

Foreign body–induced corneal perforation: A case report

Made Padma Diani Putri * and Ni Nyoman Sunariasih

Department of Ophthalmology, Sanjiwani Hospital, Gianyar, Bali, Indonesia.

GSC Advanced Research and Reviews, 2025, 24(03), 170-173

Publication history: Received on 05 August 2025; revised on 14 September 2025; accepted on 17 September 2025

Article DOI: <https://doi.org/10.30574/gscarr.2025.24.3.0284>

Abstract

Corneal perforation is an eye emergency that can lead to hypotony, iris synechiae, cataract, and endophthalmitis unless promptly repaired. The most common cause is ocular trauma from a foreign body. Closure of corneal perforation might be challenging. Case illustration: A 34-year-old man presented with a corneal foreign body in the left eye. He complained of pain, redness, blurry vision, excessive tearing, and photophobia. Visual acuity 6/12 in the left and a positive Seidel test. Slit-lamp examination showed a bone fragment penetrating into the corneal layer and entering the anterior chamber. The patient underwent foreign body extraction and corneal rupture repair. Five days postoperatively, the patient reported no complaints with improved visual acuity to 6/6.5 (pinhole 6/6). Conclusion: Corneal perforation caused by a foreign body is a vision-threatening emergency. Timely diagnosis and appropriate surgical intervention remain key to preserving ocular integrity and optimizing visual outcomes.

Keyword: Corneal Perforation; Corneal Foreign Body; Seidel Test; Management; Eye Emergency

1. Introduction

The cornea forms part of the outermost layer of the eyeball, serving as a protective barrier for the internal structures of the eye. It plays a crucial role in shielding the eye from infections while maintaining structural integrity [1]. Corneal and conjunctival injuries (CCI) represent a significant proportion of ocular cases seen in hospital-based emergency departments (EDs). The most common cause of these injuries is the presence of a foreign body (FB) in the eye, accounting for 56.5% of cases. Other causes include trauma (18.1%), chemical exposure to the eye (11.1%), and corneal disorders related to contact lens use (5.1%), as classified by ICD-9 codes [2]. Corneal perforation is an eye emergency that can lead to hypotony, iris synechiae, cataract, and endophthalmitis unless promptly repaired [3]. Small corneal perforations have conventionally been managed with sutures, patch grafts, tissue adhesives, or amniotic membrane, but in wounds <2 mm with good apposition and no tissue prolapse, healing can often be achieved conservatively with a bandage contact lens, thus avoiding post-suturing astigmatism. Whereas larger or poorly apposed wounds often need surgical repair with suturing, patch grafts, or keratoplasty, but these techniques may impair vision through induced astigmatism or corneal opacity, and reliable edge apposition can be difficult. [3,4].

This case report was compiled to describe the management of corneal perforation due to foreign body trauma using a simple suturing technique, as well as to discuss its relevance in clinical practice.

* Corresponding author: Made Padma Diani Putri.

2. Case Illustration

A 34-year-old man arrived at the emergency room 30 minutes after a bone fragment struck his left eye while mowing his lawn. He reported pain, redness, a foreign body sensation, excessive tearing, blurry vision, and sensitivity to light. There was no active bleeding, and he had no other symptoms. The right eye is unremarkable.

Visual acuity was 6/6 in his right eye and 6/12 in his left eye. Both eyes showed good eye movement. Clinical examination of the left eye revealed corneal vascular injection, peri corneal vascular injection, and corpus alienum (bone fragment) located in the peripheral zone at 8 o'clock (Figure 1.A). Slit lamp examination showed corpus alienum penetrated to the corneal layer and entering the anterior chamber. The patient had to undergo corpus alienum extraction, corneal perforation was observed (Figure 1.B). The anterior chamber was flat, and active aqueous leakage was confirmed by a positive Seidel test.

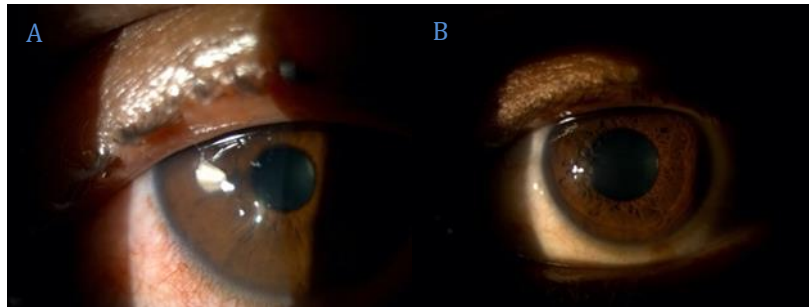


Figure 1 A) Corneal foreign body (bone fragment) in his left eye iris at 8 o'clock. **B)** Post corneal foreign body extraction

