

# Managing Cases of Dislocated Intraocular Lenses; a Retrospective Review of Cases over a 13 Year Period

## Abstract

**Purpose:** To report the incidence and outcomes over 13 years of managing cases of dislocated intraocular lens implants (PCIOL)

**Setting:** St Thomas's Hospital, London UK

**Design:** Retrospective case series

**Methods:** Clinical data of 40 patients on the VITREOR database were analyzed to determine pre-operative clinical findings, surgical methods and post operative outcomes.

**Results:** The average age of the patients was 70 years and 60% were male. 24 cases were spontaneous late PCIOL dislocations, 13 were referred directly following complicated cataract surgery and 3 were post blunt trauma. The average post operative visual acuity for all patients was 0.65 LogMAR, 0.46 LogMAR in patients managed with an anterior chamber intraocular lens (ACIOL) and 0.25 LogMAR in the those manage with a posterior scleral fixated lens (PSFL). The number of patients with dislocated IOLs as a proportion of total operations performed by the Vitreoretinal service was significantly higher (0.8% of all surgical cases) in the last 6.5 years of data collection than the first 6.5 years (0.2% of all surgical cases) ( $p=0.0036$ ).

**Conclusion:** There are several surgical options for correction of a dislocated PCIOL and none show obvious superiority. The incidence of dislocated PCIOLs appears to be increasing.

**Abbreviations:** ACIOL: Anterior Chamber Intraocular Lens; PSFL: Posterior Scleral Fixated Lens; PCIOL: Posterior Chamber Intra-Ocular Lens; PXF: Pseudo-Exfoliation;

## Introduction

Subluxed posterior chamber intra-ocular lens (PCIOL) following cataract surgery is challenging to manage. There are several surgical options and no consensus as to which one method is superior. Options include repositioning of the original PCIOL or lens exchange. If a lens exchange is performed, then an anterior chamber lens (ACIOL), posterior scleral fixated lens (PSFL), iris supported lens, or sulcal lens are all viable choices. In certain cases the patient may be left aphakic.

PCIOL dislocation as a late complication of cataract surgery is being reported in the literature with increasing frequency. Recent case series have suggested an increase in the incidence of late dislocated PCIOLs [1-3]. A study from the Mayo clinic in 2009 reported that at 5, 10, 15, 20, and 25 years after cataract extraction, the cumulative risk of PCIOL dislocation was 0.1%, 0.1%, 0.2%, 0.7%, and 1.7% respectively. Several risk factors have been reported to be associated with an increased incidence of PCIOL dislocation including pseudo-exfoliation, high myopia, connective tissue disorders, uveitis and previous vitreoretinal surgery [1,4,5]. PCIOL dislocation can also happen following complicated cataract surgery and may require lens repositioning or exchange. Capsular weakness is not always noted at the time of surgery and therefore the patient may present post-operatively

with dislocated PCIOL. A case series of 36 late PCIOL dislocations published in 2010 reported posterior capsular rupture to be the most commonly associated risk factor [6].

The aim of this paper is to analyze the outcomes of the different methods for surgical management for dislocated PCIOL in our practice, and to measure the incidence of spontaneous PCIOL dislocations over a 13-year period.

## Methods

A review of cases of surgical correction of dislocated PCIOLs was performed. Data was extracted from the VITREOR database (an electronic database utilized to record Vitreoretinal surgery and post operative details) covering Vitreoretinal services at three separate hospitals. A search was performed for all patients having surgery for dislocated PCIOL over the last 13 years (2003-2015).

## Inclusion criteria

All patients who had a surgical procedure to address a dislocated PCIOL were included in the review. Patients were only included if there was documented follow up in excess of 3 months after the IOL repositioning/exchange.

## Data collection

The following data was recorded from each patient:

- I. Aetiology of lens dislocation

## Case Report

Volume 3 Issue 3 - 2015

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**Received:** October 23, 2015 | **Published:** November 13, 2015

- II. Risk factors for PCIOL dislocation (eg. pseudo-exfoliation)
- III. Method of surgical correction
- IV. Post operative visual acuity
- V. Post operative complications

The patients who had spontaneous dislocations were analyzed separately to compare the incidence in our practice to other papers recently published which have suggested an increase.

