Pediatric Glued Secondary IOL Implantation: Yale Eye Center Experience

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Introduction

• Implantation of secondary intraocular lenses (IOL) in children requires special consideration and can be challenging
• Glued intraocular IOL allows for placement of a posterior chamber IOL in eyes with inadequate capsular support

Purpose

• To analyze outcomes of intrascleral secondary IOL fixation with fibrin glue (Tisseel) in children with inadequate capsular support

Methods

• **Design:** Retrospective, case series study
• **Participants:** Three patients (4 eyes) that underwent implantation with glued secondary IOL
  - Aphakia with deficient capsular support was following traumatic cataract removal from ruptured globe or due to lensectomy for congenital cataracts
  - Best corrected visual acuity preoperatively and postoperatively were analyzed
  - Foldable 3-piece acrylic IOL (MA60AC, Alcon Laboratories, Fort Worth, Texas, USA) was implanted
  - The IOL power was calculated from Holladay and Hoffer Q formula and emmetropia was targeted using immersion A-scan and IOL Master (Carl Zeiss Meditec, Dublin, California, USA)
• **Surgical Technique (Figures 1-6):** All surgeries were performed under general anesthesia. Two peritomies were created 180 degrees apart, in the horizontal meridian. Cautery was applied. Two partial-thickness scleral flaps about 2.5x2.5 mm were created, 180 degrees apart. Using a 23-gauge needle, 2 sclerotomies into the sulcus were made under the existing scleral flaps, approximately 1.5 mm posterior to the limbus. An anterior chamber maintainer was placed. A 2.75 mm clear corneal incision was made. The IOL was introduced using an injector. 23 gauge micro forceps (Micro Surgical Technology, Redmond, Washington, USA) was passed through the distal sclerotomy to hold the haptic. The leading haptic was then externalized through the sclerotomy. Next, using the handshake technique, the trailing haptic was externalized through the proximal sclerotomy. A circumferential scleral tunnel was made with a 26-g needle at the point of externalization of the haptics and the haptics were tucked into the intralamellar scleral tunnel. The scleral flaps were then closed with fibrin glue (Tisseel; Baxter, Deerfield, Illinois, USA). The corneal main wound was closed with 1 10-0 vicryl suture. The conjunctiva was apposed with fibrin glue.

Results

• 4 eyes in 3 children, age 6-7 years (average of 6.5±0.5 years) were studied
  - Aphakia was due to traumatic cataract following ruptured globe (n=1) and due to lensectomy for congenital cataracts (n=3)
  - One of the three children with congenital cataracts had bilateral disease
    - Mean follow-up after IOL surgery was 12.5±5.7 months
    - Foldable 3-piece IOLs were used in all eyes
    - Preoperative mean best corrected visual acuity (BCVA) was 1.40±0.47 LogMar units
    - Corresponding postoperative mean BCVA was 1.59±0.71 LogMar units (p=0.31)
    - One patient required a second surgery due to intraoperative IOL dislocation
    - There were no other complications

Discussion

• Glued IOL fixation, in the absence of capsular support, may be a good option for secondary IOL implantation in pediatric eyes
  - Benefits include placing a posterior chamber IOL in eyes without capsular support, absence of inducing astigmatism, and enhanced rate of adhesion with hemostasis with fibrin glue utilization
  - The glued IOL technique can be considered when an anterior chamber IOL is contraindicated, for instance, in eyes that have low endothelial cell count and peripheral anterior synechiae

Conclusion

• Pediatric glued IOL implantation is another option to consider in aphakic children with deficient capsular support, who require secondary IOL placement for visual rehabilitation
  - Longer follow-up and more patients are needed to determine the functional visual outcome

References


Figure 1. (A) First peritomy. (B) Second peritomy 180 degrees away. (C) Hemostasis with cautery.

Figure 2. (D) Outline of scleral flap. (E) Creation of partial-thickness scleral flap. (F) Intralamellar scleral tunnel at the point of externalization of haptic made within the scleral flap.

Figure 3. (G) Placement of anterior chamber maintainer. (H) Entry into sulcus, under scleral flap, with 23-gauge needle. (I) Creation of a 2.75 mm main wound with keratome.

Figure 4. (J) Injection of intraocular lens into anterior chamber. (K) Externalization of IOL haptic through scleral flap. (L) One haptic externalized through scleral flap and other haptic resting outside of the eye.

Figure 5. (M) Externalization of other haptic through scleral flap, using the handshake technique. (N) Both haptics externalized under scleral flap. (O) Placement of haptic into previously created sclerostomy.

Figure 6. (P) Application of fibrin glue to close first scleral flap. (Q) Closure of second scleral flap with fibrin glue. (R) Conjunctival closure.