

# Outcomes of Congenital Cataract Surgery in a Tertiary Care Hospital

Kanwal Latif, Munira Shakir, Shakir Zafar, Syed Fawad Rizvi, Saliha Naz

*Pak J Ophthalmol 2014, Vol. 30 No. 1*

See end of article for authors affiliations

**Purpose:** To determine outcomes of congenital cataract surgery in a tertiary care hospital.

Correspondence to:  
Dr. Kanwal Latif  
Resident Medical Officer  
LRBT Free Base Eye Hospital  
Kornagi 2 ½ Karachi-74900

**Material and Methods:** A total of 192 eyes of 120 patients of age group 3-8 years with visually significant congenital cataract ( $\geq 3$  mm in diameter) underwent cataract surgery with posterior chamber foldable intraocular lens implantation were enrolled in this interventional study. Posterior capsulotomy with anterior vitrectomy was performed in all cases. The span of study was July 2011 to January 2013. The minimum follow up of patients was 6 months. In follow-up period postoperative treatment, management of surgical complications, amblyopia therapy and assessment of visual acuity was done. Final outcome of congenital cataract surgery in terms of improvement in visual acuity was assessed at the end of 6<sup>th</sup> month. The study was performed at Layton Rehmatullah Benevolent Trust Eye Hospital, Karachi.

**Results:** At the end of study 51% of patients achieved good vision and the better visual outcome is significantly higher in younger age groups. Fibrinous reaction was the most common complication occurred in this study.

**Conclusion:** This study demonstrate that early congenital cataract surgery is a safe procedure and beneficial in achieving good visual acuity.

Childhood blindness is a priority of Vision 2020: the Right to Sight, the global initiative to reduce the world's burden of avoidable blindness<sup>1,2</sup>. Globally there are estimated 1.5 million blind children, almost three-quarters of them living in developing countries<sup>3</sup>. The prevalence of blindness in children in Pakistan is estimated to be about 10 per 10,000 children<sup>4</sup>. Various studies across the globe show one third to half of childhood blindness is either preventable or treatable<sup>5</sup>. Cataract is the leading treatable cause of childhood blindness in children<sup>6,7</sup>.

Worldwide 5 - 20% of the blindness in children is due to congenital cataract and the global incidence of congenital cataracts has been reported to be 1 - 15/10,000 live births<sup>7</sup>. A hospital based study in Pakistan showed that 54.7% of the children are visually handicapped and 23% of them are because of congenital cataract<sup>8</sup>.

Congenital cataract usually present as a whitish

reflex called leukocoria in eye. The morphology of cataract is important because it may indicate a likely etiology, mode of inheritance and effects on vision<sup>9</sup>. Congenital cataract requires early detection and treatment to prevent permanent visual impairment from amblyopia ('lazy eye')<sup>10</sup>. Earlier cataract surgery with adequate visual rehabilitation contributes a better visual outcome<sup>11</sup>.

Optimal surgical treatment of the pediatric cataract requires a procedure that will provide a clear optical axis. The visual axis may be obstructed by posterior capsule opacification, inflammatory membranes, thickening and opacification of the hyaloid face, and proliferation of the lens epithelial cells<sup>12</sup>. Leaving the posterior capsule intact in children predisposes to an unacceptably high rate of capsule opacification<sup>13,14</sup>. To reduce the rate of visual axis opacification in the post operative period posterior continuous curvilinear capsulorhexis with anterior

vitrectomy, has become the gold standard in the treatment of congenital cataract<sup>15</sup>. This procedure will give a clear visual axis with a reduce rate of visual axis opacification and postoperative need of yag laser capsulotomy. Along with posterior capsulotomy and anterior vitrectomy implantation of posterior chamber intraocular lenses (PC - IOL) in children is becoming more common and better accepted procedure throughout the world<sup>16</sup>.

There are various postoperative complications encountered in children after surgery. Increased reactivity of uveal tissue in children causes formation of membranes, fibrinous reaction and posterior synechie. It may results in pupillary block and cause raised intraocular pressure postoperatively<sup>17</sup>.

The rationale of this study is to determine the outcomes of congenital cataract surgery in a series of patients in tertiary care hospital.

