



Excellence Eye Research Centre
 Certified as Member of EVICR.net
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CNAT | Centro Nazionale di Alta Tecnologia in Oftalmologia

Femtosecond Laser assisted anterior lamellar and intrastromal keratoplasty

No Financial Interest
Mario Nubile


 RIO Cairo January 2020

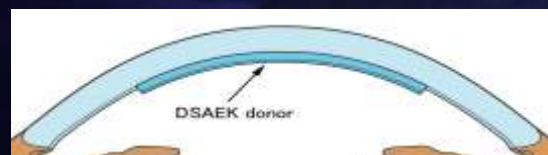
FSL-assisted Options for Keratoplasty (tissue Replacement/addition)



FSL PK (different shapes)



FSL ALK (different depths and side cuts)



FSL EK (different thickness)



FSL Intrastromal Lenticule Implantation

FSL – ALK-DALK Nomenclature

FSL ALK (FALK)

Femtosecond laser anterior lamellar keratoplasty

Femtosecond Laser-Assisted Keratoplasty

SONIA H. YOO AND VOLKAN HURMERIC

-**Indications:** Superficial or mid-stromal cornea scars and anterior stromal dystrophies

- **Dissection involves the upper 2/3 of the stroma**

FSL DALK (FDALK)

Femtosecond laser deep anterior lamellar keratoplasty

-**Indications:** Deep stromal scarring, keratoconus or corneal ectasia

- **Residual stromal bed 70-100 μ m or FSL- big bubble**

FSL Intrastromal SLAK

Stromal lenticule addition keratoplasty



From : Shehadeh-Mashor R , Rootman D. Cornea 2013



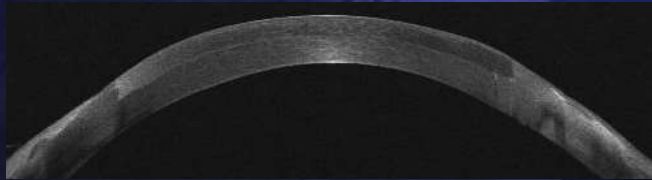
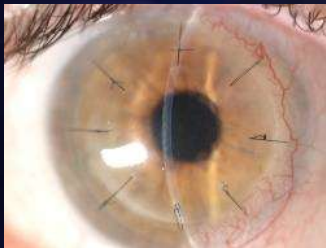
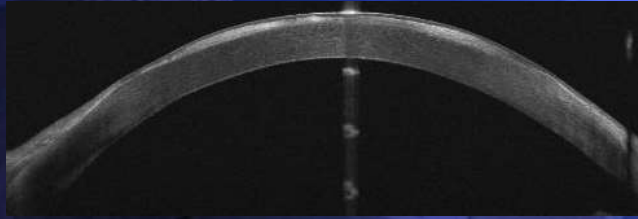
From : Farid M, Steinert R. JCRS 2009

FSL-ALK technique

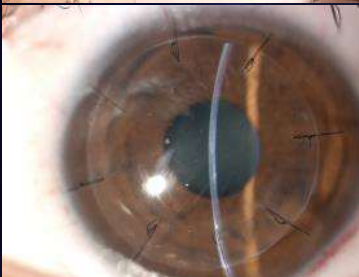
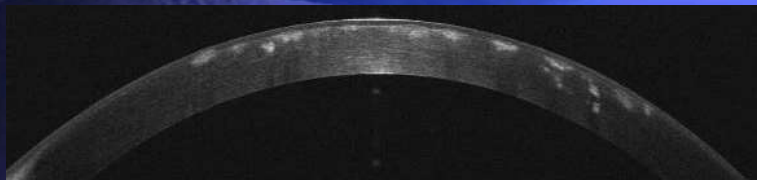


- Donor preparation
(custom shape, thickness, diameter)
- Recipient dissection
(custom shape, thickness, diameter)
- topical anaesthesia, minimal suture,
15 mins, low complication rate

