

NIIOS Newsletter

Netherlands Institute for Innovative Ocular Surgery

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REFERRALS TO MELLES CORNEA CLINIC ROTTERDAM

For referrals to Melles Cornea Clinic Rotterdam, please use the referral form enclosed, or download it from www.nijos.com. Please fax the referral form to +31 10 297 4440 and one of our international secretaries will make further arrangements.

To contact us by e-mail, please write to info@corneaclinic.nl.

Post-mortem specimens give unique insight in transplant adherence mechanism

How does a DMEK graft stick to the recipient cornea?

In modern corneal transplantation, instead of excising the entire cornea over its full thickness, only the diseased layer is removed and replaced by donor tissue. In conventional penetrating keratoplasty, sutured apposition of the graft was mandatory to keep the tissue in place. However, the hallmark of the new lamellar transplant techniques is that the graft adheres to the recipient cornea without the use of synthetic fixation materials. The body's help is taken for granted, and little is known about the mechanism through which the donor tends to stick to the overlying recipient tissue. Why does it not simply fall off? It would seem to be an event far more likely to occur...

To determine the interaction between donor and recipient tissues, NIIOS started a research program to investigate the anatomy of the interface in post mortem human eyes. Patients were routinely requested to donate their DMEK eyes for microscopic analysis after death, and (luckily with the vast majority of our patient population still being alive and kicking) the first two specimens were received in 2014.

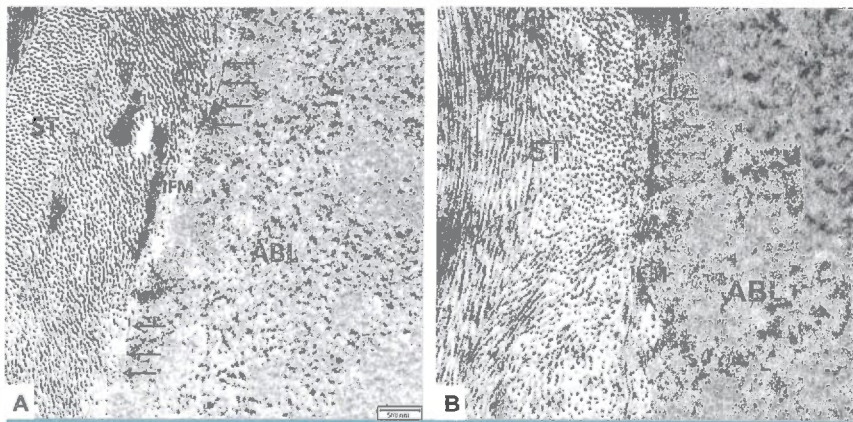
Light and transmission electron microscopy of these tissues revealed that so called 'anchoring fibers' were present at the donor-to-host junction. The interface appeared to be amazingly similar in eyes with or without prior surgery. From a clinical point of view this may be excellent news, since it would then seem highly unlikely that a Descemet graft would ever detach once these anchoring fibers have been laid down; spontaneous detachment of a naive Descemet membrane may never occur.

But from a scientific point of view our observations may have generated even more puzzling questions because the production of new collagen fibers would suggest a subtle collaboration between the transplanted donor endothelial cells and the stroma fibroblasts... across the donor Descemet membrane sitting in between.

Livny E, Parker JS, van der Kaaij M, Haasdijk ED, van der Wees J, Bruinsma M, Melles GRJ. Post-mortem ultra-structural analysis of a cornea transplanted with Descemet membrane endothelial keratoplasty (DMEK). *Cornea* 2014;33:790-4.



(Top) Light microscopy of a DMEK cornea two years after surgery. The donor Descemet membrane shows normal adherence (arrows; partial splitting occurred during tissue processing (*)). With transmission electron microscopy, anchoring fibers (arrows) are visible in the interfibrillar matrix (IFM) between the recipient stroma (ST) and the anterior donor Descemet membrane (ABL), in both an unoperated (lower-left) and DMEK eye (lower-right).



Please note our NIIOS LinkedIn profile, with information on publications and upcoming meetings

NETHERLANDS INSTITUTE FOR INNOVATIVE OCULAR SURGERY



WWW.NIIOS.COM

Cornea & Research fellows 2014



Left-to-right:

Eitan Livny, Israel; Maria Satué, Spain; Bharath Kumar Raghuraman, India; Jack Parker, USA; Ester Fernández, Spain

