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NIIOS Cornea Evening
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Preliminary results of Quarter-DMEK: A next step in endothelial keratoplasty?

Early postoperative outcomes seem to mimic those of conventional DMEK

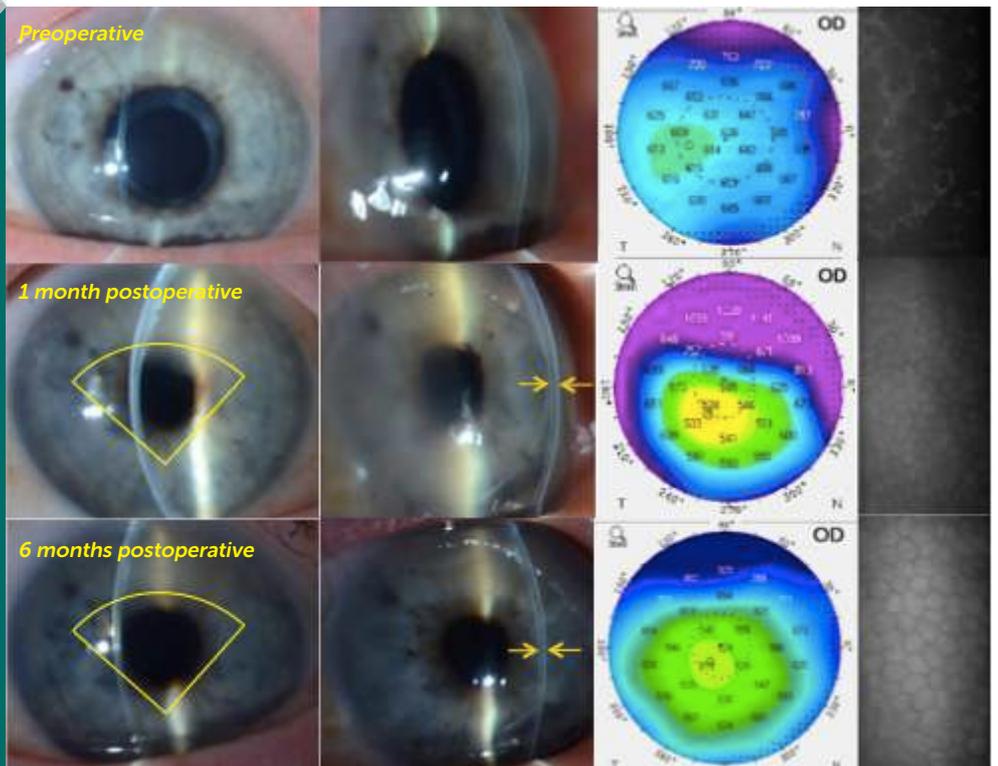
Conventional Descemet membrane endothelial keratoplasty (DMEK), ie. a technique designed by NIIOS for the transplantation of an isolated 8.0 to 9.5mm circular donor Descemet graft carrying viable endothelium, may be the most advanced corneal transplantation technique currently available in the treatment of corneal endothelial disorders like Fuchs endothelial dystrophy and bullous keratopathy. Although the technique may be slightly more challenging than Descemet stripping endothelial keratoplasty (DSEK), a technique previously designed by NIIOS, corneal surgeons around the world are now converting from DSEK to DMEK. Making the switch seems worthwhile because of the better visual outcomes in DMEK while the surgical technique feels more elegant and better controlled in comparison with DSEK.

**Quarter-DMEK:
a new hybrid
technique
between
DMEK and DMET**

At the same time, evidence is mounting that host peripheral endothelial cells may still have potential in re-populating the cornea. A first indication for this regenerative capability came from the clinical observation that virtually all Fuchs dystrophy eyes that suffered from a subtotal graft detachment after DMEK, surprisingly showed near complete restoration of corneal transparency, with - despite persistent detachment - visual recovery up to 20/20 (1.0). Since clearance did not occur with detachments in post-DMEK eyes operated on for bullous keratopathy, we introduced the concept of Descemet membrane endothelial transfer (DMET) and we questioned whether Fuchs endothelial disease is a 'dystrophy', because the latter

Continued on page 2 →

Slit-lamp, pachymetry and specular microscopy images of an eye before and at 1 and 6 months after Quarter-DMEK. The cornea shows a clearance pattern similar to that after conventional DMEK.



