

Risks associated with your anaesthetic

Section 5: Damage to the eye during general anaesthesia

During a general anaesthetic it is possible for your eyes to be damaged. This is an uncommon or rare event. The types of damage that can occur, and its consequences and treatment are described in this article.

Routine procedures used by anaesthetists to prevent damage to your eyes can sometimes cause temporary irritation or bruising around the eye. This is also described in this article.

Damage caused during anaesthesia or surgery to the eye itself is not described here. You can talk about this with the eye surgeon or specialist anaesthetist who is looking after you.

What is the most common type of damage?

The most common type of damage to the eye that can occur during or after a general anaesthetic is a **corneal abrasion**.^{1,2}

A corneal abrasion...

The cornea is a superficial clear layer of the eye. An abrasion is a tear or graze of this layer.

Corneal abrasions often heal without long-term effects on vision, but a scar usually remains on the cornea. This may not be noticed during normal vision, or it may leave a dark spot in the field of view.

What other damage can occur?

Other types of damage to the eye are rare or very rare. There may be accidental trauma to the eye, or unintended pressure on the eyeball during the operation.

Pressure is more likely if you need to be turned face down for your operation. Anaesthetists are trained to take a great deal of care to position your head and neck, but it can be difficult to achieve a good position when you are face down, especially in people who are overweight.

Possibilities include:

- ▶ pressure on nerves in the eyebrow area causing a droopy eyelid
- ▶ pressure on the eyeball itself. This can cause dislocation of the lens of the eye, or even blindness. Blindness can be due to detachment of the retina (the light detecting layer inside the eye), or pressure on the optic nerve (the main nerve to the eye) or blockage of the main artery to the eye.

These injuries are described in the medical literature, but are so rare that overall figures about how often they happen are not available.

The rest of this article describes the cause, treatment and consequences of corneal abrasions.

Why do corneal abrasions happen?

About 1 in 5 (20%) of corneal abrasions happen due to direct trauma or to chemicals getting into the eye.¹ Trauma can be due to your eyes rubbing on bed linen or surgical sterile drapes, and anaesthetic or surgical equipment may touch the exposed cornea.

Most abrasions happen because your eye does not close fully during the anaesthetic and the cornea becomes dry.

Approximately 6 out of 10 people (60%) having a general anaesthetic do not close their eyes naturally.¹ In addition, general anaesthetics reduce the rate of tear production and change the composition of the tears themselves. The dry cornea may stick to the inside of the eyelid and the abrasion occurs when the eye opens again.

What is it like having a corneal abrasion?

Corneal abrasions are usually very painful. Healing takes a few days after which the pain will stop completely. The treatment is aimed at keeping the eye as still as possible. It may involve eye drops, ointments and an eye patch, as well as pain-relieving medicines. No surgical treatment is necessary.

When it is healed there may be a scar on the cornea. The effect of the scar on vision will depend on how big it is and where it is on the cornea. Many corneal abrasions heal and leave no effect on vision, although an eye specialist will be able to see the scar using a slit lamp (a lamp and microscope combined, used to examine the eye very closely). Contact lens users should take advice before using contact lenses again. Occasionally the abrasion will be right in the centre of the cornea and there may be some long-term blurring of vision.

What is done to prevent corneal abrasions?

Corneal abrasions can usually be prevented by careful protection of the eye. A detailed review article¹ recommends that tape should be used to close the eyes fully in all people having a general anaesthetic. The tape needs to be

removed carefully and bruising of the eyelid can happen, especially if you have thin skin and bruise easily.

Another method is to put an aqueous (water-based) gel or paraffin-based ointment into the eyes. This may be necessary for some operations in the nose when the surgeon needs to look in the eyes during surgery. However, there are some reports of the ointments, and less commonly the aqueous gels, causing irritation for a few hours after the anaesthetic.¹ Redness of the eye, blurred vision and a feeling that there is something in the eye may occur for up to eight hours.

How likely is a corneal abrasion?

If eye protection is not used, corneal abrasions are very common (perhaps as often as 1 in 4 patients).³ Your anaesthetist should always therefore take care to protect your eyes during your anaesthetic.

If eye protection is used, corneal abrasions have been shown to happen in 1 in 600 patients having a general anaesthetic, but this rises to 1 in 140 patients who are turned face down for the operation. Some studies are described in more detail below.

A study of 150 people having general anaesthetics lasting more than 90 minutes without eye protection⁴ showed 10% developed a corneal abrasion. In shorter operations the risk would be less. Another study in 100 patients who had no eye protection showed 26% developed corneal abrasions, whereas a further 100 patients using eye protection developed no abrasions at all.⁵ In this study, an eye specialist used a slit lamp (a lamp and microscope combined) to examine the eyes before and after the anaesthetic. This means that any damage, however small, would be noted, even if there were no symptoms. No abrasions were found in operations that lasted less than an hour.

In a study of 4,652 people having general anaesthetics for neuro-surgery (operations on the brain or spine), tape or tape and ointment were used to protect the eyes. There were eight corneal abrasions found (0.17% or about 1 per 600 patients). In the same study, 681 of the patients were turned face down for surgery on their spine. In this group five abrasions were found, making it more common (0.73% or about 1 in 140 patients).⁵

Is anyone at particular risk?

Corneal abrasions can happen to anyone having a general anaesthetic, but they are more likely if you need to be turned face down for your operation.

If you have poor vision, it is helpful if you tell your anaesthetist about it. This is because he/she can give you any extra information that you need to help you feel at ease if you cannot see well. However, this will not make any difference to the risk of getting a corneal abrasion, or to the ways in which your anaesthetist cares for your eyes while you are anaesthetised.

Summary

The most common kind of damage to the eye is a corneal abrasion. This often heals without long-term effects, but may occasionally lead to blurred areas in the field of view.

Your anaesthetist should take care to look after your eyes. He/she may use tape to close the eyes and/or ointment or gel. Ointments and, less commonly, gels can lead to temporary irritation of the eye. Tape can leave bruises when it is removed if the skin is thin or delicate.

Corneal abrasions are more likely if you are turned to lie face down for your operation. Some studies suggest that corneal abrasions are less likely if the eyes close naturally during general anaesthesia or if the operation is short.

More serious damage to the eye is very rare. It may be due to pressure on the eye which is more likely if you are turned face down for the operation.

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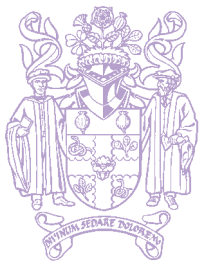
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References

- 1 White E, Crosse MM. The aetiology and prevention of peri-operative corneal abrasions. *Anaesthesia* 1998;**53**:157–161.
- 2 Gild WM et al. Eye injuries associated with anesthesia. *Anesthesiology* 1992;**76**:204–208.
- 3 Batra YK, Bali IM. Corneal abrasions during general anaesthesia. *Anesth Analg* 1977;**56**:363–365.
- 4 Grover VK et al. Comparison of methods of eye protection under general anaesthesia. *Can J Anaesthesia* 1998;**45**:575–577.
- 5 Cucchiara RF, Black S. Corneal abrasions during anesthesia and surgery. *Anesthesiology* 1998;**69**:978–979.



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