Lamellar Keratoplasty

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Deep Anterior Lamellar Keratoplasty DALK

- Von Walther, Muhlbauer 1840
- Von Hippel, Filatov, Fuchs
- Hallerman 1959 (Full Thickness Donor)
- Anwar 1972 (DM stripping)
- Archilla 1997 (intrastromal air)
- Melles 1999 (AC air interface)
- Anwar 2002 (Big bubble)
Classification

160µm SALK

160-400µm 30-75% MALK

400-495 µm 90%DALK
• Direct dissection
• Melles technique (optical dissection)
• Ferrara technique (cyclic dissection)
• Archilla technique (dissection with air)
• Anwar technique (dissection with pre Descemet's air bubble)
• Femto assisted Dalk – Intrabubble

DALK
Optical visualization of dissection depth using Dr Melles technique

“an air-to-endothelium optical interface can be used to visualize the corneal thickness and the relative depth of a dissection knife within the stroma during surgery, and with the optical effects described dissections can be made to approximately the desired corneal depth”.

www.niio.nl/edalkcrs
Pellucid Marginal Degeneration

- Red arrows: semi-circular, specular light-reflex at the air-to-endothelium interface near the tip of the blade, caused by the indentation of the tissue (left)

- Yellow arrow:
  - Optical reflection (right)
  - Descemet’s folds (middle)
Videos
Femto MALK
Femto MALK
A channel in the posterior stroma of the recipient is created, 50 μm above the endothelium and a smooth cannula is introduced into this channel for air injection.

Descemet’s membrane was consistently reached in all eyes (20 patients) treated with this version of the IntraBubble technique.
Close to Descemet’s membrane

- Air dissection clearly occurs above the level of Descemet’s membrane.
- Reaching the level of Descemet’s membrane minimizes the healing process and thus the production of haze, thereby providing good corneal clarity.


<table>
<thead>
<tr>
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<th>DALK</th>
<th>PKP</th>
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<tr>
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<tr>
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## Endothelial cell count

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### Astigmatism

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<td>BB vs PKP</td>
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PK ν DALK, Tan

- Μ.Τ. Ενδοθηλιακών
  - 1 έτος 2895 2629
  - 3 έτη 1848 2274
  - 4 έτη 1656 2143
  - 5 έτη 1503 2068

- Απώλεια ενδοθηλιακών κυττάρων
  - 38.1%
  - 7.7% (p 0.0042)
PK v DALK, Tan

Mean BCVA at 1 year:

- DALK (a): 20/30
- PK: 20/40
- DALK (m): 20/50
"We can only call penetrating keratoplasty a temporary procedure."

- After five years 25 per cent will have to be re-operated. Based on our data, DALK should be used, whenever the endothelium is normal, to finally heal the corneal disease’
  - *Krumeich*
PK v DALK, Tan

Attainment of 20/20 vision:
- DALK(a) = 45
- PK = 28
- DALK(m) = 7.1

(p = 0)

Attainment of 20/30 or better:
- DALK(a) = 81
- PK = 49
- DALK(m) = 38

(p = 1)

Attainment of 20/40 or better:
- DALK(a) = 91
- PK = 70
- DALK(m) = 50

(p = 1)
Intralamellar keratoplasty

• Lamellar interface at a depth of 400 μm posterior to the epithelial surface.
• The diameter of the lamellar cut was 9 mm.
• A side cut was then performed creating a tapered edge to the lenticule.
• A second superficial lamellar cut was made at a depth of 150 μm posterior to the epithelial surface.

David J. Schanzlin et al NEW SURGICAL APPROACHES TO THE MANAGEMENT OF KERATOCONUS AND POST-LASIK ECTASIA Trans Am Ophthalmol Soc. 2006 December; 104: 212–220

www.perfectvision.gr
Intralamellar keratoplasty group. BCVA pre) and post 6 months

- **BCVA 0.88 ± 0.34 (20/150) preop to 0.40 ± 0.09 (20/50) at 3 months and to 0.48 ± 0.06 (20/60) at 6 months postop.**
- All eyes gained between 1 and 8 lines of BCVA at 6 months.
- Manifest SE −10.38 D preoperatively, to −8.82 D at 3 months, and −9.25 D at 6 months postoperatively.
- Manifest refractive cylinder 3.5 D preoperatively, to 2.25 D at 3 months, and 1.68 D at 6 months postoperatively (a reduction by 1.82 D, 6 months postoperatively).
• RHC-I and -III implants can be safely and stably integrated into host corneas.

• Optical clarity was maintained in both implants. RHC-III implants showed superior optical clarity.

– Kimberley Merrett, Per Fagerholm Tissue-Engineered Recombinant Human Collagen-Based Corneal Substitutes for Implantation: Performance of Type I versus Type III Collagen IOVS. 2008;49:3887-3894
• Over 12 months show comparably stable integration, with regeneration of corneal cells, tear film, and nerves.
Nerve regeneration in recombinant human collagen-based biosynthetic corneal grafts proceeded similarly to that in allograft tissue, demonstrating the suitability of recombinant human collagen constructs as nerve-friendly corneal substitutes. Furthermore, only minor differences were noted between type-I and -III collagen grafts, indicating an insensitivity of nerve regeneration to initial collagen type.

ΓΕΝΙΚΗ ΣΥΝΕΛΕΥΣΗ ΤΩΝ ΜΕΛΩΝ ΤΗΣ ΕΕΕΦΑΧ
ΑΡΧΑΙΡΕΣΙΕΣ ΓΙΑ ΝΕΟ Δ.Σ.
ΣΑΒΒΑΤΟ 26/2/2011 - 11:00
ΑΙΘΟΥΣΑ ΤΕΡΨΙΧΟΡΗ

25ο ΔΙΕΘΝΗΣ ΣΥΝΕΔΡΙΟ
της Ελληνικής Εταιρείας Ενδοφακών και Διαδημοτικής Χειρουργικής

Member of