The wound was linear, peripheral, and without stromal loss or uveal prolapse, making it amenable to closure with suture. We performed the repair surgery in the operating room under local anesthesia, using 10-0 nylon suture, along with anterior chamber reformation. He was hospitalized for one day and received intravenous antibiotic injection of ceftriaxone 1 gr twice a day, topical antibiotic-corticosteroids combination eye drop 6 times a day and pain killer injection (paracetamol). **Figure 2.B** shows the appearance of the left eye on post-operative day 1, prior to discharge. Upon discharge, he was prescribed oral corticosteroids, oral antibiotics, oral analgesics, and topical antibiotic-corticosteroid combination eye drops to the affected eye. He came for post-operative check-up after 5 days. His vision improved. There was no complaints. Visual acuity was 6/6 in his right eye and 6/6.5 (pinhole 6/6) in his left eye. Clinical examination revealed left eye cornea was clear with suture and corneal edema. There is no corneal vascular injection and peri corneal vascular injection anymore (Figure 2.B). No intraoperative or postoperative complications.

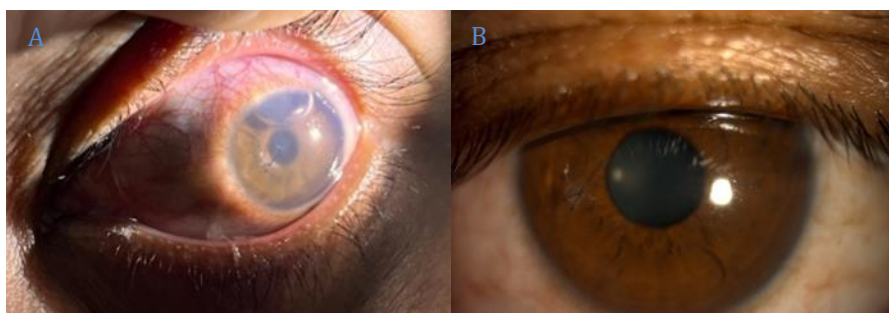


Figure 2A) Post-operative day 1. **B)** Post-operative check-up after 5 days

3. Discussion

Corneal trauma is among the most common ophthalmic emergencies, particularly affecting young and active individuals. In one prospective study of 179 patients with corneal trauma, the majority were males in their twenties, and corneal perforation accounted for more than 80% of cases [5]. Corneal perforations can result from foreign body, infectious, and stromal melting related to chemical and thermal burns. Regardless of the underlying reason, any corneal perforation is considered an ocular emergency requiring prompt intervention to preserving vision and maintaining ocular integrity [6]. The Seidel test is performed by applying a sterile fluorescein strip saturated with a small amount

of sterile saline and painted over the suspected area of perforation. Uveal prolapse or a positive Seidel test are definitive for confirming the diagnosis of corneal perforation. Failure to diagnose this condition may lead to progressive corneal damage, anterior chamber collapse, endophthalmitis, secondary glaucoma or cataract, severe vision loss, and even loss of the globe [7].

The approach to managing corneal perforations varies according to their etiology, size, shape, and location. Among the various treatments for corneal perforation, small puncture-induced perforations may be managed with tissue adhesives, Tenon's patch grafting, or amniotic membrane transplantation [8]. The use of a bandage soft contact lens (SCL) is particularly indicated for small corneal lacerations where the wound edges are well-aligned, properly apposed, and there is no involvement or prolapse of the uveal tissue or lens. Typically, puncture wounds smaller than 2.0 mm in diameter heal without the need for suturing [4].

However, SCLs are inadequate for larger perforations. In such cases, surgical techniques like direct suturing, patch grafting with corneal or scleral tissue, or lamellar keratoplasty may be necessary to restore the anterior chamber, though these can induce astigmatism and/or opacification, especially if the perforation is centrally located. Amniotic membrane transplants, with or without fibrin glue assistance, can help alleviate corneal astigmatism. While lamellar keratoplasty is effective, it carries a risk of visual impairment if large grafts are used near the central cornea. [3,9]

Two case reports have shown successful closure of small corneal perforations using cyanoacrylate tissue adhesive combined with a bandage soft contact lens [4,10]. Kobayashi et al. [4] reported sealing of a <1 mm wound with cyanoacrylate, resulting in stable anterior chamber restoration and 20/20 final visual acuity. Similarly, Sharma et al. [10] achieved effective closure and long-term visual stability (6/9 at 18 months follow-up) using isoamyl cyanoacrylate with a bandage lens. Managing corneal perforation presents notable challenges [3]. While tissue adhesive may be effective for perforations <2 mm, limitations include early dissolution (fibrin glue), risk of dislodgement (cyanoacrylate), and restricted use due to cost, availability, and storage requirements [3].