## MATERIAL AND METHODS

A total of 192 eyes of 120 patients aged 3 to 8 years with visually significant congenital cataract ( $\geq 3$ mm diameter) treated and followed up at our hospital between July 1st, 2011 and January 31st, 2013, were included in this interventional study. The study was performed at Layton Rehmatullah Benevolent Trust Eye Hospital Karachi. Informed consent was taken from the guardians. Exclusion criteria were other congenital anomalies like microphthalmia and microcornea, history of intrauterine infections, traumatic cataract, congenital glaucoma, nystagmus, ptosis, strabismus, retinal pathologies and fundal dystrophies, systemic disorders like galactosemia, hyper and hypoglycemia and complicated surgeries. After detailed history patients were examined thoroughly and relevant investigations were done. Ophthalmic checkup including visual acuity, slit lamp examination of anterior and posterior segment, keratometry, B-scan ultrasonography and intra ocular lens power calculation wherever possible were done. Un-cooperative children were examined under general anesthesia before surgery for keratometry and intraocular lens power calculation. Intra ocular lens power was calculated by using SRK II formula.

Pre operatively dilatation of pupil was done by using cyclopentolate 1% and phenylephrine 2.5%. Under general anesthesia and sterilized draping supero-temporal limbal incision of 3mm was made with surgical knife no.3.2. A viscoelastic agent was injected to maintain the anterior chamber depth and facilitates easy entry of instruments with less surgical

trauma during surgery. Anterior capsulorrhexis was done by a bent 26 gauge needle or utrata forceps according to the elasticity of anterior capsule. Lens matter aspiration was done by means of an irrigation-aspiration hand piece. After aspiration of lens matter posterior chamber foldable acrylic intra ocular lens was implanted in the bag on posterior capsule. Posterior capsulotomy and anterior vitrectomy was performed. Incision was closed by one interrupted 10-0 monofilament nylon suture and an air bubble is injected so as to maintain anterior chamber depth postoperatively.

One drop of topical atropine 1% and an antibiotic was instilled and pad applied. Dressing removed after 24 hrs. Systemic antibiotics were given for five days after surgery. Topical antibiotics, steroids and cycloplegic were given in the follow-up period for six weeks.

Patients were followed on 1st post operative day and 1<sup>st</sup> post operative week for early postoperative complications and then patients were followed after 1 month, 3 months and 6 months. Visual acuity was assessed using the Lea symbols and ETDRS charts depending on the age, intelligence and cooperation of child. Amblyopia therapy was given to those whose visual acuity was greater than Log MAR 0.5. The therapy was given according to the age and density of amblyopia. Occlusion of normal eye with better visual acuity was done by means of a patch applied to that eye. Hours of patching depends on the age of the child. These patients were followed at one month interval to monitor the improvement of vision. Final visual acuity was assessed at 6 months and considered to be good if it ranged between Log MAR 0.0 to 0.5.

## RESULTS

A total of 192 eyes of 120 patients with visually significant congenital cataract were included in this study. Out of 120 patients, 70 (58.3%) were males and 50 (41.6%) were females. Regarding site of eye, 102 (53.1%) left and 90 (46.9%) right eyes were involved.

Mild to moderate anterior chamber inflammation (up to Grade +2 anterior chamber cells and flare) was seen in 25 (13%) eyes on first postoperative day. Patients were treated with topical prednisolone acetate 1% and cyclopentolate 1% and were closely followed. Anterior chamber inflammation was completely settled after 2 weeks. Severe anterior chamber inflammation (Grade +3 to +4 anterior chamber cells and flare) with pupillary membrane was

seen in 30 (15%) eyes on first post operative day. They received topical and systemic steroids treatment for 2 weeks along with atropine 1%–Inflammation settled down in 20 (10%) children while 10 (5%) children underwent Yag laser membranectomy. Surgical membranectomy was not required as children were cooperative. They were repeatedly followed after one week and prolonged steroid treatment was given for one month. Post- operative inflammation was well controlled in both the age groups and there was no visually significant complication after treatment.

Raised intra ocular pressure was seen in 10 (5.2%) eyes at first post operative week. Those patients were treated with topical anti glaucoma medications (beta blockers) and followed after one week to check intra ocular pressure. Intra ocular pressure was settled down after one week with topical medication and did not rise within the follow up period.

Pupillary deviation was seen in 8 (4.1%) eyes. This was due to trauma to iris at the time of surgery. Intraocular lens (IOL) capture was observed in 4 (2%) eyes. Decentration of intra ocular lens was seen in 9 (4.6%) eyes. Small upward decentration was seen in these cases and none of the IOL decentrations was visually significant or a true dislocation, and no eye required surgical repositioning of the IOL.