REFERRALS TO MELLES CORNEA CLINIC

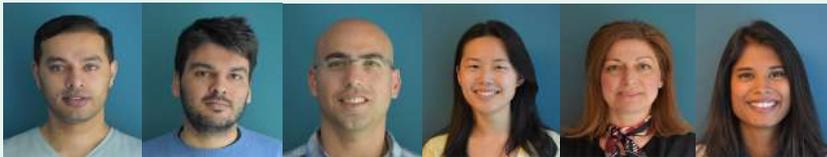
For referrals to Melles Cornea Clinic Rotterdam, please use the referral form enclosed, or download it from www.niios.com.

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: info@corneaclinic.nl.



Cornea & Research fellows 2016 / 2017



From left to right: Abbas Ilyas, Netherlands; Daniele Spinozzi, Italy; Itay Lavy, Israel; Shugi Hsien, Netherlands; Vasiliki Zygoura, Greece; Rénuka Birbal, Netherlands

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2017

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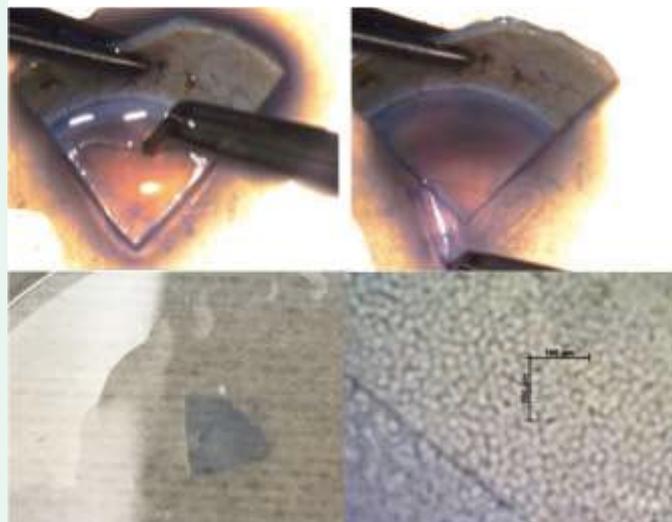
term implies an irreversible tissue condition that would not agree with nearly complete endothelial wound healing.

In 2009, most scientific ophthalmic journals were not yet open for the idea to reconsider a well established disease entity like Fuchs endothelial dystrophy. However, since then investigators independently from each other started to report similar observations of spontaneous corneal clearance after detached DSEK and DMEK, and more recently, several groups have described endothelial repopulation of the host cornea after 'descemetorhexis only', which may be indicative that in a percentage of Fuchs dystrophy eyes, host endothelial cells may have regenerative capacity, rendering the term 'dystrophy' questionable, if not obsolete. From a clinical point of view, however, endothelial repopulation may occur at a rather slow rate, and although effective, the sometimes long standing corneal edema proved difficult to manage for both corneal surgeons and their patients.

Entertaining the idea that the endothelial cells in Fuchs eyes are not dystrophic, NIOS R&D expanded on this concept by modifying our conventional DMEK technique such that both the advantage of conventional, large diameter, circular DMEK (visual recovery within weeks) and that of DMET (slower host peripheral endothelial wound healing) were combined. By transplanting only a quarter of a full-diameter donor Descemet membrane - with a graft surface area similar to that of a 6.0mm circular graft - the central cornea may show deturgescence with the corneal thickness quickly returning to normal, while the paracentral corneal area may be repopulated with host endothelial cells. As such, the antigen load may be reduced, potentially further minimizing the risk of allograft rejection after Quarter-DMEK (compared to conventional DMEK). Furthermore, with Quarter-DMEK the yield of transplants from the same donor pool would potentially quadruple.

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A Quarter-DMEK graft as it is produced in Amnitrans Eye Bank Rotterdam





NIIOS R&D | NIIOS ACADEMY | AMNITRANS EYEBANK | MELLES CORNEA CLINIC

IN FOCUS

- INNOVATIONS
- OPTIMAL DONOR TISSUE USE
- FOR CORNEAL PATIENTS

WHAT'S HAPPENING

NIIOS USA
NIIOS has opened a branch office in San Diego, California. Since June 2016 NIOS USA Inc. is a fact!

