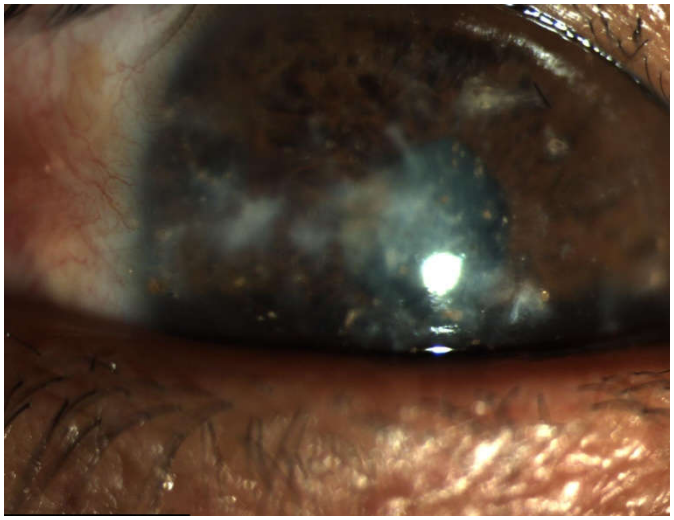

**Fig.1. Rust coloured deposits on corneal endothelium and confluent stromal scarring obscuring visual axis**

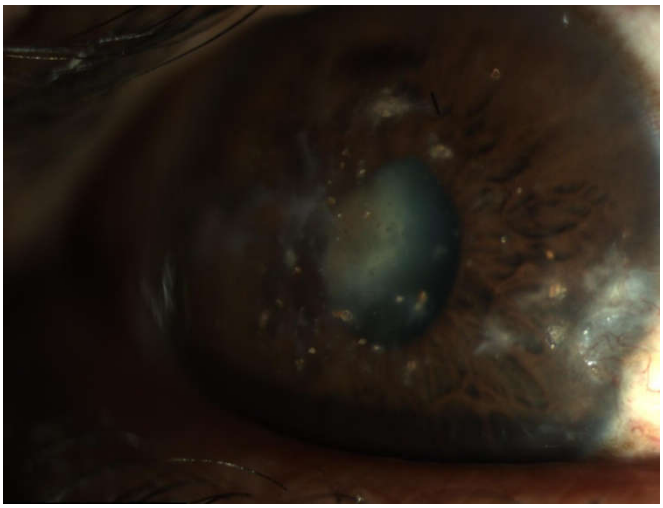

**Fig. 2. Scleral scttaer revealing irregular pupil (od) and rust coloured deposits on corneal endothelium**

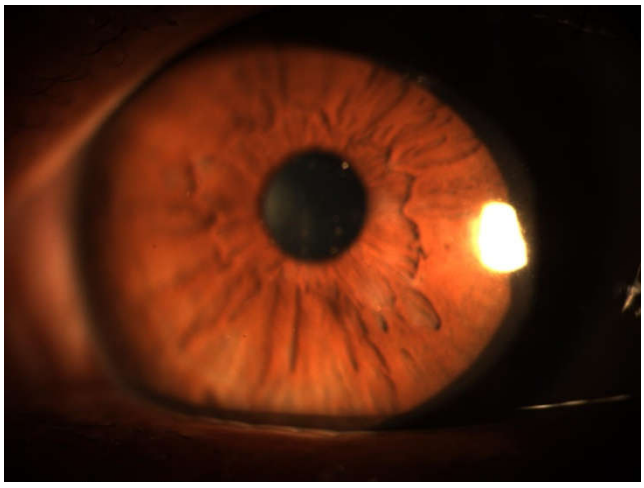

**Fig.3. Direct illumination revealed rust coloured deposits on corneal endothelium. (OS)**

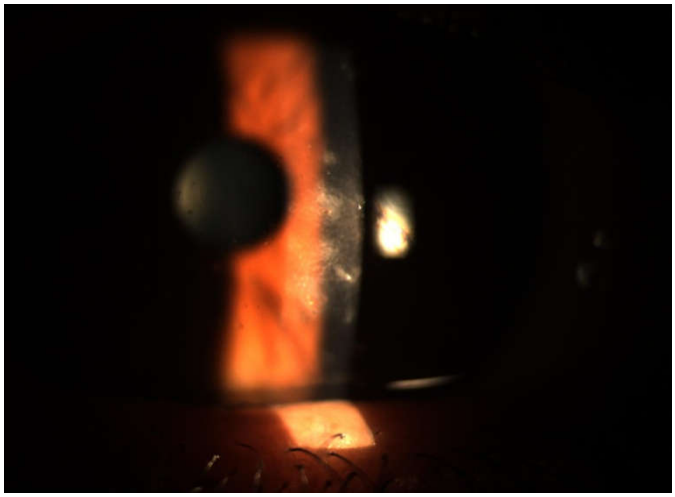

**Fig.4. SLE revealed nebular grade corneal scarring outside visual axis (OS)**

The patient was kept in fellow up to look for remote side effects of siderosis. The Patient was kept on close follow up and prescribed with Lubricants for FBS.

### Conclusion

Adequate eye protection and positioning of appropriate machine guards over potential hazards is necessary in view of reducing mortality due to ocular siderosis. Proper training and making wearing safety glasses mandatory while working can reduce the incidence of ocular bulbi. Importance of repeated follow ups in cases of retained IOFB needs to be emphasized upon.

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