Loose corneal scleral sutures were seen in 4 (2%) patients. Those sutures were removed under sedation in younger children and at slit lamp in older and cooperative children.

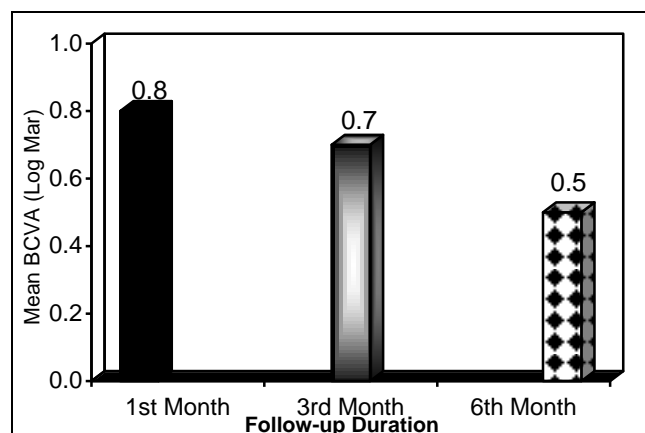
**Table 1:** Final best corrected visual acuity in children after congenital cataract surgery at 6th months with respect to age groups (n = 192)

Age Groups (Years)	Final Best Corrected Visual Acuity		Total
	Good	Not Good	
3 to 5 Years	96 (96%)	4 (4%)	100
6 to 8 Years	2 (2.2%)	90 (97.8%)	92

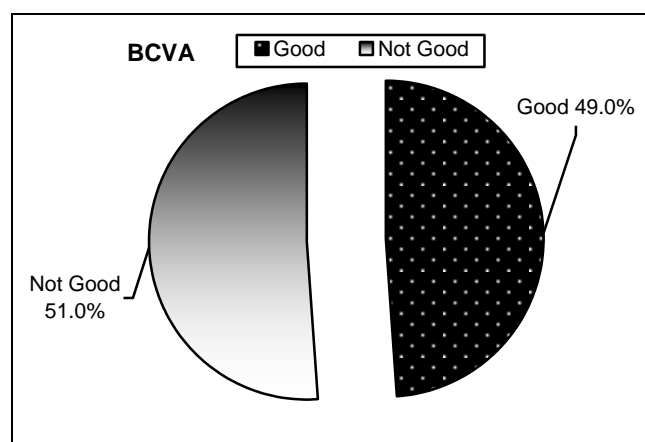
Chi-Square = 84.4 p = 0.0005

Final outcome of best corrected visual acuity was assessed at the end of 6th month after surgery. Mean BCVA at first month was  $0.8 \pm 0.15$ , at 3<sup>rd</sup> month was  $0.7 \pm 0.19$  and at 6<sup>th</sup> month was  $0.5 \pm 0.25$  (Figure 1). Mean best corrected visual acuity (range BCVA log

Mar 0.0 to 0.5) was observed in 51% (98/192) while not good (BCVA > 0.5) was observed in 49% (94/192) cases as presented in figure 2. BCVA was significantly better in 3 to 5 years of age as compared to 6 to 8 years of age (Table 1).



**Fig. 1:** mean best corrected visual acuity according to follow-up (n = 192)



**Fig. 2:** Final best corrected visual acuity in children after congenital cataract surgery at 6th months

There were no severe complications encountered after surgery such as post operative endophthalmitis, retinal detachment, glaucoma or significant postoperative inflammation with lens deposits or synechias.

**DISCUSSION**

Congenital cataract is the most common cause of visual impairment in children because of sensory deprivation during the period of visual maturation<sup>18</sup>.

Its etiology is multifactorial and among the various risk factors, most important is the age of child. Management of the posterior capsule, aggressive amblyopia therapy, and refractive management are major factors governing the ultimate visual outcomes of congenital cataract surgery<sup>15</sup>. Many surgical procedures have been used to reduce the rate of posterior capsular opacification in children. Posterior chamber intra ocular lens implantation with posterior capsulotomy and anterior vitrectomy is the most accepted surgical procedure in management of congenital cataracts<sup>16</sup>.