NIIOS USA and NIOS Cornea Evenings 2017
Educational evenings that will coincide with the start of the ASCRS (Los Angeles) and the ESCRS (Ljubljana).

Ophthalmologist Power List 2016
Dr. Melles is ranked number 11 in the Ophthalmologist Power List 2016. The list contains the 100 most influential people in ophthalmology.

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→ Textbook on DMEK
→ Live Video Streaming DMEK Surgeries
→ DMEK Wetlab Courses
→ Advanced DMEK Wetlab Courses
→ DMEK Wetlab Courses in the US
→ Advanced Keratoconus Wetlab Courses
→ Custom DMEK Courses for Eye Bank Professionals

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NIIOS launches new website

Website now search engine seductive, bot proof, self hacking, mobile friendly and deep net supported

The late NIOS website was created in 2006, a time in which most organizations were satisfied with a simple, static website that was functional and efficient. But after ten years of flawless performance and up to 2,500 visitors a day, one of NIOS' staff members, Kim Herders, was consumed by the idea that upgrading was mandatory. She could no longer live with the skeuomorphism, an environment void of vectors and without clearly defined CMYK or RGB values, while the interface was not responsive, lacking a masonry grid, let alone a metro design, and why did the reader have to search under the fold using infinite scrolling and why did nobody acknowledge the need for white space? Fortunately, all her worries have now been addressed and as a result a website emerged that gravitates to the center of the virtual world, with pages that fulfill the most basic desires of both eye doctors and their patients.

NIIOS' newly designed home page at www.nios.com

"A disease like this ruins more than just your eyesight"

Mr. Thierry Stern wanted treatment 'from the best'

Blind in one eye, vision failing in the other... it's a true nightmare. A nightmare that was to become reality for Mr. Thierry Stern from Switzerland this year. Mr. Stern is the president of an international company and his eyesight affected his work. "It's very hard to run a large corporation when you can't read! But most of all I felt terrible for my children. 'Want to play ball, dad?' I couldn't even see the ball anymore!" An operation at the Melles Cornea Clinic improved his ability to see and stabilized his situation.

Mr. Stern has had poor eyesight all his life. He was born with glaucoma and developed buphthalmia, a condition that causes the eye to enlarge. "I was the first baby in the world to have laser surgery—the machine they used had just been built! If I'd been born a week earlier, I'd be blind." In short, Mr. Stern was used to seeing poorly. "I'd learned to live with it; I didn't know any better, and life marches on either way." That changed at age 43, when his sight began to worsen. "I'd gotten a little lazy with my eye drops. I really want to warn people about that: use your eye drops! Even if you only have ten percent of your sight left. That ten percent makes a world of difference." His right eye could be saved; his left was lost.



The master

"I learned to live with that, too," Mr. Stern says. "That's just how I am." But two years later, his vision started fogging up from time to time. "It was like I was sitting in a steam room! It started out as half an hour in the morning, but within a few weeks I couldn't see a thing until after lunch." Mr. Stern turned out to have edema in his remaining good eye. "It ruined more than just my vision. It made me sad and unsure of myself. I literally saw no point anymore, and of course my wife and children could sense that."

His own ophthalmologist claimed nothing could be done, but Mr. Stern didn't take no for an answer. He visited doctors in Geneva and Paris and kept searching the web (with the text set to extra large on his iPad). "Finally, I heard from several doctors about Dr. Gerrit Melles and his clinic in Rotterdam. This was my last remaining eye, so I was absolutely unwilling to take any more risk than I had to. As the inventor of DMEK, Dr. Melles is obviously the grand master of the technique. I decided that I wanted him to treat me."

Trust

Mr. Stern was impressed by the time Dr. Melles took to thoroughly explain the procedure to him. "He's an exceptionally pleasant, practical man who cares about his patients. I trusted him instantly." Mr. Stern weighed the pros and cons, and on June 16, 2015 he underwent the DMEK procedure, in which the inner layer of his diseased cornea was replaced. "Three days later, my vision was back to 20/30, the level it had been before the fogging! I could see the ground beneath my feet again. I saw the leaves on the trees, raindrops, a painting. I had forgotten how much I used to be able to see, and it was wonderful to have it back!"

