Subconjunctival foreign body with suspected scleral penetration

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\textbf{ABSTRACT}

Ocular foreign bodies may be threat to vision loss. Superficial foreign body present on the conjunctiva or cornea can be easily detected and removed, and may not cause much harm if treated appropriately without delay. Subconjunctival foreign bodies are relatively rare, commonly missed and present as foreign body granuloma, even if they are visible their extent in deeper tissue is difficult to assess. Foreign bodies penetrating the ocular coat can result in partial or full thickness penetration of cornea and sclera with or without involvement of posterior segment. Here we present a case of subconjunctival metallic foreign body embedded in deeper sclera in a 22-year male working in factory. Foreign body was removed carefully under local anaesthesia avoiding further damage to the eye.

\textbf{Introduction}

Work-related injuries were the most common type of ocular trauma reported in literature and ocular foreign body injury is one of the most common workplace injuries [1–3]. Ocular foreign bodies are commonly acquired at the workplace, particularly if appropriate protective eyewear is not worn [1–5]. Common activities related to ocular foreign body injury are grinding, hammering, drilling and sawing and metallic objects, such as wire, steel fragments are leading agents that cause eye injuries [1–3]. Superficial foreign body present on the conjunctiva or cornea can be easily detected and removed, and may not cause much harm if treated appropriately without delay. Subconjunctival foreign bodies are rare, only few cases are reported in the literature [6,7]. We could not find any review or prospective/retrospective studies reporting prevalence of subconjunctival foreign body as separate entity [2,3]. Also, subconjunctival foreign bodies are commonly missed and may present as foreign body granuloma, even if they are visible their extent in deeper tissue is difficult to assess [8].

Foreign bodies penetrating the ocular coat can result in partial or full thickness penetration of cornea and sclera with or without involvement of posterior segment.

Here we present a case of subconjunctival metallic foreign body embedded in deeper sclera in a 22-year male working in factory.

\textbf{Case report}

A 22-year-old male presented to the emergency department with history of injury in left eye (LE) by steel fragment while doing grinding in a factory two and half hours back. He was not wearing eye protection glasses. Patient complained of pain, redness, blood-stained discharge and diminution of vision in left eye since he acquired injury. Ocular examination showed bulbar conjunctival...
congestion all around the limbus, and a suspected long foreign body was stretching the conjunctiva over the cornea in the pupillary area somewhat indenting the cornea (Fig. 1a). The tip of a metallic foreign body was partially visible through the end of the stretched conjunctiva (Fig. 1b). There was subconjunctival haemorrhage in superior conjunctiva. Visual acuity was 6/6 in right eye (RE) and 6/18 in LE. The pupil was normal with no relative afferent pupillary defect. The visible portion of cornea and lens are transparent, anterior chamber was normal in depth and content. Intraocular pressure (IOP) was 14 mm of Hg in RE and 16 mm of Hg in LE measured by rebound tonometer. Right eye examination was unremarkable.

Patient was advised X-ray Orbit to see the extent of foreign body. Radio opaque density was noted in superior orbital region on X-ray orbit AP and lateral view (Fig. 2). The patient was advised broad spectrum antibiotics and planned for foreign body removal under local anaesthesia.

Examination in the operation room revealed that the foreign body was difficult to move, it was seeming to be inserted deep into the limbus and sclera. A small incision is made in the conjunctiva at the pointing end through which the anterior end of steel foreign body came out. The foreign body was removed by slowly moving it out with applying little force. Fortunately, it was not a full thickness perforation in the sclera. The conjunctiva was sutured. A small linear vertical corneal abrasion was present on 12 O’clock position (Fig. 3). The eye was patched with antibiotic eye ointment for 24 h. Extracted metallic foreign body was about 1 cm in length with pointed ends (Fig. 4). On first post-operative day the corneal abrasion was healed, IOP was 16 mm of Hg in both eyes, visual acuity was 6/9 in LE which improved to 6/6 on subsequent follow-up visit after seven days. Dilated fundus examination was within normal limits in both eyes.

Discussion

Ocular foreign bodies may be threat to vision loss. The superficial foreign body may be clearly seen on the conjunctiva or cornea. Patients often present with complain of a foreign body sensation, redness, pain and photophobia. A foreign body lodged in the tarsal conjunctiva, can be missed if the lids (especially the upper lid) are not examined after everting it. In these cases, Fluorescein staining is useful in identifying a linear corneal abrasion that may result from a subtarsal foreign body rubbing against the cornea. Conjunctival and Corneal foreign bodies can be easily removed with a cotton bud, or 26-gauge needle under topical anaesthesia, under aseptic measures. However, in developing countries like in India patient commonly present with infective corneal ulcer or even endophthalmitis after few days of foreign body removal by quacks in rural setup, probably because strict aseptic protocol not followed or the corneal abrasion after foreign body removal is not treated appropriately.

Subconjunctival foreign bodies are relatively rare, commonly missed and may present as foreign body granuloma, even if they are visible their extent in deeper tissue is difficult to assess [8]. Foreign bodies penetrating the ocular coat can result in partial or full thickness penetration of cornea and sclera with or without involvement of posterior segment.