NIOS scientific articles 2013/2014

2013

- Mohr A, Bruinsma M, Oellerich S, Frank H, Gabel D, Melles GRJ. Dyes for eyesTM: Hydrodynamics, biocompatibility and efficacy of 'leaky' dyes for chromophore-free Ophthalmologica 2013;239(suppl 2):57-61.
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- van Dijk K, Ham L, Tse WHW, Liarakos VS, Quilendrin R, Yeh RY, Melles GRJ. Near complete visual recovery and refractive stability in modern corneal transplantation: Descemet membrane endothelial keratoplasty (DMEK). Cornea 2013;32:240-1.
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NIOS staff writes textbook on 'Standardized No-touch DMEK'

NIOS textbook on DMEK

Foreword

P Binder

Preface

G Melles

1. Introduction to endothelial keratoplasty

I Dapena, L Ham

2. Indications for DMEK surgery

V Liarakos, I Dapena

3. 'No-touch' donor tissue preparation for DMEK

M Bruinsma, E Groeneveld-van Beek, J Lie, K Mangundap, C van Luijk, J van der Wees

4. 'No-touch' DMEK surgical technique

I Dapena, V Liarakos, L Baydoun, P Ciechanowski, E Livny, FC Lam

5. Surgical considerations for challenging DMEK cases

V Liarakos, I Dapena

6. Novel DMEK surgeons' outcomes and complications

K Drouzas, C Monnerau, M Naveiras, C Balachandran, J Cabrerizo, M Dirisamer

7. Diagnostic imaging techniques after DMEK

S Oellerich, L Ham, V Bourgonje, K Moutsouris

8. DMEK clinical outcomes

K van Dijk, L Ham, H van Esch, P Leeuwenburgh, M Rodriguez, L Baydoun

9. DMEK complications

J Parker, R Quilendrin, RY Yeh, M Naveiras, M Dirisamer

10. DMEK and lens disease

L Baydoun, F Musa, J Parker

11. Repeat DMEK

L Baydoun, I Dapena

12. Clinical approach to future therapies in endothelial disease

I Dapena, K Drouzas, FC Lam, M Bruinsma

13. Clinical case examples

C Monnerau, L Ham, V Bourgonje, M Satué, C Tong, I Dapena

14. Frequently asked questions

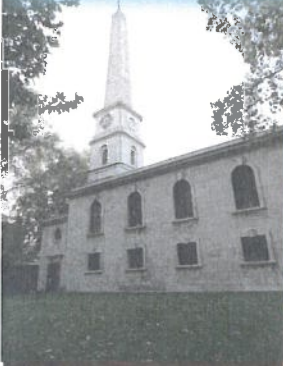
M Rodriguez, P Ciechanowski, A Miron

15. Netherlands Institute for Innovative Ocular Surgery (NIOS)

S Oellerich, K Herders, J van der Wees, D Zomot, C de Kort

16. Patients' personal experiences with DMEK

C de Kort, V Bourgonje



NIIOS organizes yearly DMEK meeting
DMEK evening on Friday preceding 2014 ESCRS

DMEK may currently gain worldwide interest and a growing number of corneal surgeons appears to be making the switch from penetrating keratoplasty or Descemet stripping (automated) endothelial keratoplasty (DSEK/DSAEK) to Descemet membrane endothelial keratoplasty (DMEK). To further support all these colleagues with starting out successfully with DMEK, NIIOS has been organizing dedicated satellite meetings preceding ophthalmic congresses.

At this year's NIIOS meeting before the ESCRS congress in London, the major topics in Descemet graft preparation and the DMEK surgical technique were addressed by NIIOS staff members and (former) fellows. The NIIOS textbook on DMEK was launched and the new set up of 'live-video streaming' of DMEK surgeries performed in Rotterdam was presented. The evening may also have given DMEK surgeons the opportunity to meet each other, to exchange tips and tricks among themselves.

Dr Moutsouris 2015 president NIIOS alumni

With the group of ex-fellows who studied at NIIOS enlarging, the activities and interest of the alumni group are also steadily growing. To channel next year's activities, Dr Moutsouris (NIIOS cornea fellow February through September 2009) was elected president for 2015.



On September 12th, 2014, a NIIOS meeting on DMEK followed by a classical music concert, took place in LSO St Luke's in London (top left). With about 250 people attending, former NIIOS fellows and staff members (Martin Dirisamer, top middle; and Peter Ciechanowski, Marina Rodriguez Calva de Mora, Miguel Naveiras, Jack Parker, Eitan Livny, and Isabel Dapena; left hand column) gave presentations on the current topics in DMEK surgery. Kyros Moutsouris was chosen 2015 president elect of the NIIOS alumni (right hand column, top and bottom), and the evening was concluded with two piano concerts played by Tobias Haunhorst with the Arch Sinfonia orchestra (right hand column, middle).

NEW



**Patient compares DALK (right eye) with Bowman layer transplantation (left eye)
“Life after Bowman layer transplantation”**

Mr Visser, a 39-year old industrial designer, underwent deep anterior lamellar keratoplasty (DALK) in the right eye, and Bowman layer transplantation (BLT) in the left eye for advanced keratoconus.

