



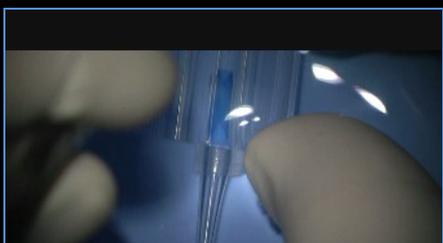
SISTEMA SANITARIO REGIONALE

AZIENDA OSPEDALIERA
SAN GIOVANNI ADDOLORATA



REGIONE
LAZIO

PREPARAZIONE DI LENTICOLI DMEK: TECNICA SCUBA (STRIPPING)



ROSSELLA A.M. COLABELLI GISOLDI
Azienda Ospedaliera
S. Giovanni Addolorata
Roma



PAVIA , 26 maggio 2018

PREPARAZIONE DEI TESSUTI IN EYE BANK

CERTIFICAZIONE DELLA QUALITA' DEL TESSUTO

CONTROLLO MICROBIOLOGICO

RIDUZIONE DEI TEMPI CHIRURGICI IN SALA OPERATORIA

La standardizzazione di una tecnica di dissezione del DESCOMET ENDOTELIO in grado di consentire la preparazione di tessuti di qualità , con un rischio di fallimento basso legato alla procedura , è essenziale sia per gli operatori di BANCA che per i chirurghi utilizzatori

Human Corneal Anatomy Redefined

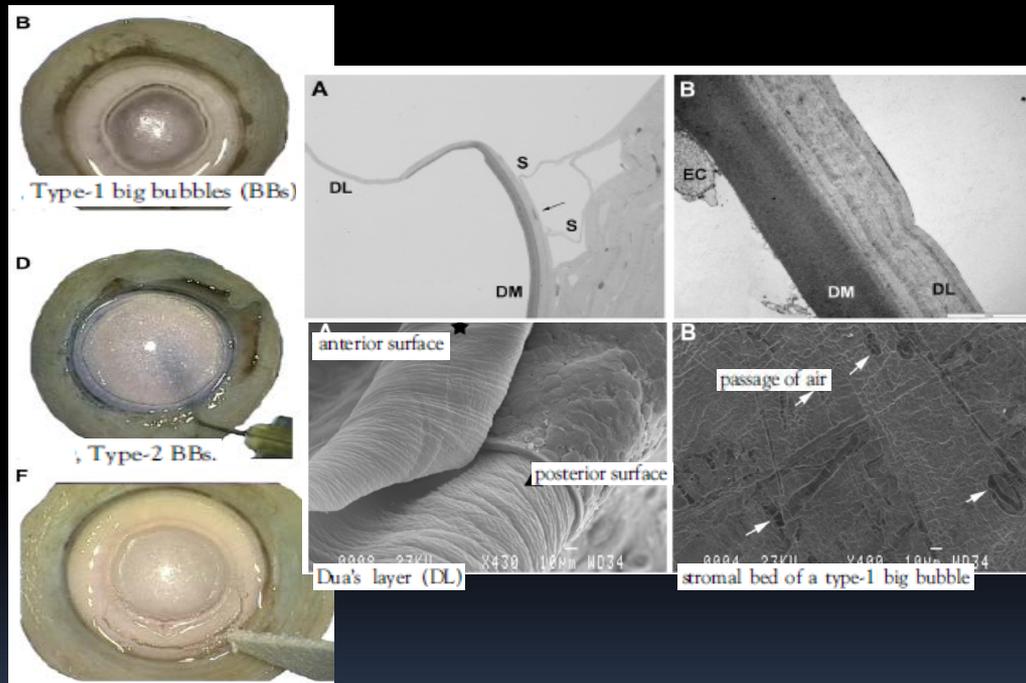
A Novel Pre-Descemet's Layer (Dua's Layer)

Harminder S. Dua, MD, PhD,¹ Lana A. Faraj, MD, MSc,¹ Dalia G. Said, MD, FRCS,¹ Trevor Gray, MSc,² James Lowe, MD, FRCPath²
Ophthalmology 2013;

Scrolling Characteristics of Pre-Descemet Endothelial Keratoplasty Tissue: An Ex Vivo Study

HARMINDER S. DUA, KAROLIEN TERMOTE, MOHAMED B. KENAWY, DALIA G. SAID, RAKESH JAYASWAL, MARIO NUBILE, LEONARDO MASTROPASQUA, AND SIMON HOLLAND

(*Am J Ophthalmol* 2016;166:84-90.)