## Results

Data was collected for 40 eyes from 40 patients. Of these 16 were female and 24 were male with an average age of 70 (range 33-92) years. 13 patients had undergone previous Vitreo-retinal surgery (32.5%), 11 were myopic (27.5%) and 2 were documented to have pseudo-exfoliation (PXF) (5%).

Of the 40 patients, 24 were spontaneous late PCIOL dislocations, 13 were referred directly following complicated cataract surgery (a PCIOL had been inserted and found to be unstable in the capsular bag and thus referred to the Vitreo-retinal service) and 3 were after blunt trauma. 30 patients were managed with a lens exchange, 18 of which received an ACIOL, 10 a PSFL (using the Scharioth sutureless IOL fixation technique) [7], and 2 sulcal IOL. Of the remaining 10 patients 6 were managed with McCannell suture iris fixation of the original PCIOL [8], whilst 4 were left aphakic after removal of the dislocated IOL (indications for aphakia were high levels of myopia which reduced the need for IOL implantation or poor visual potential). Overall, 53% (21 of 40) had a postoperative visual acuity of 0.3 LogMAR (6/12) or better. The average postoperative visual acuity in patients managed with an ACIOL was 0.46 LogMAR compared to 0.25 in those managed with a PSFL (Scharioth sutureless IOL fixation technique) (p=0.30).

Of the patients managed with an ACIOL 4 were reported as having postoperative complications. One patient had transient postoperative raised intra-ocular pressure, one developed corneal oedema (transient), one developed cystoid macular oedema and one had iris damage intra-operatively. In those managed with PSFL, one patient developed transient raised intra-ocular pressure post operatively, one had postoperative vitreous hemorrhage and two patients had subluxation of the newly fixated IOL (20%).

In the group of patients who had spontaneously dislocated PCIOL a pars plana vitrectomy was performed (cases prior to 2009 were managed with 20g vitrectomy whilst those after 2009 were managed with 23g vitrectomy) followed by thorough indentation of the retina to check for breaks. The dislocated PCIOL was explanted through the anterior chamber via a corneal wound. If the IOL was flexible it was cut across the optic (two thirds of the diameter) and folded using lens folding forceps before explantation through a small corneal incision. Of the 24 spontaneously dislocated PCIOL cases 13 were managed with lens exchange and ACIOL, 5 with lens exchange and PSFL (using the Scharioth sutureless IOL fixation technique) [7], 4 with McCannell suture iris fixation of original PCIOL and 2 were left aphakic after lens removal.

In the group of patients with complicated cataract surgery, 5 were managed with lens exchange and PSFL, 4 with lens exchange and ACIOL, 2 with lens exchange and sulcus fixated IOL and 2 with McCannell suture fixation of the original IOL. The numbers of patients requiring surgery for spontaneously dislocated PCIOLs, as a proportion of total operations performed by the Vitreoretinal service, were significantly higher (0.8% of all surgical cases) in the last 6.5 years of data collection than the first 6.5 years (0.2% of all surgical cases) (p=0.0036). See Table 1.

**Table 1:** Last 6.5 years of data collection than the first 6.5 years (0.2% of all surgical cases) (p=0.0036).

	Total Number of Patients Presenting to VR Service	Total Number of Patients with Dislocated PCIOL	Total
2003-2008	2032	4	2036
2009-2015	2384	20	2404
Total	4416	24	4440

## Discussion

In our study the most prevalent risk factor for PCIOL dislocation was previous vitreoretinal surgery (32.5%). This is likely to be a biased figure because the data was collected from a vitreoretinal database and therefore from a group of patients with inherently more retinal problems. The rate of PXF in our study was just 5%, which is low in comparison to other studies (19.7%) [9]. This may be because many of our patients were secondary referrals and therefore the initial pre cataract surgery examination documentation was not accessible and the clinical signs of PXF are less evident after cataract surgery.

