PHAKIC IOLs
How much weight should surgeons attach to the risk of endothelial cell loss?

by Gary Finnegan in Brighton

The debate boils down to a single question: how much weight should surgeons attach to the risk of endothelial cell loss?

Thomas Kohnen MD, PhD, professor of ophthalmology and deputy chairman of ophthalmology and deputy chairman of Goethe-University, Frankfurt, said iris-fixated anterior chamber lenses are safe and effective but require close monitoring because a number of studies have shown endothelial density can decline after three or four years. Despite this, Prof Kohnen says the hydrophobic lenses currently on the market are easy to implant and offer excellent stability, provided patients are carefully selected.

For Bruce Allan MD, Moorfields Eye Hospital, UK, angle-supported anterior IOLs carry too many long-term concerns and the jury is still out on new iris-fixated options. With posterior chamber lenses, he said, the endothelium eventually recovers from any initial trauma suffered during implantation, as with phacoemulsification, whereas problems can begin to emerge with anterior IOLs over time.

Unlike anterior chamber lenses, posterior chamber implants do not require continuous monitoring, according to Dr Allan, as they are not in contact with the endothelium.

“The absolute crux of the matter is long-term safety. The thing that swings it for me is what happens to the endothelium in the years following implantation,” he told the United Kingdom and Ireland Society of Cataract & Refractive Surgeons (UKISCRS) annual meeting in Brighton, UK.

Prof Kohnen said he has used both posterior and anterior chamber phakic lenses. “We know all phakic IOLs are very effective in treating refractive error but when problems arise they are mainly due to the positioning of the lens. And in my view the question of which lens is the best in terms of long-term outcomes brings us to the issue of complications,” he said.

Research on outcomes of iris-fixated lenses found they are safe and effective, Prof Kohnen told the meeting, but he acknowledged that some problems have emerged with inflammation in the eyes of patients who had the foldable lens implanted. He then discussed the evolution of a series of angle-supported foldable hydrophilic lenses, several of which have been withdrawn from the market due to endothelial cell loss and pupil ovalisation. “There’s only one implant, the AcrySof Cachet, which should be implanted in the anterior chamber. I have to highlight this because it’s the future,” he said.

Unlike the anterior chamber lenses that were withdrawn, the Cachet lens is made of hydrophobic material. It is suitable for -6 D to -16.5 D and has an overall diameter of between 12.50mm and 14.00mm. The exclusion criteria are important when using this lens, according to Prof Kohnen.

“You have to have a deep anterior chamber, so exclude anything less than 3.2mm. Astigmatism of more than 2.0 D is excluded because the lens cannot correct it. Patients should have no previous corneal or ocular surgery, and no history of glaucoma or any type of cataract. The most important factor for these patients is endothelial cell density,” he said. Prof Kohnen also advised colleagues that limbal relaxing incisions are also required in some cases.

A one-year study of the Cachet lens looked at 900 eyes and showed good predictability, safety and efficacy. Four-year data demonstrated UCVA of 20/20 or better in 60 per cent of cases, Prof Kohnen said.

“At five-year follow-up, we occasionally see very slight synechiae but we don’t see pupil ovalisation. The endothelial cell density data demonstrates a four per cent loss after four years. But you have to take into account that there is also a natural loss over time by 0.5 per cent,” he said.

“For me, pluses for anterior chamber lenses include the fact that they are effective, predictable and stable. I also think that the new hydrophobic lenses have a very easy implantation process. It is a surgery that takes about 45 minutes – and so far the results have been very good.”

“In short, I think that the anterior chamber lenses have an advantage in that they are easy to implant, but they have to be monitored for endothelial cell loss,” Prof Kohnen said.

Bruce Allan kept the focus on the endothelium but advocated for posterior chamber phakic IOLs, which he said offered better long-term outcomes. Data for the ICL lens revealed some trauma at the time of the initial surgery but endothelial loss “settles down to background rates by about year three or four”.

He said looking at other indices of endothelial health, such as coefficient variation and hexagonality, shows the overall quality of the endothelium improving between year one and year four.

Dr Allan said that some of the four-year data on the Cachet lens presented by Dr Kohnen was encouraging but noted that “all other anterior chamber lens implants don’t do so well.”

“There’s no other angle-supported implant that has stood the test of time on the market. The I-Care is the best recent example of a lens withdrawn after encouraging one-year data was followed by dramatic losses at three years and is no longer available,” said Dr Allan.

The major drawback for posterior chamber implants is sizing.

“I’ve had to replace about five of the 200 I’ve done as there is currently no perfect way of sizing these lenses,” he said.

Dr Allan recommends doing a surgical peripheral iridectomy (PI) with the ICL lens to combat this. “YAG PIs are not large enough to prevent pupil block reliably in ICL implantation. One message I’d like to get across is that you must do a surgical PI if you’re using a posterior chamber lens,” he said.

Dr Allan acknowledged that the anterior chamber Cachet lens is easy to implant and to size but said posterior chamber lenses look better and have a much wider refractive range.

“For my money, I think that’s why I’m going to stick with the posterior chamber lens until there is more long-term data for the Cachet lens. I’d add one caveat: you’ve got to be able to do a tidy surgical PI. That’s the key ingredient if you’re going down the posterior chamber route.”