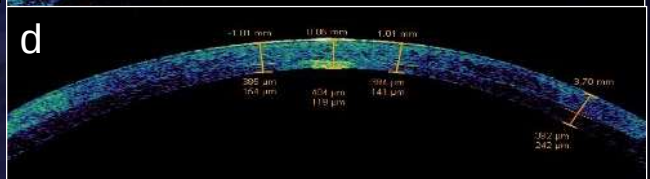
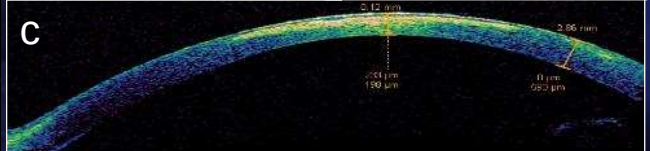
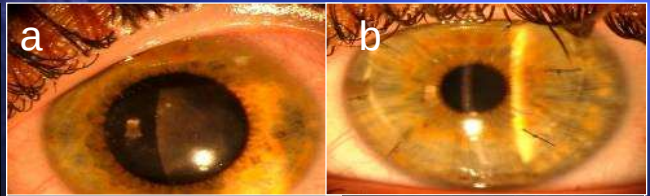
FSL-ALK technique



FSL-ALK: Stromal dystrophies

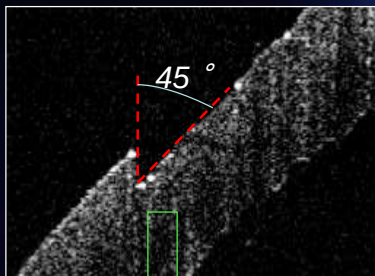


500 KhZ FSL - ALK 390/320 microns
8.3 mm - 90° rim

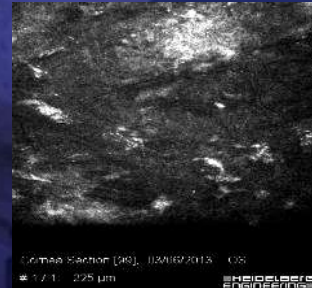
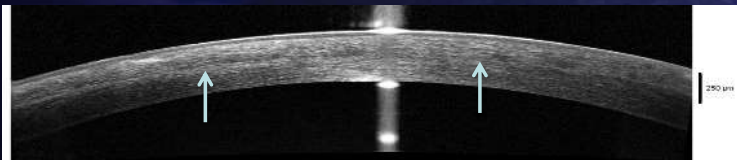
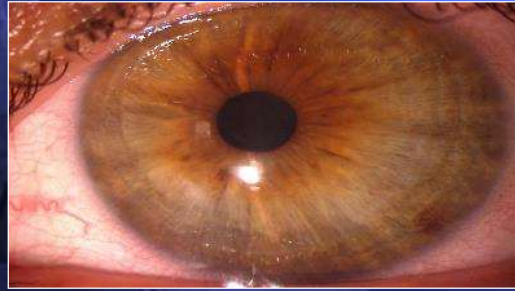
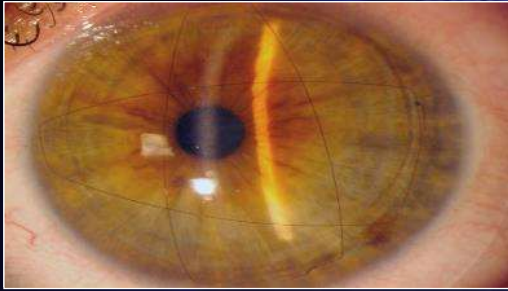


Post-infectious stromal scar
3 months after LK
Preop OCT - 430 µm CCT
3 months post op- 520 µm CCT

