Momentum across Europe

MICS experiences from across the region
Coaxial 1.8mm Micro Incision Cataract Surgery

Akreos® Micro Incision Lens临床 outcomes after 231 implantations

In this article, the authors present their results gained from the insertion of a micro incision intraocular lens (Akreos Micro Incision Lens) in patients undergoing phacoemulsification surgery. Surgery was performed with a corneal incision of 1.8mm. Their experience found the Akreos Micro Incision Lens to be easy to manoeuvre, safe and it has guaranteed an excellent and stable visual outcome.

Introduction

In the field of cataract surgery in recent years, we have seen continuous research and the optimisation of a technique defined as ‘micro-incisional’ cataract surgery (MICS) which allows intracocular lenses (IOLs) to be implanted through sub 2mm incisions. This technique reduces not only the surgical trauma but also the surgically induced astigmatism which leads to a quicker and better visual rehabilitation. For this reason, a MICS IOL should allow the easy insertion through small incisions, resist lens deformation and have excellent biocompatibility and superior in-the-bag stability. Our work aims at presenting the results gained from the insertion of a micro incision intraocular lens (Akreos Micro Incision Lens) in patients undergoing cataract surgery, operated by a corneal incision of 1.8mm.

Methods

Since March 2007, in our department, 231 eyes of 164 patients were subject to coaxial phacoemulsification during cataract surgery through a 1.8mm incision, with subsequent insertion of the Akreos Micro Incision Lens in patients undergoing cataract surgery, operated by a corneal incision of 1.8mm. All patients were operated by the same surgeon (D’Eliseo) under topical anaesthesia and the phaco chop technique performed through a two step temporal corneal incision. All intracocular lenses were delivered using the specific injector for this lens (Viscoject® 1.8 single-use injection system). At the end of surgery, the corneal tunnel was left unsutured (sutureless technique). During surgery, the effective phaco time (EPT) was 2.71 +/- 2.04 seconds, while the ultrasound percentage was 5.48 +/- 1.72. In the course of the follow-up, after more than 3 months in all cases, we evaluated visual acuity (uncorrected and best corrected), contrast sensitivity, IOL stability, and level of patient satisfaction.

Results

During the entire follow-up, the uncorrected visual acuity was at least 8/10 (10/10 in 64%) in all eyes, while the corrected visual acuity was determined to be 10/10 in 87% of the cases. The mean post operative spherical equivalent was 0.230 with respect to a target refraction of -0.50. The average preoperative astigmatism was 0.71D. The average postoperative astigmatism value amounted to 0.74D. The contrast sensitivity which was evaluated using the MAW Professional DMD Computers SR-Sky system showed an average value of 28%. The refraction remained stable during the course of the follow-up, and there was no case of IOL dislocation. The level of subjective patient satisfaction, evaluated through the anonymous completion of a questionnaire completed by the patient, was rated “high” in 94.6% of patients sampled for distance vision and 94.5% for near vision. No patients experienced halos, only 2 experienced glare.

Conclusions and Discussion

The Akreos Micro Incision Lens could easily be implanted through a corneal tunnel of 1.8mm. It is easy to manoeuvre and safe, guaranteeing an excellent and stable visual outcome. With incisions of 1.8mm, the most recent generation system (e.g. the Stellaris system) must be used in order to comply with the intra-operative safety criteria. Patient benefit and satisfaction stems from the rapid postoperative rehabilitation, which is also of benefit to the surgeon.

The micro incision technique justified its existence when IOLs with quality-improving features started being manufactured. Previously, when the surgeon was still forced to enlarge the incision for a neat insertion and placement of the IOL, the MICS technique did not receive much enthusiasm. The surgeons lived with the contradiction of complicating the surgical phacoemulsification phase while still having to enlarge the tunnel in the IOL insertion phase. Now, the most recent generation of MICS IOLs, such as the Akreos MI60 lens, have a proven good stability in the capsular bag. In other words, they have reached a quality level which competes with the common standard IOLs.

