ICL In Children

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Pediatric Refractive Surgery

Controversies

- Age at which to perform the refractive surgery
- Surgical Technique

AGE

- **Young age Vs Refractive stability**
- **Nomograms**
- **Child compliance**
- **General Anesthesia**

- Risks of GA
- Effect on optical centration of laser treatment

Surgical Techniques

- **LASER Refractive Surgery**

- **PRK**
- **LASIK**
- **LASEK**
- **Femtosecond (Flap, FLEX, SMILE)**

- **Phakic IOLs (PIOLs)**

- **AC PIOL … Iris fixated (Artisan, Verisyse)**
- **PC PIOL … Staar Visian ICL**

Literature Review

- Laser Refractive Surgery Papers
- Phakic IOL Papers (Few)
- No Femtosecond Papers …!!!!

ARTICLE

Anterior chamber phakic intraocular lens implantation in children to treat severe anisometropic myopia and amblyopia: 3-year clinical results

Amir Pirouzian, MD, Kenneth C. Ip, MD

PURPOSE: To evaluate the midterm efficacy of Verisyse anterior chamber phakic intraocular lens (AC pIOL) implantation in reducing clinically significant (>−8.0 diopters) myopic anisometropia in children who have been noncompliant with traditional medical treatment.

SETTING: Private practice in affiliation with San Diego Children's Hospital, San Diego, California, USA.

METHODS: A retrospective interventional chart review identified highly anisometropic myopic pediatric patients in a single practice who had AC pIOL implantation in the more myopic eye. None of the patients were compliant with spectacle correction or contact lens therapy, and all had dense amblyopia. Preoperative and postoperative visual acuity, stereoacuity, central corneal thickness, motor alignment, and endothelial cell counts were performed in all patients. Occlusion therapy was initiated subsequent to pIOL implantation.

RESULTS: The review identified 7 patients ranging in age from 5 to 11 years; the postoperative follow-up was 34 to 36 months. All patients had a significant improvement (>6 lines) in visual acuity postoperatively. The mean corrected distance visual acuity was 20/40 at 3 years. All patients had improved stereoacuity Randot testing, from a mean of 0 seconds of arc preoperatively to a mean of 185 seconds of arc at 3 years. No intraoperative or postoperative complications were identified.

CONCLUSIONS: Results indicate that AC pIOL implantation can be considered an alternative modality to manage clinically significant, severe anisometropic myopia in pediatric eyes when there is poor patient compliance with traditional medical treatment. Long-term follow-up of corneal endothelial cell density after pediatric AC pIOL implantation is strongly encouraged.

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Phakic Posterior Chamber Intraocular Lens for the Correction of Anisometropia and Treatment of Amblyopia

DAVID BENEZRA, MD, PhD, EVELYNE COHEN, CO, AND ILANA KARSHAI, CO

• PURPOSE: To assess the potential visual benefits of posterior chamber phakic intraocular lens implants in eyes of children with anisometropic amblyopia.

