Surgeons tout benefits of deep anterior lamellar keratoplasty

Dermot McGrath
in Monte Carlo

DEEP anterior lamellar keratoplasty (DALK) is increasingly being considered as a viable alternative to penetrating keratoplasty (PK) for patients with keratoconus and other serious anterior corneal pathologies, according to Vincenzo Sarnicola MD.

Speaking to delegates attending the first Cornea Day organised as part of the 10th ESCRS W inter Refractive meeting, Dr Sarnicola noted that more surgeons are making the switch to DALK as the technique becomes more widely known and more clinical data becomes available to justify the transition.

According to Dr Sarnicola, Misericordia Hospital of Grosseto, Italy, DALK offers the best features of both lamellar and penetrating keratoplasty techniques.

“Lamellar keratoplasty offers the advantages of reducing the risk of immune rejection and making any rejection more easily treatable, and there are also fewer intraoperative and postoperative complications compared to PK. Penetrating keratoplasty, however, is associated with better visual outcomes. With DALK, we have the best of both worlds and there is no compromise on a patient’s quality of vision,” he said.

In technical terms, DALK is defined as the replacement of the anterior and medium layers of a pathologic cornea with healthy donated corneal tissue while preserving the recipient’s Descemet’s membrane and endothelium. The indications for its use include anterior dystrophies, corneal scarring and keratoconus.

Dr Sarnicola acknowledged that there was a definite learning curve in mastering the techniques for DALK but that surgeons could experiment with several different approaches to find the one that suits them best.

These DALK approaches include dry dissection popularised by Kazu Tsutova MD, hydrodissection as described by Gentaro Sugita MD, Gerrit Melles MD’s viscoelastic dissection and also air dissection or the ‘big bubble’ technique pioneered by Mohammed Anwar MD. Many surgeons, in fact, opt for a combination of several of these techniques to arrive at a satisfactory outcome, said Dr Sarnicola.

Several theoretical advantages have been described in using this technique over PK, including long-term endothelial survival, a low risk of rejection and a faster visual rehabilitation time because of early suture removal.

A number of surgeons then illustrated the usefulness of DALK in a series of case presentations. Roberto Bellucci MD discussed the case of a 20-year-old female patient who presented with an infection due to contact lens-related Pseudomonas aeruginosa. After one month in hospital care, the patient developed a very thin corneal scar in one eye and the medical team opted to proceed with DALK because of the young age of the patient.

The pre-Descemet membrane dissection was carried out using a combination of air and visco-dissection, but the very tight intra-corneal adhesion resulting from the corneal scar made it difficult for the surgeon to achieve a good lamellar dissection, said Dr Bellucci.

In the course of the dissection, a small perforation occurred in Descemet’s membrane, prompting a change of strategy by the surgical team.

“It was only a minor break in Descemet’s membrane so we opted not to convert immediately to a penetrating corneal graft. Instead we decided in the end simply to stop the procedure and to leave the remaining tissue there in order to offer the patient the possibility to recover sufficient vision to avoid a penetrating corneal graft,” said Dr Bellucci.

Several months after surgery, the eye recovered well, reported Dr Bellucci.

“Now the patient is 20/30 with a minor astigmatic correction, the corneal depth is acceptable and the penetrating keratoplasty has been delayed maybe for many years, maybe forever,” he said.

“Perhaps in the future we might see some drugs being used in the first few postoperative weeks after DALK to increase the maximum levels of visual acuity that we can achieve with this technique”

Jose Güell MD

Dr Güell noted that there is a sub-clinical fibrosis that helped to explain the limited maximal levels of vision in some series of DALK patients compared with penetrating keratoplasty outcomes.

“It’s only a very tentative hypothesis at this stage and clearly more studies are needed to look into this. But perhaps in the future we might see some drugs being used in the first few postoperative weeks after DALK to increase the maximum levels of visual acuity that we can achieve with this technique,” he said.

v.sarnicola@tiscalinet.it
robertobellucci@azop.vr.it
geull@imo.es