The short follow-up does not allow for the important issue of secondary opacities to be assessed. The follow-up of these patients will be necessary in order to compare our data with the data published in the literature which does not show a significant variation in the incidence of secondary cataracts compared to standard IOLs.
Last December, the Stellaris system was installed in the Wilhelmina Hospital in Assen (WZA). What were the first experiences with the MCS Platform®? Ophthalmologists and their surgical assistants give their view.

You can’t really call it love at first sight, but the ophthalmologists Dr Henry Van den Brom and Dr Erik Witmer were immediately taken when they made their acquaintance with the Stellaris system during the test installation in September 2008. “We were a little sceptical”, said Van den Brom, looking back. “You think: sure, it’s new, but how much better is it really? Yet we quickly noticed that it provided a much more stable anterior chamber than we were used to with the Millennium® machine. An important advantage.”

And through other innovations, such as the wireless footpedal and the safe Luerlock connection on the handpiece, the Stellaris system was able to win the favour of both eye doctors. “And then we haven’t even talked about all the new gadgets on this machine yet”, Dr Witmer explains. Last December the final installation was completed, triggering a rapid process of working with new innovative technology and learning a new technique: “We just started with phaco at the end of the resistors.”

“So we were a bit late. Even the University Medical Centre in Groningen, where we were trained, was relatively late on the scene. The Millennium® was our first phaco machine. For that reason we wanted to get ahead of the cataract game, for once. But that certainly demands some adjustments.”

**Faster wound healing**

Dr Witmer had the biggest transition. He made the jump from scleral to corneal incisions, from coaxial to biaxial irrigation/aspiration, and from coaxial 2 mm to coaxial MICS through 1.8 mm. “I now also use more topical anaesthesia than before” said Dr Witmer. Dr Van den Brom already had experience with corneal cataract surgery and the use of standard topical anaesthesia. Both doctors, who annually perform around 660 cataract operations between them, embraced the modernisation process enthusiastically. Since then, together they have carried out around 150 procedures with the Stellaris system, about 100 of these being MICS through 1.8 mm. They weren’t disappointed.

Dr Witmer said “During the trial period we first tried the new device with the old settings and instruments. That already provided a more stable anterior chamber. When we started to work with smaller instrumentation through 1.8 mm back in December, we saw even more improvement. We hoped for faster wound healing, and the wounds did close noticeably sooner, with the result being a shorter after-care period for the patient.”

Dr Van den Brom continued “With a smaller wound, there is a smaller chance that the wound will start to leak over time. But with a smaller incision you also have a much nicer wound closure during the phaco, with much less leakage. I am very satisfied with it. We hope to encounter fewer complications than we had, through greater stability in the anterior chamber. Moreover, it is now easier to ready the device: cassette in, water out, done. As far as that goes, you can save just a bit of time.”

**Good Control**

Both eye doctors have had nothing but good experiences up to now with biaxial irrigation/aspiration. “During the procedure you have very good control of the eye, since you are working on two points,” said Dr Witmer. “With the one hand, you hold the eye and with the other you do the real work, as it were. With coaxial you are working through one incision and you can hold the eye with another instrument, but that is not always comfortable for the patient.” Dr Van den Brom commented “Biaxial irrigation/aspiration works very nicely. I can now do everything better. In the past you sometimes had to work at a bit of an angle, and then you saw the camera wrinkling, with the risk of tearing. Now the camera is much more at rest. The disadvantage is that you have to make extra incisions. In the beginning we used the phaco knife. We didn’t think it was necessary to use a separate side-port knife, but the wounds were less tidy, so now we are using the side-port knife.”

Both Dr Witmer and Dr Van den Brom also have good things to say about the Akreos MI60® lens, which now use as their standard lens. They are especially pleased with the centing and the stabilisation of the authentic MICS-lens. “Most of all, it is very easy to manipulate”, states Dr Witmer. Dr Van den Brom summarises his experiences with the lens by saying “It’s a fine lens.”