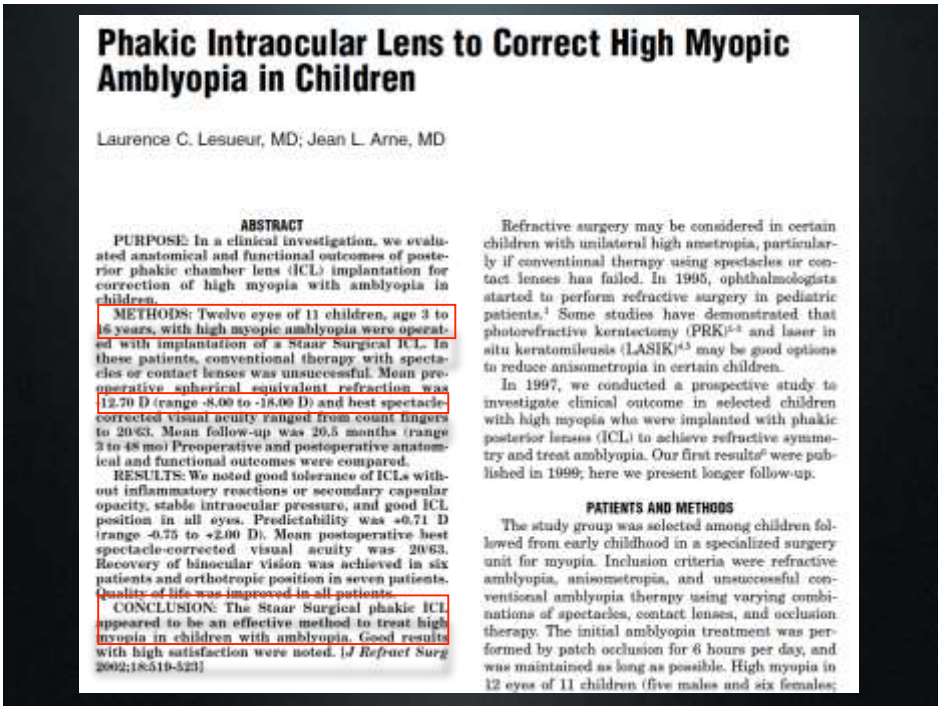
• METHODS: In a prospective study, three girls (9, 14, and 10 years old) with high anisometropia and deep amblyopia were included in this study. The phakic posterior chamber intraocular lens (ICL; STAAR Surgical AG, Nidau, Switzerland) was used to correct the anisometropia. This intraocular lens was inserted in the anterior chamber through a 3.0-mm temporal clear corneal incision and manipulated into the posterior chamber using an iris manipulator. A peripheral iridectomy was performed using the Ocutome Probe (Storz Premiere, St. Louis, Missouri). Local therapy with corticosteroids and antibiotics were prescribed for 2 weeks, and patients were followed regularly for a period of 6 to 9 months.

• RESULTS: In the three amblyopic eyes of the three patients, the preoperative best-corrected visual acuity of 6/30, 6/60, and 6/30 improved, to 6/7.5 (20/25), 6/10 (20/30), and 6/15 (20/50), respectively, 6 months after the surgery. Binocular functions with development of fusional abilities and stereopsis were observed in two of these patients after the intraocular lens implantation. In the third patient, the fusional abilities developed only after surgical correction of the esotropia. The intraocular pressure remained within normal limits, and there was no significant change in the corneal endothelial cell count during the period of follow-up. No major intraoperative or postoperative complications were observed, except for a temporary pupillary distortion.

• CONCLUSIONS: Implantation of phakic posterior chamber intraocular lenses may be beneficial for the treatment of amblyopia in children with anisometropia. Although additional cases and long-term follow-up observations are necessary, it appears that amblyopia may be overcome by the use of posterior chamber phakic intraocular lens implants, even in eyes of children beyond the age generally considered to be responsive to anti-amblyopic treatment. (Am J Ophthalmol 2000;130: 281–286. © 2000 by Elsevier Science Inc. All rights reserved.)

HIGH HYPERMETROPIC OR MYOPIC ANISOMETROPIA (with or without accompanying astigmatism) induces anisokonia, leading to deep amblyopia. Younger children are particularly prone to develop deep amblyopia, especially when the anisometropia is also associated with aphakia.[1] Deep amblyopia in these cases can be avoided if the wearing of contact lenses is tolerated. When there is a need for bilateral contact lens wear, children more readily accept the hardship associated with them.[2] When the need for contact lens is for one eye only (usually the amblyopic eye), compliance for the contact lens wear is generally poorer. Therefore, in most of these cases, the response to anti-amblyopic treatment is at best partial and in the worst cases nil.[3] To circumvent the need for the use of contact lenses in unilaterally aphakic children, aphakiaplasty had been advocated.[4] Despite the initial high enthusiasm for this type of surgery, today this approach has become obsolete. At present, the only viable option for the correction of aphakic anisometropia in children is intraocular lens implantation.[5]

