

ONLINE FIRST

Prevention and Management of Graft Detachment in Descemet Membrane Endothelial Keratoplasty

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Objectives: To describe the prevention and management of various types of graft detachment after Descemet membrane endothelial keratoplasty.

Methods: In 150 consecutive eyes that underwent Descemet membrane endothelial keratoplasty, the incidence and type of graft detachment were studied at 1, 3, 6, 9, 12, and 24 months after surgery in a nonrandomized, prospective clinical study at a tertiary referral center. Four groups of detachments were identified: a partial detachment of one-third or less of the graft surface area ($n=16$; group 1); a partial detachment of more than one-third of the graft surface area ($n=8$; group 2); a graft positioned upside down ($n=4$; group 3); and a free-floating Descemet roll in the host anterior chamber ($n=8$; group 4).

Results: Partial or complete graft detachment was found in 36 cases (24%), of which 18 (12%) were clinically significant. All 24 eyes with a partial detachment (groups 1 and 2) showed spontaneous corneal clearance, and all but 6 of these eyes (75%) reached visual acuity of 20/40 or better (≥ 0.5). A reversed clearance pattern and interface spikes were observed in eyes with the graft positioned upside down

(group 3). Eyes with a free-floating graft (group 4) showed persistent corneal edema. Detachments were associated with inward folds (12 eyes [33%]), insufficient air-bubble support (7 eyes [19%]), upside-down graft positioning (4 eyes [11%]), use of plastic materials (2 eyes [6%]), irido-graft synechiae (1 eye [3%]), poor endothelial morphology (1 eye [3%]), and stromal irregularity under the main incision (1 eye [3%]); 14 (58%) of the partial detachments were localized inferiorly.

Conclusions: Awaiting spontaneous clearance may be advocated in eyes with a partial detachment. Minor adjustments in surgical protocol as well as careful patient selection may further reduce the incidence of graft detachment after Descemet membrane endothelial keratoplasty to 4% or less.

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SINCE 1998, WE HAVE INTRODUCED various techniques for selective replacement of diseased corneal endothelium.

These techniques have been popularized as deep lamellar endothelial keratoplasty and Descemet stripping endothelial keratoplasty (DSEK) or Descemet stripping automated endothelial keratoplasty.¹⁻⁴ Recently, we further refined the concept of endothelial keratoplasty by introducing selective transplantation of Descemet membrane (DM) and its donor endothelium, referred to as DM endothelial keratoplasty (DMEK).⁵⁻⁹

From the introduction of deep lamellar endothelial keratoplasty, DSEK, and Descemet stripping automated endothelial keratoplasty, we learned that adaptation of a technique among peers may depend not only on the feasibility and clinical outcome but also on the incidence of com-

plications and their possible management. With all endothelial keratoplasty techniques, graft detachment may be the most frequent complication. Because thinner graft thickness has been suggested as a risk factor for graft failure and/or detachment,¹⁰ isolated DM transplantation in DMEK may therefore be prone to higher detachment rates.⁷

The purposes of our study were to identify potential causes of partial and complete graft detachments in DMEK and how they can be avoided and to define preferred treatment options through the analysis of 150 consecutive DMEKs.

METHODS

A total of 150 eyes of 133 patients were enrolled in our prospective study. All patients signed an institutional review board–approved

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