

Clinical & Refractive Optometry is pleased to present this continuing education (CE) article by Dr. Ron Melton and Dr. Randall Thomas entitled **Corneal Foreign Body**. In order to obtain a 1-hour Council of Optometric Practitioner Education (COPE) approved CE credit, please refer to page 322 for complete instructions.

Corneal Foreign Body

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Subjective

A 35-year-old man presents with right eye pain and photophobia. Two days ago, he was grinding metal at work and felt something strike his right eye. His eye hurt so much that last night he went to a hospital emergency room, where a foreign body was partially removed and his eye patched. He was referred for follow-up today.

Objective

- Visual acuity (VA): OD 6/15 (20/50); OS 6/6 (20/20)
- Pupil dilated OD from emergency room
- Conjunctiva: 2+ bulbar injection
- Cornea: central abrasion with residual foreign body and rust ring in the anterior stroma. There is 2+ stromal edema surrounding the corneal defect (Fig. 1)
- Anterior chamber: 1+ cells and flare

Assessment

- Central corneal foreign body with residual rust, inflammatory stromal keratitis, and secondary iritis OD

Plan

- Educate patient up front of potential for permanent reduction in acuity from this type of injury
- Slit-lamp removal of embedded corneal foreign body and rust ring with spud and Alger brush (Fig. 2)
- In office pressure patch OD under dexamethasone/tobramycin (Tobradex) ophthalmic ointment. The eye was already cyclopleged from ER visit day before. Recheck 1 day

Recheck Day 1:

- 50% improvement in epithelial defect and slight improvement in corneal edema. Pupil still dilated and anterior chamber 1+ cells and flare remain. Have patient use dexamethasone/tobramycin 1 gt. q.i.d. alternated with GenTeal 1 gt. q.i.d. OD. Recheck 2 days

Recheck Day 3:

- Approximately 95% re-epithelialization and mild edema remaining with 6/9 (20/30) VA. Anterior chamber shows only trace cells. Pupil back to normal. Continue present medicines and recheck 4 days

Recheck Day 7:

- Epithelial defect shows no fluorescein stain and only a minimal nebular defect remains (Fig. 3). No anterior chamber reaction remains. VA is 6/7.5 (20/25) OD. Continue dexamethasone/tobramycin b.i.d. OD and GenTeal q.i.d. OD and recheck 5 days

Recheck Day 12:

- VA is 6/6 (20/20) with a minimal nebular corneal scar. Discontinue the dexamethasone/tobramycin and continue the GenTeal artificial tears q.i.d. OD for 1 week. Patient should have a complete ocular health exam over the next month as it has been 5 years since his last complete eye exam.

Comments: This case represents more of a challenge than the typical corneal foreign body because of its central location. It is important to inform the patient up front of the potential for a permanent reduction in acuity associated with this type of injury. The dexamethasone/tobramycin combination will serve several key roles in this case. First, the tobramycin is a broad-spectrum antibiotic that will protect the cornea from infection until the epithelium has healed. The dexamethasone steroid will minimize corneal scarring potential in this centrally located defect. It will also reduce the corneal edema and anterior chamber reaction. The clinician may be concerned that the steroid in the combination drops will keep the cornea from healing, when in reality it may actually enhance re-epithelialization by controlling all of the inflammatory

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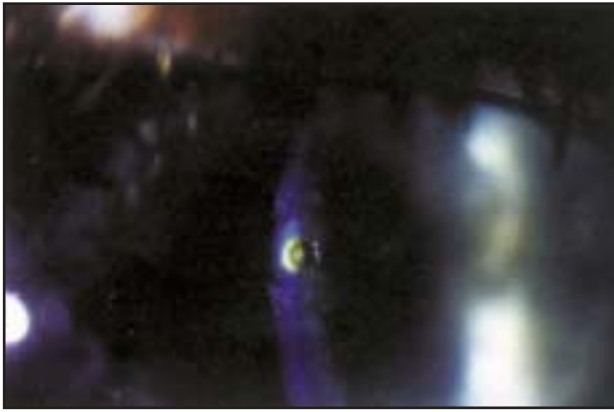


Fig. 1 Following delayed definitive care by an eye doctor because of primary presentation to an emergency room, there is 2+ stromal edema surrounding this central metallic foreign body.

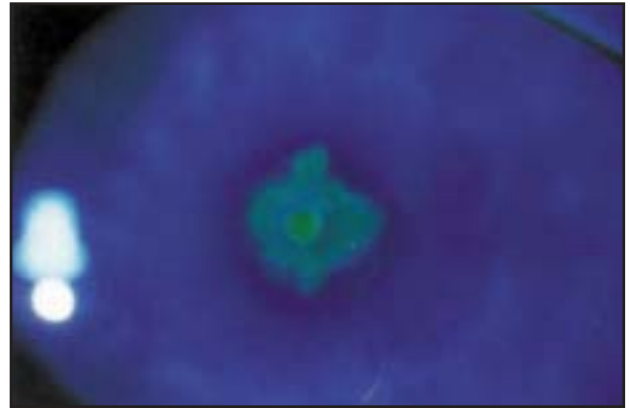


Fig. 2 Once the foreign material is removed, a central abrasion remains. Following two days of abrasion therapy, the epithelium renormalized.