In this case the injury was with a slender metallic foreign body with pointed ends that can easily penetrate the cornea or sclera. Fortunately, it did not result in a full thickness perforation in the sclera may be because of the decrease velocity of the foreign body and the direction of impact was tangential not perpendicular to the globe. A similar case is reported where only tip of the long metallic foreign body was visible which has penetrated through the sclera was confirmed by imaging. Patient needed a pars plana vitrectomy and removal of foreign body [9]. Very few cases of subconjunctival foreign body with or without intrasleral penetration are reported [6,7]. Intrascleral foreign body may be associated with complications like cataract, siderosis bulbi, Chorioretinitis Sclopetaria and secondary infection [10,11].

Ocular trauma with pointed metallic objects may result in intraocular penetration and serious complications, particularly if associated with retained intraocular foreign body [12].

Penetrating ocular injury is the most common cause of severe ocular injury, usually require surgery, hospitalization and have poor prognosis resulting in long-term visual impairment [13,14].

Ocular foreign body injury with suspected intraocular penetration, need immediate ophthalmology consultation. The eye should be examined very gently without applying any pressure on the globe. It may result in deeper penetration and injury to the intraocular contents and irreversible damage can be caused if the eye and orbit are not examined with utmost care. This case of workplace ocular

![Fig. 1. Clinical image showing (a) a subconjunctival foreign body stretching the conjunctiva, (b) the tip of a metallic foreign body visible through the conjunctiva.](image-url)
A flying pointed metallic object was a rare presentation of subconjunctival foreign body embedded in sclera at the risk of intraocular penetration. With careful examination and early intervention, we achieved good visual outcome and avoided any further complications.

Conclusion

Early referral to ophthalmologist in well-equipped specialised centres is recommended in ocular trauma with suspected intraocular penetration to achieve good visual outcome and avoid further complications like in this case. Properly fitted eye protective glasses are essential to prevent occupational injuries. Employers should ensure that all at-risk workers are well informed and provided with appropriate eye protection.
Presentation at meeting

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Declaration of competing interest

None.

References

[1] H. Cao, L. Li, M. Zhang, Epidemiology of patients hospitalized for ocular trauma in the chaoshan region of China, 2001–2010, PLoS ONE 7 (10) (2012), e48377, https://doi.org/10.1371/journal.pone.0048377.
[2] C.J. Macewan, Eye injuries: a prospective survey of 5671 cases, Br. J. Ophthalmol. 73 (1989) 888–894.
[3] L.W. Voon, J. See, T.Y. Wong, The epidemiology of ocular trauma in Singapore: perspective from the emergency service of a large tertiary hospital, Eye 15 (2001) 75–81.
[4] F. Kuhn, V. Mester, R. Morris, J. Dalma, Eye injury epidemiology and prevention of ophthalmic injuries, in: F. Kuhn (Ed.), Ocular Trauma: Principles and Practice, Thieme, New York, 2002, pp. 14–22.
[5] N. Du Toit, C. Cook, in: Ocular Trauma, Juta, Cape Town, 2009, pp. 46–52.
[6] Y.M. Park, H.S. Jeon, H.S. Yu, J.S. Lee, A subconjunctival foreign body confused with uveal prolapse, Indian J. Ophthalmol. 62 (6) (2014 Jun) 730–731.
[7] M. Preston, K.I.M. Muma, Subconjunctival foreign body mistaken for a scleral tea, Health Press Zambia Bull. 3 (12) (2019) 49–51.
[8] Z. Jaja, M. Laghmari, R. Daoudi, Scleral granuloma revealing intraocular foreign body, QJM 108 (3) (March 2015) 251–252, https://doi.org/10.1093/qjmed/hcu174.
[9] A. Silvester, S. Cazabon, Scleral foreign body, Emerg. Med. J. 32 (3) (2015 Mar) 225, https://doi.org/10.1136/emermed-2014-203817. Epub 2014 May 14. PMID: 24829255.
[10] F.G. Burch, D.M. Albert, Transcleral ocular siderosis, Am J. Ophthalmol. 84 (1977) 90–97.
[11] G. Sertan, S. Yasar, O. Mummen, S. Rabia, Cataract in low-grade uveitis due to scleral foreign body, Eur. J. Gen. Med. 11 (4) (2014) 282–284.
[12] S. Havens, O. Kosoko-Lasaki, M. Palmer, Penetrating eye injury: a case study, Am. J. Clin. Med. 6 (2009) 42–49.
[13] B.S. Oum, J.S. Lee, Y.S. Han, Clinical features of ocular trauma in emergency department, Korean J. Ophthalmol. 18 (2004) 70–78.
[14] X. Zhang, Y. Liu, X. Ji, Y. Zou, A retrospective study on clinical features and visual outcome of patients hospitalized for ocular trauma in Cangzhou, China, J. Ophthalmol. 2017 (2017) 7694913, https://doi.org/10.1155/2017/7694913.