Corneal Grafts

When is a graft needed to treat a deep corneal ulcer?

The cornea is the transparent window of the eye that allows light to enter. Damage to the surface of the cornea (most commonly by trauma) exposes the underlying tissue, causing an ulcer. If the ulcer is shallow and uncomplicated it will usually heal within a few days without surgery. Sometimes, however, the ulcer may become very deep, and in such cases there is a risk that the eye may rupture. These deep corneal ulcers may require surgery in the form of a graft.

There are several types of graft and your ophthalmologist will talk through which of these options is most appropriate for your pet.

Grafts using a patient’s own tissues (autografts)

Conjunctival pedicle grafts
The conjunctiva is the pale pink tissue that covers the ‘white’ of the eye. It is a thin, strong tissue containing many blood vessels. These properties make it a useful graft material for corneal ulcers. Conjunctival pedicle grafting is performed with the aid of an operating microscope. A strip of conjunctiva is freed and rotated so that it covers the ulcer, then stitched into position using very fine dissolvable suture material.

The conjunctival graft provides a blood supply and physical support to the ulcer to allow it to heal. The main disadvantage is that it reduces vision, at least temporarily. The graft usually thins over in the months following surgery and in many cases can be left in place long-term. However, if the graft is large or is affecting vision then it can be surgically removed under a brief anaesthetic.

A conjunctival pedicle graft 1 week post-operatively.

**Conjunctival 360° graft**

When ulceration is extensive and there is insufficient cornea remaining to attach a graft to, we might use a 360-degree conjunctival graft to support and protect the healing ulcer. These grafts usually require a second surgery to release the conjunctiva 6-8 weeks after the first surgery. Outcomes can be very good, but if there has been extensive damage then there may be significant scarring.
A 360° conjunctival graft immediately after surgery (this graft will be removed 8 weeks later).

**Corneoconjunctival transposition (CCT) graft**

A CCT graft is a form of ‘sliding’ graft in which healthy cornea adjacent to the ulcer is moved into the defect to provide structural support for repair. The conjunctiva remains attached to the healthy cornea and slides across with it bringing a blood supply. Initially the graft will be reddened but in time it becomes clearer and can lead to good vision post-operatively.

A CCT graft in a cat immediately after surgery.
A CCT graft in the same patient 2 months post-operatively.

Grafts using other tissues
For some ulcers we can use a selection of xenografts (grafts not of patient's own tissue, typically of another species) rather than their own tissue.

Amniotic membrane graft
(Amniograft)

Commercially available amniotic membrane discs contain growth factors that can encourage healing in some types of corneal ulcer.

Amnion graft immediately post-operatively.
**A-cell graft**

Derived from sterilised, porcine bladder tissue, this graft material is acellular (i.e. it contains no cells), which reduces the immune response and so limits the risk of graft rejection.

The A-cell graft acts as a porous scaffolding as the damaged cornea beneath it regenerates.

An A-cell graft after surgery

**BiocorneaVet**

A more recent addition to our graft options at Davies Veterinary Specialists, BiocorneaVet is a xenograft derived from sterile, freeze-dried porcine cornea. It is used in cases in which a large amount of cornea has been lost to the ulcer. Following surgery, there is often a strong reaction to the graft, initially creating a red, proud fleshy appearance to the graft. However, this fades over a few weeks once healing is complete. The long-term outcomes with this option can be outstanding, but it is only suitable for a small percentage of cases.

A deep, infected corneal ulcer prior to surgery.
BioCorneaVet graft immediately after surgery.

BioCorneaVet graft 2 weeks post-operatively.

BioCorneaVet 8 weeks post-operatively.
Corneal graft surgery and post-surgical care

What happens when my pet is admitted for corneal graft surgery?

Our anaesthesia team will assess each individual to ensure they provide a premedication and anaesthetic plan suited to their needs. Corneal grafting is performed with the patient under general anaesthetic, using an operating microscope.

After surgery, we usually keep patients in our hospital for a day or two to ensure that the eye is healing and they are comfortable. A Buster collar is needed for at least a week to prevent rubbing at the eye. We give a course of oral pain-relief and antibiotic eye drops. The eye is usually a little uncomfortable and itchy, but this settles over a week or two.

What about when my pet returns home?

You will need to keep your pet relatively calm and quiet for a few weeks following the surgery to allow the eye to heal. Usually this means lead or garden exercise only, no boisterous play and trying to reduce excitement and barking as much as possible.

We will recommend a follow-up examination here 7-14 days after the surgery to ensure the graft is healing. The stitches placed to hold the graft are very small and so are not easy to see without specialist equipment. They are dissolvable and so will not usually need rem
Does the graft need removing, and what is the effect on vision?

Most grafts (with the exception of conjunctival grafts) are not removed and the area where the original ulcer was should ultimately be relatively transparent with reasonable vision. Pigmentation and scarring of the cornea are common post-operatively, particularly in dogs of brachycephalic (short-nosed) breeds. To reduce scarring, we often dispense a course of eye ointment ('Optimmune') following the surgery.