The age at which anterior vitrectomy and posterior capsulotomy should be performed is controversial. Many studies have different results. Basti et al performed primary posterior capsulotomy with anterior vitrectomy in children younger than 8 years<sup>14</sup>. Dahan and Salmenson recommended posterior capsulorhexis and anterior vitrectomy in children younger than 8 years<sup>19</sup>. Vasavada and Desai suggested that anterior vitrectomy with posterior continuous curvilinear capsulorhexis was desirable in children with congenital cataracts younger than 5 years<sup>20</sup>. In our study we performed anterior vitrectomy and posterior capsulotomy in all cases so as to minimize the rate of visual axis opacification and to achieve early postoperative visual rehabilitation.

In our study after treatment of postoperative complications and amblyopia therapy 51% of eyes achieved good best corrected visual acuity (BCVA). It ranges from 0.0 to 0.5 Log MAR. Vision was not improved in 49% eyes despite proper management of complications and aggressive amblyopia therapy. The results of good visual acuity after congenital cataract surgery are variable. Kim et al reported improved visual acuity in 51.7% of patients<sup>7</sup>. Lai et al showed improvement in 50% of patients<sup>21</sup>. Magnusson et al reported 50% of children achieved improvement in vision after surgery<sup>22</sup>.

In follow-up period visual acuity was not improved during the 1<sup>st</sup> month but in subsequent follow-ups most of the patients achieve good vision with mean value of Log MAR 0.5. Magnusson et al also showed a mean value of Log MAR 0.5 at the end of followups<sup>22</sup>.

Improvement in visual acuity after congenital cataract surgery was seen in patients who presented in younger age. In younger age group of 3 - 5 years 96% of children achieved good vision as compared to older age group of 6-8 years in which only 2% achieved

good vision. In older age groups late intervention was the cause of decreased vision because of form deprivation due to cataract during the sensitive period of visual maturation. This showed that visual outcome following cataract surgery depends on the age and earlier cataract surgery is beneficial in achieving good vision<sup>11</sup>.

Moderate anterior chamber inflammation was seen in 13% and severe inflammation was seen in 15% of eyes. Keech et al reported 10% of eyes developed inflammation and secondary membrane formation<sup>23</sup>. Zwaan et al reported 13% of eyes developed fibrinous membranes after surgery<sup>24</sup>. Raised intra ocular pressure was seen in 5% of eyes. Ondraek and Lokaj reported raised intraocular pressure in 4.3% of cases<sup>25</sup>.

Pupillary deviation was seen in 4.1% of eyes. Ondraek and Lokaj reported pupillary deviation in 3.8% of eyes<sup>25</sup>. IOL capture was observed in 2% of eyes. Luo et al observed IOL capture in 2.6% of patients<sup>26</sup>.

## CONCLUSION

This study concludes that timing of the congenital cataract surgery is the most important factor for visual prognosis.

### Author's Affiliation

Dr. Kanwal Latif  
Resident Medical Officer  
LRBT Free Base Eye Hospital  
Kornagi 2½ Karachi-74900

Dr. Munira Shakir  
Consultant Ophthalmologist  
LRBT Free Base Eye Hospital  
Kornagi 2½ Karachi-74900

Dr. Shakir Zafar  
Consultant Ophthalmologist  
LRBT Free Base Eye Hospital  
Kornagi 2½ Karachi-74900

Dr. Syed Fawad Rizvi  
Chief Consultant Ophthalmologist  
LRBT Free Base Eye Hospital  
Kornagi 2½ Karachi-74900

Dr. Saliha Naz  
Resident Medical Officer  
LRBT Free Base Eye Hospital  
Kornagi 2½ Karachi-74900