For the time being, Mr. Stern must return to Rotterdam for regular checkups, but his eye is stable. "I can do my work again, play ball with my children, and I've even taken up skiing again. I do have to keep using my eye drops, but of course I do that faithfully now." By telling his story, he hopes to encourage others to never give up. "Science is advancing so quickly. So always keep searching for an answer, just as I did."



Advanced keratoplasty wetlab courses in Rotterdam, The Netherlands

Bowman layer transplantation for advanced keratoconus & Descemet membrane endothelial keratoplasty (DMEK)

DMEK course are 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 are given. Bowman layer wetlabs are given on Thursday.

Further information and applications: dekort@nios.com

- Bowman layer surgical course: February 9, 2017
- Beginner DMEK surgical course: April 11/12, 2017
- Advanced DMEK surgical course: April 13, 2017
- Beginner DMEK surgical course: May 16/17, 2017
- Bowman layer surgical course: June 29, 2017
- Beginner DMEK surgical course: September 5/6, 2017
- Advanced DMEK surgical course: September 7, 2017

Course level: Corneal fellows and surgeons



NIIOS-USA Cornea Evening on Friday May 5TH, 2017; 7-11 pm (before ASCRS)

Venue: Courtyard Los Angeles L.A. LIVE, 901 West Olympic Boulevard, Los Angeles, California 90015, USA

After the successful NIOS Cornea Evenings preceding the ESCRS in Europe, a NIIOS-USA meeting on the latest topics in keratoplasty surgery is organized on the Friday evening before the 2017 ASCRS in Los Angeles. Among the speakers are Drs. Mark Terry, Friedrich Kruse, Kathryn Colby, Oganeg Oganesyanyan, and NIIOS staff members and fellows. Topics include: 'Descemetorhexis only' for Fuchs dystrophy, 10 year DMEK outcomes, DMEK complication management, and Bowman layer transplantation for advanced keratoconus. Free entrance tickets are available through info@nios.com or register at www.nios.com/CorneaEvening2017.

Two-day DMEK wetlab course at the Callahan Eye Hospital in Birmingham, United States &

One-day DMEK wetlab course at the Wilmer Eye Institute in Baltimore, United States

Descemet membrane endothelial keratoplasty (DMEK)

In **Birmingham**, each course is scheduled on a Thursday & Friday or Friday & Saturday. On the first course day, the course participants join live surgery sessions; on the second day, various techniques are practised during educational wetlab sessions and patient demonstrations are given.

In **Baltimore**, each course is scheduled on Friday evening & Saturday. On Friday evening, lectures are given on DMEK surgical technique and on Saturday, various techniques are practised during educational wetlab sessions.

Further information and applications: dekort@nios.com

- Birmingham DMEK surgical course: February 23/24, 2017
- Birmingham DMEK surgical course: February 24/25, 2017
- Baltimore DMEK surgical course: June 16/17, 2017

During wetlab courses in the United States, NIIOS surgeons as well as eye bank professionals from Amnitrans Eye Bank Rotterdam will be present for teaching purposes.

Course level: Corneal fellows and surgeons



NIIOS corneal fellow group just after voting the next NIIOS Fellow President and before hitting the buffet

Live-video streaming of DMEK surgeries performed in Rotterdam

Sessions are scheduled on Thursdays from 9 am thru 4pm (+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: info@nios.com

Level: Corneal fellows and surgeons



SIGOTT for updated info on advanced keratoplasty techniques

'Special Interest Group' for advanced keratoplasty techniques

In recent years, there has been a growing interest in keratoplasty surgical techniques developed by the Netherlands Institute for Innovative Ocular Surgery (NIOS), like DALK, DLEK, DSEK, DMEK, and Bowman layer transplantation. To accommodate all requests for information, a Special Interest Group for Ocular Tissue Transplantation was founded for all eye professionals with an interest in corneal surgery or eye banking techniques. Membership is free of charge; applications can be submitted via info@sigott.com.

For more information: www.sigott.com



Our textbook on DMEK is available through info@nios.com

