

NIIOS Newsletter

Netherlands Institute for Innovative Ocular Surgery

Laan op Zuid 88
3071 AA Rotterdam - The Netherlands
Tel +31 10 297 4444 - Fax +31 10 297 4440
info@niios.com - www.niios.com



PAGE 2
IN THE BEGINNING WHEN LIFE WAS SIMPLE, THE FUTURE BRIGHT AND SHINY

PAGE 4
GEOGRAPHICAL VARIATION IN ACCEPTANCE OF NEW SURGICAL TECHNIQUES

PAGE 4
NIIOS WETLAB COURSES

PAGE 4
“DAS MÜSSEN KÜNSTLER SEIN”



'Beurs van Berlage' in Amsterdam (near Central Station)

REFERRALS TO MELLES CORNEA CLINIC ROTTERDAM

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, please write to info@corneaclinic.nl.

Anniversary Netherlands Institute for Innovative Ocular Surgery:
12.5 years NIIOS, 10 years Amnitrans Eye Bank, and 7.5 years Melles Cornea Clinic

October 5th 2013, during ESCRS: NIIOS anniversary concert in Amsterdam

In the year 2000, the Netherlands Institute for Innovative Ocular Surgery (NIIOS) was founded as an independent organization for developing, supporting and performing new ocular surgical techniques. Some of the first projects focused on devices and alternative techniques for cataract and vitreoretinal surgery, for example, the use of vital dyes to visualize the anterior lens capsule while performing capsulorhexis and likewise epiretinal membranes during vitrectomy surgery. The first 'chromo-surgeries' with trypan blue were presented in 1998, and shortly thereafter these techniques became widespread, inspiring a series of dye solutions like *VisionBlue*, *MembraneBlue*, *ILM-Blue*, and *DualBlue*.

Intellectually more challenging were the design and development of surgical techniques for keratoplasty surgery. Until the late 1990s, penetrating keratoplasty was routinely performed for managing virtually all corneal disorders eligible for surgical intervention. Lamellar procedures were limited to anterior keratoplasty techniques, in which the stroma was removed layer-by-layer with a crescent knife, and performed in relatively small numbers owing to the risk of perforation during dissection.

Continued on page 3



Join us for our 12.5-year Anniversary Evening Concert on Saturday, October 5th 2013, 7.30-10.00 p.m.

Venue: 'Beurs van Berlage', Amsterdam, The Netherlands

Melles - Bassoon concerto no.1 - Leah Blomenkamp, bassoon
Mozart - Piano concerto no.23 - Tobias Haunhorst, piano

MCMF Chamber Orchestra

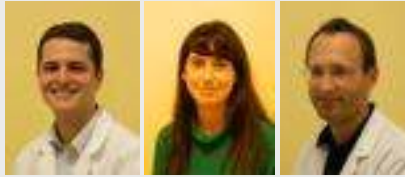
Directed by Ian Fountain (Royal Academy of Music, London)

For more information: www.MellesClassicalMusicFoundation.com



MCMF Chamber Orchestra performing in Utrecht, December 2012

Cornea & Research fellows 2012/2013



Left-to-right: Javier Cabrerizo, Spain; Marina Rodriguez Calvo de Mora, Spain; Peter Ciechanowski, Austria.

