

In primary reverse optic capture, placement of a 3-piece IOL in the bag is advocated because it is easier to manipulate and prolapse out of the bag and it ensures greater degrees of entrapment of the anterior capsule behind the IOL optic as a result of its design compared with that of 1-piece IOLs. Studies^{9,10} report a reduced incidence of capsule opacification with the use of CTRs as they help maintain the tautness of the capsular bag, which is important as the optic is placed anteriorly, even though the haptics maintain their position in the bag. Because the haptics remain in the bag, theoretically a modest myopic shift would be induced, varying directly with the power of the IOL. The IOLs implanted in the eyes were of the same power calculated for in-the-bag placement, and no major refractive surprise occurred that necessitated surgical intervention. The concept of performing primary reverse optic capture is debatable; however, it has been observed that patients who have negative dysphotopsia in 1 eye do not develop it in the other eye when they have primary reverse optic capture. However, negative dysphotopsia symptoms might not be bilateral. Long-term studies with longer follow-up are essential to establish the effectiveness of the procedure.

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Predisposing factors for intraocular lens dislocation treated by pars plana vitrectomy: Involvement of atopic dermatitis



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Online Video

Recent expansion in the use of intraocular lenses (IOLs) in complicated cataract surgery might have changed the predisposing factors for IOL dislocation. We report clinical characteristics of recent cases of IOL dislocation requiring treatment with pars plana vitrectomy (PPV).

Fifty-seven eyes of 55 consecutive patients (men, 45 eyes of 43 patients [78.2%]; mean age, 60.6 years $\pm$ 16.2 [SD]) with IOL dislocation treated by PPV to remove IOLs that were hanging or had dropped into

Table 1. Comparison of subjects with and without atopic dermatitis.

Parameter	Atopic Dermatitis	No Atopic Dermatitis	P Value
Mean age at time of IOL dislocation (y)	44.3 $\pm$ 13.0	66.3 $\pm$ 13.0	<.001
Mean age at time of cataract surgery (y)	32.7 $\pm$ 14.4	57.9 $\pm$ 18.6	<.001
Mean time from IOL insertion to dislocation (mo)	144.0 $\pm$ 66.0	104.3 $\pm$ 75.8	.089
IOL subluxation*, n (%)	7 (46.7)	20 (47.6)	.951
IOL reinsertion at the time of PPV, n (%)	14 (93.3)	38 (90.5)	.727
Minor post-PPV complications, n (%)	3 (20.0)	7 (16.7)	.787
Mean CDVA after PPV	0.53 $\pm$ 0.71	0.41 $\pm$ 0.65	.591
Mean IOP after PPV	11.2 $\pm$ 7.3	12.2 $\pm$ 4.2	.614

CDVA = corrected distance visual acuity; IOL = intraocular lens; IOP = intraocular pressure; PPV = pars plana vitrectomy

Means $\pm$ SD

*Defined as when the preoperative IOL was found near the pupil area in a seated position, although all the IOLs were hanged down or dropped in the vitreous cavity in the supine position during surgery.

the vitreous cavity at the Department of Ophthalmology Vitreo-Retina Surgical Clinic, Keio University Hospital, between August 2008 and July 2012 were retrospectively analyzed.

Categorical variables were compared by the chi-square test, and mean differences were compared using the Student *t* tests and SPSS software (IBM version 19, SPSS, Inc.). Statistical significance was defined as $P < .05$.

The mean time between cataract surgery and IOL dislocation was 107.9 ± 52.6 months. The mean follow-up after PPV was 14.3 ± 13.9 months. Fifty-one eyes required an IOL suture, 1 eye had sulcus IOL fixation, and the remaining 5 eyes remained aphakic after the PPV.

Predisposing factors for IOL dislocation were analyzed. Fifteen eyes (26.3%) of 14 patients had atopic dermatitis, 13 eyes (22.8%) of 13 patients had a history of PPV performed for reasons other than IOL

dislocation (eg, retinal detachment), 8 eyes (14.0%) of 7 patients had unusual IOL fixation during cataract surgery (ie, sulcus IOL fixation likely resulting from posterior capsule rupture), and 4 eyes (7.0%) of 4 patients had a history of ocular trauma. Pseudoexfoliation syndrome and primary angle-closure glaucoma were observed in 2 eyes (3.5%) of 2 patients, respectively.

All 15 eyes with atopic dermatitis belonged to male patients, which was statistically significantly different from patients without atopic dermatitis (30 eyes [71.4%]) ($P < .001$) (Table 1). At the time of cataract surgery and of PPV, patients with atopic dermatitis were statistically significantly younger than those without atopic dermatitis ($P < .001$). In addition, the time between cataract surgery (IOL implantation) and PPV (IOL dislocation) tended to be longer in eyes with atopic dermatitis than in those without ($P = .089$).

The success rate of IOL reinsertion, the mean corrected distance visual acuity (CDVA), and the mean

