Ocular injury is the commonest reason for emergency intervention in ophthalmology departments worldwide and represents the second most common cause of visual loss\(^1\). Corneal foreign bodies have been reported to be the second most common type of eye injury, comprising approximately 30.8% of ocular injuries\(^2\). The cornea is prone to injury by foreign bodies; approximately 4-7% of ocular injuries in adults and children involve glass.

Figure 1: Slitlamp photograph of various intracorneal foreign bodies (a): Glass (b): Metal (c): Organic foreign body – insect wing (d): Stone.
Substances, such as glass (Figure 1a) and sand, are well tolerated without precipitating a reaction. In these cases, the inert foreign body can be left intrastromal with the patient kept on follow up. However when glass foreign body is in visual axis or causing inflammation it needs to be removed. We have previously published the role of ASOCT and Pentacam in studying posterior astigmatism induced by foreign body and added that as an indication for removal. Other substances, including metals (Figure 1b), wood, organic substances (Figure 1c) and stone (Figure 1d) are poorly tolerated leading to localized edema, inflammatory reaction, opacification, vascularization, and stromal necrosis. Such foreign bodies warrant prompt removal.

ASOCT is a non-contact method of anterior segment imaging. Higher resolution (5 μm) and faster speed of...
A-scan (26,000 scan/sec) can be obtained with the 840-nm spectral domain OCT (RTVue-100; Optovue, Inc., Fremont, CA) as compared to the 1,310-nm time domain OCT. In ocular trauma, AS-OCT results can be used to support diagnosis of ocular surface injuries and monitor the healing process after surgical repair. In addition, it may reveal unexpected lesions that are invisible or difficult to recognize on routine slit-lamp examination.

ASOCT allows non-invasive, rapid imaging of various depths into ocular tissue and therefore provides accurate measurements of foreign body location, number and dimensions. Different reflectivity is appreciable depending on the nature of foreign body. Glass foreign body is well delineated on ASOCT (Figure 2a) with no internal reflectivity. Wood foreign body (Figure 2b) showed moderate internal reflectivity while metal and stone (Figure 2c) foreign bodies showed high anterior reflectivity with shadowing. Endothelial continuity may not be appreciable in such cases. However reflectivity in the anterior chamber or iris adhesion to the site of entry (Figure 2c) may suggest penetration into anterior chamber.

The location of the intracorneal foreign body and the status of the surrounding ocular structure dictate which surgical technique should be employed. In the past, Au et al described the removal of a corneal foreign body through a lamellar corneal pocket. A lamellar dissection was extended centrally toward the corneal foreign body and the wound was closed with a circumferential mattress suture of 10-0 nylon. This technique was used as the original entry of the foreign body had healed and epithelialized.

ASOCT provides vital detail about status of DM integrity and site of entry of foreign body. This information can be utilized to plan the surgical removal. In one such case (Figure 2a), the DM was intact and the scar at the site of entry was appreciable. Hence foreign body was retrieved through the anterior route. However in another case (Figure 3) with trauma with glass foreign body, DM was breached and the entry site had healed. Therefore foreign body could be easily retrieved through the anterior chamber followed by an air tamponade. No sutures were required in that scenario preventing any astigmatic effect. As ASOCT allows the exact determination of location of foreign body along with status of surrounding ocular structures, surgical planning can be performed preoperatively (Figure 4). This prevents any intra or postoperative surprises, thus providing best possible outcomes.
In certain cases, corneal thinning might be suspected after removal of foreign body. ASOCT is extremely advantageous in such situations (Figure 5) as it gives quantitative assessment of remnant corneal thickness and hints the risk of impeding perforation. Cyanoacrylate glue and bandage contact lens can be performed in such cases if the defect is less than 2 mm in dimensions.

Future research: ASOCT can be used to prepare high-quality cross-sectional and 3D images of the anterior segment. Currently we are exploring the potential of 3D reconstruction ASOCT technology (Figure 6) in management protocol of intracorneal foreign body.

Conclusions
Most injuries are mild and do not cause significant ocular morbidity or loss of work. The majority of corneal foreign bodies can be prevented by appropriate eyewear. Anterior segment optical coherence tomography (AS-OCT) is a valuable tool in the early diagnosis and monitoring of treatment progress in cases of ocular trauma.

References

NOTICE

The General Body Meeting of Delhi Ophthalmological Society will be held on Sunday the 12th April, 2015 at 4:30 PM at Banquet Hall, Ashok Hotel, Chanakyapuri, New Delhi.

The Agenda of the General Body Meeting shall be:

1. Confirmation of the minutes of the previous Annual General Body Meeting held on 24th August, 2014.
2. Adoption of the annual report of executive committee presented by Hony. Secretary.
4. Report of Editor DJO.
5. Report from Representative to AIOS.
6. Ratification of New Members.
7. Presentation of Awards and Momentoes.
8. Announcement of election results.
9. Address of the outgoing President.
10. Installation of incoming President.
11. Address of incoming President.
13. Any other matter with the permission of the Chair.
14. Vote of thanks by Secretary. All members are requested to attend.

Thanking you,

Sincerely yours,

Dr. Rajendra Khanna
President, DOS

Dr. Rajesh Sinha
Secretary, DOS