Management of Nucleus and IOL Drop

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Abstract

Background: Thirty six cases of lenticular nucleus drop following phacoemulsification and 43 cases of posterior dislocation of intraocular lens (IOL) inclusive of two paediatric cases were managed by a modified vitrectomy procedure without using perfluorocarbon liquid (PFCL).

Methods: In these cases the incision was placed inferotemporally at pars plana. The limbal sites of the earlier cataract surgery were utilised as the other two ports. In either case adequate vitrectomy was performed first. In cases of nuclear drop, the nucleus was impaled (speared) with a micro vitreo retinal blade and brought into the anterior chamber from where it was delivered out. In cases of IOL drop the same was picked up by an intra-vitreous forceps.

Result: Of the 77 adult cases treated 57 (74%) of the eyes had a visual recovery of 6/18 or more.

Conclusion: Prompt surgical management in cases of nuclear drop or posterior dislocation of IOL yields good results.

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Key Words: Phaco-emulsification; Intraocular lens drop; Nucleus drop; Vitrectomy

Introduction

Phaco-emulsification has become the procedure of choice for cataract surgery all over the world [1]. However, it has also resulted in the increased incidence of drop of lens nucleus into the vitreous and posterior dislocation of intra-ocular lens (IOL) [2]. Eyes with loss of nucleus and or lens fragments develop chronic uveitis, elevated intra-ocular pressure, cystoid macular oedema, corneal oedema and retinal detachment, leading to significant visual loss. IOLs dislocated posteriorly rarely produce these manifestations but they produce visual symptoms [3].

Material and Methods

Thirty six patients of nucleus drop and 43 of posterior dislocation of IOL were managed at two tertiary eye centres over the past six years. Of 36 cases of lens drop, seven (19.5%) were managed at the time of the accident itself. The remaining 29 (80.5%) patients of lens drop and the 43 of IOL dislocations were referred from other centres. The 29 cases of nucleus drop were operated within 14 days of the initial surgery. Two (4.6%) patients having posterior dislocations of IOL were less than a year old and they were operated under general anaesthesia, while the rest were operated under peribulbar anaesthesia. Patients with a drop of the nucleus were managed with topical and systemic steroids and ocular anti-hypertensives from the time of admission to post-operative period.

The surgical procedure for dropped nuclei involved the exposure of the sclera after surface diathermy and making a 6 mm port infero-temporally for infusion canula. The side

port for the phacoemulsification procedure was used for passing the endo-illuminator and the main entry site for the vitrectomy probe. After clearing the section and the anterior chamber (AC) of vitreous, the lens fragments were cleared of vitreous adhesions and were impaled by the micro vitreo retinal (MVR) blade with the aid of the endo-illuminator. The viewing system used was either the irrigating lens or the EIBOS of Moller-Wedel. The lens was brought into the AC and then taken out. Thereafter vitreous was cleared of retained lens particles. Any left over cortical matter was removed by vitrectome or the flute needle. A 6.5 mm optic sized hard posterior chamber IOL (PC IOL) was then implanted in the sulcus, if the capsular support was good. Otherwise, an anterior chamber IOL (AC IOL) was placed over a constricted pupil followed by a peripheral iridectomy. Of these 36 cases, AC IOL was implanted in 30 (83.34%) cases and PC IOL in the remaining six (16.64%).

The surgical procedure for dropped IOL involved making an infero-temporal port at 2 mm for infusion with a 6 mm canula. There was a limbal section with interrupted 10-0 sutures in all the 43 cases. In 39 (90.7%) cases the initial limbal entry for a phaco-emulsification procedure was visible. A posterior capsular rent was discernable in all the cases. The ends of the limbal incision were used for introducing the endo-illuminator and the vitrectomy probe if necessary by cutting the end sutures. The AC and the section were first cleared of the vitreous. After releasing the adhesions around the IOL, it was delivered into the AC by grasping it with an intra-vitreous forceps. The IOL was then removed from the AC after cutting the sutures. In 38 (88.37%) cases, the removed PC IOL was exchanged with an AC IOL which was implanted over a constricted pupil with a peripheral button-hole

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iridectomy. In three cases, however, the capsular support was good enough for exchange with a 6.5 mm optic sized hard PC IOL. The remaining two cases were paediatric cases which were rehabilitated with contact lenses. The post-operative regimen consisted of topical steroid-antibiotic drops, 0.5% timolol and systemic acetazolamide in their routine doses. Depending upon the rise of intra-ocular pressure, intravenous mannitol was instituted whenever necessary. Patients were reviewed daily for the first seven days followed by weekly follow-up for six to eight weeks when glasses were prescribed. The post-operative follow up included intraocular pressure measurement.

Results

Of the 77 adult patients, only two (2.60%) cases had a final visual acuity of less than 6/60 (Table 1) and none had raised intraocular pressure after six weeks.

Discussion

The frequency of retained lens fragments is estimated between 0.3-1.1% [3]. In our study, seven (0.14%) cases were operated at the time of the accident itself, out of a total cataract load of about 5000 cases in six years.

Phacofragmentor removal is the favoured technique for the removal of the dropped nuclei. This approach is through pars plana as compared to the limbal approach used in our procedure. The important pre-requisite of the fragmentor is to keep the nucleus engaged in mid-vitreous and prevention of nucleus slippage. This procedure is time consuming and leads to dissemination of force in the eyeball particularly with hard nucleus resulting in higher incidence of drops.

The procedure described in this study was first described in 1987 [4,5]. In this study the original limbal incisions of the phaco-emulsification surgery were used for the removal of the retained material, thus avoiding separate entries. Proper management of the infusion flow keeps the iris from prolapsing out. This procedure is quick and there is decreased incidence of retinal damage as ultrasonic force is not liberated into the vitreous cavity. Perfluorocarbon liquid (PFCL) is useful in associated retinal detachment, but it has to be removed completely to avoid toxicity to the retina. Scott et al [6], did not use PFCL. We did not use PFCL in this study. Raised intra-ocular tension in the immediate post-operative period was the most significant complication in this study, seen in all cases of lens drop. This was probably due to the inflammation set up by the lens nucleus without the protective cover of its capsule, which accounts for the better outcome of the IOL drop cases. There was no case of chronic glaucoma, since all patients underwent vitrectomy and the removal of vitreous remnants from the anterior chamber as was also observed by Scott et al [6].

Posterior dislocation of IOLs is easier to remove

Table 1

Visual outcome of nucleus and lens drop cases

	<5/60	6/60-6/24	>6/18
Lens drop	02 (2.60%)	12 (15.58%)	22 (28.58%)
IOL drop	-	06 (07.79%)	35 (45.45%)
Total (77)	02 (2.60%)	18 (23.37%)	57 (74.03%)

because the associated inflammation is less or absent. IOLs dislocated into the vitreous can be managed conservatively, repositioned or exchanged with another IOL [3]. In this study due to the absence of good capsular support, the sunken IOLs were explanted and exchanged with AC IOLs in all but three cases. In these three cases the retrieved IOLs were foldable. It was felt that a hard lens with 6.5 mm sized optic would be a better option where a foldable lens has dislocated into the vitreous. Posterior dislocations of IOLs are rare in paediatric cataract surgical practice. However two cases were managed in this study.

To conclude, a careful assessment of the predisposing factors leading to a nuclear drop or a posterior dislocation of IOL is important. Removal of the lens material, if possible, at the time of initial surgery is the best course of action. Otherwise a good vitrectomy and clearing the section of vitreous strands before sending the case to a retinal centre is a must, for a favourable outcome.

Conflicts of Interest

None identified

Intellectual Contribution of Author

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