NIIOS scientific articles 2012/2013

- ♦ Dapena I, Yeh RY, Baydoun L, Cabrerizo J, van Dijk K, Ham L, Melles GRJ. Potential causes of incomplete visual rehabilitation at 6 months post-operative after Descemet membrane endothelial keratoplasty. *Am J Ophthalmol*. Accepted.
- ♦ Veckeneer M, Mohr A, Alharthi E, Azad R, Bashshur ZF, Bertelli E, Bejjani RA, Bouassida B, Bourla D, Corocostegui Crespo I, Fahed C, Fayyad F, Mura M, Nawrocki J, Rivett K, Scharioth GB, Shkvorchenko DO, Szurman P, van Wijck H, Wong IY, Wong DSH, Frank J, Oellerich S, Bruinsma M, Melles GRJ. Novel 'heavy' dyes for retinal membrane staining during macular surgery: Multicenter clinical assessment. *Acta Ophthalmol*. Accepted.
- ♦ Droutsas K, Giallourou E, Melles GRJ, Chatzistefanou K, Sekundo W. Descemet membrane endothelial keratoplasty: Learning curve of a single surgeon. *Cornea*. Accepted.
- ♦ van Dijk K, Parker J, Liarakos VS, Ham L, Frank LE, Melles GRJ. Incidence of irregular astigmatism eligible for contact lens fitting after Descemet membrane endothelial keratoplasty (DMEK). *J Cataract Refr Surg*. Accepted.
- ♦ Yeh RY, Quilendrin R, Musa FU, Liarakos VS, Dapena I, Melles GRJ. Predictive value of optical coherence tomography in graft attachment after Descemet membrane endothelial keratoplasty. *Ophthalmology* 2013;120:240-5.
- ♦ Liarakos VS, Dapena I, Ham L, van Dijk K, Melles GRJ. Intraocular graft unfolding techniques in Descemet membrane endothelial keratoplasty (DMEK). *JAMA Ophthalmol* 2013;131:29-35.
- ♦ Quilendrin R, Höhn H, Tse WHW, Chi H, Dapena I, Ham L, Oellerich S, Melles GRJ. Do we overestimate the endothelial cell 'loss' after Descemet membrane endothelial keratoplasty? *Curr Eye Res*. 2013;38:260-5.
- ♦ 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). *Cont Lens Anterior Eye* 2013;36:13-21.
- ♦ Quilendrin R, Yeh RY, Dapena I, Ham L, Dirisamer M, van Nickerk J, Melles GRJ. Large-diameter Descemet membrane endothelial keratoplasty in buphthalmic eyes. *Cornea*. 2013;32:74-8.
- ♦ Salouti R, Masoumpour M, Nowroozzadeh MH, Zamani M, Ghoreishi M, Melles GRJ. Changes in corneal endothelial cell profile measurements after Deep anterior lamellar keratoplasty (DALK) for keratoconus. *Cornea*. 2013;32:751-6.
- ♦ Dirisamer M, Parker J, Naveiras M, Liarakos VS, Ham L, van Dijk K, Melles GRJ. Identifying causes for poor visual outcome after DSEK/ DSAEK following secondary DMEK in the same eye. *Acta Ophthalmol* 2013;91:131-9.
- ♦ Parker J, Parker JS, Melles GRJ. Descemet membrane endothelial keratoplasty (DMEK): A review. *US Ophthalmic Review*. 2013;6:29-32.
- ♦ Groeneveld-van Beek EA, Lie JT, van der Wees J, Bruinsma B, Melles GRJ. Standardized 'no-touch' donor tissue preparation for DALK and DMEK: Harvesting undamaged anterior and posterior transplants from the same donor cornea. *Acta Ophthalmol*. 2013;91:145-50.
- ♦ Bruinsma M, Lie JT, Groeneveld-van Beek EA, Liarakos VS, van der Wees J, Melles GRJ. Are polymegethism, pleomorphism, and 'poor swelling' valid discard parameters in immediate post-mortem evaluation of human donor corneal endothelium. *Cornea* 2013;32:285-9.
- ♦ Musa FU, Cabrerizo J, Quilendrin R, Dapena I, Ham L, Melles GRJ. Outcome of phacoemulsification after Descemet membrane endothelial keratoplasty (DMEK). *J Cataract Refr Surg*. 2013;39:836-40.
- ♦ Baydoun L, Tong CM, Tse WHW, Chi H, Parker J, Ham L, Melles GRJ. Endothelial cell density after Descemet membrane endothelial keratoplasty: 1-5 year follow-up. *Am J Ophthalmol* 2012;154:762-3.
- ♦ Tong CM, Melles GRJ. Where would endothelial keratoplasty be going: from DSAEK to DMEK to DMET? *Can J Ophthalmol* 2012;47:197-200.
- ♦ Parker J, Melles GRJ. Graft detachment after Descemet membrane endothelial keratoplasty. *Cataract Refract Surg Today* 2012;April:38-9.
- ♦ Dapena I, Yeh RY, Quilendrin R, Melles GRJ. A surgical step to facilitate phacoemulsification after Descemet membrane endothelial keratoplasty (DMEK). *J Cataract Refr Surg* 2012;38:1106-7.
- ♦ Dirisamer M, Yeh RY, van Dijk K, Ham L, Dapena I, Melles GRJ. Recipient endothelium may relate to corneal clearance in Descemet membrane endothelial transfer (DMET). *Am J Ophthalmol* 2012;154:290-6.
- ♦ Dieleman M, Wefers Bettink-Remeijer M, Jansen J, et al. High incidence of adverse reactions to locoregional anaesthesia containing hyaluronidase after uneventful ophthalmic surgery. *Acta Ophthalmol* 2012;90:e245-6.
- ♦ Parker J, Dirisamer M, Naveiras M, Tse WHW, van Dijk K, Frank LE, Ham L, Melles GRJ. Outcome of Descemet membrane endothelial keratoplasty in phakic eyes. *J Cataract Refr Surg* 2012;38:871-7.
- ♦ Naveiras M, Dirisamer M, Parker J, Ham L, van Dijk K, Dapena I, Melles GRJ. Causes of glaucoma after Descemet membrane endothelial keratoplasty (DMEK). *Am J Ophthalmol* 2012;153:958-66.
- ♦ Dirisamer M, van Dijk K, Dapena I, Ham L, Oganesyan O, Frank LE, Melles GRJ. Prevention and management of graft detachment in Descemet membrane endothelial keratoplasty. *Arch Ophthalmol* 2012;130:280-91.
- ♦ van Luijk CM, Bruinsma M, van der Wees J, Lie JT, Ham L, Melles GRJ. Combined chlorhexidine and PVP-I decontamination of human donor eyes prior to corneal preservation. *Cell and Tissue Banking* 2012;13:333-9.
- ♦ Dirisamer M, Ham L, Dapena I, van Dijk K, Melles GRJ. Descemet membrane endothelial transfer (DMET): 'Free floating' donor Descemet implantation as a potential alternative to 'keratoplasty'. *Cornea* 2012;31:194-7.

