

## **KERATOPLASTY (CORNEAL TRANSPLANTATION).**

Cornea is the transparent tissue which forms the outer layer of an eye. Sometimes cornea becomes opaque or its shape can change. In this case the visual acuity of a person will decrease. In corneal transplantation surgery the corneal layer which cannot fulfill its function is replaced with the transparent donor corneal layer taken from a cadaver.

Corneal transplantation is performed in different ways according to lesion location. If the disease has affected all the corneal layers then full-thickness (penetrating) corneal transplantation will be performed. If the disease has affected the anterior part of the cornea and the shape of the cornea as in keratoconus disease, then only the anterior surface of the cornea can be replaced. We call it deep anterior lamellar keratoplasty (DALK). If the damage is only on the posterior part of cornea, then we change only that posterior part. When posterior part of cornea is changed there is no suture, which is why astigmatism does not occur. It is called posterior lamellar keratoplasty (PLK).

Specially designed trepans and punches are used for corneal transplantation surgery. Sometimes laser can also be applied for corneal incisions.

In penetrating keratoplasty general anesthesia is usually preferred. Lamellar keratoplasty surgeries are performed under general or local anesthesia.

Duration of surgery depends on the type of surgery and varies between 45 to 120 minutes.

Follow-ups after the surgery are very frequent for the first few months and go on totally at least within 1 year. After this patients will have eye drops treatment in very small amounts for protective purposes for a lifetime.

### **Treatment success rate:**

Corneal transplantation success rate depends on the disease and surgical technique. According to 5 –year survey it may vary from 60 to 95%.

The treatment success rate depends on such factors as: the type of the previous disease, presence or absence of glaucoma, amblyopia, state of retina that could not be properly observed because of the clouded cornea, optic nerve and macula diseases and the patient' s immune system.

### Possible Complications

A corneal transplant is considered a fairly safe procedure, but it is surgery, so there are risks. In about 1 out of every 10 transplants, the body's immune system attacks the donated tissue. This is called rejection. It can be reversed with eye drops most of the time. Because so little donor tissue is used for DSEK and especially DMEK, there's a much lower risk of rejection with these procedures.

Other things that could happen include:

Infection

Bleeding

Higher pressure in the eye (called glaucoma)

Clouding of the eye's lens (called cataracts)

Swelling of the cornea

A detached retina, when the back inside surface of your eye pulls away from its normal position

### Important notes to maintain health after the surgery

It is imperative to protect the eye from any strokes for a lifetime after surgery as cornea is a non-vascular tissue and stromal wound healing can never reach the level of the healthy tissue. After corneal transplantation surgery traumatic wound dehiscence rate is 2.5% (1 out of every 40 people). That is why combat sports and professions where eye is not protected against blows must be abandoned.

**Recovery Process / Period** • The recovery process after posterior lamellar keratoplasty is very fast, and a patient can return to his or her daily activities in 1 week after the surgery. As in DALK and penetrating keratoplasty there are sutures being applied, they can be removed in about 1 year after. This period of time can differ according to the type of the surgery and suture technique.

For penetrating keratoplasty:

Days of Stay in the Country • about 2 weeks

Expected After Care •

The follow-ups after the surgery are made on the 1st day, 1st week, 1st month and later every month within 1 year. The doctor can adjust this follow ups schedule and subsequent follow-ups according to condition of a patient and eye.

Doctor experience with the procedure • 1-year cornea fellowship experience on corneal transplantation at Wills Eye Hospital, Thomas Jefferson University in the USA and numerous surgical experience in all corneal transplantation surgeries within 20 years of medical practice. In addition, there is a vast amount of articles in international journals written on this topic.

Scientific References:

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2. Deng SX, Lee WB, Hammersmith KM, Kuo AN, Li JY, Shen JF, Weikert MP, Shtein RM. Descemet Membrane Endothelial Keratoplasty: Safety and Outcomes: A Report by the American Academy of Ophthalmology. Ophthalmology. 2018 Feb;125(2):295-310.
3. Feizi S, Javadi MA, Karimian F, Abolhosseini M, Moshtaghion SM, Naderi A, Esfandiari H. Penetrating Keratoplasty Versus Deep Anterior Lamellar Keratoplasty in Children and Adolescents With Keratoconus. Am J Ophthalmol. 2021 Jan 30;226:13-21.

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