Two weeks of trial installation were sufficient to win over the eye doctors and their surgical assistants in ophthalmology to the Stellaris system. “The purchasing decision had already been made by October 2008”, explains surgical assistant and full-time senior specialist in ophthalmology Aletta Tatar. “No further testing was carried out using other systems. After the trial period we had an internal discussion. The surgical assistants were also involved and asked if we were for or against, or if we had any comments. I think that if we had had any serious complaints, then it wouldn’t have gone through. We were and remain entirely satisfied with this phaco machine.”

Most of all, it was the ease of use that immediately caught the attention of the surgical assistants. “After having it explained just once, we could actually use the system,” says part-time senior specialist Aletta Piek. “It shows you everything you need. The machine is structured in a very well-organised way. Operation proceeds in steps, so that you can’t miss a required action. And the basic principles haven’t really changed that much in comparison with the Millennium system. We used the trial period to try out different things, and find the most practical way to do things. That was very useful. We made all of the little mistakes that you can make. The wireless foot pedal was very well-received. “Now you can comfortably sit with your stool very close, without having to worry about the wires,” said Ms Piek. Ms Tatar also agrees “It’s terrific”, she remarked “No more cords that get tangled up or that develop kinks. We no longer worry about cables breaking. We need to load them up at the end of the day, but that’s just a routine chore.”

Another advantage Ms Tatar finds is that she has to make fewer calls to the technician. “The tech just hooks up the rinse bottle and I can take care of everything myself from there. I can connect everything myself.”
The **Stellaris** system resulted in less mean phaco time, total phaco time and effective phaco time (EPT) in a study comparing a number of phaco systems. Professor Gian Maria Cavallini, Dr S Pelloni and Dr C Masini, from the Institute of Ophthalmology, University of Modena, Italy, compared the performance of the Sovereign Whitestar, Signature Whitestar and the **Stellaris** phaco systems. The findings were presented by Dr Pelloni at the ESCRs in Berlin last September.

### The Study Design

The prospective, randomised study aimed to compare the intraoperative and postoperative outcomes of biaxial MICS performed with three different phaco machines. One hundred and fifty eyes with cataracts, grade 2-4, underwent surgery by the same surgeon with the same surgical technique. Each group of 50 eyes underwent surgery using either the Sovereign, Signature or Stellaris system. The exclusion criteria were preoperative BCVA less than 0.9 LogMAR and pre-existing ocular pathologies. The pre-operative parameters were BCVA examination, biomicroscopy, echo biometry, endothelial cell count and corneal thickness. Mean phacoemulsification time, total phacoemulsification percentage, effective phacoemulsification time (EPT), total BSS solution and total surgical time were the measured intraoperative parameters.

### Surgical Technique

Biaxial MICS was performed through two 1.4mm trapezoidal incisions in the clear cornea at 10 and 2 o’clock. Continuous cavitransparent capsulorhexis was performed with a 25 gauge cannula was used for the hydrodissection. Phacoemulsification was conducted with a 20 gauge, 3/4 sleeveless phaco needle and an angiolyte chopper. The stop-and-shop technique was used for segment removal, followed by irrigation/aspiration with a 20 gauge probe with a rounded shapen section. One of the incisions was then enlarged for IOL implantation.

### Intraoperative Parameter Results

Lower intraoperative parameters including EPT and mean phaco time were recorded in the Stellaris group, although these results are not statistically significant. The results of the intraoperative parameters are shown in Table 1.

Less endothelial cell loss was also found in the Stellaris group. Similar results for BCVA and corneal thickness were reported in all groups.