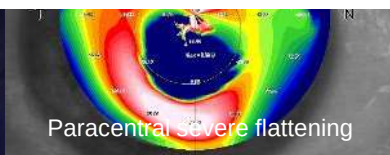
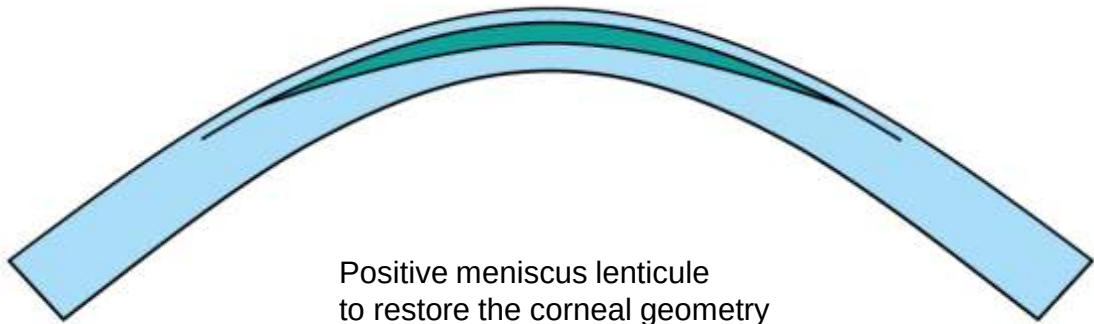
500 KhZ FSL - Dovetail ALK 450/400 microns
9.2 mm - 45° rim



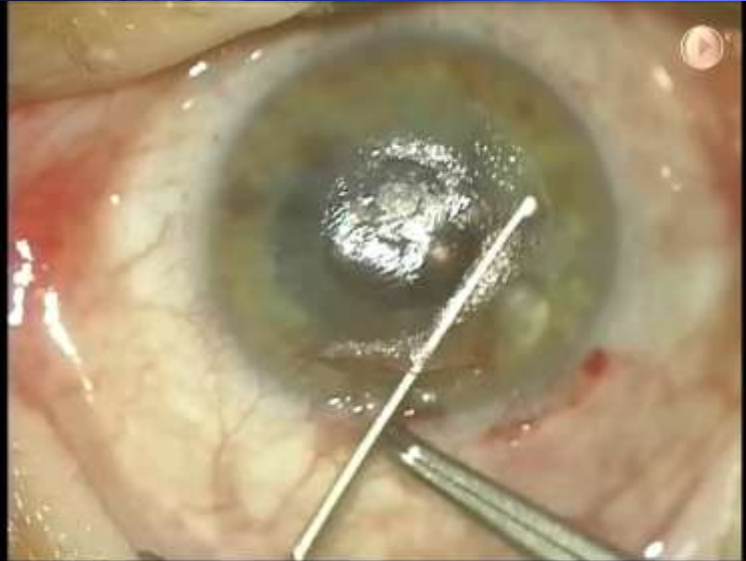
SUTURELESS: real advantages?



Corneal Re-shaping in stromal disease **SLAK in stromal loss: increasing corneal thickness and curvature**