With the development of the excimer laser technology and the routine use of photorefractive keratectomy and laser in situ keratomileusis for the correction of anisotropia, especially myopia, attempts also have been to correct the anisometropia in children by us and by others[6] in a few patients. Although the early results of photorefractive keratectomy in children with anisometropia were encouraging, its many potential drawbacks, complications, and



Phakic Intraocular Lens to Correct High Myopic Amblyopia in Children

Laurence C. Lesueur, MD; Jean L. Arne, MD

ABSTRACT

PURPOSE: In a clinical investigation, we evaluated anatomical and functional outcomes of posterior phakic chamber lens (ICL) implantation for correction of high myopia with amblyopia in children.

METHODS: Twelve eyes of 11 children, age 3 to 16 years, with high myopic amblyopia were operated with implantation of a Staar Surgical ICL. In these patients, conventional therapy with spectacles or contact lenses was unsuccessful. Mean preoperative spherical equivalent refraction was 12.70 D (range -8.00 to -18.00 D) and best spectacle-corrected visual acuity ranged from count fingers to 20/63. Mean follow-up was 20.5 months (range 2 to 48 mo) Preoperative and postoperative anatomical and functional outcomes were compared.

RESULTS: We noted good tolerance of ICLs without inflammatory reactions or secondary capsular opacity, stable intraocular pressure, and good ICL position in all eyes. Predictability was +0.71 D (range -0.75 to +2.00 D). Mean postoperative best spectacle-corrected visual acuity was 20/63. Recovery of binocular vision was achieved in six patients and orthotropic position in seven patients. Quality of life was improved in all patients.

CONCLUSION: The Staar Surgical phakic ICL appeared to be an effective method to treat high myopia in children with amblyopia. Good results with high satisfaction were noted. [*J Refract Surg* 2002;18:519-523]

Refractive surgery may be considered in certain children with unilateral high ametropia, particularly if conventional therapy using spectacles or contact lenses has failed. In 1995, ophthalmologists started to perform refractive surgery in pediatric patients.[1] Some studies have demonstrated that photorefractive keratectomy (PRK)[2,3] and laser in situ keratomileusis (LASIK)[4,5] may be good options to reduce anisometropia in certain children.

In 1997, we conducted a prospective study to investigate clinical outcome in selected children with high myopia who were implanted with phakic posterior lenses (ICL) to achieve refractive symmetry and treat amblyopia. Our first results[6] were published in 1999; here we present longer follow-up.

PATIENTS AND METHODS

The study group was selected among children followed from early childhood in a specialized surgery unit for myopia. Inclusion criteria were refractive amblyopia, anisometropia, and unsuccessful conventional amblyopia therapy using varying combinations of spectacles, contact lenses, and occlusion therapy. The initial amblyopia treatment was performed by patch occlusion for 6 hours per day, and was maintained as long as possible. High myopia in 12 eyes of 11 children (five males and six females;

PC-PIOLs

- Visian ICLs are not very much preferred.
- Although more distant from the corneal epithelium than iris claw PIOLs, problems in sizing the lens arises.
- As the child grows, the sulcus diameter may increase and so the lens may become mobile leading to cataract development and visual instability.

Pediatric Ophthalmology Unit

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- **Nihal El-Shaqanqiry, MD, PhD**
- **Nader Bayoumi, MD, PhD**
- **Amr El-Kamshoshy, MD**
- **Amira Mohamed, MD**

Our Study

- Started 2008
- 52 eyes of 52 anisometropic myopic children
- 20 males and 32 females
- Mean Age: 8.54 yrs. (Range: 3-18 yrs)
- Mean Sph: -9.11D (Range: -5.50 D to -15.00 D)
- Mean Cyl: -1.59 D (Range 0.0 D to -4.75 D)

Our Study

- **Preop evaluation:**

- Manifest and Cycloplegia Refraction
- UCVA, BSCVA
- Corneal topography and Pentacam
- Visante OCT (ant. segment)
- UBM
- IOL Master

