

Corneal Foreign Body

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Tom Ayton speaks to Elisa Cornish about the assessment of a patient with a corneal foreign body, the procedure to remove the corneal foreign body and provides some tips to help make it a little easier for junior doctors working in the emergency department.

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About Dr Elisa Cornish

Dr Elisa Cornish specialises in the management of medical retinal and inflammatory disorders of the eye as well as glaucoma and inherited eye disease.

Elisa has been passionate about research in retinal disorders since graduating with Honours in Science and completing a PhD in retinal development at the University of Sydney. She graduated in Medicine from the University of Sydney and then undertook her general ophthalmology training at the Sydney Eye Hospital network. She pursued sub-specialty training in Medical Retina, Uveitis, Glaucoma and Inherited Eye Diseases at the Professorial Unit at Sydney Eye Hospital and Moorfields Eye Hospital, London.

Elisa is a Consultant Eye Surgeon, Staff Specialist at [Sydney Eye Hospital](#) and [Westmead Hospital](#), as well as being a Clinical Lecturer at the University of Sydney. She is actively involved in ophthalmology registrar and medical student teaching and is part of the Inherited Eye Disease Unit at the [Save Sight Institute](#), Discipline of Ophthalmology where she has a special interest in electrophysiology.

About Dr Tom Ayton

Dr Tom Ayton is an Ophthalmology Registrar at Sydney Eye Hospital, Sydney, Australia. He is from Albany in Western Australia and has a background in exercise physiology and sport. During his postgraduate medical training Tom became interested in medical education, which he completed his course research in, as well as [medical student teaching](#) and Junior Medical Officer advocacy. Tom loves the beach, keeping healthy and is a very poor [surfer](#).

Corneal Foreign Body

With Dr Elisa Cornish, Consultant Ophthalmologist, Sydney Eye Hospital, New South Wales, Australia

Introduction

The assessment of a patient with a corneal foreign body is not an uncommon one for the junior doctor in the emergency department. Junior doctors should aim to become competent in removing an uncomplicated corneal foreign body, and should perform the procedure under supervision until they become confident. Using the slit lamp as well as the correct instrument to remove the object can be a little daunting.

Case: You are a junior doctor in the emergency department and you are about to see a 22 year old construction worker who has presented to the emergency department with an acutely painful and red eye. He complains of blurry vision and mentions that he has been grinding metal earlier in the day.

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1. How common is this presentation in the emergency department?

- This is one of the most common eye presentations in the emergency department, the first being a corneal abrasion and coming in a close second, a corneal foreign body.
- A tertiary-referral teaching hospital would be bound to see one or twice per day, and sometimes more.

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2. What information would you like to have immediately?

- Visual acuity of both eyes
- Intraocular pressure
- Pupils > size and shape, any pupillary defects

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3. What are some of the important questions you would like to ask?

- When the event occurred
 - Sometimes patients present several days after the event occurred (e.g. pain from a flash burn that never relieved).
 - A foreign body that has been present for a long duration can result in white cell recruitment, a rust ring and infective keratitis.
- It is important to know what material you are looking for in the eye.
 - E.g. hammer to cement or grinding metal.
 - This is important so as to understand the velocity at which the object hit the cornea.
- Ask the patient whether they were wearing eye protection (this is also important for educating the patient about the importance of eye protection).

4. How would you examine a patient?

- Topical anaesthetic is the first step to deal with the pain prior to examining.
 - Children may need systemic ibuprofen.
- Then position the patient on the slit lamp once the pain is well managed.

5. Any tips for the novice in using the slit lamp?

- Observe the ophthalmology or Emergency registrar/consultant before starting to use the slit lamp.
- Ensure the eye pieces are dialled to zero, not a myopic refraction.
- Modify the position by moving the two eye pieces together to suit your interpupillary distance (so as to obtain one image instead of two).
- Switch the slit lamp on, turn on the white light and change it to 45 degrees from the direction you are looking at the patient.
- With this slit of light, you can work out where the foreign body is in the cornea.
- When prepared, ask the patient to put their chin on the chin rest and ensure their lateral canthus is aligned to the black line, and by this you will be able to observe their eye with the light.
- Also ensure their forehead is sitting on the forehead rest, and that their head is pushed forward.
- Focus the beam of light by looking at it on the patient's nasal bridge, and then move to looking through it in the eye piece.
- By pushing the handpiece forward you are looking at deeper intraocular structures, e.g. the cornea, then the iris, and then the lens.
- Then ask the patient to look at your ear. If looking at the right eye ask them to look at your right ear.
- You may need to lift the upper lid with a cotton tip to get a good view of the cornea.

