

Risks associated with your anaesthetic

Section 5: Damage to the eye during general anaesthesia

Summary

This leaflet explains the possible causes of damage to the eye during anaesthesia. Serious damage is an uncommon or rare event but should be considered a risk in certain operations. Anaesthetists take care to prevent it by using tape or other forms of eye protection. It is more common in patients who need to lie face down for surgery. The types of damage that can occur, and its consequences and treatment are described in this leaflet.

Damage caused during surgery to the eye itself or associated with anaesthesia for eye surgery is not described here.

What is the most common type of damage?

The most common damage to the eye which can occur during or after general anaesthesia is a corneal abrasion.^{1,2}

What is a corneal abrasion?

The cornea is one of the outer clear layers of the eye. An abrasion is a tear or graze of this layer. The abrasion can cause pain, blurred vision and considerable irritation for a few days. Almost all corneal abrasions heal without long-term effects on vision.

How do corneal abrasions happen?

It is not always known how or why corneal abrasions happen. One cause is that the eye does not close fully during the anaesthetic. Approximately 6 out of 10 people (60%) do not close their eyes naturally when they have a general anaesthetic.¹ The cornea is then exposed to the air and becomes dry. Fewer tears are produced during an anaesthetic, which also causes dryness in the eyes.^{2,3}





Section 5: Damage to the eye during general anaesthesia

The dry cornea can then stick to the inside of the eyelid and the abrasion occurs when the eye opens again at the end of the anaesthetic.

Corneal abrasion can also occur because something rubs against the exposed cornea. This may be one of the sheets used during surgery to cover the patient and keep the operation area sterile, or other equipment. Anaesthetists take care to ensure the eyes are closed during a general anaesthetic and to protect the eyes.

What is done to prevent corneal abrasions?

Corneal abrasions can usually be prevented by careful protection of the eyes. Small pieces of sticking tape are commonly used to keep the eyelids fully closed during the anaesthetic. This has been shown to reduce the chance of a corneal abrasion occurring.^{1,2} However, bruising of the eyelid can occur when the tape is removed, especially if you have thin skin and bruise easily. It is important not to wear eye makeup or mascara as small particles might irritate or damage the eye under the tape.

Sometimes, the anaesthetist may use a gel, an ointment or eye drops to moisten the eyes during your anaesthetic. These may be helpful if tape cannot be used or for certain operations in which the eyes need to be opened briefly during the operation. Eye ointments can sometimes cause temporary eye irritation or blurring of vision following an anaesthetic.

Anaesthetists are trained to take care that nothing rubs against the eyes. If your surgery requires you to be positioned lying on your front, your anaesthetist will use goggles, cushions and/or eyepads to protect your eyes.

How often do corneal abrasions occur?

Following a general anaesthetic, it is uncommon to suffer from a corneal abrasion that causes symptoms. A large study of over 60,000 patients having a general anaesthetic found that 1 in 2,800 patients suffered symptoms from a corneal abrasion.⁴

Studies have also been done using a microscope to examine the eyes following an anaesthetic. These show that small corneal abrasions occur commonly. Around 1 in 25 patients may have a small corneal abrasion, which the patient does not notice. This occurs even when protective eye tape or ointment is used.

You are more likely to suffer from a corneal abrasion if your surgery requires you to be positioned lying on your front or your side, if your operation lasts a long time, or if you are having surgery on your head or neck.⁴

What if I already have poor vision?

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.



Section 5: Damage to the eye during general anaesthesia

What happens if I have a corneal abrasion?

Corneal abrasions may be very painful. Healing usually takes a few days, after which the pain will stop completely. Treatment during this time can reduce pain and aims to prevent an eye infection developing. Eye drops, ointments and an eye patch may be used, as well as pain-relieving medicines. No surgical treatment is necessary.

Almost all corneal abrasions heal with no visible scar and no long-term effect on vision. An eye specialist may be able to see a scar through a microscope. Contact lens users should take advice before using contact lenses again.

Can I lose my sight during a general anaesthetic?

Serious eye injuries during a general anaesthetic are very rare, but can lead to loss of eyesight.⁵ Two structures can be damaged:

- the retina is the light-sensitive layer inside the eye
- the optic nerve carries visual information from the eye to the brain.

One or both of these can be damaged by one or more of the following:

- low blood pressure during the operation can mean that the optic nerve and/or the retina do not get enough oxygen
- tiny clots in the blood vessels to the eye can also cause lack of oxygen to the optic nerve or the retina
- too much pressure on the eyeball during the operation can damage the optic nerve or interrupt the blood supply to the nerve and the retina.

The operations with higher risk are:

- operations on the spine in the prone position (face down), and head down, especially if the operation lasts more than six hours and there is a lot of blood loss⁶
- operations which require cardiopulmonary bypass (open heart surgery with use of a heart/lung machine)
- neck dissection operations on both sides of the neck.

During these operations the anaesthetist will take particular care to keep the blood pressure at an appropriate level and prevent pressure on the eyeball.

