Endothelial Keratoplasty: the relationship between preoperative endothelial cell density and the five-year postoperative endothelial cell loss.

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Introduction

To determine if the preoperative central Endothelial Cell Density (ECD) in triple and non-triple DSAEK procedures has a relationship with the five-year postoperative Endothelial Cell Density (ECD) or percent loss (ECL).

Methods

We identified a consecutive series of 206 DSAEK transplant patients who had specular images taken at 5 years post surgery. All patients were treated for Fuchs and had no co morbidities that would affect the endothelium. DSAEK cases were stratified into two cohorts: Those taking part in a ‘triple’ procedure and those not taking part in a triple (non-triple). Endothelial cell counts post op were used to evaluate endothelial cell loss by comparison to endothelial cell counts measured before graft preparation.

Results

206 underwent DSAEK (triple and non-triple)

ECD at 5 years: 1556 ± 632
Percent ECL: 43.8
Relationship between preoperative ECD and 5 years postoperative ECD (p value = < 0.01)

150 eyes underwent Triple ECD at 5 years: 1580 ± 638
Percent ECL at 5 Years: 43.6%
Relationship between preoperative ECD and 5 years postoperative ECD (p value = < 0.01)

56 eyes were non triple procedures ECD at 5 Years: 1463 ± 620
Percent ECL at 5 Years: 44.7%
Relationship between preoperative ECD and 5 years postoperative ECD (p = < 0.01)

Clinical Significance

Preoperative ECD is routinely provided by eye banks to surgeons for DSAEK grafts, but the parameters of what is considered to be acceptable need to be better supported by evidence of a correlation with the medium- and long-term postoperative ECD.

In a previous study for DSAEK eyes, we did not find a significant correlation between the preoperative central Endothelial Cell Density (ECD) and the one-year postoperative (ECD). In this experience, we compared the preoperative ECD with the five-year postoperative ECD and found significant correlation between the two in both triple and non-triple procedures. We also found that postoperative ECD was unaffected by the concurrent triple procedure.

Whether this should affect our minimum preoperative ECD or not needs to be elaborated by further similar experiments.

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