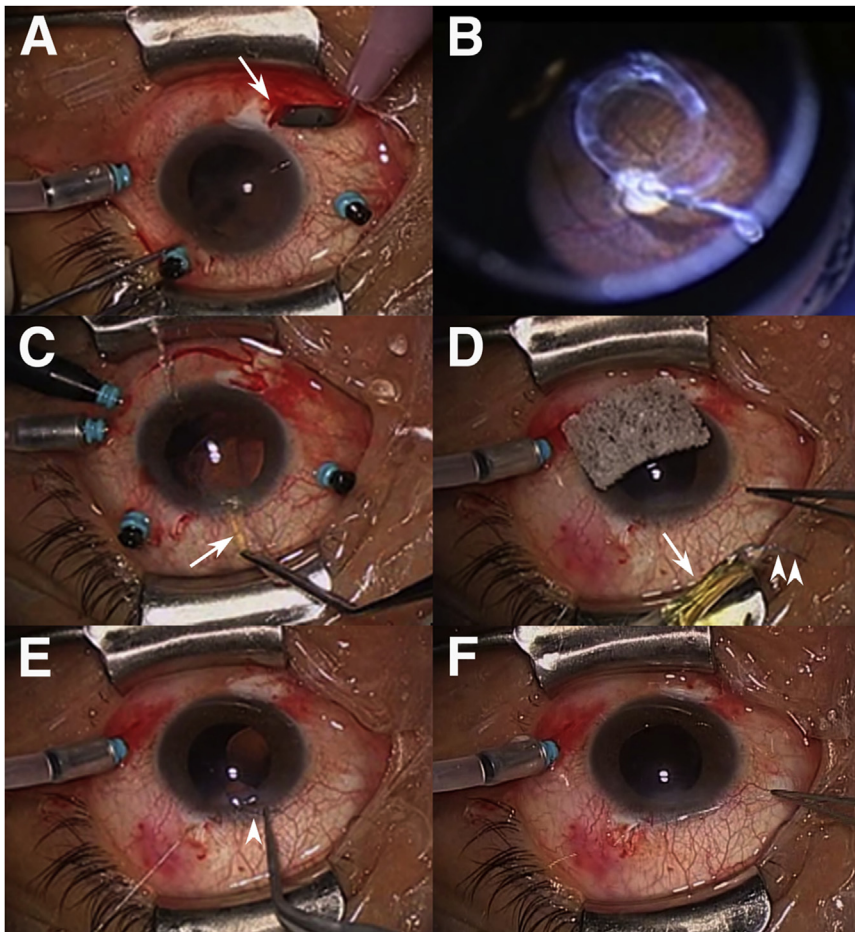


Figure 1. A case of IOL dislocation treated with PPV, IOL removal, and IOL suture in the left eye of a 58-year-old man with atopic dermatitis. Two years after cataract surgery, he was diagnosed with IOL dislocation into the vitreous cavity. **A:** The PPV was performed using 25-gauge and wide-viewing systems. Scleral flaps (arrow shows 1 flap) for IOL suture were created. **B:** After as much of vitreous as possible was removed (including around the vitreous base), the dislocated IOL in the bag was grasped in the vitreous cavity and lifted into the anterior chamber using a vitreous forceps. **C:** The IOL (arrow) cut with an IOL cutter in the anterior chamber was removed from the eye through a corneal incision. During the process, a chandelier system was used to properly illuminate the surgical field. **D:** A newly prepared foldable IOL (arrow) was sutured into the sulcus through a scleral pocket, and a haptic (arrowheads) was strung with 10-0 nylon after the IOL was loaded into the injector. **E:** The infusion port for PPV was kept during IOL suturing to maintain proper IOP. After IOL insertion with the injector, but before complete IOL placement, the other haptic (arrowhead) was strung. **F:** The IOL location was confirmed and the scleral pocket was sutured before the infusion port was removed. Postoperative decimal (logMAR) CDVA was 1.2 (−0.079) in the right eye and 0.1 (1.0) in the left eye; neither was significantly different from preoperative values. However, the uncorrected visual acuity improved from 0.04 (1.40) to 1.0 (0.0) in the right eye and from 0.03 (1.52) to 0.1 (1.00) in the left eye after PPV. Major complications and IOP increases were not observed in either eye after treatment.

intraocular pressure (IOP) after PPV were unchanged in eyes with atopic dermatitis and in eyes without atopic dermatitis (Table 1). No major complications (eg, retinal detachment) occurred after the PPV. Figure 1 and Video 1 (available at <http://jcrsjournal.org>) shows a representative case of a 58-year-old man with untreated atopic dermatitis.

Previously reported risk factors for IOL dislocation include pseudoexfoliation, retinitis pigmentosa, high myopia with a long axis, previous vitrectomy, and trauma.^{1,2} In contrast, we found that atopic dermatitis was the most common predisposing factor. This might partly be the result of the increasing incidence of atopic dermatitis³ and improvements in cataract surgery technology, which allow expansion of IOL insertion in eyes with atopic cataract. In atopic dermatitis, an allergic condition might have caused the ciliary zonular fibers to be vulnerable because of inflammatory stimuli,^{3,4} as in eyes with uveitis,^{1,5} and trauma caused by slapping one's face and/or eyelids to relieve severe itching.

Previous vitrectomy was also a risk for IOL dislocation, consistent with a previous report.¹ In older and larger 20-gauge vitrectomy systems, most peripheral vitreous was removed, which unintentionally damaged the ciliary zonular fibers at the time of peripheral vitreous shaving. Future studies are required to determine the influence of vitrectomy with smaller 23-gauge and 25-gauge systems using trocars, which require less extensive peripheral vitreous removal.

The rate of pseudoexfoliation (3.5%) was much lower than the 45.0% incidence observed in a previous study.¹ This discrepancy might have resulted from the condition that all participants required PPV to treat the

IOL dislocation, while eyes with pseudoexfoliation allowed detection of IOL dislocation before the IOL dropped into the vitreous cavity during the chronic progression of the ciliary zonule damage, preventing the need for PPV in these patients.

Limitations of this study include its retrospective nature and the relatively short PPV postoperative follow-up because patients with a good postoperative course were immediately sent back to their community clinics.

In summary, a history of atopic dermatitis and previous vitrectomy were major predisposing factors for IOL dislocation requiring treatment with PPV. As the number of patients with IOLs increases, it would be valuable to better understand factors that predispose eyes to IOL dislocation.

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