### Table 1: Intraoperative parameters

<table>
<thead>
<tr>
<th>Intraoperative Parameter</th>
<th>Stellaris</th>
<th>Sovereign</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical time</td>
<td>9mins 6s</td>
<td>10mins 41s</td>
<td>9mins 41s</td>
</tr>
<tr>
<td>BSS</td>
<td>90.23cc</td>
<td>116.66cc</td>
<td>94.73cc</td>
</tr>
<tr>
<td>Mean phaco time</td>
<td>3.76s</td>
<td>4.16s</td>
<td>3.94s</td>
</tr>
<tr>
<td>Total phaco time %</td>
<td>5.46%</td>
<td>7.69%</td>
<td>5.77%</td>
</tr>
<tr>
<td>EPT</td>
<td>2.25s</td>
<td>3.86s</td>
<td>2.98s</td>
</tr>
</tbody>
</table>
GEMICS, the French Study Group for Micro-incision Cataract Surgery (Groupe d’Etude Micro Incision Cataract Surgery), was established in 2007. This group is composed of 10 French surgeons: Prof. X. Ripal Soutoarme (Hôpital Clamart, Paris), Dr C. Abou Garabem (Clinique de la Vision, Paris), Dr F. Amzallag (Institut ophtalmologique de Samain), Dr C. Boureau (CHNO XVe, Prof. C. Baudoz Service, Paris), Dr D. Derdié (Clinic St Vincent, Toulon), Dr A. Denoyer (CHNO XVe, Dr Baudoz Service, Paris), Dr F. Fajnuchen (Avicenne hospital, Dr Chaine service, Bobigny), Dr G. Galien (Fondation Rothschild, Paris), Dr P. Levy (Montpelier) & Dr D. Monnet (Cochin hospital, Pr Brezin service, Paris).

The group aims to develop support and communications on making the transition to MICS easier for surgeons wishing to understand and switch to the 1.8mm solution.

In 2008, with the support of Bausch & Lomb France, the group has written a comprehensive book entitled “MICS and Quality of Vision”. This book helps surgeons to understand:

– Why the quality of vision is fundamental for the quality of life of your patients?
– How, through the surgical technique and mainly through micro-incisions, we can make the quality of vision better?
– How the quality of vision can be improved through the use of new generation IOLs?
– Which tricks and tips can make C-MICS, or B-MICS, or wound injection easier?

Many of the surgeons in the GEMICS group were involved in the recent MICS programmes at the JRO congress in Paris. Live surgery included a C-MICS case by Dr Boureau and B-MICS was performed by Dr Poirier. There were 230 attendees at the “Experts to Support Your Transition” Symposium to hear presentations which covered the benefits of MICS and the key MICS steps. Prof. Baudoz presided over the session with presentations by Prof. Gocheux, Prof. Krigal Soutaarme, Prof. Alió, Dr Amzallag, Dr Monnet, Dr Derdié and Dr Pietri.

A limited number of the French MICS book are available upon request by emailing Expert@bausch.com.

Surgeons performing the MICS technique can now customise their own MICS instrument kit to suit their own personal requirements. Storz Ophthalmics’ new Sterile Single Use Per Procedure Trays can be assembled in three simple steps. First, browse the instruments catalogue, which can be viewed on www.storzeye.eu, then choose your tray configuration, and finally request a quotation. The Bausch & Lomb Storz Ophthalmics single use range of high precision MICS Instruments are specifically designed for 1.8mm B-MICS and C-MICS.

New website for Storz Ophthalmics

There is a new address for Storz Ophthalmics. Please now visit www.storzeye.eu for further information on the single use Per Procedure Trays and other Storz Ophthalmics instrumentation.

The S. Fyodorov Eye Microsurgery Complex, Federal State Institution, Moscow, served as the impressive venue for the IXth Annual Scientific Practical Conference on “Modern Technologies in Cataract and Refractive Surgery”, in October 2008.

An informative and diverse scientific programme included three days of live surgery with participating surgeons from the Russia, the US, Greece and Belgium, as well as many other Eastern European countries such as Belarus, Ukraine and Georgia. Dr Boris Malysyeng from Russia, reported on the global perspectives on phacoemulsification techniques, discussing his own results comparing 1.8mm C-MICS with standard 2.8mm coaxial surgery using the Stellars system. The learning curve on the transition from standard phaco to C-MICS was described by Dr Björn Ijsenhon from Sweden.

