

# Long-Term Results of Secondary Intraocular Lens Implantation in Children under 30 Months of Age

Authors: Camila R. Koch<sup>1,2</sup>, Newton Kara-Junior<sup>1</sup>, Alicia Serra<sup>2</sup>, Marta Morales<sup>2</sup>

<sup>1</sup>University of São Paulo (USP), São Paulo, Brazil  
<sup>2</sup>Sant Joan de Déu Hospital, Barcelona, Spain

## Purpose

To report the long-term outcome of early secondary intraocular lens (IOL) implantation following congenital cataract extraction in a large number of eyes.

## Methods

Data of aphakic children under 30 months of age who underwent secondary IOL implantation and had at least one year of follow-up after the surgery was reviewed. In all of the patients, a foldable three-piece acrylic IOL was implanted in the ciliary sulcus by the same surgeon using the same technique. The database studied included refractive and visual acuity (VA) outcomes and complications.

## Results

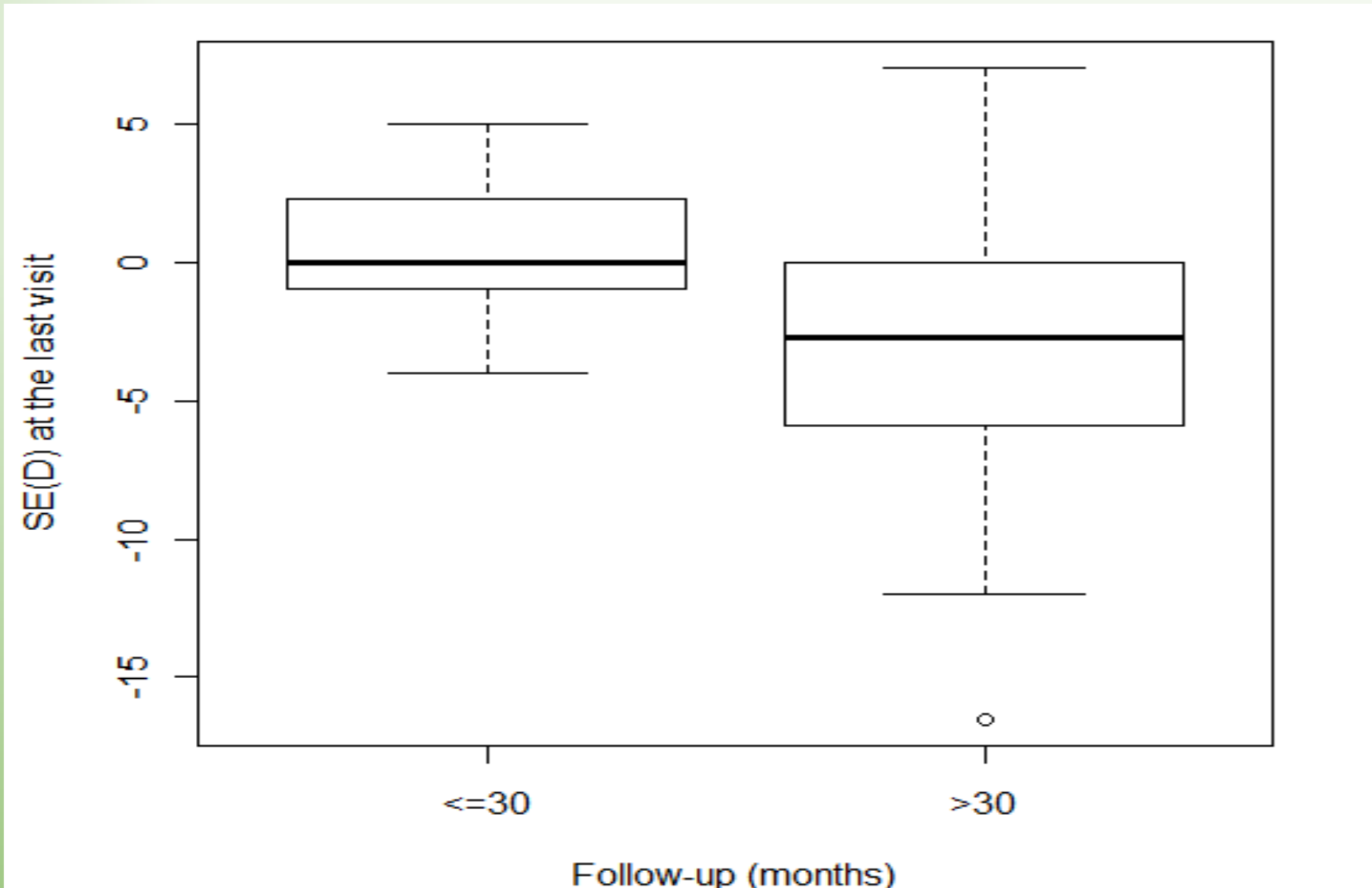
### Baseline Data

Fifty patients (75 eyes) were included. Forty-six (66.7%) had bilateral cataracts, 40 (53.3%) in the right eye, and 43 (57.3%) were male. Among the included eyes, 15 eyes in eight children had systemic diseases (three had Lowe syndrome, three had Down syndrome, one had cystic fibrosis, and one had autism). The most frequent cataract morphology was nuclear (42.7%), followed by total (25.3%) and lamellar (16.0%). The mean age of the cataract surgery was  $94.20 \pm 44.94$  days (range 20 to 204) and  $20.73 \pm 6.02$  months (range 11 to 30) at the secondary intraocular lens (IOL) implantation. The mean time elapsed between the cataract extraction and the secondary IOL implantation was  $17.73 \pm 5.87$  months (range 7 to 28). The mean follow-up time was  $82.32 \pm 48.91$  months (range 13 to 189).

