

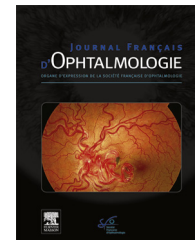


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SFO COMMUNICATION

Reproducibility of single-pass donor DSAEK tissue preparation with the MORIA single-use microkeratome[☆]



Reproductibilité de la simple découpe pour la préparation des DSAEK avec le microkératome MORIA à usage unique

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KEYWORDS

Endothelial keratoplasty;
DSAEK;
Graft thickness;
Single-pass technique;
Lamellar keratoplasty;
Microkeratome;
Corneal biomechanics

Summary

Purpose. – To assess the reproducibility of single-pass cutting for preparation of ultra-thin ($\leq 120 \mu\text{m}$) donor cornea grafts in Descemet stripping automated endothelial keratoplasty (DSAEK).

Methods. – All consecutive patients of DSAEK performed using the MORIA One Use microkeratome (MORIA, Antony, France) in between June 2014 and August 2015. Patient and donor central corneal thickness (CTT), microkeratome head, remaining stromal bed thickness (RSBT), number of cut and graft thickness at 1 month and 6 months postoperatively were recorded in this single-center prospective study.

Results. – The mean preoperative donor graft CCT was $569.0 \pm 45.1 \mu\text{m}$ and the mean donor endothelial graft CCT immediately after the cut was $116.5 \pm 28.7 \mu\text{m}$. At 1 month postoperatively, the mean CCT was $102.8 \pm 35.9 \mu\text{m}$. At 6 months, the mean CCT was $89.4 \pm 26.2 \mu\text{m}$.

[☆] This paper have been presented at the 121st meeting of the Ophthalmological French company in May 2015.

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In all eyes, the mean CCT decreased from the post-cut ($116.5 \pm 28.7 \mu\text{m}$) to the last visit ($89.4 \pm 26.2 \mu\text{m}$) ($P < 0.01$) due to in vivo deturgescence of the graft. We obtained 77.5% ultra-thin DSAEK immediately after the cut, 77.5% at 1 month and 89.8% after 6 months.

Conclusion. – Single-pass technique with the MORIA One Use microkeratome offers safe and reproducible DSAEK tissue preparation and allows achieving ultra-thin DSAEK in 89.8% of cases.

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MOTS CLÉS

Grefe endothéliale ;
 DSAEK ;
 Épaisseur du greffon ;
 Simple découpe ;
 Grefe lamellaire ;
 Microkératome ;
 Biomécanique
 cornéenne

Résumé

Objectif. – Évaluation de la reproductibilité de la simple découpe pour la préparation de greffons cornéens ultrafins ($\leq 120 \mu\text{m}$) dans les *Descemet stripping automated endothelial keratoplasty* (DSAEK).

Méthodes. – Étude prospective monocentrique. Tous les patients ayant eu une DSAEK dont la découpe a été réalisée avec le microkératome MORIA à usage unique (MORIA One Use microkeratome, MORIA, Antony, France) ont été inclus de façon consécutive entre juin 2014 et août 2015. La pachymétrie centrale du greffon et de la cornée du receveur en préopératoire, la tête de microkératome utilisée, l'épaisseur du lit stromal résiduel, le nombre de découpe ainsi que la pachymétrie centrale à 1 et 6 mois postopératoire ont été mesurés.

Résultats. – La pachymétrie centrale moyenne des greffons était $569,0 \pm 45,1 \mu\text{m}$ en préopératoire et $116,5 \pm 28,7 \mu\text{m}$ en post-découpe immédiat. À 1 mois postopératoire, l'épaisseur moyenne du greffon était $102,8 \pm 35,9 \mu\text{m}$. Elle était de $89,4 \pm 26,2 \mu\text{m}$ à 6 mois. Il existait une diminution significative de l'épaisseur du greffon entre l'épaisseur en post-découpe immédiat ($116,5 \pm 28,7 \mu\text{m}$) et la dernière visite ($89,4 \pm 26,2 \mu\text{m}$) dans tous les yeux. Cela est dû à la déturgescence in vivo du greffon. Nous avons obtenu 77,5 % de DSAEK ultrafines en post-découpe immédiat et 89,8 % à 6 mois postopératoire.

Conclusion. – La découpe unique avec le microkératome MORIA One Use permet une préparation reproductible et sûre des DSAEK avec une obtention de DSAEK ultrafine dans 89,8 % des cas en postopératoire.

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Introduction

Over the past decade, endothelial keratoplasty (EK) has gained popularity in the surgical treatment of endothelial corneal disease, such as Fuchs corneal dystrophy and pseudophakic bullous keratopathy.

Descemet's stripping with automated endothelial keratoplasty (DSAEK), which involves removal of recipient endothelium and Descemet's membrane (DM) and replacement with a donor disc consisting of endothelium, DM, and a thin portion of posterior corneal stroma, offers an effective choice over traditional PK for the treatment of corneal endothelial dysfunction.

Indeed, this surgical technique, in contrast to conventional penetrating keratoplasty, allows a more rapid visual recovery, elimination of suture-related astigmatism, better preservation of structural integrity and favorable cost-effectiveness and utility outcomes [1–6].

Preparation of the donor endothelial graft has been simplified by use of a microkeratome on a corneal button mounted on an artificial chamber. Price et al. showed that microkeratome dissection significantly reduces the risk of donor tissue perforation and provided faster visual recovery as compared to manual dissection [7]. Neff et al.

reported that grafts with a mean central thickness of $131 \mu\text{m}$ exhibited a statistically significant improvement in the Best Corrected Visual Acuity (BCVA) compared with thicker grafts [8]. Recently, Busin et al. introduced the concept of ultra-thin DSAEK (UT-DSAEK) using donor tissue prepared with the microkeratome-assisted double-pass technique and intended to be thinner than $130 \mu\text{m}$ [9]. Visual recovery seems to be faster, and more patients can achieve 20/20 of BCVA with UT-DSAEK comparing with "conventional" DSAEK [9]. To date, the definition of ultra-thin lamellar graft carries a central graft thickness of 100 to $130 \mu\text{m}$ [8,9].

In this study, our strategy was to give the priority to a single-cut for corneal disk thickness close to physiological donor thickness (less than $620 \mu\text{m}$ without epithelium) according to our nomogram and for donor thickness of $621 \mu\text{m}$ or higher we performed the double-pass technique using a single-use $150\text{-}\mu\text{m}$ calibrated cutting head in order to return to a "pseudo-physiological" donor thickness and perform a second cut with the same nomogram. The aim of this study was to assess the predictability and reproducibility of this method using a linear One Use microkeratome with disposable heads of 11 different calibrations from 110 to $550 \mu\text{m}$ (MORIA SA, Antony, France) to obtain UT-DSAEK (defined here as $\leq 120 \mu\text{m}$ graft thickness).

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