COMBINED PROCEDURE
Treating cataracts and corneal dystrophy in one procedure best reserved for eyes with more advanced corneal disease

by Roibeard O’hEineachain in Warsaw

Combining cataract surgery with endothelial keratoplasty may have a role in treating patients with advanced corneal pathology, but so long as the cornea is clear, cataract surgery is enough on its own. This was the consensus arrived at by the two participants in a debate on the issue at the 17th ESCRS Winter Meeting.

“Performing cataract and keratoplasty is the way to go if the endothelium is close to decompensation and you are well trained in Descemet’s-stripping automated endothelial keratoplasty (DSEK),” said Beatrice Cochener MD, PhD, professor and chair, Department of Ophthalmology, Brest University Hospital, France.

She noted that Fuchs’ corneal dystrophy is the most common indication for endothelial keratoplasty, and patients with the condition frequently suffer from coexisting cataract. In those cases where corneal dystrophy has advanced to the point where decompensation is likely, combining the cataract and endothelial keratoplasty procedures can reduce the time required for visual rehabilitation, without compromising the safety or efficacy of either procedure.

The corneal criteria for a combined procedure should not be the endothelial cell density, since corneas with cell counts below 500/mm² do not always decompensate. Instead, surgeons should base their decision on the effect of the disease on corneal clarity, Prof Cochener said.

PKP vs DSAEK
The classic triple procedure, which combines penetrating keratoplasty (PKP), phacoemulsification and IOL implantation, provides faster rehabilitation than performing the two procedures separately. It also reduces the chance of further endothelial trauma, such as might occur if the keratoplasty had been performed first and cataract procedure had been performed later.

However, the predictability of the postoperative refraction is limited with this combination, because it results in a cornea with an anterior and posterior corneal curvature different from that which was measured preoperatively.

In contrast, DSEK produces no significant changes in corneal topography, and so changes the corneal refraction significantly less than PKP. As a result, the refractive outcome of combined cataract and DSEK procedures is much more predictable.

In a series of 315 eyes of 233 patients who underwent the combined cataract/DSEK procedure, the mean BCVA was 20/31 and 93 per cent of patients had visual acuity better than 20/40 at six months’ postoperative (Terry et al, Ophthalmology. 2009; 116(4):631-639).

However, DSEK does induce mild postoperative hyperopic shift because of increased concavity of the posterior surface. The amount of the hyperopic shift ranges from zero to three dioptres, and is dependent on the difference between the peripheral and central thickness of the corneal button.

The more recently introduced technique of Descemet’s membrane endothelial keratoplasty (DMEK) may eliminate the hyperopic shift, since the donor button consists entirely of the endothelium and Descemet’s membrane.

In addition, Friedrich E Kruse MD, in Erlangen, Bavaria, Germany, has reported that procedures combining DMEK with phacoemulsification result in visual acuity outcomes equivalent to those of DMEK alone.

Keratoplasty not to be undertaken lightly
Combined procedures should only be performed in Fuchs’ dystrophy cases where the patient who would have required the cornea procedure anyway, stressed Jesper Hjortdal MD, PhD, Aarhus University Hospital, Denmark.

Combining phacoemulsification plus IOL implantation with DSAEK is attractive in patients with Fuchs’ endothelial dystrophy. However, endothelial keratoplasty has a number of associated risks. Besides which, DSAEK can be performed three to six months after phacoemulsification if the cornea deteriorates,” he said.

Dr Hjortdal noted that Fuchs’ dystrophy progresses in a gradual way going through several distinct stages before vision is seriously compromised. Moreover, corneal guttata such as are seen in the early stages of Fuchs’ corneal dystrophy do not always progress Fuchs’ corneal dystrophy. It would therefore be a waste of corneal donor tissue to perform keratoplasty in eyes that still only have the early signs of disease.

Complications occurring during phacoemulsification may necessitate postponement of keratoplasty, leading to the waste of the lamellar button. In addition, the unclear intraocular media after keratoplasty can make cystoid macular oedema difficult to diagnose and treat.

Furthermore, unlike patients who undergo cataract surgery alone, patients who undergo DSAEK rarely have a postoperative visual acuity of 20/20 or better. In a study involving 548 eyes the median visual acuity was 20/28 (Terry et al, Ophthalmology. 2012;119(10):1988-96).

In addition, primary failures are not uncommon with DSAEK, especially in a surgeon’s first procedures. In fact, 10 per cent of DSAEK grafts fail within three years (Ang et al, Ophthalmology 2012; 119: 2239-2244). DSAEK is also still a fairly new procedure and the literature published to date provides no information as to what will happen to DSAEK grafts in the long-term. In particular, the long-term safety in terms of endothelial cell loss compared to PKP has yet to be determined.

Moreover, in common with those who undergo PKP, patients who undergo DSAEK often receive topical steroid for six to 12 months postoperatively. Given that 15 per cent of people are steroid responders, patients must be closely monitored for increased IOP in order to avoid glaucomatous damage to the optic nerve.

And finally, despite its non-invasive and topography-preserving nature, there are as yet no prospective randomised studies demonstrating that DSAEK is superior to PKP for Fuchs’ endothelial dystrophy. Dr Hjortdal nonetheless maintained that in his own experience DSAEK is clearly better. He also concurred with Prof Cochener regarding endothelial keratoplasty’s future promise.

“We will have better techniques available in a few years. DMEK and ultra-thin DSAEK may result in better visual acuity compared to conventional DSAEK. Further down the pipeline we may also be using autologous endothelial cells that are cultivated ex vivo, which could greatly reduce the risk of rejection,” he said.

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