## REFERENCES

1. **Gogate P, Gilbert C.** Blindness in children: a worldwide perspective. *Community Eye Health.* 2007; 20: 32-33.
2. **Chak M, Wade A, Rahi JS.** British Congenital Cataract Interest group. Long-term visual acuity and its predictors after surgery for congenital cataract: findings of the British congenital cataract study. *Invest Ophthalmol Vis Sci.* 2006; 47: 4262-9.
3. **Sethi S, Sethi MJ, Saeed N, Kundi NK.** Pattern of common eye diseases in children attending outpatient eye department Khyber Teaching Hospital. *Pak J Ophthalmol.* 2008; 24: 166-71.
4. **Mahdi Z, Munami S, Shaikh ZA, Awan H, Wahab S.** Pattern of eye diseases in children at secondary level eye department in Karachi. *Pak J Ophthalmol.* 2006; 22: 145-51.
5. **Gogate P, Gilbert C, Zin A.** Severe visual impairment and blindness in infants: causes and opportunities. *Middle East Afr J Ophthalmol.* 2011; 18: 109-114.
6. **Chandna A, Gilbert C.** When your eye patient is a child. *Community Eye Health.* 2010; 23: 1-3.
7. **Kim KH, Ahn K, Chung ES, Chung TY.** Clinical outcomes of surgical techniques in congenital cataract. *Korean J Ophthalmol.* 2008; 22: 87-91.
8. **Butt IA, Jalil M, Waseem S, Abdul Moqet, Inam-ul-Haq M.** Spectrum of congenital and developmental anomalies of eye. *Al Shifa J Ophthalmol.* 2007; 3: 56-60.
9. **Amaya L, Taylor D, Russell - Eggitt I, Nischal KK, Lengyel D.** The morphology and natural history of childhood cataracts. *Surv Ophthalmol.* 2003; 48: 125-44.
10. **Sethi S, Sethi MJ, Hussain I, Kundi NK.** Causes of amblyopia in children coming to ophthalmology outpatient department, Khyber Teaching Hospital, Peshawar. *J Pak Med Assoc.* 2008; 58: 125-8.
11. **Ye HH, Deng DM, Qian YY, Lin Z, Chen WR.** Long term visual outcome of dense bilateral congenital cataract. *Chin Med J (Engl).* 2007; 120: 1494-7.
12. **Nishi O.** Fibrinous membrane formation on the posterior chamber lens during the early postoperative period. *J Cataract Refract Surg.* 1988; 14: 73-7.
13. **BenEzra D, Cohen E.** Posterior capsulectomy in pediatric cataract surgery; the necessity of a choice. *Ophthalmology.* 1997; 104: 2168-74.
14. **Basti S, Ravishankar U, Gupta S.** Results of a prospective evaluation of three methods of management pediatric cataracts. *Ophthalmology.* 1996; 103: 713-20.
15. **Petric I, Lonèar VL.** Surgical technique and postoperative complications in pediatric cataract surgery: retrospective analysis of 21 cases. *Croatian Medical Journal.* 2004; 45: 287-91.
16. **Astle WF, Alewenah O, Ingram AD, Paszuk A.** Surgical outcomes of primary foldable intraocular lens implantation in children: understanding posterior opacification and the absence of glaucoma. *J Cataract Refract Surg.* 2009; 35: 1216-22.
17. **Kariman F, Ali Javadi M, Reza Jafarinasab M.** Pediatric cataract surgery. *Iran J Ophthalmic Res.* 2007; 2: 146-53.
18. **Kaul H, Riazuddin SA, Yasmeen A, Mohsin S, Khan M, Nasir IA, et al.** A new locus for autosomal recessive congenital cataract identified in a Pakistani family. *Mol Vis.* 2010; 16:240-5.
19. **Dahan E, Salmenson BD.** Pseudophakia in children: precautions, techniques, and feasibility. *J Cataract Refract Surg.* 1990; 16: 75-82.
20. **Vasavada A, Desai J.** Primary posterior capsulorhexis with and without anterior vitrectomy in congenital cataracts. *J Cataract Refract Surg.* 1997; 23: 645-51.
21. **Lai J, Yao K, Sun ZH, Zhang Z, Yang YH.** Long term follow up of visual functions after pediatric cataract extraction and intra ocular lens implantation. *Zhonghua Yan Ke Za Zhi.* 2005; 41: 200-4.
22. **Magnusson G, Abrahamsson M, Sjostrand J.** Changes in visual acuity from 4 to 12 years of age in children operated for bilateral congenital cataract. *Br J Ophthalmol.* 2002; 86: 1385-9.
23. **Keech RV, Tongue AC, Scott WE.** Complications after surgery for congenital and infantile cataract. *Br J Ophthalmol.* 1989; 108: 136-41.
24. **Zwaan J, Mullaney PB, Awad A, al-Mesfer S, Wheeler DT.** Pediatric intraocular lens implantation. Surgical results and complications in more than 300 patients. *Ophthalmology.* 1998; 105: 112-8.
25. **Ondraek O, Lokaj M.** Visual outcome after congenital cataract surgery. Long term clinical results. *Scripta Medica (BRNO).* 2003; 78: 95-102.
26. **Luo Y, Lu Y, Lu G, Wang M.** Primary posterior capsulorhexis with anterior vitrectomy in preventing posterior capsule opacification in pediatric cataract microsurgery. *Microsurgery.* 2008; 28: 113-6.