The people with higher risk include those with other vascular diseases (high blood pressure, heart attack or stroke), diabetics and those with high red blood cell counts.

Overall, it is very rare to lose sight in an eye after a general anaesthetic. It is difficult to give an accurate figure for the risk because it is so rare. Studies suggest that the overall risk, for all operations under general anaesthetic is between 1 in 60,000 and 1 in 125,000 operations.^{2,3,5,7,8} However it is more likely (but still uncommon) in the high risk operations listed above. One study estimates that visual loss happens in 1 in 3,300 operations on the spine and 1 in 1,100 open heart operations.⁸



Section 5: Damage to the eye during general anaesthesia

Are there any other eye injuries that can happen?

Other eye problems that can follow a general anaesthetic include:

- pressure on nerves in the eyebrow area may cause a droopy eyelid. This is usually temporary and should recover
- protective tape or eye ointments used to protect your eyes from corneal abrasions may cause temporary bruising of the eyelids or irritation of the eyes. Redness of the eye, blurred vision and the feeling that there is something in the eye may last for up to eight hours
- a few operations are performed in an extreme head down position. This includes prolonged laparoscopic (keyhole) surgery for major procedures such as removal of parts of the bowel. This can lead to swelling of your eyelids which should resolve within a short time
- if you have glaucoma, which causes high pressure inside your eye, your anaesthetist will need to take extra care to protect your eyesight during surgery.

References

- 1 White E, Crosse MM. The aetiology and prevention of peri-operative corneal abrasions. *Anaesth* 1998;**53**:157–161.
- 2 White E. Care of the eye during anaesthesia. *Anaesth Inten Care* 2004;**5**:302–303.
- 3 Contractor S, Hardman JG. Injury during anaesthesia. *CEACCP* 2006;**6**(2):67–70.
- 4 Roth S et al. Eye injuries after non ocular surgery: a study of 60,965 anaesthetics from 1988 to 1992. *Anesthesiol* 1996;**85**:1020–1027.
- 5 Roth S. Perioperative visual loss: What do we know, what can we do. *Br J Anaesth* 2009;**103**(Suppl 1):i31–40.
- 6 Lee LA et al. The American Society of Anesthesiologists Postoperative Visual Loss Registry: analysis of 93 spine surgery cases with postoperative visual loss. *Anesthesiol* 2006;**105**(4):652–659.
- 7 Rupp-Montpetit K, Moody ML. Visual loss as a complication of non-ophthalmic surgery: a review of the literature. *AANA Journal* 2004;**72**(4):285–292.
- 8 Roth S. Perioperative visual loss : what do we know, what can we do? *Br J Anaesth* 2009;**103**:i31–i40.

Further information

Anaesthetists are doctors with specialist training who:

- discuss the type or types of anaesthetic that are suitable for your operation. If there are choices available, your anaesthetist will help you choose what is best for you
- discuss the risks of anaesthesia with you
- agree a plan with you for your anaesthetic and pain control
- are responsible for giving your anaesthetic and for your wellbeing and safety throughout your surgery
- manage any blood transfusions you may need
- plan your care, if needed, in the intensive care unit
- make your experience as calm and pain free as possible.



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Common terms

General anaesthesia – This is a state of controlled unconsciousness during which you feel nothing and may be described as ‘anaesthetised’.

Regional anaesthesia – This involves an injection of local anaesthetic which makes part of your body numb. You stay conscious or maybe sedated, but free from pain in that part of your body.

You can find out more about general and regional anaesthesia in the patient information booklet *Anaesthesia explained*, which is available from the RCoA website via:

www.rcoa.ac.uk/document-store/anaesthesia-explained

Risks and probability

In modern anaesthesia, serious problems are uncommon. Risk cannot be removed completely, but modern drugs, equipment and training have made anaesthesia a much safer procedure in recent years.

The way you feel about a risk is very personal to you, and depends on your personality, your own experiences and often your family and cultural background. You may be a ‘risk taker’, a ‘risk avoider’, or somewhere in between. You may know someone who has had a risk happen to them, even though that is very unusual. Or you may have read in the newspapers about a risk and be especially worried about it.

People vary in how they interpret words and numbers. This scale is provided to help.

 Very common	 Common	 Uncommon	 Rare	 Very rare
1 in 10 Someone in your family	1 in 100 Someone in a street	1 in 1,000 Someone in a village	1 in 10,000 Someone in a small town	1 in 100,000 Someone in a large town

Your anaesthetist will give you more information about any of the risks specific to you and the precautions taken to avoid them. There are some rare risks in anaesthesia that your anaesthetist may not normally discuss routinely unless they believe you are at higher risk. These have not been listed in this leaflet.

You can find more information leaflets on the College website www.rcoa.ac.uk/patientinfo.

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This leaflet has been reviewed by the RCoA Patient Information Group which consists of patient representatives and experts in different areas of anaesthesia.

Tell us what you think

We welcome suggestions to improve this leaflet.

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