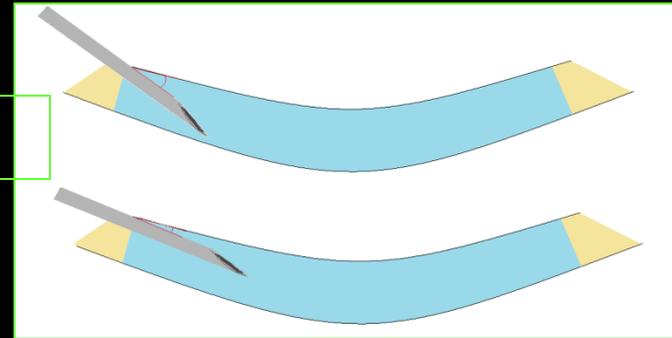


Possibilità di clivaggio tra descemet-endotelio e strato di DUA e tra Dua's layer e stroma profondo

TECNICHE DI PREPARAZIONE DI TESSUTI PER DMEK IN EYE BANK

❑ Dissezione manuale “STRIPPING”

❑ Dissezione pneumatica



❑ Idrodissezione

Muraine et al, American J. Ophthalmol. 2013
(Novel technique for preparation of corneal grafts for DMEK.)

Dissezione con cannula e BSS
dopo trapanazione su camera anteriore
artificiale
4% ECL 4% insuccesso



SUBMERGED HYDRO-SEPARATION METHOD

Descemet Membrane Endothelial Keratoplasty Tissue Preparation From Donor Corneas Using a Standardized Submerged Hydro-separation Method

MOHIT PAREKH, ALESSANDRO RUZZA, GIANNI SALVALAIO, STEFANO FERRARI,
DAVIDE CAMPOSAMPIERO, MASSIMO BUSIN, AND DIEGO PONZIN

(Am J Ophthalmol 2014;158:277-285..)

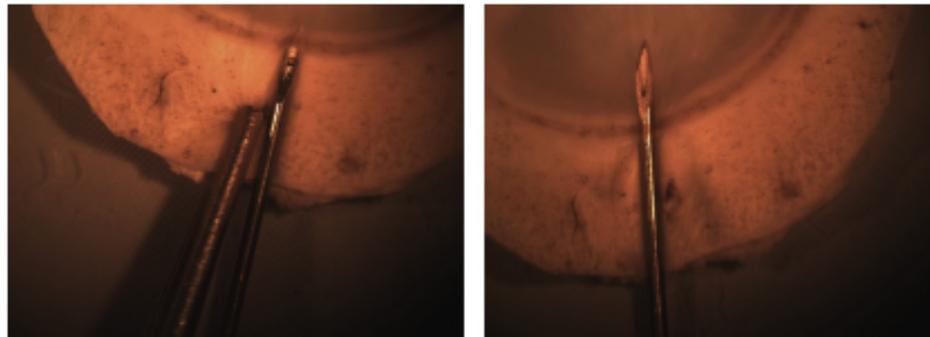


FIGURE 1. Descemet membrane endothelial keratoplasty lenticule preparation using submerged hydro-separation method: the insertion technique and site to create a liquid bubble. Human donor corneal sclera was fixed with a sterile forceps and the bevel of the needle was initiated beneath the trabecular meshwork (Left) and inserted until it was completely inside the cornea, considering it as a threshold point (Right).

DMEK..... STRIPPING

UN PO' DI STORIA.....

Melles 2006 Cornea (Descemet Membrane Endothelial Keratoplasty DMEK)

peeling manuale del descemet endotelio in BSS
4-7% mortalità endoteliale

Price and Giebel 2009 Ophthalmology : (Descemet's Membrane Endothelial Keratoplasty:
prospective multicenter study of visual and refractive outcomes and endothelial survival)

SCUBA technique

(cornea immersa in Optisol o BSS per diminuire la tensione superficiale)

Kruse 2011 Cornea: (Stepwise approach to donor preparation and insertion
increases safety and outcome of DMEK)

1% di insuccesso

DONOR AGE AND DM STRIPPING

Cornea 2014;33:683–685

Donor Tissue Characteristics in Preparation of DMEK Grafts

Ian R. Gorovoy, MD, Qi N. Cui, MD, PhD,* and Mark S. Gorovoy, MD†*

The few grafts in this series from patients younger than 50 years old were most likely to develop tight spontaneous scrolls and predispose to subsequent detachments postoperatively.