What problems were you having before your surgery?

“I was wearing these little hard contact lenses and I really had trouble with painful eyes. But elsewhere they told me it was the only way to deal with this problem. At some point my girlfriend urged me to search the internet for another solution, and that is how we found Melles Cornea Clinic. In the right eye a lamellar transplant was performed, which gave me a much better visual acuity, and a new kind of contact lens was fitted. Instead of a small lens, I am wearing a larger ‘scleral’ lens”

What has that been like?

“It’s unbelievable. I used to do windsurfing but I stopped because I couldn’t see well with glasses and I was losing my contact lenses all the time. With the scleral lenses I could windsurf again, and just recently I went to St. Martin in the Dutch Caribbean islands for that. Also, I picked up Aikido and Judo again: with the scleral lenses that works out well! It’s a really big improvement.”

How about the Bowman layer transplantation in your other eye?

“My left eye also had keratoconus, it wasn’t as severe, but it was also unstable. So at the Cornea Clinic they suggested to do a tissue sparing type of surgery, that allows you to keep your own cornea; only a very thin splint is implanted to lessen the keratoconus and to stabilize it. About three years ago I had the surgery done in my left eye. The operation was much quicker and the aftercare is easier: for example, there are no stitches that have to be removed. Now I have a good chance the situation which occurred in the right won’t happen in the left.”

And what would you say about your time at the NIIOS?

“They’re really experts. They really know what they’re doing, and the whole vibe is supergood. They train people and they want to share the knowledge and I truly like that. Also, the people are really nice. You certainly get good treatment.”

Live-video streaming of DMEK surgeries performed in Rotterdam

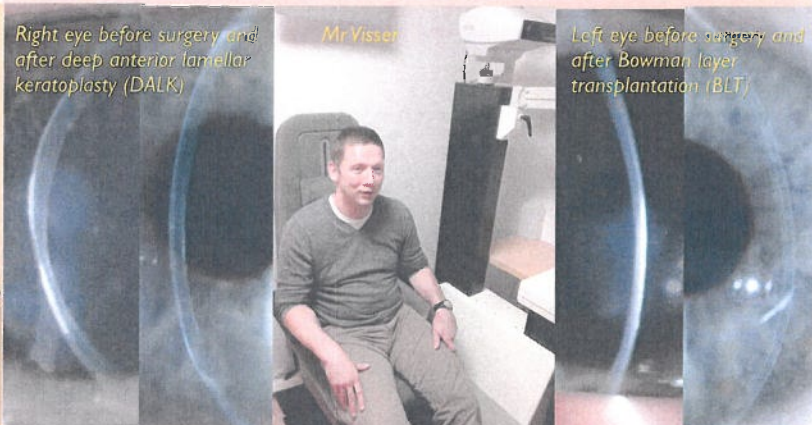
Descemet membrane endothelial keratoplasty (DMEK)

Sessions are scheduled on Tuesdays and Thursdays from ±9 am through ±4 pm (+1h Greenwich Time). Participants receive live images of the surgical microscope and side tables and can chat (verbally or by typing) with the surgical staff during surgery.

Further information and applications: dekort@nijos.com

- ☞ DMEK live-video stream: Nov. 20, 2014
- ☞ DMEK live-video stream: Feb. 12, 2015
- ☞ DMEK live-video stream: Mar. 12, 2015

Level: Corneal fellows and surgeons



Two-day advanced Keratoplasty wetlab courses in Rotterdam

Descemet membrane endothelial keratoplasty (DMEK)

Each course is scheduled on a Tuesday/Wednesday. On Tuesdays, the course participants join live surgery sessions; on Wednesday, various techniques are practised during educational wetlab sessions and patient demonstrations.

Further information and applications: dekort@nijos.com

- ☞ DMEK surgical course: Feb. 10/11, 2015 (before Winter ESCRS)
- ☞ DMEK surgical course: March 10/11, 2015
- ☞ DMEK surgical course: March 31 / April 1, 2015
- ☞ DMEK surgical course: June 2/3, 2015

Course level: Corneal fellows and surgeons

One-day advanced Eye Banking wetlab courses in Rotterdam

Tissue harvesting techniques for Descemet membrane endothelial keratoplasty (DMEK)

Each course is scheduled on a Friday. Various techniques are demonstrated and practised during educational wetlab sessions and changing eye bank logistics will be discussed.

Further information and applications: dekort@nijos.com

- ☞ DMEK eye bank course: Feb. 6, 2015
- ☞ DMEK eye bank course: Apr. 10, 2015

Course level: Senior eye bank technicians