SLAK in stromal loss: surgical technique



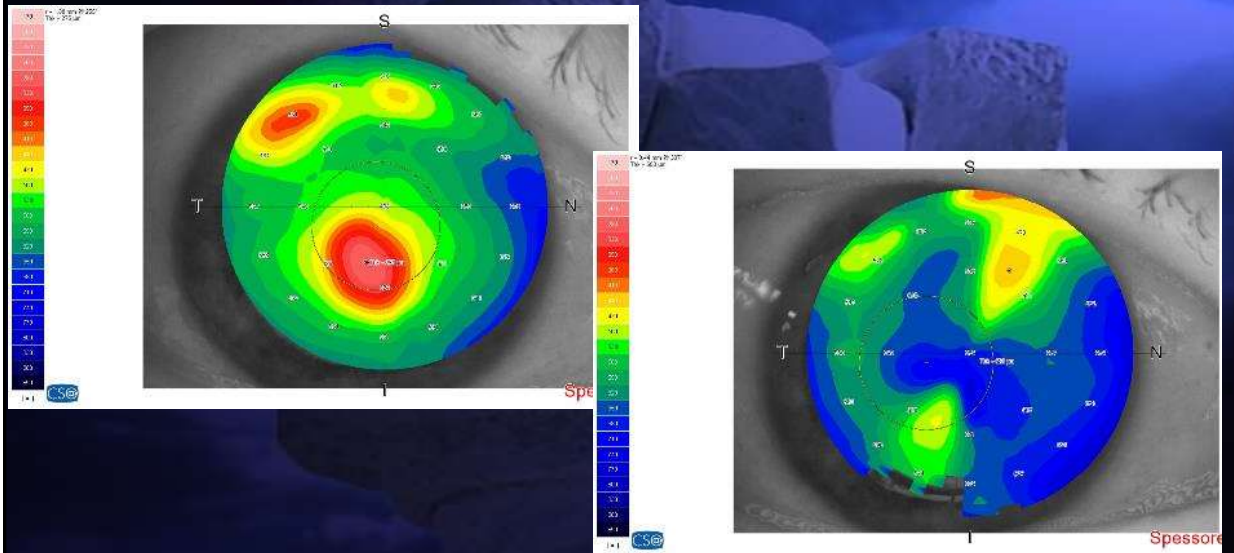
Corneal Re-shaping in stromal disease

SLAK in stromal loss: increasing corneal thickness and curvature



Corneal Re-shaping in stromal disease

SLAK in stromal loss: increasing corneal thickness and curvature



FSL and ALK/ pd DALK

ADVANTAGES:

1. Thickness (donor-host), profiles/shapes customization
2. Topical anesthesia
3. Less sutures (astigmatism?)
4. Wound integrity and resistance
5. Fast wound healing
6. Low complication / conversion rate

DISADVANTAGES:

1. Cutting plane ineffective in ectasia
2. Interface quality
3. Recovery time
4. Difficult cuts through severe opacity
5. Costs

Baradaran-Rafii A, BJO 2013 – Shehadeh Mashor R, Cornea 2013

Bofandini G, Cornea 2013 – Shousha MA, Ophthalmology 2011 – Lu Y et al, Int J Ophthalmol 2014

J Aliò, Biomed Res Intern 2015

Conclusions

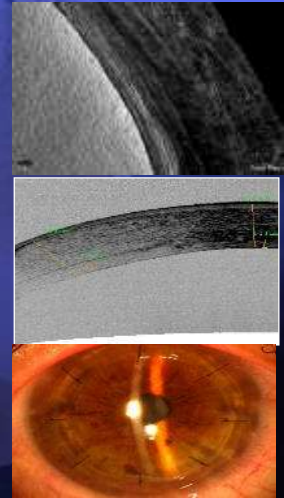
EDITORIALS

Is the Femtosecond Laser Worth It?

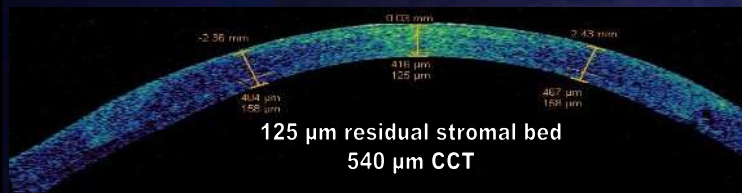
DAVID B. GLASSER

AJO 2012

1. FSL in refractive Surgery: proven to be Better and continuous evolution
2. Structural advantages over conventional KP but not proven benefits
3. New approaches possible with FSL (intrastromal surgery – SLAK)
Can offer new insights in corneal additive keratoplasty



**500 KhZ FSL DALK 400/350 microns
8.1 mm – 90° rim**



**Preop. Central stromal scar
20/200 BCVA**



**2 months postop.
20/40 BSCVA**