Sometime there is difficulty in graft peeling for both eye of the same donor. This notion speaks about the inherent adhesive qualities of the individuals' DM, its intercellular connective matrix, or the adjacent corneal stroma that undoubtedly exist.

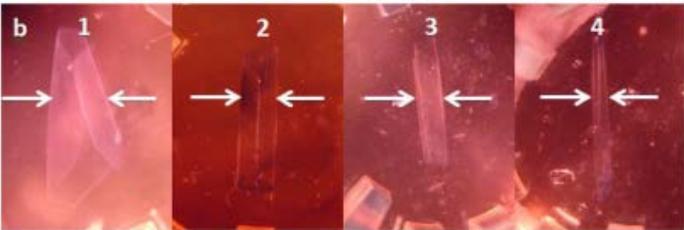
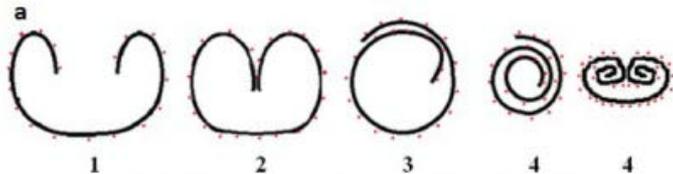


THE AUTORS SUGGEST THAT GRAFTS FROM DONORS YOUNGER THAN 50 YEARS SHOULD NOT BE USED IN DMEK, BUT INSTEAD BE RESERVED FOR DSAEK OR PK

**DIABETIC DONORS HAD INCREASED RISK OF DESTRUCTION BY TEARING DURING THE PRE-STRIPPING PROCESS
INCREASE IN THE ADHESIVE GLYCOPROTEINS IN THE INTERFACIAL MATRIX BETWEEN DM AND STROMA ??**

DONOR AGE AND SCUBA TECHNIQUE IN DMEK

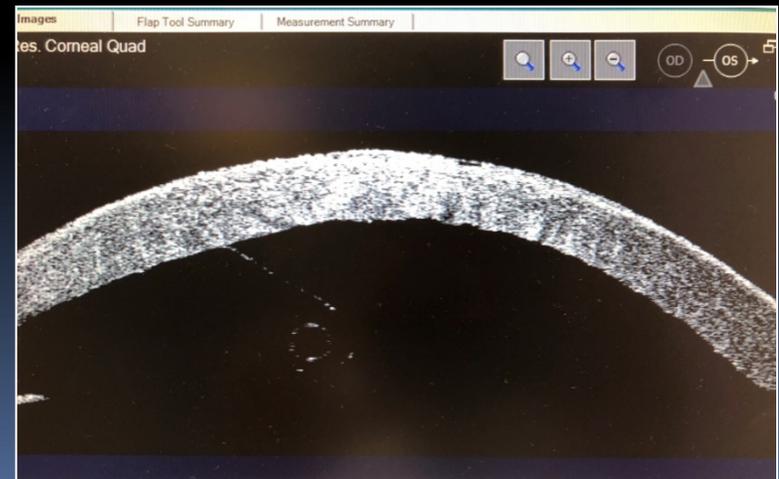
Tissue from donors older than 65 years old peels faster, and this advantage is related to deposition of the posterior non-banded layer of DM



The grafts from donors younger than 50 years should not be used in DMEK but reserved for DSAEK or PK

Cornea 2014;33:683-685

**Complete DM detachment
Tissue from 54 years old donor**



TECNICA SCUBA

- ❑ stripping con spatola dal reticolo trabecolare
- ❑ stripping con ressi periferica dell'endotelio con uncino di SINSKEY o con lama 15°
- ❑ stripping con punch da 10 mm di diametro a 100 microns di profondità (MORIA)
- ❑ manovra bimanuale di stripping con suzione su punch

Moria
Leading Innovations in Ophthalmology



PREPARAZIONE DEL ROLL

IN BANCA DEGLI OCCHI

ETA' DEL DONATORE > 55 anni

LO STRIPPING SI ESEGUE:

NEI TESSUTI CONSERVATI A CALDO, dopo 48 ore di Carry-C

NEI TESSUTI CONSERVATI A FREDDO , dopo valutazione morfologica e ,
se necessario, dopo trasferimento in THIN C 1-4 ore

TECNICA SCUBA (preparazione di lenticoli per DMEK)

PNEUMODISSEZIONE (BOLLA tipo 1 per PDEK e tipo 2 per DMEK)

TECNICA SCUBA



Scollamento per STRIPPING
del DESCOMET-ENDOTELIO
dal sottostante strato di DUA

Validazione con tessuti non idonei
Mortalità endoteliale indotta < 2%

ECD PRE



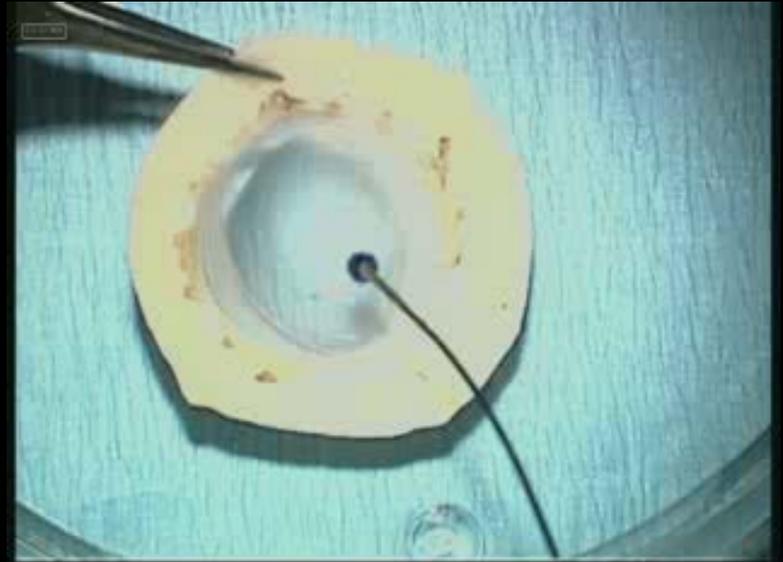
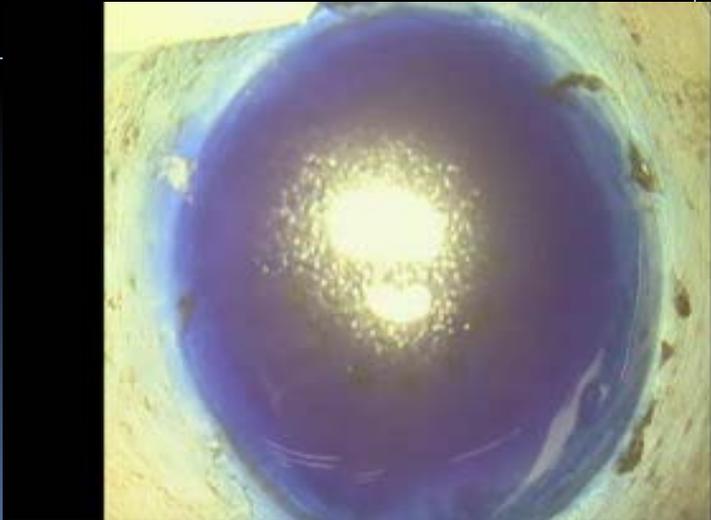
ECD POST



TECNICA SCUBA

Materiale di consumo

Telino sterile
Lama 15° , uncino o punch MORIA
Tripán Blu
Asciughini
Forbici ad anello
2 pinze serratili / 1 pinza di Mc Pherson
1 pinza di HOSKIN
Carry C
Galleggiante

