

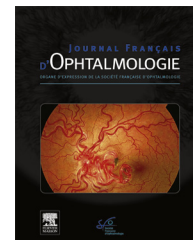


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IMAGE

Short-term clinical and confocal microscopy changes after synthetic endothelial replacement

Changements cliniques à court terme et microscopie confocale après remplacement endothélial synthétique

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A 66-year-old female presented to our clinic complaining of reduced visual acuity and photosensitivity in her right eye (RE). She had already undergone a Descemet's membrane endothelial keratoplasty (DMEK) to treat endothelial decompensation secondary to pseudoexfoliation glaucoma that had required valve implantation in her RE eight years earlier. Slit lamp biomicroscopy showed a pseudophakic eye with a DMEK lamella still attached, diffuse epithelial and stromal edema, and certain areas of mid-peripheral subepithelial fibrosis (Fig. 1A). By using in vivo laser confocal microscopy (IVCM) (HRT III®, Rostock Cornea Module, Heidelberg, Germany), no structures of the epithelium (Fig. 1C) or stroma (Fig. 1D) could be recognized due to the corneal edema. After informed consent, the patient underwent an artificial endothelial replacement surgery (EndoArt®, EyeYon Medical, Israel). Five months later, central corneal thickness had significantly decreased, improving central transparency

(Fig. 1B). IVCM scanning showed a progressive reduction in corneal edema, allowing visualization of cellular structures. The epithelial layer has begun to become visible, with restoration of its phenotype (Fig. 1E). The keratocytes are becoming recognizable within the corneal stroma (Fig. 1F), correlating with the clinical improvement observed.

This synthetic endothelial layer is a dome-shaped, thin (50 µm), flexible implant that has emerged as an alternative to endothelial keratoplasty in selected cases (Fig. 2A and B). This membrane functions as a water-impermeable barrier at the host's posterior stroma, hindering the aqueous humor influx into the central corneal stroma, reducing corneal edema, and re-establishing corneal homeostasis. This device is a promising treatment for certain cases of corneal edema. Recent clinical evidence gives insights into its safety and efficacy; however, these need to be confirmed in further controlled and long-term studies.

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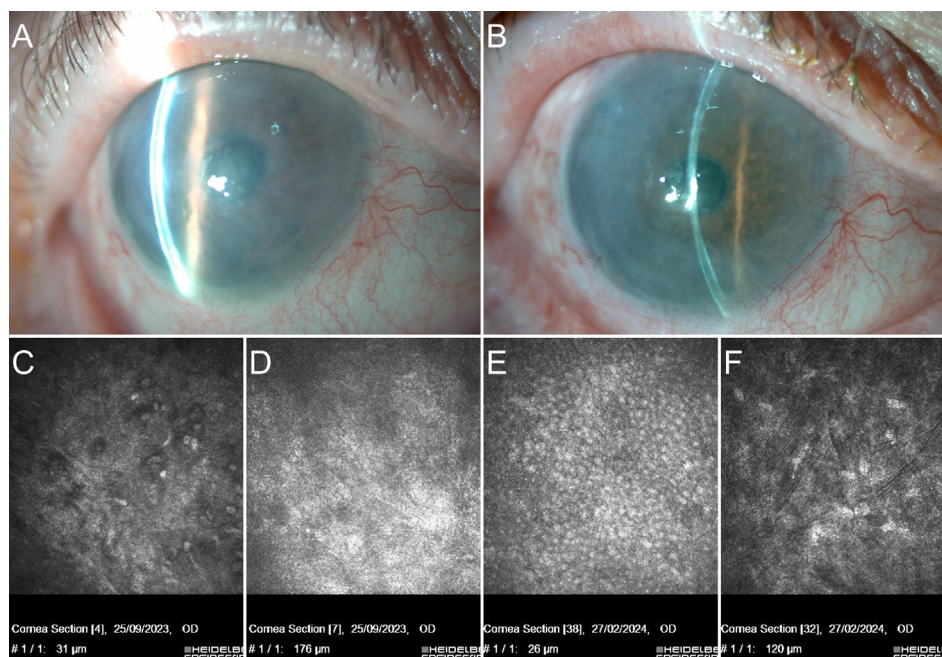


Figure 1. Clinical and in vivo confocal microscopy images at baseline (A, C, and D), and in the 5th month after surgery (B, E, and F).

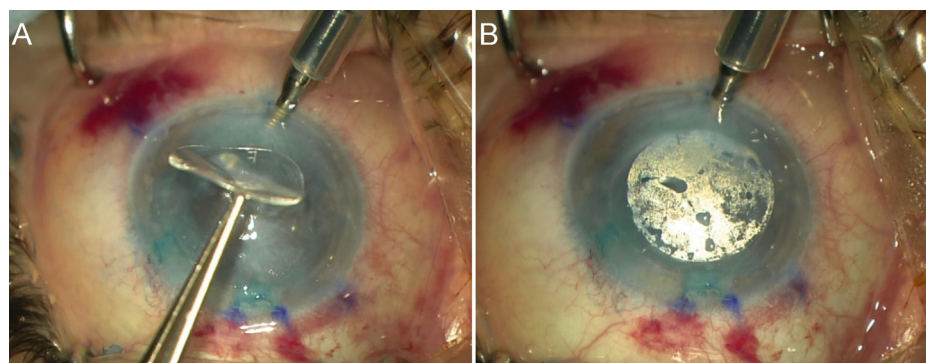


Figure 2. Intraoperative views of artificial endothelial layer implantation. After descemetorhexis, the EndoArt® is placed on the cornea (A) for subsequent manual insertion into the anterior chamber, where it is gently spread over the posterior stroma (B).

Disclosure of interest

The authors declare that they have no competing interest.