Medical Xpress

Newer cornea transplant surgery shows short- and long-term promise

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One year post-surgery, patients who underwent Descemet's stripping automated endothelial keratoplasty (DSAEK) experienced greater cell loss overall compared to those who underwent penetrating keratoplasty (PKP), according to a new analysis of data collected from the Cornea Donor Study (CDS) Investigator Group's 2008 Specular Microscopy Ancillary Study (SMAS). However, the study, published in the March issue of *Ophthalmology*, showed that cell loss in DSAEK patients plateaued more quickly than in those who underwent PKP. The two procedures are alternative methods of corneal transplant surgery for diseases affecting the back cell layer of the cornea, the endothelium.

Both the operation and recovery time associated with DSAEK are shorter because the 360-degree PKP wound is larger, weaker and more prone to rupture. PKP, a procedure that has been actively performed for more than 50 years, involves replacing all the layers of the cornea with healthy donor tissue. DSAEK is a newer procedure, developed within the last five years, by which the diseased, endothelium—a layer of cells that maintains the cornea's clarity and thinness—is replaced with a piece of only healthy donor endothelial tissue. "There is no question of the immediate benefits of DSAEK," says senior author of the study Jonathan H. Lass, M.D., Professor and Chair of the Department of Ophthalmology and Visual Sciences at Case Western Reserve University School of Medicine and University Hospitals Eye Institute. These benefits include greater eye integrity due to a smaller wound; quicker recovery with less visual distortion; and decreased severity in postoperative surface problems, such as dry eye.

According to Dr. Lass, the present study suggests the potential long-term benefits of DSAEK may outweigh the initial cell loss. "The fact that the transplants are less susceptible to trauma is promising for this growing procedure. DSAEK patients are seeing more quickly than PKP patients and this data suggests that long term they may do better too," says Dr. Lass. The study's authors hypothesize that the greater initial cell loss associated with DSAEK is due to greater surgical manipulation of the donated graft itself.

"Demand for DSAEK has grown rapidly because patients appreciate the faster visual recovery with fewer activity restrictions. The greater early cell loss seen with DSAEK initially caused some concern about long-term graft survival, but the results of this study, together with what we've learned from continued follow up of DSAEK pioneers treated over five years ago, have helped allay those fears," says Marianne Price, Ph.D., lead author of the study and Executive Director, Cornea Research Foundation of America.

DSEAK and PKP are both used to manage when the cornea swells due to Fuchs' dystrophy and pseudophakic/aphakic corneal edema, both conditions affecting the function of the corneal endothelium. The study also found that patients who underwent PKP to correct Fuchs' dystrophy could expect significantly less cell loss 12 months after the surgery than PKP recipients suffering from pseudophakic/aphakic corneal edema. DSAEK, on the other hand, resulted in similar cell loss after one year for these two diagnoses. The study concludes that long-term follow-up with DSAEK patients will be needed to determine whether differences similar to those experienced by PKP recipients will emerge over time.

Francis W. Price, M.D., and Mark S. Gorovoy, M.D., co-authors of the study, have been leaders in the field of DSAEK surgery since its inception. Dr. Gorovoy says, "As I've seen in my patients six years out, the stabilization of endothelial cell loss mitigates the surgical trauma and

promotes continued graft clarity. It's reassuring to have confirmation from the data that the continued clinical success of these patients supports the significant benefits of DSAEK over PKP in the long term management of patients with cornea endothelial failure."

Provided by Case Western Reserve University