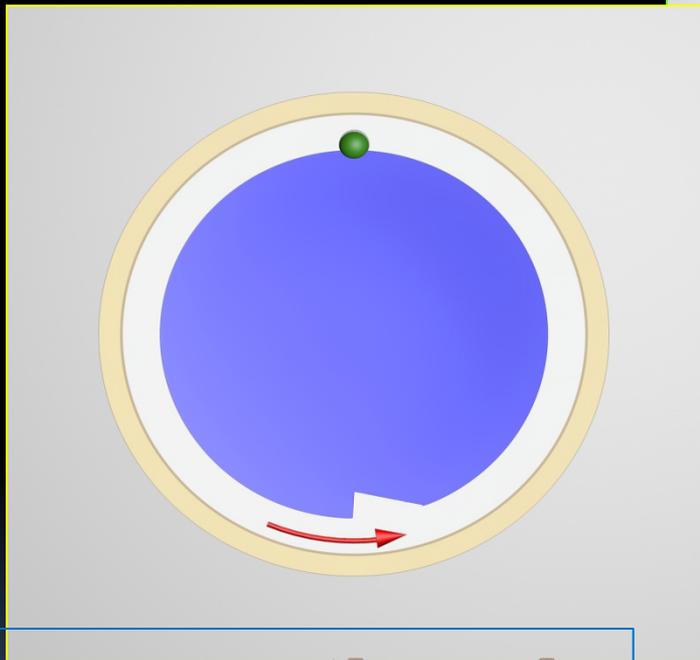


Use of a single peripheral triangular mark to ensure correct graft orientation in Descemet membrane endothelial keratoplasty

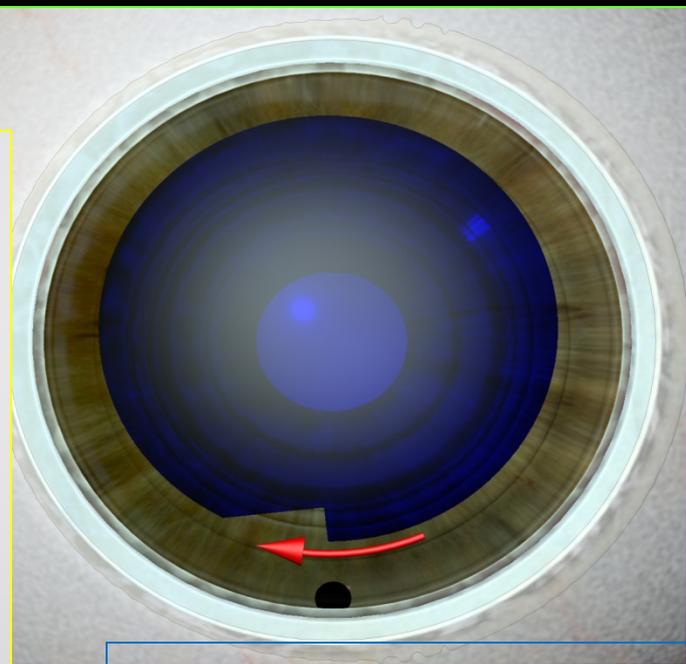


*Maninder Bhogal, MB BS, FRCOphth,
Vincenzo Maurino, MD,
Bruce D. Allan, MD, FRCS, FRCOphth*