Kato et al. [9] reported a one-bite mini-keratoplasty after initial management with a soft contact lens failed, achieving stable wound closure, promotion of corneal epithelialization, and good visual recovery with minimal astigmatism. Amniotic membrane transplantation has also been described as a useful option, particularly for inflammatory perforations, due to its ability to promote epithelial growth and reduce inflammation [1]. However, corneal grafting and even amniotic membrane are not available at short time. Scleral autografts offer an effective and accessible alternative [11]. As reported by Macarie et al. [11] demonstrated that scleral autografts can effectively restore ocular integrity in peripheral perforations while minimizing aesthetic concerns and visual outcomes over time. Shekhawat et al. [3] described a cost-effective technique suitable for resource-limited settings, combining Tenon patch grafting with a conjunctival pedicle flap promotes rapid stromal replacement and perforation closure, with complete healing within 6 weeks and regression of feeder vessels by 4 months. This approach may accelerate corneal healing compared with prior reports of Tenon patch grafting, which can take up to 15 months for normalization [3].

In this context, we report a case of traumatic corneal perforation that was successfully managed with simple corneal suturing, resulting in stable wound closure and early visual improvement observed at five days of follow-up. Management included foreign body extraction, corneal wound closure using 10-0 nylon sutures, and anterior chamber reformation, without the use of additional procedures such as patch grafting, keratoplasty, or tissue adhesive. In contrast to the published cases cited in our discussion—which predominantly utilized other surgical techniques and reported follow-up periods extending over several months—this case illustrates management with simple suturing along with anterior chamber reformation, with only a limited early follow-up period reported. These findings therefore primarily reflect short-term outcomes and should be interpreted with appropriate caution.

Nevertheless, this case suggests that simple corneal suturing may serve as an initial management option for selected cases of traumatic corneal perforation, particularly in urgent or resource-limited settings. Further research with larger sample sizes and longer follow-up is needed to more definitively evaluate the long-term safety, efficacy, and visual outcomes associated with this approach.

4. Conclusion

Due to visual impairment, foreign body removal was deemed necessary. Corneal perforation caused by a foreign body can represent an urgent surgical condition in ophthalmology. The primary objectives of the procedure are to restore the anatomical integrity of the eye optimize visual outcomes and minimize complications. Timely management, appropriate technique selection, and access to surgical resources allow such patients to maintain a good vision.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this case report.

Statement of informed consent

Informed consent was obtained from the patient for the publication of this case report and all accompanying images.

References

- [1] Minhalina FA, Noerdiyani NI. Corneal Ulcer Impending Perforation et causa Corpus Alienum. Vision Science and Eye Health Journal. 2023 Mar 31;2(2):49–51.
- [2] Zimmerman DR, Shneor E, Millodot M, Gordon-Shaag A. Corneal and conjunctival injury seen in urgent care centres in Israel. Ophthalmic and Physiological Optics. 2019 Jan 1;39(1):46–52.
- [3] Shekhawat NS, Kaur B, Edalati A, Abousy M, Eghrari AO. Tenon Patch Graft With Vascularized Conjunctival Flap for Management of Corneal Perforation. Cornea. 2022 Nov 1;41(11):1465–70.
- [4] Kobayashi A, Yokogawa H, Sugiyama K. Management of a small paracentral corneal perforation using iatrogenic iris incarceration and tissue adhesive. Case Rep Ophthalmol. 2012 May;3(2):226–9.
- [5] Balde AK, Diane S, Aziz SK, Barry AK, Magassouba A, Sovogui DM, et al. Corneal Trauma: An Epidemiological, Clinical and Therapeutic Study in CADES/O Donka. Open J Ophthalmol. 2022;12:362–72.
- [6] Shrestha P, Joshi P, Mahat P, Suwal R, Maharjan SS. Traumatic Corneal Perforation, Its Clinical Profile and Outcome in Eastern Nepal. Asian J Res Rep Ophthalmol. 2022;5(1):11–18.
- [7] American Academy of Ophthalmology. Management of Descemetocoele and Corneal Perforation [Internet]. San Francisco: EyeWiki; 2023 [cited 2025 Sep 14]. Available from: https://eyewiki.org/Management_of_Descemetocoele_and_Corneal_Perforation
- [8] Deshmukh R, Stevenson LJ, Vajpayee R. Management of corneal perforations: An update. Indian J Ophthalmol. 2020;68(1):7–14.
- [9] Kato Y, Nagasato D, Nakakura S, Chikama T, Katakami C, Tabuchi H, et al. A case of paracentral corneal perforation treated with one-bite mini-keratoplasty. Turk J Ophthalmol. 2021;51(1):55–7.
- [10] Sharma A, Sharma R. Removal of full-thickness vertical corneal stromal wooden foreign bodies: An innovative ab-interno technique. Indian J Ophthalmol. 2021 Apr 1;69(4):971–3.
- [11] Macarie SS, Vlad F, Macarie D. Corneal perforation after corneal foreign body - Case Report. Rom J Ophthalmol. 2023 Apr 15;67(1).