The first NIIOS office in Rotterdam at Laan op Zuid 390
In the beginning, when life was simple, the future bright and shiny

Patients, colleagues and others may still remember the 'old' NIIOS office in Rotterdam, at 'Laan op Zuid 390'. The surrounding buildings were still under construction, so everybody was happily walking dirt into the clinic, which was never really noticed because the floor had a sand-shade color.

We also came to realize that when visiting for a consultation, patients would tend to bring one or two relatives with them, soon posing a problem: the capacity of the waiting room proved too small, so people had to sit on the stairs, blocking the way towards our coffee.

Compounding the problem, our space limitations further obliged us to locate our Pentacam and specular microscope behind the counter, which hardly left space to enter or exit our single consultation room. Inside this tiny room, the situation was even more critical, especially when the humidity went up on a rainy day, clouding the mirrors for reading the letter chart.

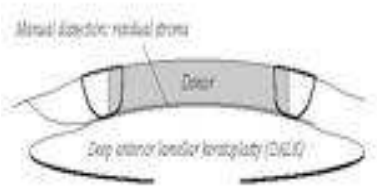
And just when NIIOS seemed to dive into complete chaos, Kim Herders came in for a job interview and was persuaded into running the clinic in a more decent way. Her desk soon became the nerve center of the entire organization, where all activities were now monitored, scrutinized, re-directed, and non-negotiable orders were given.

Freedom of speech was no longer routine, especially because Jacqueline van der Wees also joined our staff around that time, to rule over the eye bank, of which the growing activities till then had been taken care of by our dear colleague Frank Lock (sadly, deceased in 2012).

To keep costs low, we designed the SurgiCube, that would allow for performing intraocular surgery outside a conventional operating theatre. The very first SurgiCube was home made and assembled in the living room of the NIIOS director. Later Ramón Hilberink took the concept to a higher level, by redesigning the construction, and marketing it professionally.

Some of our early co-workers have moved on, but fortunately, most of them are still working with us at NIIOS today.