Our Study

- **Preop evaluation:**

- Binocular Vision Assessment

1. Bagolini Striated lens
2. Worth 4 dots test
3. Stereopsis : Lang II and Titmus fly tests



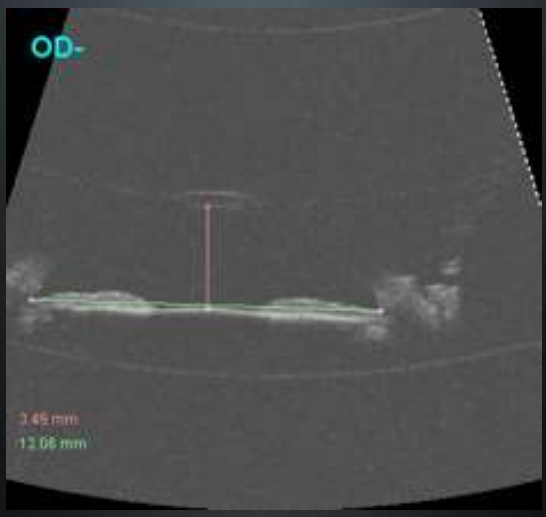

Our Study

- 31 eyes conventional LASIK
- 6 eyes Femto LASIK (VisuMax 200 KHz , VISX)
- **15 eyes Phakic IOLs (Staar Visian ICL) … Started 2010**
  - Postop. follow ups included the same Preop. measures

Case #1

- 6 yrs. old girl
- OD= -14.00 DS / -0.75 DC X 60
- OS= -1.00 DS / -0.50 DC X 150

