A CASE OF TOXIC KERATITIS FOLLOWING INJURY BY HYMENOPTERAN INSECT - CLINICAL FEATURES AND MANAGEMENT

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PRESENTATION OF CASE

A 33-year-old male patient presented within two hours of injury to his left eye with insect while riding two-wheeler without eye protection. (Figure 1)

Patient presented with pain, pricking sensation and mild blurring of vision. On examination, visual acuity was 6/6 in the right eye and counting fingers five meters in left eye. Anterior segment examination of left eye showed mild lid oedema, mild conjunctival chemosis and hyperaemia. There was generalised corneal haze, oedema and striae keratopathy with central corneal epithelial defect of about 3mm in diameter with mild infiltration with brown foreign body in 2 O’clock position mid peripheral cornea (Figure 2). Body of the insect had fallen off by lid movement (Figure 3).

And two tiny pieces of brownish foreign bodies (probably Stinger and insect leg) in corneal stroma were noted on slitlamp examination (Figure 4). One was superficial corneal stromal foreign body; and another foreign body was projecting into anterior chamber. Patient had developed immediate extensive toxic and immunological reaction to the foreign body in the form of increasing striae keratopathy, infiltrate and corneal oedema (Figure 5). Pupil was normal and reactive. Lens was clear. Fundus was normal. Ocular movements were normal. Intraocular pressures measured by air puff tonometer were normal.

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Figure 1. On Presentation

Figure 2. Development of Striate Keratopathy

Figure 3. Body of the Insect had Fallen off by Lid Movement

Figure 4. Two Tiny Brownish Foreign Bodies seen Through Sit Lamp Examination
Figure 5. Increasing Striate Keratopathy and Infiltrate due to Toxicity and Immunological Reaction

CLINICAL DIAGNOSIS
Toxic keratitis due to corneal injury by insect.

Management
Superficial stromal foreign body was easily removed using 26G needle under topical anaesthesia. The second foreign body which was projected into anterior chamber was difficult to visualise because of severe corneal oedema and infiltrate. It was removed completely without leaving any fragments through a side port using micro forceps under local anaesthesia. Two Corneal sutures were put with 10-0 nylon owing to the depth of foreign body and side port was also sutured (Figure 6).

Figure 6. Post-op day 1

Patient was treated with topical (prednisolone acetate 1% eye drops) and systemic steroid (intravenous dexamethasone 4 mg/ml) along with topical antibiotics (ofloxacin 0.3% eye drops), antifungals (natamycin eye drops 5% and itraconazole eye ointment 1%) and cycloplegics (homatropine 2%) were used. Tear substitutes 0.5% were used till epithelial defect was healed.

On post op day 7 (Figure 7); left eye visual acuity was 6/24. Striate keratopathy and corneal oedema had reduced, and infiltrate was healing.

Figure 7. Post-Op Day 7 - Healing Infiltrate with Reduced Striate Keratopathy and Corneal Oedema with Suture in Situ

On 2 weeks follow up (Figure 8), infiltrate was healed with scarring of cornea and there was no corneal oedema and striate keratopathy. Visual acuity in left eye was 6/18.

Figure 8. Postop day 2 Weeks–Healed Infiltrate with No Evidence of Corneal Oedema and Striate Keratopathy with Suture in Situ. Scar Formation Noted

Sutures were removed after one month. Scar formation was noted at the entry point.

PATHOLOGICAL DISCUSSION
The sting member of the order Hymenoptera causes local, regional reactions, systemic anaphylactic reactions and rarely delayed hypersensitivity reactions.1 When the insect stings, it leaves two components into the eyes: the stinger and the venom.2 Corneal injury due to Hymenoptera insects are rare occurrence. Sequel can range from mild hyperaemia to severe corneal decompensation and intractable glaucoma.3 Clinical feature are due to mechanical, toxic and immunological damage.4

Most common features are mucopurulent conjunctivitis with corneal infiltrate. Conjunctival chemosis is due to vasodilatation caused by dopamine and histamine.5 High molecular weight enzymes such as phospholipase A and B, and hyaluronidase may induce type 1 hypersensitivity reactions.6 Allergic reactions lead to release of various
chemotactic factors and anaphylatoxins and are responsible for corneal oedema and conjunctival chemosis, sterile infiltrate around stinger. Melittin is a strong toxin present in venom, causes membrane disruption haemolytic effect and denaturation of protein and are responsible for endothelial cell damage, cataract formation, zonulolysis and lens subluxation. Apamin, a neurotoxin blocks neuromuscular junction and can result in internal ophthalmoplegia and sectoral iridoplegia. Toxins are responsible for immediate effects and results in corneal oedema, striate keratopathy, corneal infiltrate around the stinger. Other features reported are heterochromia, uveitis, optic neuritis, external ophthalmoplegia, optic atrophy and papillitis. The variable clinical response are due to quantity of venom and other pathological mechanism.

Management of insect injury can be surgical, medical or both. Reported literature say early removal of foreign body with additional therapy helps to attain good visual outcome. Foreign bodies can be removed at the slit lamp if it is superficial or else can be removed under operating microscope. Confocal microscopy can be done to rule out retained foreign body. Once the effect of toxin wears off presence of stinger is well tolerated and therefore presence of residual fragment can be clinically insignificant. However persistent inflammation warrants complete removal of stinger.

Medical management is mainly for suppressing inflammation. Topical steroid and cycloplegic control anterior segment inflammation. A topical antibiotic is often needed to prevent risk of infection. A Study done by Gudiseva H et al reported that supplementing systemic corticosteroid along with topical steroid in cases of bee sting injury with severe corneal involvement and anterior segment reaction at presentation prevents vision threatening complications.

**FINAL DIAGNOSIS**

Toxic keratitis.

**CONCLUSION**

Though uncommon, these corneal injuries due to insects can cause devastating visual complications. Clinical presentation can sometimes mimic microbial keratitis and retained insect parts are usually very tiny, so may be missed. Awareness, proper history, high level of clinical suspicion, and early treatment is must. Early removal of foreign body with use of topical steroid and topical antibiotic along with additional systemic steroid specially in case of severe presentation decreases chances of complications and improves visual outcome. Awareness regarding use of eye protection while driving is necessary. Home remedies should be avoided.

**REFERENCES**


