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CTAK Procedure

CTAK (Corneal Tissue Addition Keratoplasty) Is a novel intrastromal lamellar keratoplasty procedure for keratoconus. The procedure uses preserved corneal tissue, custom shaped with a femtosecond laser based on several patient tomography characteristics. Clinical studies have shown substantial improvement in UDVA, CDVA, and topography outcomes in keratoconus patients.*

A set of specialized instruments, tailored for accurate marking, dissection, and tissue implantation and manipulation are utilized during the CTAK procedure.

The procedure itself involves several key steps: marking the cornea; laser assisted tunnel creation; opening the tunnel for implantation; CTAK tissue insertion; and tissue smoothing.

*(Greenstein SA, Yu AS, Gelles JD, Eshraghi H, Hersh PS. J Cataract Refract Surg. 2023 Jul 1;49(7):740-746)

Step 1

Initial Marking:

1. Initial marking is designed by a surgical plan to determine where the tissue is placed.
2. 3 marks are made by the marker which guide where the OZ mark is made.
3. For marking point reference, the center of the pupil is used.

Hersh-Greenstein-Gelles 2pt mks (K3-9261 to K3-9267)

- A double-sided two-point marker from sizes 1.0 to 4.0 with 0.25mm increments.
- Used to make the initial reference marks from pupil for 2nd stage OZ marking.

Step 2

Optic Zone Marking:

1. A circular mark of the appropriate size is made using the three marks from step one.
   This will guide the positioning of the fs laser channel.

Hersh-Greenstein-Gelles CTAK OZ Marker (K3-9258, K3-9259)

- An optic zone marker with sizes of 3.5 & 4mm, 4.5 & 5mm.
- Used to make the pre-procedure circular mark for fs-laser channel placement.

Step 3-4

Laser dissection and separation of tissue

1. Using a femtosecond laser, the dimensioned pocket is created.
2. Two C-shaped dissectors on a trephine handle are used for tissue dissection and opening the pocket. Two directions — left and right oriented C-shapes.

Hersh-Greenstein-Gelles CTAK channel dissector clockwise (K3-9270) + Hersh-Greenstein-Gelles CTAK channel dissector counterclockwise (K3-9271)

- A unique shape allows for maximum visibility and control by the surgeon.
- Comes with a protective ring, for the C-shaped tips.

Hersh-Greenstein-Gelles CTAK Incision Spatula (K3-9274)

- A single sided 8mm length spatula to open the incision.

Step 5

Picking and inserting Donor tissue:

1. Tissue forceps, specifically designed for the CTAK inlay, to hold and place tissue into the FS laser channel.

Hersh-Greenstein-Gelles CTAK Inlay Forceps (K5-6220)

- A specially curved, smooth tissue forceps for placement of the CTAK inlay into the fs laser channel.

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Step 6

Manipulation of tissue:

1. The manipulator is designed with a 0.8mm wide tip that facilitates final positioning of the CTAK tissue in the laser-created channel.
2. The tip of the manipulator is mildly sandblasted on the underside for gripping the tissue.

Hersh-Greenstein-Gelles CTAK Inlay Manipulator (K3-9269)

- The manipulator with wide tip to push and advance inlay through the fs-laser channel. Tip is lightly sandblasted.

Step 7

Smoothing CTAK Tissue:

1. The device is used to smooth the CTAK tissue from the corneal surface after insertion is completed.
2. The large surface area that is highly polished allows for an efficient smoothening of the tissue.

Hersh-Greenstein-Gelles CTAK Inlay Applanator (K3-9268)

- A device to smooth the CTAK inlay from the corneal surface after insertion is completed. In conjunction with the CTAK Inlay Forceps and Manipulator, it can also facilitate inlay insertion. It has a large, highly polished surface and allows for easy smoothing of the inlay.

Developed with

Peter S. Hersh, M.D.
Dr. Hersh is originator and co-developer of CTAK. He is the Founder of the Cornea and Laser Eye Institute and CLEI Center for Keratoconus, and Clinical Professor of Ophthalmology at Rutgers New Jersey Medical School.

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