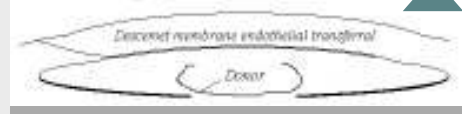
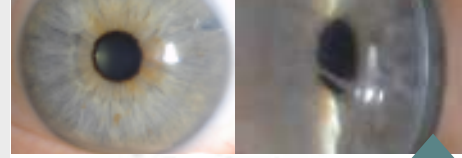
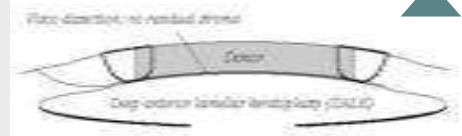
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To overcome the main complications associated with penetrating keratoplasty (as well as the layer-by-layer dissection method in anterior lamellar keratoplasty), NIOS introduced several lamellar techniques in the past decade. For anterior corneal pathology, a manual dissection method was designed, using an air bubble in the anterior chamber as a reference plane for dissection depth. Simultaneously, four groups described the separation of Descemet membrane from the stroma by visco-dissection (Manche et al., Xuan et al., and NIOS) and by air (Anwar et al), of which the latter procedure would gain the most popularity.

To manage endothelial disorders, NIOS introduced various concepts popularized in the United States as 'deep lamellar endothelial keratoplasty' (DLEK) and 'Descemet stripping (automated) endothelial keratoplasty' (DSEK/ DSAEK). Further refinement of the technique resulted in selective transplantation of a donor Descemet membrane, referred to as 'Descemet membrane endothelial keratoplasty' (DMEK). In the past years, NIOS described 'Descemet membrane endothelial transferal' (DMET), in which a descemetorhexis is made and donor tissue is merely introduced in the recipient anterior chamber to induce 'spontaneous corneal clearance'. The latter concept may challenge the idea that a 'keratoplasty' is required in eyes with Fuchs endothelial dystrophy, because the procedure no longer aims for anatomical repair, but to stimulate the host endothelial cells to repopulate the denuded posterior stroma.

Otherwise NIOS has also concentrated on more practical inventions, for example, the SurgiCube. Anyone who is starting a clinic faces major up-front costs, especially if the plans include facilities to perform (intraocular) surgery. A conventional operating theatre is extremely costly to build and to maintain, and with the medical reimbursement system changing into budget-limited health care, a safe return on investment may be far from certain. Hence, to minimize the financial risk, the SurgiCube was designed, a stand-alone unit that provides a local sterile environment for 'small surface surgery', ideal for routine intraocular procedures. Since 2004, the SurgiCube has been in use in ophthalmic clinics throughout Europe, now permitting many ophthalmologists - including those lodged within successful university settings - to upgrade their existing surgical facilities to make them safer, more efficient, and to operate at a higher volume. Because the SurgiCube can be used in virtually any >20m² room, it revolutionized performing high volume ophthalmic surgery.

Also widely used in Europe is the CorneaClaw, an easy-to-use fixation device for donor corneas during preservation in eye banks and transportation of the tissue. However, the one project that generated by far the most attention in the press and hits on the website - that once was portrayed on the front page of CNN - was the JewelEye. Embraced by some and foresworn by others...





Dr Larkin from Moorfields Eye Hospital in London (left); the president of the Royal College of Ophthalmologists, professor Dua from the University of Nottingham (middle); and Dr Melles in Liverpool, May 2013.

NIIOS awarded with '5th Optic lecture' in Liverpool and '13th Montgomery lecture' in Dublin

Geographical variation in acceptance of new surgical techniques

Today, corneal surgeons may struggle with the question whether it's worth it making the switch from Descemet stripping (automated) endothelial keratoplasty (DSEK/DSAEK) to Descemet membrane endothelial keratoplasty (DMEK). DSEK was introduced by NIIOS at the American Academy of Ophthalmology in 2003, and since then has become widely adopted as the 'gold standard' in corneal transplant surgery. DMEK is a further refinement of the same concept: only an isolated donor Descemet membrane with its endothelial cells is transplanted, to replace the diseased host tissue.