For one of the live surgery sessions, featuring the Belgian Society of Refractive & Cataract Surgery, Dr Robert van Horenbeek operated with the Stellaris system and then implanted the Akreos MI60 lens. Further MICS cases were performed, using the complete MICS Platform, by Dr Panos Zafirakis from Greece, and Russian surgeons, Dr Elena Egorova, MNTK Novosibirsk and Dr Nikolai Sobolev, MNTK Moscow.

By Julia Guseva

From top left (clockwise): Dr Elena Egorova, Dr Nikolai Sobolev, Dr Robert Van Horenbeek and Dr Panos Zafirakis.
1.8mm microincisions provide greater preservation of corneal quality

A study comparing the corneal incision quality of 1.8mm MICS versus 2.2mm small incision quality found the corneal prolacteness was maintained more by the 1.8mm incision compared with the larger incision size.

The study, published in March 2009 issue of the Journal of Cataract & Refractive Surgery, was conducted by Dr Elkady et al., Vissum-Instituto Oftalmológico de Alicante, Alicante, Spain.

In this prospective randomised cumulative interventional comparative study, a series of 50 eyes were randomly classified into the MICS group or the 2.2 coaxial group. In the MICS group, 1.4mm B-MICS surgery was performed prior to enlarging the incision to 1.8mm for lens implantation. Topography measurements of corneal asphericity (Q), at 1 month, showed there was a significant difference in corneal prolacteness, in the MICS group compared with the 2.2mm coaxial group (Q 4.5mm: -0.08±0.39 versus 0.20±0.72, P=.05; Q 8.0mm: -0.22±0.45 versus 0.05±0.49, P=.04).

At day one postop, less corneal oedema was observed in the MICS group, 44% compared with 87% (P=0.002) for the coaxial group and the corneal thickness was lower in the 1.8mm to 7.0mm area in the MICS group (659±56.7μm compared with 697±89.6 μm) (P=.06). These differences only occurred at the first day postop. Slightly improved RMS results were also observed in the MICS group, compared with 2.2mm coaxial results.

In a further study by Tong et al examining the changes in corneal wavefront aberrations in microincision and small-incision cataract surgery, MICS was found to reduce the effect on the cornea compared with the small incision surgery technique. The total RMS results indicated that the surgically induced astigmatism was dependent upon incision size, 1.5mm versus 3mm. The results also suggested that greater changes in the mean HSA terms were caused by the small incision surgery. Less induced astigmatism was also measured using vector analysis in Hayashi et al’s study on postoperative corneal shape changes, when comparing a coaxial 2mm incision with a 2.65mm incision.

Significantly less focal wound-related flattening of the peripheral cornea and less corneal surface irregularity was also reported with 2mm incision compared with 2.65mm.

Reference:
MICS Support
Reviews from the ASCRS 2009
in San Francisco

Learnings from the MICS Reference Centres

If you wish to receive future editions of MICS Expert by email, please email Expert@bausch.com

Check out www.micsplatform.com for further details on the MICS Platform.

Next issue:

Bausch & Lomb
European Office
166 London Road
Kingston-Upon-Thames
Surrey KT2 6TN, UK
T +44 20 8781 5500
F +44 20 8781 2997

Belgium/Luxembourg
T +32 3 280 82 49
F +32 3 280 82 59

DistOps, Greece & Turkey
T +33 4 37 48 83 83
F +33 4 37 48 83 84

France
T +33 4 67 12 30 30
F +33 4 67 12 30 31

Germany/Switzerland/Austria
T +49 30 330 93 5702
F +49 30 330 93 5712

Italy
T +39 039 207 3744
F +39 039 201 0081

Netherlands
T +31 20 655 4555
F +31 20 653 7873

Nordic Countries
T +46 8 616 95 85
F +46 8 658 25 41

Portugal
T +351 214 241 510
F +351 214 241 519

Spain
T +34 902 386 666
F +34 902 320 300

South Africa
T +27 11 259 2600
F +27 11 259 2650

United Kingdom
T +44 20 8781 0000
F +44 20 8781 0001

© 2009 Bausch & Lomb Incorporated.
®/TM denote trademarks of Bausch & Lomb Incorporated or its affiliates.