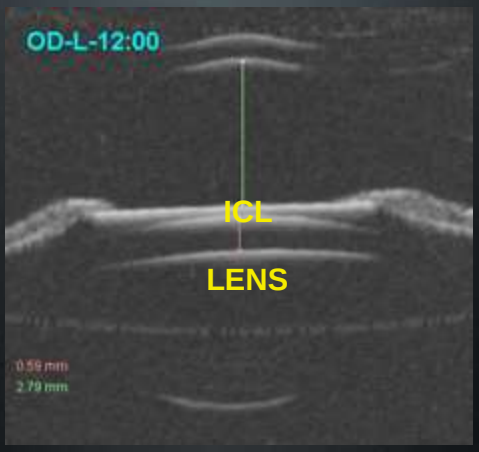
Pre-op UBM



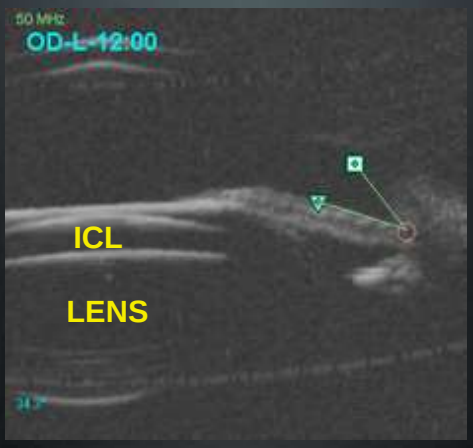
Staar Visian ICL

Post-op UBM

OD= -0.50 DS / -0.50 X 120

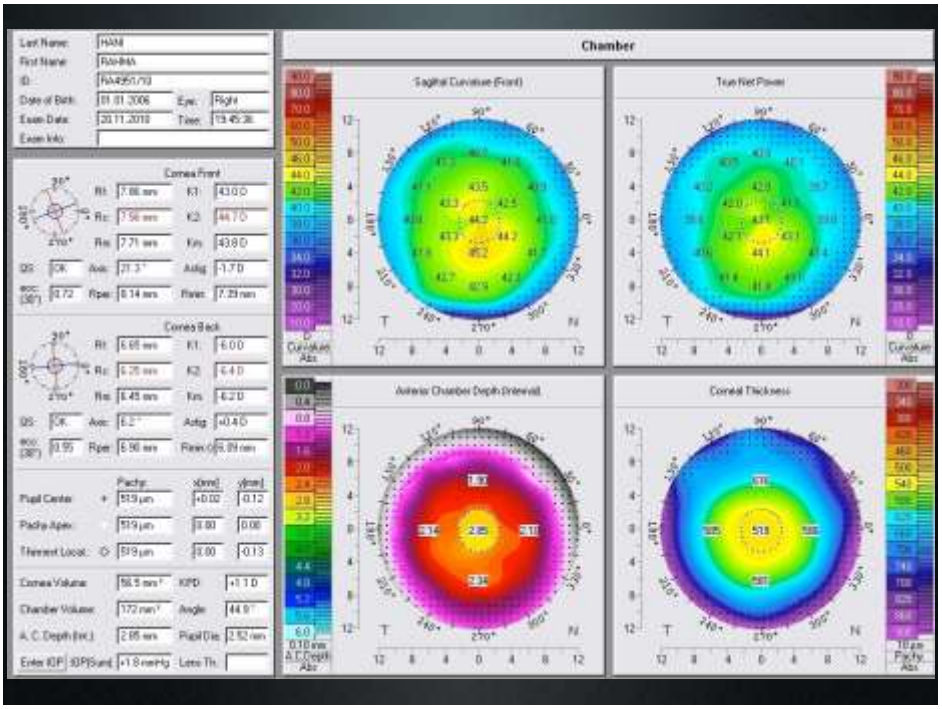


Post-op UBM

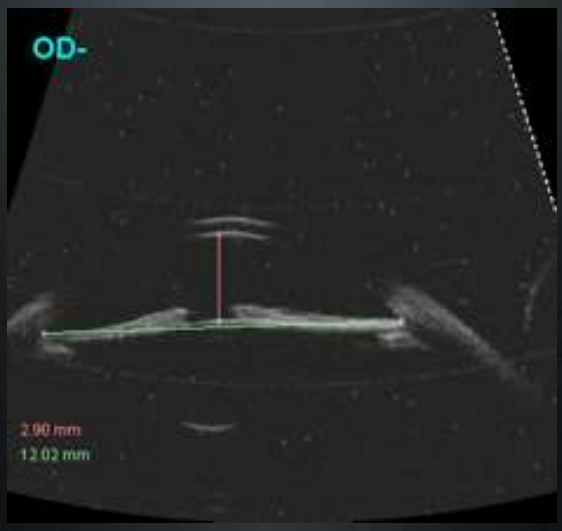


Case #2

- 4 yrs. old girl
- OD= -11.50 DS / -1.00 DC X 20
- OS= -0.75 DS / -0.50 DC X 110

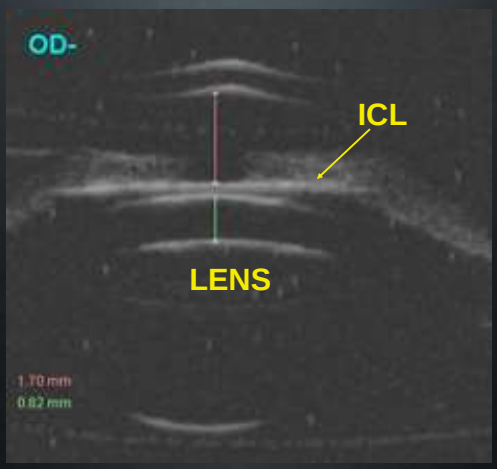


Pre-op UBM



Post-op UBM

OD= +0.75 D / -0.50 X 130



Take Home Messages

- Different modalities of refractive surgery in children seem to be effective and predictable in cases of anisometropic myopia.
- The earlier the age of intervention, the better are the results
- Ideal age ranges from 3-5 years old.
- The Staar Visian ICL seems to be very promising for anisometropic myopia in children provided that proper size of the lens used (UBM + Pentacam-HR + IOL Master + Caliber) all together for ACD and WTW.

THANK YOU ...