Interestingly, with all of the techniques designed by NIIOS, the initial interest is not evenly spread across the globe. For example, DSEK/DSAEK became quickly popular in the US. In contrast, DMEK has been embraced more quickly in Europe, with only few surgeons in the United States having converted from DSEK/DSAEK to DMEK so far. After Germany, Austria and Spain, the next countries to adopt DMEK on a larger scale may be the United Kingdom, Ireland and Greece.

Apparently, pioneer-countries may not really exist. Instead, geographical preferences may play a role in the acceptance of new surgical concepts. And if a critical mass is reached, the entire world shifts into a different gear. In other words, making the switch from one procedure to another, could be largely peer-driven rather than a true personal choice.



Dr Melles with the president of the Irish College of Ophthalmologists, professor Logan (middle); and professor Broe (right), president of the Royal College of Surgeons, in Dublin, February 2013.



Professor John Parker showing his NIIOS wetlab certificate, in his office in Birmingham, Alabama

- ☞ DMEK course: Oct. 1/2, 2013 (before ESCRS)
- ☞ DMEK course: Oct. 8/9, 2013 (after ESCRS)
- ☞ DMEK course: Nov. 5/6, 2013

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@niios.com

Ein Patient erzählt...

“Das müssen Künstler sein”

Januar 2009 und Februar 2010, wurde Herr Lahmann, ein 69 jähriger Geschäftsführer aus Edemissen, operiert mit einer Descemet membrane endothelial keratoplasty (DMEK) für eine Fuchs'sche Hornhautdystrophie. Die erste Operation fand statt in Halle, während eines augenheilkundigen Kongresses, die zweite in der Melles Hornhautklinik in Rotterdam.

Warum haben Sie sich für eine Behandlung mit der DMEK-Methode entschlossen?

“Durch einen Hinweis von der Augenklinik Halle bin ich auf die Technik DMEK, die Dr. Melles entwickelt hat, aufmerksam geworden. Es gab ein Symposium in Halle und ich durfte da operiert werden durch Dr. Melles.”

Wie haben Sie die Operation erfahren?

“Am Abend vor der OP bin ich, um die Nerven zu entspannen, spazieren gegangen in der Klinik. Da bin ich Dr. Melles begegnet und sagte ihm, dass ich ein wenig Angst hatte. Er sagte aber, nicht zu bangen, „wir kriegen das hin Herr Lahmann!“

“Die Operation wurde also live vor ca. 400 Ärzten in die Hörsäle übertragen, Dr. Melles hat auf Deutsch alles, was er machte, erläutert. Aber dann ist irgendwann während der Operation der Ton ausgefallen, und war es wieder herrlich ruhig. Die Operation war ein bewegender Moment für mich und das Team von Dr. Melles. Im OP-Raum in Halle war es fürchterlich kalt und ich habe da gelegen mit Decken über den Füßen.”

Wie war es nach der Operation?

“Am nächsten Tag wurde das Ergebnis von mehreren Ärzten bestaunt, sie waren ganz überrascht, dass ich schon 80% sehen konnte. Als die Augenklappe entfernt wurde, sah ich etwas, das die schwarze Farbe hatte, ich hatte seit langem kein schwarz mehr gesehen und rief erstaunt aus 'Oh ist das schwarz?' Zu Hause habe ich mich noch mehr gewundert, da habe ich weiße Kacheln mit schwarzen Fugen, die kannte ich nur als grau.”

“Die Operation am anderen Auge wurde dann in der Melles Klinik in Rotterdam durchgeführt, wiederum erfolgreich. Ich habe sehr gute Erinnerungen an beide Operationen.”

Wie ist Ihr Gesamteindruck der Melles Hornhaut Klinik in Rotterdam?

“Zur Nachuntersuchung beider Augen bin ich auch bei meinem eigenen Augenarzt in Deutschland in Behandlung. Bei der Begutachtung des rechten Auges war er über das Ergebnis so überrascht, dass er sagte: "Wenn man nicht wüsst, dass hier eine Operation stattgefunden hat, würde man es nicht sehen! Das müssen Künstler sein...”



Herr Lahmann wird von Korine van Dijk untersucht