MARCATURA DEL LENTICOLO



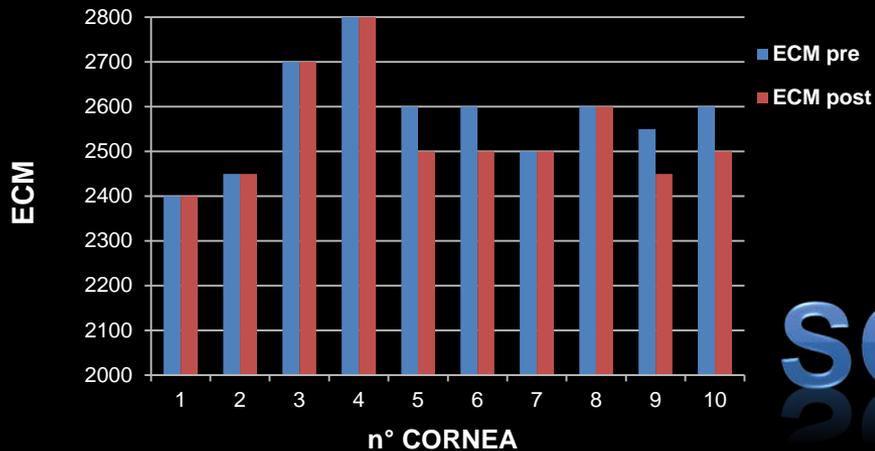
Senso antiorario



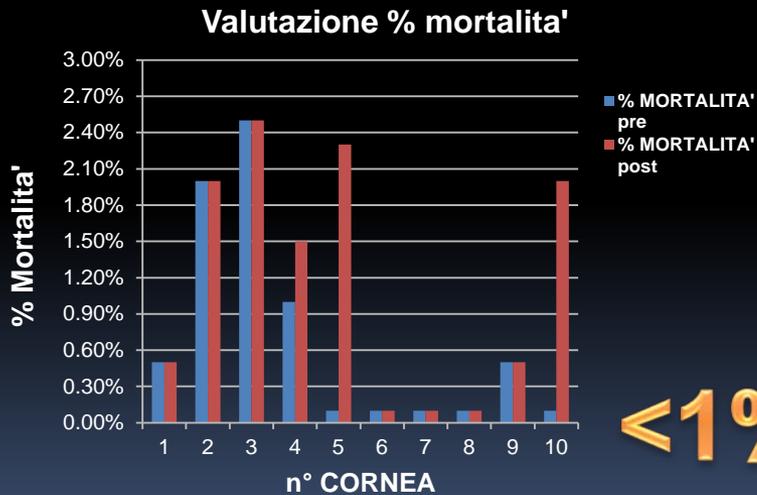
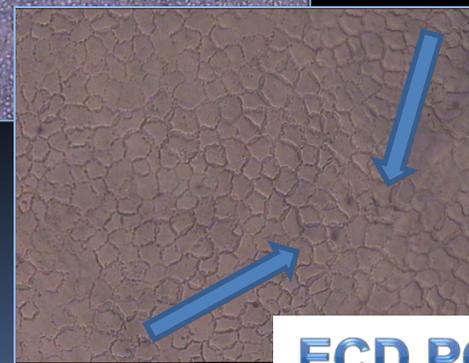
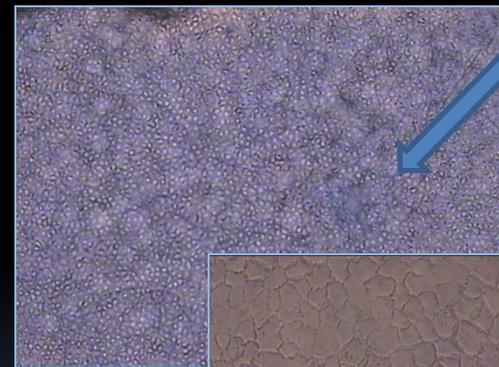
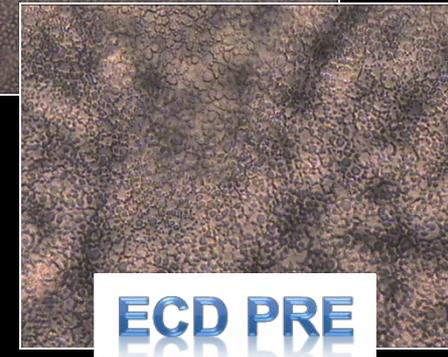
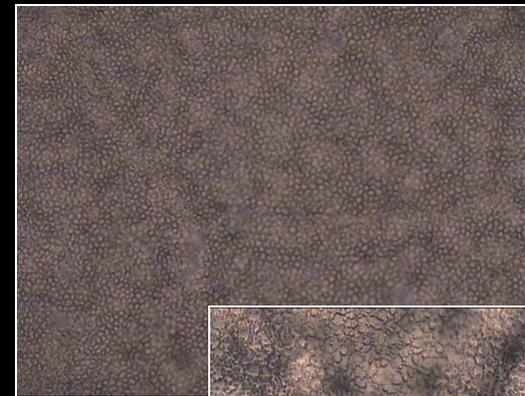
Senso orario

La marcatura consente di evitare il fenomeno dell' « upside down »

1) VALUTAZIONE DEL DANNO ENDOTELIALE INDOTTO STEROMICROSCOPIA



SCUBA



<1%

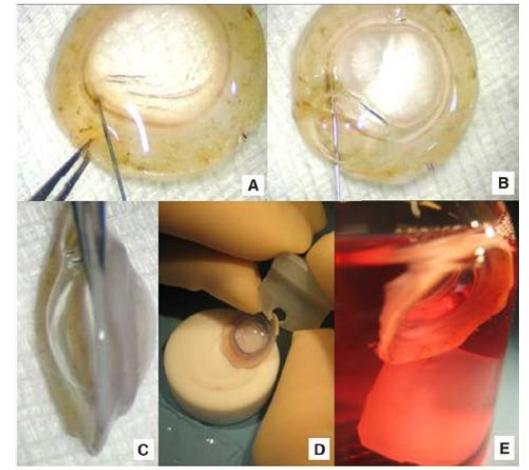
Età media del donatore 70,4 anni

Pneumatic Dissection and Storage of Donor Endothelial Tissue for Descemet's Membrane Endothelial Keratoplasty