### Visual and Refractive Outcomes

Spherical equivalent (SE) 30 days after the IOL implantation averaged  $2.16 \pm 3.12$  diopters (D) (range -4 to 8). At the last follow-up, the mean SE was  $-2.20 \pm 4.19$  D (range -16.50 to 7) and the corrected distance visual acuity (CDVA) was  $0.58 \pm 0.35$  LogMAR (range 0.0 to 1.3). Among the 19 eyes with spherical equivalent up to -5.00 D at the last visit, five were glaucomatous eyes (mean SE  $-7.52 \pm 2.64$  D; range -5.25 to -16.50) and one eye had a retinal detachment. The mean SE when glaucomatous eyes were excluded, was  $-1.72 \pm 3.66$  D (range -8.25 to 7). The mean SE was  $0.52 \pm 2.52$  in patients with less than 30 months of follow-up time and  $-2.80 \pm 4.27$  in patients with more than 30 months of follow-up, according to the Mann-Whitney test ( $p = 0.004$ ).

Figure 1 shows the difference between the SE vs the follow-up time.



Moreover, there was a negative correlation between a longer period of follow-up and myopia at the SE measured using Spearman's correlation coefficient ( $R = -0.415$ ,  $p = 0.001$ ). We included both eyes in the bilateral cataract cases because these presented different complications, CDVA and refractive error.

### Intraoperative and Postoperative Complications

No intraoperative complications or intraoperative IOL issues were noted. Of the 75 eyes, 12 (16%) had glaucoma developed. Table 1 shows the glaucoma complication details.

Table 1. Results according to glaucoma complications before and after secondary IOL implantation in 12 (16%) of 75 eyes

	Type of Glaucoma		Age at cataract surgery	Age at IOL implantation	CDVA at last follow-up	Surgical
	OAG	ACG	(days)	(months)	(LogMAR)	Cases
	(n %)		Mean $\pm$ SD (range)	Mean $\pm$ SD (range)	Mean $\pm$ SD (range)	(n %)
Glaucoma (eyes)	9 (75)	3 (25)	84.58 $\pm$ 52.21 (27, 186)	22.58 $\pm$ 5.51 (12, 29)	0.93 $\pm$ 0.45 (0, 1.3)	7 (58.33)
Before IOL implantation	3 (25)	0 (0)	47.67 $\pm$ 14.57 (31, 58)	22.33 $\pm$ 5.03 (17, 27)	1.23 $\pm$ 0.11 (1.1, 1.3)	2 (16.66)
After IOL implantation	6 (50)	3 (25)	96.89 $\pm$ 54.90 (27, 186)	22.67 $\pm$ 5.93 (12, 29)	0.82 $\pm$ 0.48 (0, 1.3)	5 (41.66)

OAG: open-angle glaucoma; ACG: angle-closure glaucoma; IOL: intraocular lens; SD: standard deviation

Two of the eyes with open-angle glaucoma (OAG) were in one patient with Lowe syndrome. Two children with persistent fetal vasculature (PFV) were included in this study; both developed glaucoma. The three patients with OAG before the IOL implantation had undergone cataract surgery before two months of age (at 31, 54, and 58 days, respectively). Two of them needed tube implantation, one before the IOL implantation and the other after the IOL implantation. The mean time of the OAG diagnosis in the children after the IOL implantation was  $50.17 \pm 28.79$  months (range 20 to 79). All surgical treatment in the OAG cases involved tube implantation. All of the angle-closure glaucoma (ACG) cases were controlled with peripheral iridectomy. One of these cases was an autism patient with IOL dislocation.

Corectopia was present in ten (13.33%) eyes, seven (70%) were after the IOL implantation. Five (50%) of these eyes underwent surgical repair. Visual axis opacity (VAO) was observed in six (8%) eyes. Of them, five eyes had VAO before IOL implantation (three needed surgery capsulotomy) and after the IOL implantation one had VAO (needed surgical capsulotomy). In these patients a vitrectomy probe via pars plicata was used to enlarge the capsulotomy. There was one IOL opacification (Hydroview HP60M IOL), one retinal detachment, and one endophthalmitis. The patient with retinal detachment needed a vitrectomy surgery. The patient with endophthalmitis was submitted to vitrectomy and IOL extraction. The overall complications related to surgery after the IOL implantation were in 19 eyes (25.33%). Of them, 13 (17.33%) had an additional surgery. Strabismus was found in 33 (64.7%) patients, being esotropia the most frequent in 18 (78.3%).

## Conclusion

Secondary IOL implantation under 30 months of age is an option for children with unsatisfactory management of the optic treatment. A predictable IOL power calculation and satisfactory visual outcomes compared to results of later secondary IOL implantation are possible.