

Case Reports

A failed corneal graft as a support for the Boston Keratoprosthesis type 1

Ralph Kyrillos, and Mona Harissi-Dagher, MD

Author affiliations: Department of Ophthalmology, Faculty of Medicine, Université de Montréal, Québec, Canada

Summary

The implantation of the Boston Keratoprosthesis (KPro) requires a corneal button, which is usually taken from a donor. Scarcity of donor tissue has been a major limiting factor in transplant surgery. Recently, autologous recipient cornea has been reported as support for the KPro. We report the successful use of an ipsilateral failed corneal graft as the carrier tissue for a patient requiring combined pars plana vitrectomy and KPro implantation.

Introduction

The major constraints with respect to corneal transplant surgery in Canada, whether standard penetrating keratoplasty or Boston KPro, are the limited supply of donor tissue and insufficient operating room time.¹ In 2004 the mean wait time from diagnosis to corneal transplant was approximately 1 year in Canada.¹ Corneal transplant surgeons performed an average of 40 corneal transplant per year, with an average of 2 cancellations per year due to lack of corneal tissue.¹ To be able to restore sight of patients requiring KPro implantation by circumventing the need for donor material can have many benefits, particularly in countries where access is limited. We report a case of KPro implantation using the patient's own failed corneal graft as support for the KPro.

Case Report

A 51-year-old woman presented to Centre Hospitalier Universitaire de Montréal-Notre-Dame with decreased vision, photophobia, and pain in her left eye of several months' duration. She suffered from congenital cataract and congenital glaucoma and had had multiple surgeries in both eyes. She had previously lost vision in her right eye due to an inoperable retinal detachment. Two years prior to presentation, her left eye had undergone penetrating keratoplasty and pars plana vitrectomy with silicone oil due to bullous keratopathy and rhegmatogenous retinal detachment, respectively. Following surgery, visual acuity in her left eye improved to hand motions but

subsequently degraded again to light perception when the corneal graft failed.

On examination, visual acuity in her left eye was light perception with good projection in all four quadrants. The corneal graft in the left eye was edematous, with band keratopathy. Intraocular pressure (IOP) was 21 mm Hg in the right eye and 10 mm Hg in the left. The fundus could not be seen due to severe corneal edema and scarring, yet a red reflex was present. Biometry showed an axial length of 29.30 mm in the right eye and 31.48 mm in the left. B-scan ultrasonography revealed a buphthalmic left eye with an attached retina. Specular microscopy was unsuccessful and unreliable since the corneal edema was too advanced. Boston KPro type 1 implantation and silicone oil removal were deemed necessary to restore sight in her only seeing eye. Since the patient needed simultaneous operations by two different specialists, the medical team decided to proceed without waiting for donor tissue availability.

An 8.5 mm trephination of the patient's failed corneal graft was performed first and an Eckardt temporary keratoprosthesis was sutured in place. Pars plana vitrectomy and silicone oil removal were performed next by the vitreoretinal surgeon. The Boston KPro was then assembled with a 16-hole polymethyl methacrylate (PMMA) backplate and a titanium locking ring assembled around the trephinated failed corneal graft. Finally,

Published December 01, 2011.

Copyright ©2011. All rights reserved. Reproduction in whole or in part in any form or medium without expressed written permission of the Digital Journal of Ophthalmology is prohibited.

doi:10.5693/djo.02.2011.11.002

Correspondence: Ralph Kyrillos, 2125 Blvd Édouard-Montpetit #11, H3T 1J3

the temporary Eckardt keratoprosthesis was removed, and the permanent Boston KPro was sutured in place.

At 55 months' follow-up the cornea remained in place, without melt, erosions, infection, or extrusion. Visual acuity in the left eye was counting fingers at 30 centimeters and pinholes to 20/400. The fundus was clear. The IOP by palpation ranged from 5 to 10 mm Hg in both eyes. The optic nerve of the left eye was cupped, with a cup-to-disc ratio of 0.9. The visual field was reduced substantially due to glaucoma, explaining the patient's limited visual acuity; nevertheless, she retained her contact lens and successfully administered her drops throughout follow-up.

Discussion

The KPro assembly consists of two PMMA plates sandwiching an allograft donor corneal button, which is sutured to the recipient.² The corneal button acts solely as a support for the KPro. Hence the patient's cornea may be used instead of a donor button if there is no melt, perforation, or infection. Use of ipsilateral autologous material has previously been described in a series

of 4 eyes showing encouraging results at follow-up of between 5 and 20 months.³ We report the implantation of the Boston KPro using the failed corneal graft of a patient requiring combined pars plana vitrectomy and KPro surgery. The use of an autologous cornea—and even a failed corneal transplant—represents a particular advance for surgeons in developing countries, and at times in developed countries, where access to donor material may be scarce or wait time for surgery very long. This case demonstrates that KPro implantation using the patient's own failed corneal graft is feasible and can provide a good visual outcome.

References

1. Cao KY, Dorrepaal SJ, Seamone C, Slomovic AR. Demographics of corneal transplantation in Canada in 2004. *Can J Ophthalmol* 2006;41:688-92.
2. Khan BF, Harissi-Dagher M, Khan DM, Dohlman CH. Advances in Boston Keratoprosthesis: enhancing retention and prevention of infection and inflammation. *Int Ophthalmol Clin* 2007;47:61-71.
3. Ament JD, Tilahun Y, Mudawi E, Pineda R. Role for Ipsilateral autologous corneas as a carrier for the Boston Keratoprosthesis: the Africa experience. *Arch Ophthalmol* 2010;128:795-7.