Our study found there to be more men (60%) than women (40%) with dislocated PCIOLs. This association has been reported in other studies and subsequently previous authors have suggested zonular weakness related to gender [9,10]. It is commonly accepted that if repositioning of the original PCIOL is possible (usually dependent on amount of remaining capsular support or the type of lens implant used for the original cataract surgery) this would be the preferred method of surgical correction to avoid the associated complications of a large corneal wound and to minimize surgical trauma [11,12]. Commonly however repositioning of the original PCIOL is not possible and subsequently a lens exchange has to be performed.

The most common methods of surgical correction of subluxed PCIOL in our study were lens exchange with ACIOL (45%) and PSFL (25%). The PSFL group had a better average postoperative acuity compared with ACIOL (0.25 Vs 0.46 LogMAR) but this did not reach statistical significance. This is in similar to a previous study which directly compared the results of ACIOL and PSFL and found no significant differences in postoperative visual acuity [13].

The rate of postoperative complications was slightly lower in the cases managed with ACIOL (22%) compared to those with

PSFL (40%). These findings concur with those from Evereklioglu et al who directly compared the results of ACIOL with PSFL [13]. If sutures are used to fixate the lens, they must be passed through uveal tissue and are therefore associated with risk of intra-ocular hemorrhage or retinal detachment [14-16]. PSFL cases in our study were completed without fixation sutures (the lens haptics were buried in scleral tunnels) and there was just one case of postoperative vitreous hemorrhage (10%). PSFL can also be associated with late IOL decentration or dislocation secondary to suture erosion. Previous papers have described decentration rates as much as 48.7% [9]. These papers were reporting 5 years of follow up data and subsequently one would expect higher rates of decentration with longer periods of follow up. Our rate of IOL decentration in PSFL cases was 20% perhaps because our PSFL were not sutured but perhaps because of a comparatively short duration of follow up.

As a result of being in close proximity to the cornea and angle structures, ACIOLs are associated with postoperative corneal decompensation and raised intra-ocular pressure [17-19]. From the patients receiving an ACIOL in our study, one developed raised intra-ocular pressure (5.6%) and one developed corneal oedema (5.6%). We report a 5.6% incidence of postoperative cystoid macular oedema (CMO) in patients receiving an ACIOL. CMO develops as a result of iris chaffing by the lens and has been reported by other groups to have an incidence as high as 8% [19].

There is published data to suggest that the incidence of spontaneous PCIOL dislocations is increasing [1-3]. A paper from 2009 by Davis et al reported an increase in the number of dislocated PCIOLs being sent to their laboratory for pathologic evaluation [18]. Our data also supports this trend. This may be secondary to the fact that more cataract surgeries are being performed in response to an ageing population and therefore the numbers of spontaneous dislocations are also increasing. The increased rate may be secondary to changes in PCIOL lens properties over the 13-year period but we have no data to substantiate this.

Relatively small numbers inherently limits our study, as PCIOL dislocation is a rare complication of cataract surgery. Our results may be biased by the fact that the patients were recruited from a vitreoretinal database and therefore have potentially higher than normal incidences of co-morbidities such as previous vitreoretinal surgery and myopia.

## Conclusion

PCIOL dislocation occurring after cataract surgery is a rare but significant complication with several choices for surgical management. We found that patients receiving PSFL had better post operative visual acuities but higher levels of complications. Our data suggests that the incidence of late spontaneous PCIOL dislocation is increasing.

## What was known

- i. Subluxed PCIOL is a rare complication of cataract surgery
- ii. Subluxed PCIOL is challenging to manage with several methods of surgical management

## What this paper adds

- I. No one surgical option for addressing dislocated PCIOL appears to be associated with significantly better visual outcomes or significantly lower complication rates
- II. The incidence of late spontaneous PCIOL dislocations appears to be increasing

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