Bimanual MICS has much to offer over coaxial phacoemulsification

Dermot McGrath
in Lisbon

BIMANUAL microincision phacoemulsification is safe and efficacious and offers a number of clear advantages over coaxial phacoemulsification, according to I. Howard Fine, MD, O regon Eye Institute, Eugene, O regon, US.

“We look at bimanual microincision phacoemulsification as being better because we think the smaller incisions are safer and we are working in an almost completely closed system,” Dr. Fine told delegates at the XXIII Congress of the ESCRS.

“An ideal fluids system would be completely closed. While we cannot achieve that, by separating infusion and outflow we can achieve improved followability. We can use the irrigation flow as a manipulation device, we have a more stable chamber and better and easier irrigation and aspiration of cortex,” he said.

Looking at the evolution of bimanual phacoemulsification over the years, Dr. Fine said that the technique has a longer historical pedigree than many people realise. He cited the work of Snick and Girard in the early 1970s and Dr. Steven Shearing in 1985 as among the early pioneers of bimanual microincisional techniques.

Experimentation the key to progress

Dr. Fine said while there is sometimes a reluctance to accept new techniques and technology as offering potentially better results than tried-and-trusted methods, no progress would be made without such experimentation.

“I think it has been shown categorically that new technology does result in improved techniques. We first studied power modulations over eight years ago and showed that with very dramatic reductions in energy into the eye, we achieved enhanced immediate visual rehabilitation. Likewise when we first surveyed new phacoemulsification technologies and demonstrated that indeed the new systems and techniques did lead to improved outcomes over pre-existing technology,” he said.

In terms of the actual demand for new surgical techniques, Dr. Fine cited a 2005 survey in which 78% of cataract surgeons believed that bimanual phaco could be potentially useful but only if IOL technology advances sufficiently to take advantage of smaller incision sizes. Almost one quarter of respondents said they considered bimanual phaco to be a difficult procedure with no obvious advantages. For refractive lens exchange, Dr. Fine said it was “shocking” to see that 70% of surgeons felt conventional ultrasound phacoemulsification modalities would become the dominant technology for soft IOLs, compared to just 17% for bimanual phaco.

Challenging cases made easier

Making the case for bimanual phacoemulsification techniques, Dr. Fine said it is perhaps most advantageous in dealing with difficult and challenging cases.

“That includes preoperative or postoperative bleeding where we can perform microincision cautery. Subluxated lenses are also much easier to deal with using these techniques, and it is a great help in the presence of microcornea or microcephalus, as smaller instruments in the eye result in less distortion of the cornea and better visualisation of intracapsular structures,” he said.

A further benefit of a bimanual approach is the ability to perform easier post-radial keratotomy (RK) incisions by going between the radial incisions. By avoiding proximity to the RK incisions with 1.2 mm bimanual incisions, the risk of an RK dehiscence is theoretically lessened, said Dr. Fine.

“We also find floppy iris syndrome to be more easily controlled because the incisions are smaller, so the iris comes to the incision but does not prolapse, and because the irrigation is held above the plane of the iris we can keep the iris flat,” he said.

May reduce risk of retinal detachment

Bimanual phaco also has something to offer highly myopic patients, said Dr. Fine.

“I believe high myopia is a special indication because we can keep the irrigating instrument in the eye throughout the procedure and never trampoline the vitreous face. Ultimately, it may show that we are going to get a decreased incidence of retinal detachment in high myopia and I think that it is absolutely the safest and least invasive technique for soft cataracts and refractive lens exchange,” he said.

Looking at the clinical results comparing bimanual and coaxial phacoemulsification, Dr. Fine said that both approaches achieved excellent outcomes in terms of the clarity of corneas two to 24 hours postoperatively.

Uncorrected visual acuity in the immediate postoperative period was also closely matched between the two techniques, he said.

Referring to concerns voiced in some quarters that microincision techniques are more likely to induce greater astigmatism than coaxial methods, Dr. Fine said that his own clinical results showed no basis for such claims.

“Most of the results in the data for 3.0 mm to 3.5 mm incisions by vector analysis show about 0.7 D of surgically induced astigmatism which is exactly what we got using bimanual techniques with a 3.5mm implantation incision. So there is no astigmatic price to be paid for two micropin incisions straddling the main implantation incision,” he said.

Procedure of choice for refractive lens exchange

For refractive lens exchange procedures, Dr. Fine said he believed bimanual phaco to be the “safest and least invasive technique” available. Discussing the finer points of the technique, Dr. Fine said that the lens is hydroexpressed out of the capsular bag into the plane of the capsulorhexis, and the irrigating cannula is held above the lens to avoid any possibility of damaging the cornea.

“We also avoid hydrodelineation. We use a phaco unsleeved needle with the bevel turned towards the equator of the lens and we carousel it in the plane of the capsulorhexis, and the irrigating cannula is held above the lens to avoid any possibility of damaging the cornea,” he said.

Turning to results achieved with the Crystallens IOL (Eyeonics, Inc), Dr. Fine said he was aware of major differences between European and US data on this particular lens.

He noted that in the recent FDA monitored trials, 70% of patients were at least 20/20 or better and J1 or better, 100% at least 20/20 and J3 or better. In the RLE group, 73% were shown to be 20/25 or better and J2, said Dr. Fine.

“T his is significant because when we look at what percentage of patients achieved spectacle independence, it is approximately the same – about 73%. In our view, we need to achieve 20/25 and J2 in order to achieve spectacle independence. And the Crystallens now has a square edge and is more resistant to posterior capsule opacification,” he said.

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Mobilising the epinucleus with vacuum alone. The eye is filled with viscoelastic.

Posterior polar cataract following hydrodelineation without hydrodissection.

Mobilising chopped nuclear material from the posterior chamber with unsleeved phaco tip.

Mobilising the epinucleus with vacuum alone. The eye is filled with viscoelastic.

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