A Novel Technique

Massimo Busin, MD,^{1,2,3} Vincenzo Scorcia, MD,^{1,2} Amit K. Patel, FRCOphth,^{1,3} Gianni Salvalaio, RN,³ Diego Ponzin, MD³

Ophthalmology Volume 117, Number 8, August 2010



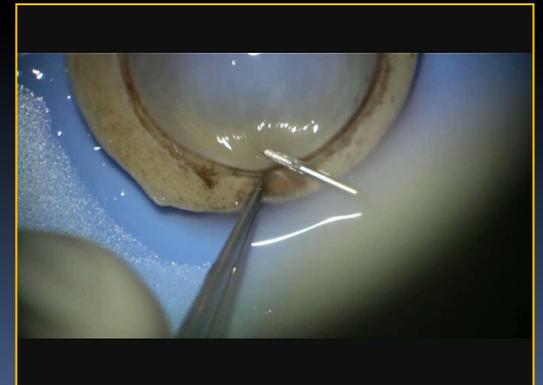
**ENDOTHELIAL CELL LOSS AFTER 7 DAYS
OF TISSUE CULTURE MEDIUM STORAGE WAS
4.4+/- 4.3%**



DUA'S CLAMP



Bolla tipo 1 PDEK



Bolla tipo 2 DMEK

2) CONTROLLO MICROBIOLOGICO SU TERRENO DI TRASPORTO

Per monitorare una eventuale contaminazione del tessuto indotta dalla procedura si esegue esame colturale su CARRY-C 4 ore dopo la preparazione del roll

Il lembo per DMEK è utilizzabile fino a 48 ore dopo la preparazione in Banca Occhi

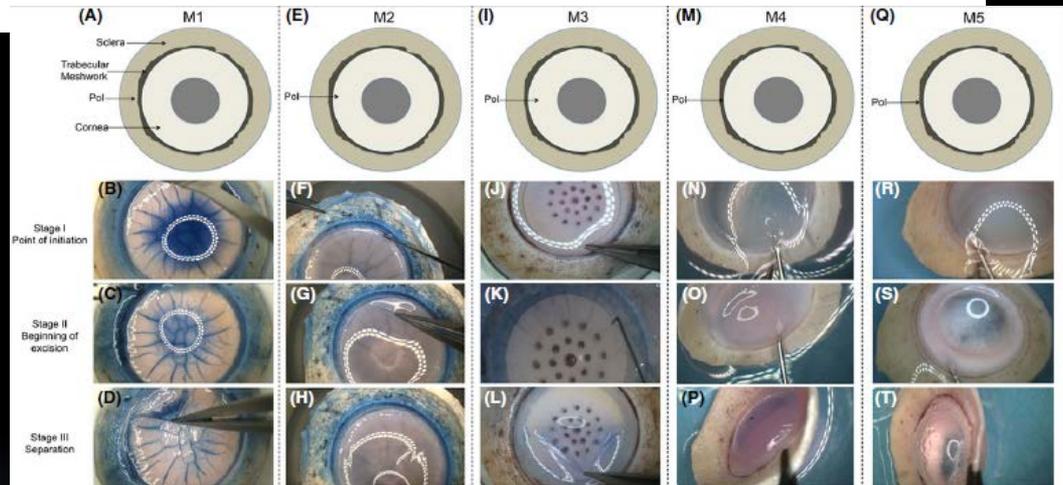


Il certificato che accompagna il lembo indica la tecnica di preparazione e il diametro utilizzabile dal chirurgo

A comparative study on different Descemet membrane endothelial keratoplasty graft preparation techniques

Mohit Parekh,¹ Davide Borroni,^{2,3} Alessandro Ruzza,¹ Hannah J Levis,⁴ Stefano Ferrari,¹ Diego Ponzin¹ and Vito Romano⁵

**metodiche
a confronto:**



Le tecniche di pneumodissezione sono le più rapide

Il danno endoteliale indotto è maggiore nella pneumodissezione

La procedura con punch di MORIA è la più costosa

PROSPETTIVE FUTURE.....

