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Long-term Visual Outcomes comparing Descemet Stripping Automated Endothelial Keratoplasty and Penetrating Keratoplasty

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Abstract

Purpose: To compare 5-year visual acuity and refraction outcome in Descemet stripping automated endothelial keratoplasty (DSAEK) and penetrating keratoplasty (PK) for Fuchs endothelial dystrophy (FED) or bullous keratopathy (BK) in Asian eyes.

Design: Prospective interventional case series.

Methods: We analyzed 828 consecutive cases of DSAEK (423) or PK (405) for FED and BK from the Singapore Cornea Transplant Registry performed from 1991 to 2011. Our main outcome measures were best spectacle-corrected visual acuity (BSCVA) with astigmatism (cylinder) and spherical equivalent (SE) over 5 years follow-up.

Results: Mean age was 67.5 ±11.5 years (50.1% male, 49.9% female) and majority Chinese (76.6%, n=634) in our multi-racial Asian population. DSAEK eyes had significantly better BSCVA (P<.001-.037) with lower SE (P<.001-.017) and cylinder (P<.001), independent of surgical indication compared to PK over 5 years. DSAEK was superior to PK over 5 years (P<.001-.026) in FED, but only over 3 years in BK (P<.001-.031). DSAEK in FED eyes had significantly better BSCVA compared to BK eyes (P=.006 at 4 year follow-up). DSAEKs with preoperative BSCVA <1.3 logMAR had significantly better visual outcomes than cases with ≥1.3 (P<.001-.042). PKs had significantly higher postoperative refractive correction than DSAEKs with no significant influence of the surgery indication.

Conclusions: In our study cohort, DSAEK provided significantly better long-term BSCVA and lower astigmatism than PK over 5 years follow-up. Visual outcomes of DSAEK for FED were better than BK. In some analyses for years 1 to 3, ANCOVA adjustment indicated that this DSAEK-associated better long-term BSCVA was independent of better pre-operative vision in DSAEK eyes.