Keratoconus and Corneal Collagen Cross-Linking

Your Questions Answered

Patient Information Leaflet

What is Keratoconus?

Keratoconus is a degenerative disorder of the cornea of the eye. In a healthy cornea the structural integrity is maintained by many collagen bonds, in keratoconus however the number of collagen bonds are reduced resulting in a change in shape of the cornea. The shape becomes more conical and the cornea becomes progressively thinner and this irregularity significantly affects vision.

The exact cause of Keratoconus is unknown. However genetic and environmental factors may play a role. Keratoconus is often associated with eye rubbing thus it is prevalent in people with poorly fitting contact lenses and in people how have eczema, hay fever or Down Syndrome as people with these conditions tend to rub their eyes a lot. Keratoconus usually affects both eyes but one eye may be worse than the other. It typically manifests in adolescence and affects approximately 1 in 2,000 people.

Symptoms include gradual blurring/distortion of vision, poor night vision, and sensitivity to light.

How is Keratoconus diagnosed?

When you arrive at the outpatient clinic the nurse will assess your visual acuity and perform tests which determine the curvature of the eye; the degree and extent of the deformation will provide a benchmark for

assessing its rate of progression. The doctor will also examine the eye at the slit lamp and perform a more detailed vision test.

How is Keratoconus treated?

There are a few different treatments for Keratoconus which include:

- Corneal collagen cross-linking (CXL)
- Wearing specially created contact lenses
- Corneal Grafting

Following detailed examination and assessment, your eye doctor will recommend what treatment is best in your case.

What happens if it is not treated?

If left untreated, scarring may occur which will cause loss of transparency of the cornea which will impair the ability of the eye to focus properly, resulting in poor vision.

What is corneal collagen cross-linking?

Corneal collagen cross-linking (CXL) is a relatively new non-invasive treatment that can stop keratoconus getting worse. It is only suitable for patients where the corneal shape is continuing to deteriorate and where there is adequate corneal thickness. The procedure

involves the application of a photosensitive solution consisting of riboflavin (Vitamin B_2) to the cornea which is activated by illumination with ultraviolet light for approximately 4 minutes. The riboflavin reacts with the ultraviolet light to create new collagen bonds (cross-links) throughout the cornea, which recovers and preserves some of the cornea's mechanical strength. If the procedure is performed early enough it can postpone the need for corneal grafting and prevent vision from getting worse. The procedure may be an advantage to individuals who are unable to wear contact lenses.

How is corneal collagen cross-linking carried out?

Corneal collagen cross-linking (CXL) is usually a one-time procedure carried out as a day case under local anesthetic. During the procedure the epithelium (the outer layer of the cornea) is removed to allow absorption of the photosensitive solution- Riboflavin. The Riboflavin drops are then applied every 2 minutes for 10 minutes. Next, the cornea is exposed to ultraviolet light for a further 4 minutes. When the cross-linking treatment is finished a clear contact lens is placed on the eye to protect the cornea, facilitate regrowth of the epithelium and quick visual recovery. The contact lens will also make the eye feel more

comfortable. This will be removed by the doctor at your follow-up Outpatient visit.

Will the eye be painful?

As the epithelium is removed prior to the treatment it means that the corneal nerve endings are left exposed. Thus, until the epithelium heals over the eye will be sore. Your eye will be sore for 1-2 days, therefore ensure you take the medications for pain relief as prescribed by the doctor. It is common for the eye to water and feel gritty for the first few hours after the procedure. To promote quick healing of the surface of your eye take a nap for 1-2 hours on returning home.

Will I be able to see clearly after the procedure?

Vision usually returns to pre-procedure level after 2 weeks following the procedure, however in some cases the vision can take up to 2 months to recover. Gradually, over a period of one year the cornea will continue to stiffen and stabilise which will result in further improvement.

When can I wear contact lenses again?

You may return to wearing your contact lenses after one month, however your contact lenses may need to be

changed occasionally until your cornea is fully recovered and vision is stable.

What are the possible complications involved in corneal collagen cross-linking?

- Inadequate wound healing causing haze and scarring thus resulting in poor quality of vision.
- Infection of the cornea, which could be severe leading to loss of vision.
- Keratoconus progression despite undergoing CXL. In this case collagen cross-linking may need to be repeated, or corneal grafting may be required.

Will I need to put in eye drops after the procedure?

Yes, you will be prescribed antibiotic and steroid drops as well as artificial tears and you will be instructed by nursing staff how and when to use them prior to discharge.

How often do I need to be seen following the procedure?

You will have regular follow up visits at one, three, six and twelve months. It is important that you attend all appointments so that your condition can be monitored. You will then be followed up annually, or as required.

Keratoconus Post-Operative Instructions

- Avoid rubbing the eye as it may cause the lens to dislodge.
- Avoid getting foreign matter such as; water, shampoo, eye creams or hair spray into the eye for two weeks.
- Avoid the use of eye makeup.
- Avoid swimming for two weeks.
- You may find that your eye will be sensitive to light thus you may use sunglasses for the first few days when you are out in the sunlight.
- It is recommended to take 3-4 days off work.
- If your contact lens falls out in the initial few days following cross-linking procedure do not attempt to put it back in, attend your next appointment as scheduled.
- Contact the hospital immediately (phone numbers on next page) if you experience increased pain, increasing redness, increasing sensitivity to light, discharge from the eye or a complete/sudden loss of vision in the eye.

We hope that this information is helpful to you. If anything is unclear, or you have any other questions you would like to ask, then please do ask the nurse/doctor before the procedure.

If you have any concerns following your treatment please contact

Day Care Unit
01 6644622
Between 8am and 5pm

Or

Royal Victoria Eye and Ear Hospital, Accident & Emergency Department
01 7088535
24 hours a day

References:

- Blackrock Clinic, Dublin. Patient Information Leaflet.
- National Institute for Health and Excellence. (2009) Photochemical corneal collagen cross-linkage using riboflavin and ultraviolet A for Keratoconus.
- Moorfields Eye Hospital, NHS Foundation Trust, London. Online Patient Information leaflet.

Revision History

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