6. Any red flags to alert that it is more than an uncomplicated foreign body?

- Any issues with vision or intraocular pressures. The intraocular pressures are normally between 10-24, so if 5 or 30, this is alerting to something more serious.
- Comment on the pupil, if there are any irregularities in shape. E.g. peaking would indicate a perforation.
- Check the anterior chamber to ensure it is not flat and that it looks formed also commenting on any haemorrhages which can occur with blunt trauma.
- Another red flag would be no relief to topical anaesthetic.

7. What are the most important steps in removing a corneal foreign body?

- First, wet a cotton tip and brush gently on the foreign body, you may need to hold the upper eyelid up with your finger or another cotton tip.
- If this does not work, you can use the end of a needle bevel, either as a straight tip or bend in an ice-cream cone shape, and then brush gently down on the foreign body to see if you can dislodge it.
- Always look for more corneal foreign bodies, there may be some in the cornea, or the fornices.
- Even trained ophthalmologists sometimes have difficulty with removing corneal foreign bodies, if it's a peripheral foreign body you can have an attempt, if it is central it is best for an eye specialist or remove it.

8. How do you gain the patient's cooperation?

- Topical anaesthesia assists with the pain. Little children may need more assistance to gain cooperation, may need parental help.
- With adults, you can give them something to look at, e.g. a poster on the wall.

9. What if the corneal foreign body has been embedded for several days?

- This would result in a corneal reaction and possibly a bacterial infection.
- A rust ring can also develop around the central object causing scarring, this can be vision threatening.

10. What considerations do we need to take after removing a corneal foreign body, do we need to remove all of the rust ring out?

- Removing the corneal foreign body is the main aim.
- If there is a residual rust ring, it is okay to leave this and apply chlorsig ointment, and follow up with an ophthalmologist.
- It is important to tell them that the pain will be there the same day of the removal. But if the pain continues the next day and is just as intense, the patient needs to return to the emergency department.

11. Any other investigations required?

- Ensure they're seidel negative, a test with 2% fluorescein to ensure no leak of aqueous solution. The fluorescein will turn the cornea yellow, and, if corneal perforation exists, you would see a waterfall effect which would be washing the fluorescein away.
- **This is an urgent eye review.**
- Dependent on the mechanism of injury you may need to do further investigations.
 - E.g. facial X-ray.

12. Are there any complications of the procedure?

- The corneal foreign body may be deep, and when removed may reveal a full thickness injury.
- Digging too deep with removal may cause an iatrogenic laceration to the eyelid, or to the nose or eye when holding a needle under a microscope. This is a difficult skill to pick up.
- Always ask for supervision from seniors if you are not comfortable.

13. When do you think a junior doctor should refer to eye registrar?

- Talk through this with a senior colleague. The most important factors are:
 - If the corneal foreign body is central.
 - If residual rust ring needs to be removed by eye registrar.
 - If it is difficult to remove.
 - If the patient only has one eye.
 - If the vision is not what you expected, or out of the normal range.

14. What should you do after you have removed the corneal foreign body?

- Give the patient analgesia, e.g. NSAIDs.
- Antibacterial drops or ointment
 - Fill the eye with this and double pad shut (fold one against the lid and then another one).
 - The corneal epithelium heals more quickly when it is closed.
- Arrange follow up with an ophthalmologist or optometrist.

- Ensure the patient that the pain will get better and if it doesn't, to represent to the emergency department.

15. Should the patient take home the anaesthetic drops?

- No, the use of anaesthetic drops impairs the healing of the corneal epithelium, so they should never be prescribed on discharge.
- Anaesthetic drops would also mask the pain which would bring them back to the emergency department if something's not right.
 - E.g. the presence of another corneal foreign body, or a more penetrating eye injury.

16. What signs and symptoms should they watch out for so to represent to the emergency department?

- Ensure the patient the pain will persist for the rest of the day, and it won't be completely gone the next day, but should be improving by the next day.
- Additionally, the vision won't be perfect on day one, but should get better slowly; it takes longer to improve.
- If the next day the pain is worse or the vision is worse, they need to represent to the emergency department.

17. Do you recommend any guides to supplement this topic?

- The Eye emergency manual - provides simple ways of working out what's wrong with the patient.

18. Take home messages

- Ask for help if feeling out of your depth.
- If an eye registrar comes to examine the patient, watch and learn, ask questions, especially with the slit lamp.
- Always arrange follow up with either the optometrist or ophthalmologist.
- Remind the patient of the 'red flags' for representation.



Resources

Eye Emergency Manual - An Illustrated Guide. Agency for Clinical Innovation
(2nd edition) -

https://www.aci.health.nsw.gov.au/__data/assets/pdf_file/0013/155011/eye_manual.pdf

Related Podcasts

- [A journey with research and Ophthalmology](#)
- [Acute visual loss](#)
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