



KERATOPROSTHESIS IN HIGH-RISK PEDIATRIC CORNEAL TRANSPLANTATION

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Introduction

- Prognosis poorer for pediatric PK
- Factors
 - Surgical technique challenging
 - Heightened immune response

Introduction

- Congenital Corneal Opacification
 - Anterior Segment Dysgeneses
 - Congenital Glaucoma
 - Sclerocornea
 - Birth Trauma

Introduction

- Other high-risk factors:
 - Uncontrolled glaucoma
 - Combined surgery (CE, ppv, tube shunt)
 - Age <1 year
 - Repeat graft
- (Yang et al. Ophthalmology 1999)
(Comer et al. JAAPOS 2001)

Introduction

- Amblyopia: limits visual acuity
 - Irregular astigmatism
 - Aphakia
 - Difficulty in visual rehabilitation
 - 60% clear graft / VA only 30% achieved 20/400 or better

(Stulting RD, et al. 1984 and Dana MR, et al 1005)

Introduction

- Keratoprosthesis
 - Favorable outcome in multiple graft failure cases
(Yaghouti et al. Cornea 2001)
 - Low incidence of endophthalmitis in non-cicatricial corneal opacities
(Nouri et al. Am J Ophthalmol 2001)

Advantages of K-pro

- Keratoprosthesis does not opacify/vascularize
- Spherical anterior shape
- Can correct for refractive errors including aphakia

Purpose

- To propose keratoprosthesis as an alternative procedure to PK in high-risk pediatric cases

Patients

- N= 15 (Baltimore=5 and Rochester=10)
- Age: mean 36 mos (2 mos to 11 years)
- M/F: 8/7
- Dx: Congenital corneal opacities

Surgical Technique



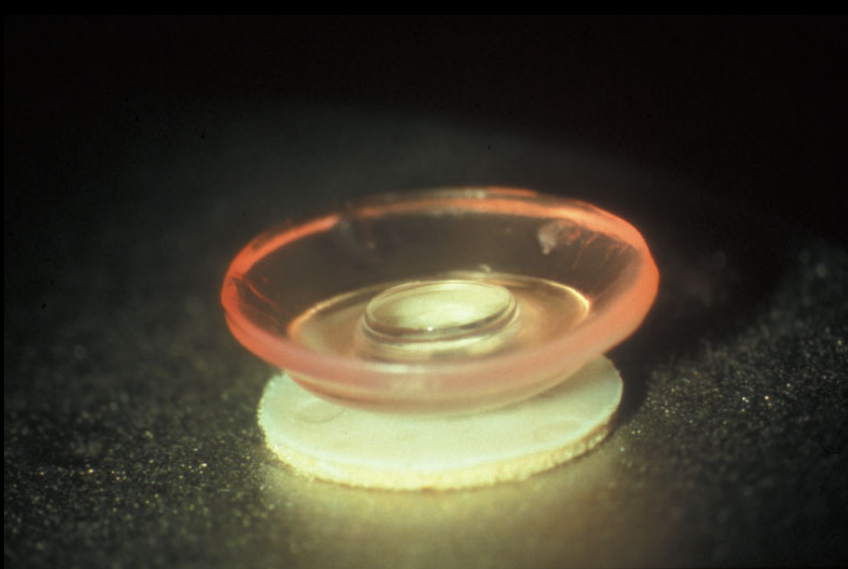
Surgical Technique

- Dohlman-Doane type I keratoprosthesis



Surgical Technique

- Donor corneal button oversized 1.0 mm
- Keratoprosthesis + Baerveldt tube shunt + pars plana vitrectomy + lensectomy



Results

- Follow-up: 1- 28 mos (median 10 mos)
- Boston K-pro (n=13) and AlphaCor (n=2 both failed)
- Retinal detachment and phthisis of the globe (n=1, Boston K-pro)
- One patient had traumatic dehiscence of the Boston K-pro and underwent second one
- Rest are doing well

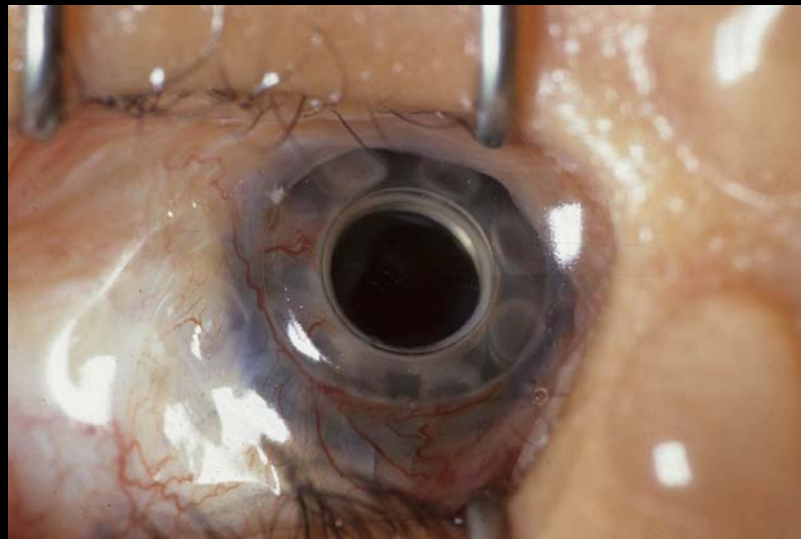
Case One

- 20 mos female with Peters' syndrome
- S/P multiple glaucoma procedures, and PKs, OU
- Phthisis OD with NLP
- Failed PK (x2), OS with LP

- **Initial EUA**

- Opaque graft with epi defect; microcornea, IOP over 40
- B-Scan; aphakia with dense epiretinal membrane
- K-pro + PPV + tube shunt placement, OS
- No intra-op complications

- 9 weeks post-op, choroidals with RD
- Membrane peeling, SBP, fluid-air exchange, silicone oil tamponade, replacement K-pro
- Retina remained attached 28 months following repair





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Case 5

- 5 year old F with Peters anomaly
- S/P multiple PKs, OU
- VA OD: NLP OS: LP
- Glaucoma
- OD phthisical

Case 5

- Underwent Boston K-pro and tube shunt
- No complications
- Developed retroprosthetic membrane 10 mos after surgery requiring YAG
- Did well with a f/u 17 mos



Discussion

- Keratoprosthesis in high-risk pediatric cases may maintain clear visual axis during the formative early years of visual development

Discussion

Cons

Glaucoma management altered following keratoprosthesis; monitor optic nerves

Surgery and post-operative care challenging

Requires team of experienced surgeons

Conclusion

- Keratoprosthesis may be a viable alternative to corneal transplantation in pediatric high-risk cases
- Future studies with longer follow-up are needed prior to recommending keratoprosthesis in high-risk pediatric cases