

The effect of early selective suture removal on post-penetrating keratoplasty keratometry and refraction

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Introduction

- Keratoplasty is a surgical procedure in which a damaged or diseased cornea is replaced entirely (penetrating keratoplasty) or partially (lamellar keratoplasty) by a donated corneal graft.
- Astigmatism management is still an important issue after PK which is closely related with the patient's visual ability and rehabilitation.
- Different techniques have been described to address moderate-to-high astigmatism following corneal transplantation.
- Suture manipulation is usually considered to be the first step in managing post-keratoplasty astigmatism, while the sutures are still present.
- This may include selective suture removal in eyes with interrupted sutures or suture adjustment in eyes with running sutures. (Figure 1)

Purpose

- The aim of this study was to determine the effect of selective suture removal on post-penetrating keratoplasty (PK) refraction and keratometry in patients operated with 16 interrupted 10.0 nylon sutures.

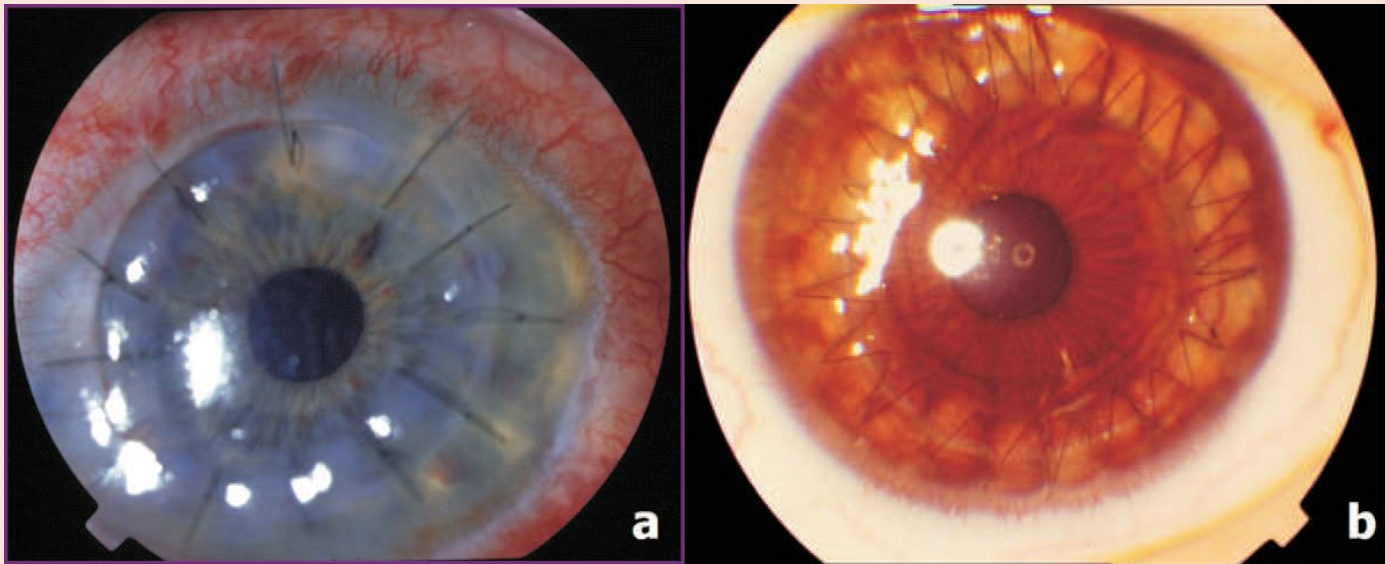


Figure 1. Anterior segment photographs of post penetrating keratoplasty patients with interrupted sutures (a) and running sutures (b).

Methods

- The study group consisted of 48 consecutive penetrating keratoplasties operated between January 2021 and January 2023 at Baskent University Faculty of Medicine, Department of Ophthalmology.
- Selective suture removal started 2 months after PK.
- In each visit one or two sutures were removed under guidance of corneal topography.
- Best corrected visual acuity (BCVA), manifest refraction and keratometry were recorded at the postoperative 2nd, 6th, and 12th months.

Methods

- The meridian of the suture and the number of sutures to be removed were determined according to the patient's refraction and topography (Figure 2), by an experienced ophthalmologist, with an attempt to decrease astigmatism.

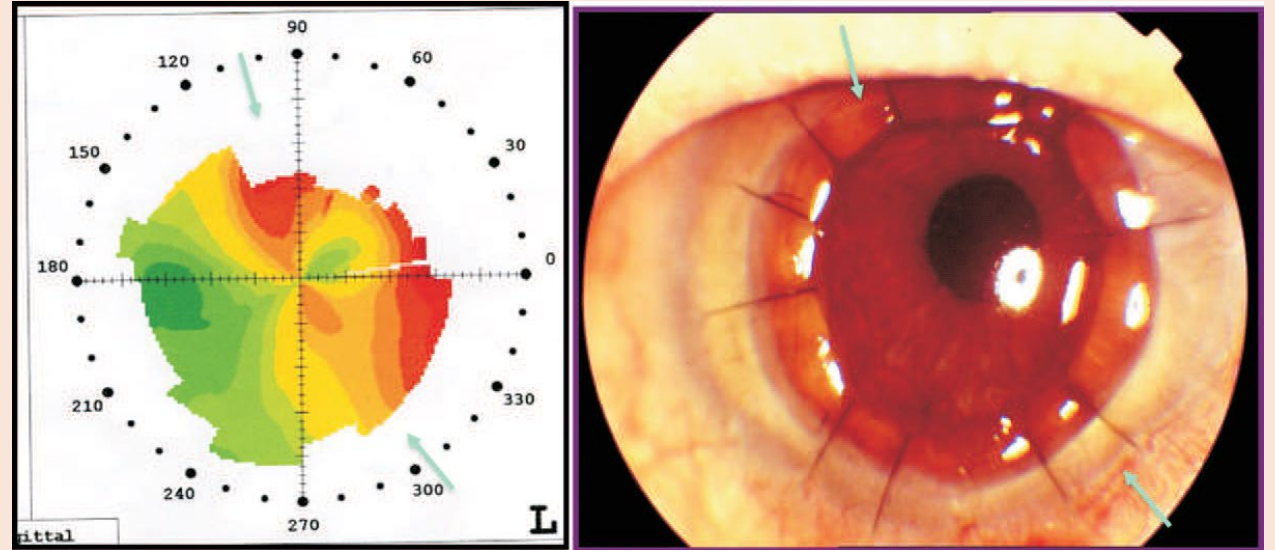


Figure 2. The paired topography and anterior segment photograph of a patient during identification of the tight sutures during selective suture removal. The arrows indicate the steep corneal meridians on the topography and anterior segment photograph.

Results

- At the second month, before suture removal, the average spherical equivalent of refraction was -0.160 ± 3.59 diopters; it was -0.84 ± 4.21 diopters at the 6th month and -1.58 ± 2.66 diopters at the completion of suture removal at 1 year.
- Refractive and keratometric astigmatism were 4.02 ± 2.14 and 4.65 ± 2.25 at the 2nd month and 2.81 ± 1.82 and 3.19 ± 2.94 diopters, respectively at the 12th month. ($p=0.01$ and $p=0.02$)
- A BCVA of 20/50 or better was achieved in 59% of patients.
- None of the patients had any complications including infections, wound dehiscence, or rejection following selective suture removal.

Conclusions

- Early selective suture removal in PK patients operated with interrupted 10-0 nylon sutures is associated with a favorable keratometric and refractive outcome.
- A decrease of at least one diopter of keratometric and refractive astigmatism can be achieved when compared to pre-suture removal values.