

## Corneal Endothelial Dystrophy

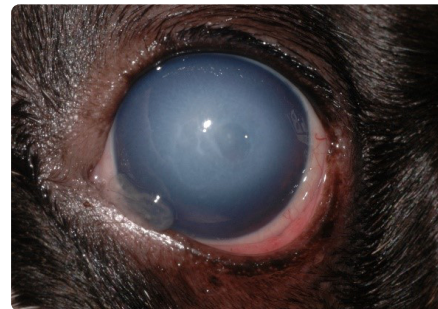


### What is corneal endothelial dystrophy?

The cornea is the clear window of the eye. To be transparent, it is kept dehydrated by a complex 'pump' function of its innermost layer – the corneal endothelium. In some dogs, the function of the corneal endothelium is lost prematurely and as a result, waterlogging and oedema occur. The condition often affects older dogs and certain breeds (such as the Boston Terrier and the Springer Spaniel) but can occur in any dog at any age.

### How is corneal endothelial dystrophy diagnosed?

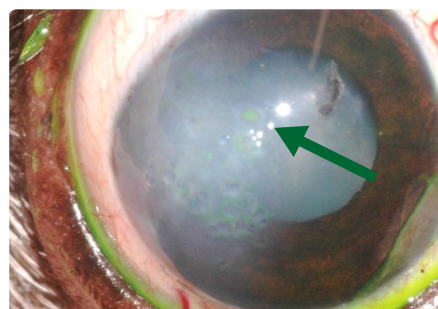
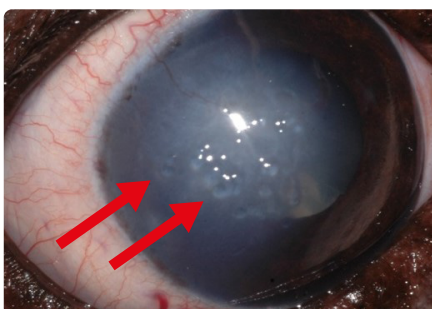
To start with, the condition is usually painless and a 'patch' of 'blueish' cornea is noticed (See Fig.1a). With time, the patch can increase both in density and in size and in some dogs it may affect the entire cornea. Early cases of endothelial dystrophy do not show pain although the vessels visible in the 'whites of the eye' are often more prominent, giving the impression of a 'red' eye. Eventually, the waterlogging can become so severe that small blisters of fluid erupt from the corneal surface – leaving small and slow healing painful wounds behind. If such wounds become infected, the eyeball may burst.



Above, both eyes of a patient with endothelial dystrophy and subsequent early oedema on the left photo, and more advanced oedema in the photo on the right. The oedema is seen as a 'blue patch' on the cornea

### How does endothelial dystrophy affect my dog?

There are two aspects to this condition – one is that in advanced cases, vision is lost due to the progressive corneal clouding. More importantly though, the recurring wounds that develop in patients with advanced disease are painful.

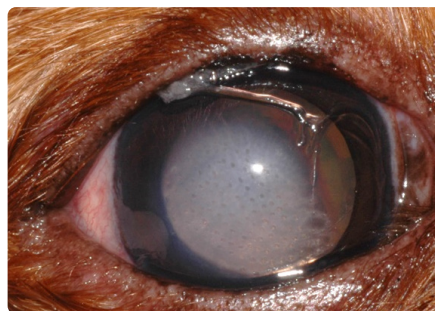
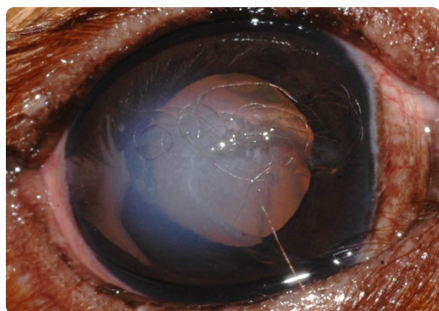


On the left, red arrows point towards small blisters developing in advanced disease, and on the right there is green stain attached to the blisters (green arrow), indicating painful corneal ulcers.

## How is the condition treated?

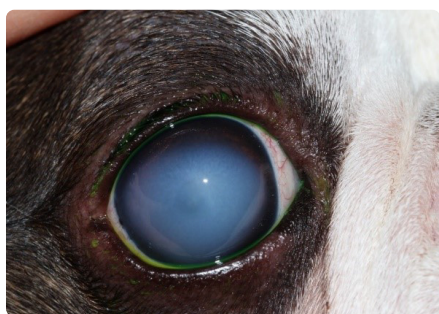
Endothelial dystrophy is unfortunately a gradually progressive condition that cannot be cured. The speed of progression varies hugely. In some patients, only part of the cornea is affected, whilst in others the entire cornea can become oedematous and opaque. Treatment options include hypertonic saline ointment, and surgery. The ointment sometimes slows the progression of the disease and aims to 'draw out' some of the excess fluid from the waterlogged cornea but it does not always work. Surgical procedures available at EVC include:

**Thermokeratoplasty (TKP):** In this procedure, we treat the area of oedema with very fine spot 'burns' carried out with an electrolysis needle to the very front of the cornea. This creates small scars which help to prevent further ulceration. TKP does not improve the corneal clarity but it is very successful in helping to heal chronic ulcers present at the time of surgery, and prevent future ulceration. In most dogs, one treatment is adequate but on rare occasions, a second procedure is indicated. Complications are rare, with infection being highest on the list of possible concerns.



Photographs of the same eye taken before and after the TKP operation. On the left photo, the cornea is irregular due to ulceration. On the right, you can see the same eye now pain-free with a smooth corneal surface. Note that the corneal oedema remains after treatment – the operation only aims to heal the ulcer and make the eye more comfortable.

**Conjunctival grafting** (Gunderson flap; Letterbox technique): In this surgery, the opaque area of cornea is covered with a very thin layer of conjunctiva, which is stitched into place. The function of this 'graft' is to act as a 'pump' that helps keep the surrounding cornea clearer, and therefore reduce the chance of recurrent corneal ulcers. It's important to understand that the aim of this surgery is to improve comfort and reduce corneal ulceration, it cannot completely "cure" the oedema but may partially reduce it.



Photos showing the pre and post operative results of partial conjunctival grafting in a young Boston Terrier. Note how the extent of corneal oedema is reduced after surgery and the pupil can be seen in both eyes again. The conjunctival grafts can be seen as thin, pink layers covering part of the cornea.



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