

A Retrospective Study to Assess the Visual Outcome and Complications of Phacoemulsification and IOL Implantation in Patients of Congenital Cataract

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Abstract

Aim: The aim of the present study was to assess the visual outcome and complications of phacoemulsification and IOL implantation in patients of congenital cataract.

Methods: This retrospective study included 24 children (36 eyes) with congenital cataract who underwent surgery at Department of Ophthalmology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India from November 2017 to October 2018.

Results: Postoperatively, corrected and uncorrected visual acuity with a Snellen acuity chart could be checked in 20 eyes. Other methods used for visual acuity testing were observation of fixation behaviour, Cardiff test, picture matching. Increased fibrinous reaction/Uveitis in anterior chamber was seen in 4 eyes (11.11%). This resolved with frequent use of steroids. Optic capture was noticed in 3 eyes (9.37%). 2 eyes (5.55%) developed glaucoma. Retinal detachment was seen in 1 eye (2.77%).

Conclusion: We found that anterior vitrectomy had additional effect in reducing postoperative complications. We also detected those complications such as PCO, synechia were higher in children of younger age. This study focuses not only surgical techniques, materials and instrumentation but also early detection and occlusion therapy to manage amblyopia and finally to improve visual prognosis in cases of congenital cataracts.

Keywords: Visual outcomes, cataract surgery, tribal population

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Introduction

Congenital cataract is a leading cause of treatable childhood blindness [1-3]. Foster et al. [1] reported that about 200000 children are blind as a result of cataract. The global incidence of congenital cataract has been reported to be 1-15/10000 live births [4]. Outcomes of surgery has improved dramatically in recent years but management of congenital cataract still remains a challenge. Use of posterior chamber (PC) intraocular lens (IOL) implantation is increased in management of cataract in children with visually significant cataract [5-8] but it still poses problem in younger infants. Visual outcomes depend on several factors such as early detection, timing of surgery, risk of amblyopia and complications, intraocular lens power calculations. According to several studies amblyopia and posterior capsular opacification are major complications [5-7]

Congenital cataract is one of the main causes of preventable childhood blindness. In France, the incidence of congenital cataract is estimated at 1-

3/10000 births [8,9]. In the developed world, the etiological distribution of congenital cataract has changed over time, mainly because of the introduction of a rubella vaccination program. In more recent studies, the percentage of cases of unknown origin is generally reported to be at least 50.0%. The percentage of genetically based cataracts varies from 27.0% to 39.0%, the majority of these being hereditary [10-12]. Great advances have been made in the management of paediatric cataracts over the last several decades. These surgical improvements have contributed to a decrease in the incidence of postoperative complications such as posterior capsule opacification (PCO), postoperative inflammation and glaucoma [13-14].

In the most recent studies, visual improvements were better in bilateral cataracts with best-corrected visual acuity (BCVA) between 0.40 to 0.50 logMAR than unilateral cataracts with BCVA between 0.91 to

1.00 logMAR [15-17] To date, early cataract removal and replacement with an intraocular lens (IOL) is considered the most appropriate treatment to avoid irreversible amblyopia [18] Amblyopia treatment is of paramount importance. Indeed, patient compliance for patching therapy is a key factor for good visual outcome. The indication and selection of IOL continues to be a controversial subject. Recent reports by the Infant Aphakia Treatment Study (IATS) group showed no significant difference between the median BCVA of operated eyes in children who underwent primary IOL implantation and those left aphakic [19]

The aim of the present study was to assess the visual outcome and complications of phacoemulsification and IOL implantation in patients of congenital cataract.

Materials and Methods

This retrospective study included 24 children (36 eyes) with congenital cataract who underwent surgery at Department of Ophthalmology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India from November 2017 to October 2018.

Children of age group 1 month to 11 years were included. Eyes with traumatic cataract and associated with systemic diseases, neurological diseases were excluded. Twelve children underwent unilateral and twelve children underwent bilateral cataract surgery. Complete ocular examination including VA assessment if possible and slit lamp biomicroscopy were performed in all the children. Posterior segment was examined using indirect ophthalmoscopy or using B-scan ultrasonography in cases of dense cataract.

Biometry was performed and axial length measured. Lens power was calculated using SRK- II formula in cooperative patients. In uncooperative patients axial length of the eye was used for IOL power calculation using Dahan formula.²⁰

Preoperatively, topical moxifloxacin 0.5% was instilled three times a day prior to surgery. Eye were dilated with tropicacyl plus every 10 min for 30 min before surgery. Informed consent was taken from parents. Surgery was performed under general anaesthesia. Anterior capsulorhexis was performed using continuous curvilinear capsulorhexis technique of approximately 5mm followed by hydrodissection. Lens material was aspirated. Intraocular lens was implanted in capsular bag. Primary posterior capsulotomy and anterior vitrectomy was done through limbal route in children < 6years.