DMEK



DALK



**....è ipotizzabile l'utilizzo routinario
di una cornea per 2 riceventi?**

Grazie per l'attenzione

Descemet Membrane Endothelial Keratoplasty (DMEK) Tissue Preparation: A Donor Diabetes Mellitus Categorical Risk Stratification Scale for Assessing Tissue Suitability and Reducing Tissue Loss

Ryan S. Williams, CEBT,* Zachary M. Mayko, MS,* Daniel J. Friend, MS,†
 Michael D. Straiko, MD,‡ Ryan D. Clay, MD,§ and
 Christopher G. Stoeger, MBA, CEBT*

(Cornea 2016;35:927–931)

TABLE 1. Diabetes Risk Categorization Tool

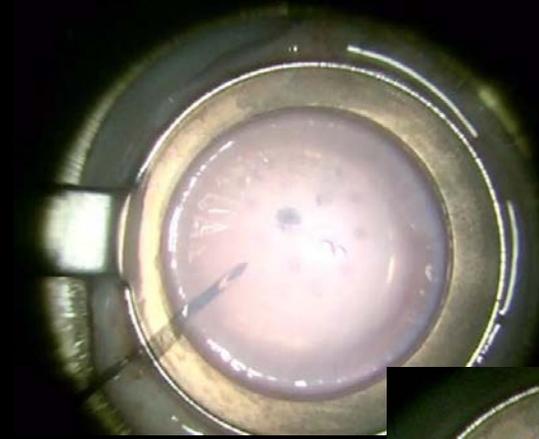
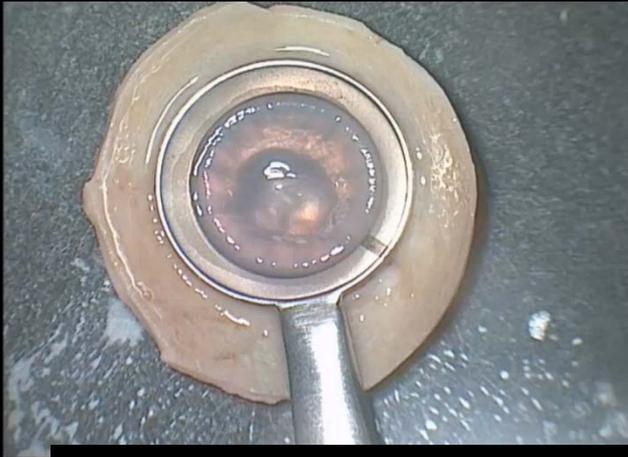
Found in Donor History	Point Value Assigned
Any history of DM	1
Body mass index >30 kg/m ²	1
HTN	1
Any one of the following:	2
DM history lasting at least 10 yrs, DM type 2 with outpatient insulin dependence, or DM diagnosis with related comorbidities	
Possible comorbidities:	
• Nerve damage (neuropathy): diabetic neuropathy	
• Kidney damage (nephropathy): CKD	
• Eye damage (retinopathy): diabetic retinopathy	
• PVD	
• DM-related amputation	

CKD, chronic kidney disease; PVD, peripheral vascular disease.

TABLE 2. Diabetes Risk Categorization and Failure Rates

	DM Rating					Total
	1	2	3	4	5	
Pass	8	25	29	20	25	107
Fail	1	0	2	4	11	18
Total	9	25	31	24	36	125
% of DM pool	7.2	20	24.8	19.2	28.8	100
Failure, %	11.1	0.0	6.5	16.7	30.6	14.4 (average)
Odds ratio	Decreased by a factor of 0.28	*	Decreased by a factor of 0.16	Decreased by a factor of 0.45	Decreased by a factor of 0.44	Odds ratio for graft failure for entire cohort: 0.168
Odds ratio P; 95% CI	0.261; 0.03–2.56	0.998;*	0.023; 0.03–0.77	0.23; 0.13–0.76	0.023; –0.27 to 1.15	—

BOLLA TIPO 1 CON CLUMP



La tecnica di pneumodossezione con Bolla tipo 1 per PDEK non comporta un danno endoteliale statisticamente significativo

(Agarwal A, et al Br J Ophthalmol 2014)
(Altaan SL et al., Br J Ophthalmol 2015)



COME PREPARARE IL LEMBO PER LA DMEK



ROSSELLA A.M. COLABELLI GISOLDI
Azienda Ospedaliera
S. Giovanni Addolorata
Roma

Roma, 23 Novembre 2016