



Patient Information

Keratoconus

Clinic 012 333-1111
Fax 012 333-4848
Emergency 083 441-2975
E-mail info@lasik.co.za
Website www.lasik.co.za

1199 Woodlands Drive
Queenswood, Pretoria 0186

PO Box 11846
Queenswood, 0121



What is a cornea?

The cornea is the clear, transparent 'front window' of the eye, through which light enters the eye. Two-thirds of the eye's focusing ability occurs at the cornea. Its shape and clarity are thus critical to enjoy normal vision.

The cornea is a multilayered structure, consisting of five separate tissue layers, namely epithelium, Bowman's membrane, stroma, Descemet's membrane and endothelium.

Any disease or defect that affects the cornea, will result in poor vision. Among the many corneal defects known, keratoconus is one important cause of visual impairment.

What is keratoconus?

Keratoconus is a degenerative condition of the cornea, which results in thinning of the stromal layer with consequent forward bulging into a conical shape due to structural weakness. The ensuing abnormal profile leads to high levels of astigmatism, often combined with myopia (nearsightedness).

Due to progressive distortion of the cornea's front surface, it may become increasingly difficult to correct the vision with spectacles or contact lenses.

It is, therefore, very important to diagnose keratoconus early on, so that the condition may be treated as quickly and effectively as possible.

What are the treatment options?

There are currently four treatment modalities for keratoconus. The treatment option depends on the stage of development of the condition.

The following are short descriptions of the four treatment modalities:

1. Spectacles or Contact Lenses

Spectacles or soft contact lenses will only correct vision in the early stages of keratoconus. As the cornea bulges forward and becomes progressively distorted, hard contact lenses may be the only conservative option. If the condition deteriorates even further, it may become impossible to wear hard contact lenses due to the abnormal shape of the cornea.

2. Corneal cross-linking

This treatment will not improve the condition, but it aims to stabilize the cornea to prevent further deterioration.

The cornea has to be at least 400 microns (0.4 millimetres) thick to apply this treatment safely.

The procedure strengthens the links between the collagen fibres in the cornea, which in turn reinforces the structure of the cornea.

The superficial epithelial layer of the cornea is first removed (this layer spontaneously recovers within 3 to 5 days).

This is followed by application of Riboflavin drops at regular intervals for up to 30 minutes until the corneal stroma is saturated with the vitamin.

Ultraviolet radiation is then applied to the cornea to induce chemical bonds among adjacent stromal fibres, forming the links.

The Riboflavin acts as a catalyst, which stimulates the cross-linking between the corneal fibres. After the initiation of the chemical cascade, the cross-linking process continues spontaneously for a further 6 to 24 months. The final result may therefore only be assessed at that time.

Only one eye is routinely treated at a time.

On average, vision may take 4 to 12 weeks to recover to the same level it was before the procedure.

3. Intra-corneal ring segments (ICRS)

ICRS consist of tiny, clear, ultra-thin, precision-made crescents made from the same material used for hard contact lenses.

These crescents are implanted into the corneal stroma, thus “bending” the cornea into a more regular shape. ICRS are indicated in early phases of keratoconus.

More information on ICRS is available in a separate information brochure.

4. Corneal Transplants

Because a corneal transplant is an invasive procedure, relatively expensive and has a long recovery period, it is considered a last resort to restore vision in a keratoconic eye.

The sick or abnormal corneal tissue is removed and replaced with healthy tissue from a human donor. It is one of the most successful types of transplant surgery in the total field of medicine, and techniques are changing continuously.

Since local cornea donor tissue is difficult to obtain, high quality corneas are imported from an overseas source.

Three cornea transplant techniques are available. The decision on which is applicable in a specific case is based upon the extent of corneal involvement.

- **Penetrating keratoplasty**

This is a full-thickness transplant in which the entire central cornea (all layers thereof) is removed and replaced by donor tissue. This method is the conventional way of doing a cornea transplant, and has been available for many years.

- **Lamellar corneal transplant:**

Here, only the affected layer of the cornea is removed and replaced with a similar section from donor tissue. This is the ideal type of transplant for keratoconus, but is unfortunately not always technically possible in each and every case.

- **“Mushroom” transplant**

The name of this procedure describes quite graphically what it entails. It combines a larger diameter superficial layer of tissue with a smaller diameter central layer, quite similar to what a mushroom looks like.

From the foregoing, it is evident that the management of keratoconus is a complex issue for which several treatment options are available.

The best treatment option for a specific patient may only be determined after extensive tests have been performed.