Postoperatively all children were prescribed topical moxifloxacin 0.5% four times a day, atropine sulphate ointment 1% twice a day for 2 weeks, prednisolone acetate 1% 6 times a day which was gradually tapered over 6 weeks. All children were examined on first postoperative day, 1 week, 2 weeks, 1 month and then 6 months. The outcome of surgery measured as VA achieved and evaluation of complications.

Postoperatively, refraction/ retinoscopy was done to assess refractive status at 2 weeks after surgery and again repeated after 2 months. Amblyopia treatment was advised as part time occlusion therapy wherever necessary. Slit lamp examination under retro illumination was done to check visual axis clarity. PCO was considered significant if it involved visual axis. Glaucoma was diagnosed if IOP >20mm Hg with progressive optic disc changes and /or myopic shift.

In uncooperative children with PCO membranectomy was performed and in cooperative children Nd-YAG laser capsulotomy of 3.5-4mm. Study parameters included age at surgery, preoperative visual acuity, ocular alignment, presence of nystagmus, IOL power, postoperatively visual outcome, complications.

Results

Table 1: Pre-op and Postop BCVA in 20 eyes having congenital cataract

	Pre op N (%)	Post op No (%)
6/6-6/18	0 (0)	13(65)
<6/18-6/60	2(10)	6(24)
<6/60-3/60	3(15)	0(0)
<3/60	15(75)	1(5)
Total	20(100)	20(100)

Postoperatively, corrected and uncorrected visual acuity with a Snellen acuity chart could be checked in 20 eyes. Other methods used for visual acuity testing were observation of fixation behaviour, Cardiff test, picture matching.

Table 2: Postoperative complications

S. No	Complications	N (%)
1.	Posterior capsular opacification	6(18.75)
2.	Intraocular lens deposit	5(15.62)
3.	Uveitis	4(11.11)

4.	Optic capture	3(9.37)
5.	Glaucoma	2(5.55)
6.	Retinal detachment	1(2.77)

Increased fibrinous reaction/Uveitis in anterior chamber was seen in 4 eyes (11.11%). This resolved with frequent use of steroids. Optic capture was noticed in 3 eyes (9.37%). 2 eyes (5.55%) developed glaucoma. Retinal detachment was seen in 1 eye (2.77%).

Discussion

Congenital cataract is a leading cause of treatable childhood blindness. [21-23] Foster et al [21] reported that about 200000 children are blind as a result of cataract. The global incidence of congenital cataract has been reported to be 1-15/10000 live births. [24]

Postoperatively, corrected and uncorrected visual acuity with a Snellen acuity chart could be checked in 20 eyes. Other methods used for visual acuity testing were observation of fixation behaviour, Cardiff test, picture matching. Increased fibrinous reaction/Uveitis in anterior chamber was seen in 4 eyes (11.11%). This resolved with frequent use of steroids. Optic capture was noticed in 3 eyes (9.37%). 2 eyes (5.55%) developed glaucoma. Retinal detachment was seen in 1 eye (2.77%). Our study showed that anterior vitrectomy should be performed routinely because vitreous opacification may occur due to contact between anterior vitreous face and IOL haptics. Vasavada and Desai suggested that anterior vitrectomy with posterior continuous curvilinear capsulorhexis was desirable in children with congenital cataract younger than 5 years. [25] Dhan and Salmeson suggested posterior capsulorhexis and anterior vitrectomy in children younger than 8 years. [26] Vitrectomy may result in complications like macular edema, increased IOP, IOL decentration, vitreous traction. Gimbel and DeBroff [27] first found that IOL implantation with optic capture prevented the development of PCO without vitrectomy. To minimize the above complications vitrectomy avoided but in another study by Koch and Kohlen [28] reported that 4 of 5 patients who underwent optic capture without anterior vitrectomy developed secondary cataract at 2.5 years postoperatively. We concluded that anterior vitrectomy is beneficial if it is performed with posterior capsulorhexis with optic capture. Two eyes in our study developed glaucoma both were in aphakic case.

Conclusion

We found that anterior vitrectomy had an additional effect in reducing postoperative complications. We also detected those complications such as PCO, synechia were higher in children of younger age. This study focuses not only surgical techniques,

materials and instrumentation but also early detection and occlusion therapy to manage amblyopia and finally to improve visual prognosis in cases of congenital cataracts.

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