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
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
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
My name is Michael.
I love you. Akpe.
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