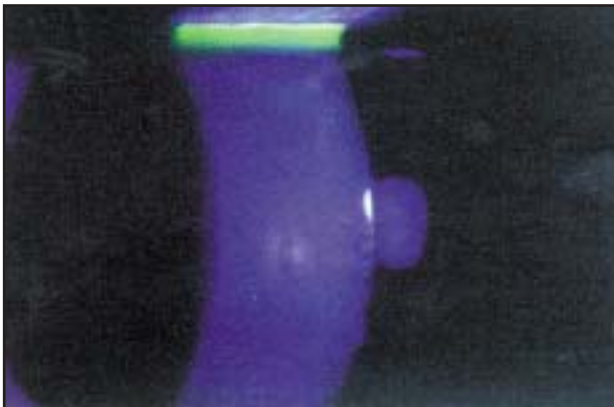


Fig. 3 The steroid in the combination drop helps reduce fibroblastic activity, thus reducing the potential for scarring.

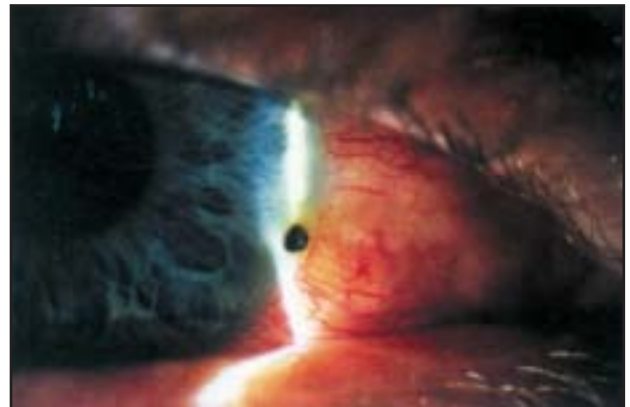


Fig. 4 Corneolimbal foreign bodies, particularly those metallic in nature, can be more challenging to remove because attaining good anesthesia in this area is more difficult to achieve.

reaction that is present. If one is hesitant to use the antibiotic/steroid combination at first, an alternative would be to use an antibiotic drop and add the steroid as the corneal defect has almost re-epithelialized.

General Observations

- If the history is compatible with possible intraocular penetration, be aggressive in the diagnostic evaluation (i.e., applanation tonometry OU, expert slit-lamp evaluation). Note roundness and reactivity of pupils, iris retroillumination defects, subtle corneal entry wounds (including Seidel's testing), and other testing as indicated
- It is wise to evert the upper lid to look for any additional foreign material
- If there is rust deposition or necrotic tissue at the injury site, remove as much as possible (preferably all) to potentiate full tissue restoration
- Cycloplege for comfort and to prevent or diminish any secondary inflammatory response of the iris or ciliary body, and to allow binocular indirect ophthalmoscope (BIO) examination
- Pressure patch as per abrasion protocol, use a therapeutic lens, or simply use a prophylactic antibiotic or antibiotic/steroid drop and viscous artificial tear lubrication. See patient for follow-up evaluation the next day
- Consider having the patient use artificial tear lubrication for several days once patching therapy is over
- If there is also a concurrent traumatic iritis, the combination antibiotic steroid will help to control the secondary inflammation
- For foreign bodies at the limbus or on the conjunctiva (Fig. 4), deeper anesthesia can be achieved with lidocaine hydrochloride (Xylocaine)

4%). Instill proparacaine first to accomplish general surface anesthesia, then place a lidocaine-saturated cotton swab pledget over the injury site for 20 to 30 seconds. This gives good, deep, prolonged anesthesia which facilitates foreign body removal

Treatment

- Materials needed for removal of ocular foreign body:
 - Proparacaine 0.5%
 - Sterile small gauge needle (5/8 inch, 25 gauge), spud or other instrument of choice
 - Alger brush/ophthalmic drill
 - Antibiotic ointment
 - 5% homatropine, or 1% cyclopentolate, or 1% tropicamide
 - Sterile saline lavage

- Eye patches and tape
- Disposable soft lenses (to use as a bandage)
- Preservative-free artificial tears
- Lidocaine hydrochloride

***Disclaimer:** Not every detail of every case is discussed, rather the key clinical findings are described. For example, if nothing is said about the corneal status, you should assume that the cornea is normal, etc. When vision is recorded, it should be assumed to be best corrected or pinholed. Regarding therapy, we show how we treated the particular case. Given that medicine is an art, as well as a science, therapy will — and often does — vary with each unique patient presentation depending on severity, known drug allergies, prior treatment, response to therapy, etc.*