

A Case of Crystalline Lens Luxation Treated with Modified Yamane technique by Applying Pars Plana Vitrectomy

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ABSTRACT

A eighty-five-year-old male patient reported that his vision was slightly better after rubbing his eye. Anterior segment examination revealed that the eye was aphakic and there were dense pseudoexfoliation materials on the pupillary area. Posterior segment examination revealed that the crystalline lens was in vitreous. Different intraocular lens (IOL) implantation methods such as anterior chamber IOL implantation, iris fixated IOL implantation, and scleral fixated posterior chamber IOL implantation are available to eliminate visual problems in aphakic eyes without capsular support. Aim of this case report is to demonstrate the functional and anatomical success of a patient with crystalline lens dislocation into the vitreous cavity treated with transconjunctival intrascleral haptic fixated intraocular lens implantation with pars plana vitrectomy.

Keywords: Aphakia, Hypermature cataract, Pars plana vitrectomy, Pseudoexfoliation, Sutureless scleral fixation.

INTRODUCTION

Pseudoexfoliation (PES) materials accumulation at pupillary margin, lens anterior capsule and zonules can cause pupil dilation problems, zonular weakness and difficulty during cataract surgery. Late postoperative complications such as spontaneous dislocation / sublucation of the lens into the vitreous cavity are more common in patients with PES.¹ With the advancement of technology and the development in surgical methods, several surgical approaches have been described for patients with dislocated lenses.² These developments lead us for microinvasive treatments. The Yamane technique and its modifications, which have been widely applied in recent years, have become a popular surgical method in aphakic eyes without capsular support.³⁻⁵ These methods have some advantages and disadvantages compared to each other. Yamane et al. used 30-gauge thin wall needle. This needle is not freely available in all countries and this needle's lumen is not appropriate for every three-piece intraocular lenses (IOL). The 27-gauge needle used in modified Yamane technique is freely available and lumen width is appropriate for all three-piece IOLs used in routine. While Yamane et al. preferred angled sclerotomy, modified Yamane technique preferred the sclerotomy with

2 mm scleral tunnel and thus risk of hypotony, IOL tilt, decentralization and iris capture are minimized. Modified Yamane technique preferred the sites of 6 and 12 o'clock for sclerotomy while Yamane et al. preferred nasal and temporal quadrants for sclerotomy. In this way the haptics are under eyelids and haptic related complications such as exposure, conjunctival scar formation, discomfort are minimized.^{3,6} The management of the crystalline lens, which is completely dislocated to the vitreous, can be done by different surgical methods. In the literature, there is a tendency to microinvasive and sutureless surgeries due to their advantages such as low postoperative complication rate and rapid recovery time. This case report met these expectations in the management of dislocated lens.

In this case report, we aimed to demonstrate the functional and anatomical success of transconjunctival intrascleral haptic fixated IOL implantation with pars plana vitrectomy applied to a patient with crystalline lens dislocation into the vitreous cavity.

CASE REPORT

A 85-year-old male patient has admitted to our clinic with history of low vision at left eye for a long time and getting

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better after rubbing his eye. The best corrected visual acuity (BCVA) was 20/1250 in the right eye. Uncorrected visual acuity was 20/800 and BCVA was 20/40 in the left eye. Intraocular pressure (IOP) was 14 mmHg in the right eye and 11 mmHg in the left eye. Mature cataract and PES was seen in anterior segment examination at the right eye. The left eye was aphakic, and PES was dense on the pupillary margin. Although mydriatic agents were used in both eyes, pupillary dilatation was insufficient [Figure 1]. Fundus was not well illuminated because of mature cataract at the right eye. Posterior segment examination of the left eye showed that the crystalline lens with hypermature cataract was in the vitreous cavity and the lens zonules were swollen

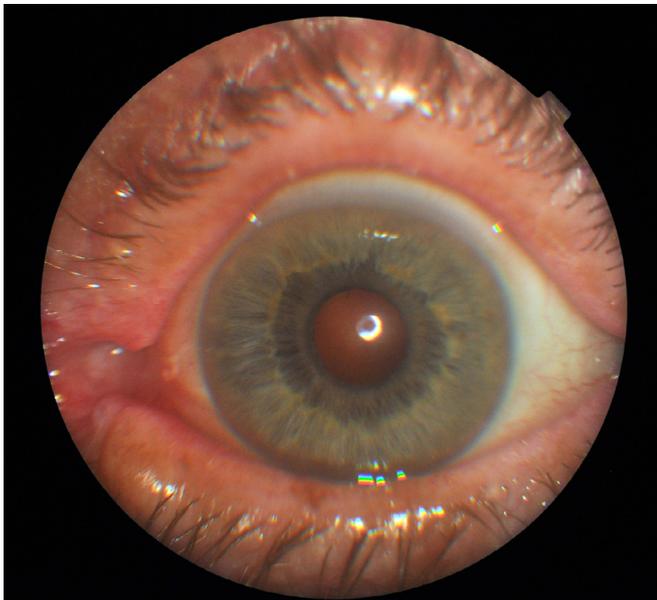


Figure 1: Aphakic eye with dilation difficulty.

[Figures 2a, 2b and 3]. After trocar (25 gauge) insertion, four iris hooks were placed because of insufficient pupillary dilation. It was thought that the application of phaco fragmatoma for a mature cataract in the vitreous cavity would not be appropriate. Posterior hyaloid was removed after core vitrectomy and perfluorocarbon was applied to float the crystalline lens to the posterior chamber. Classical phacoemulsification was performed with a clear 2.8 mm corneal incision at the temporal quadrant and three-piece IOL (Eyecryl Plus, Biotech Vision Care, India) was implanted in the anterior chamber. Two transconjunctival scleral tunnels were prepared via insulin injector at 6 and 12 o'clock at a distance of 2 mm to the limbus and haptics were externalized via this tunnels. The tips of the haptics were cauterized and terminal knobs were made. Haptics were pushed back to the scleral tunnels and by following these steps, modified Yamane technique has been applied. The BCVA in the left eye was 20/25 at the 3-month follow-up, and IOP was 13 mmHg. The anterior chamber was quiet and the IOL remained well centered [Figures 4a, 4b and 4c].

DISCUSSION

In cases with subluxated or dislocated lenses, the main vitreoretinal surgery indication to remove crystalline lens is the presence of secondary pathologies such as retinal damage because of lens movement, glaucoma, cystoid macular edema, retinal detachment and proliferative vitreoretinopathy. Prior to the development of modern vitrectomy techniques, surgical treatment was not considered in cases with intact lens capsule and entire lens is dislocated into the vitreous cavity. Even today, it has been reported that lens dislocation cases without

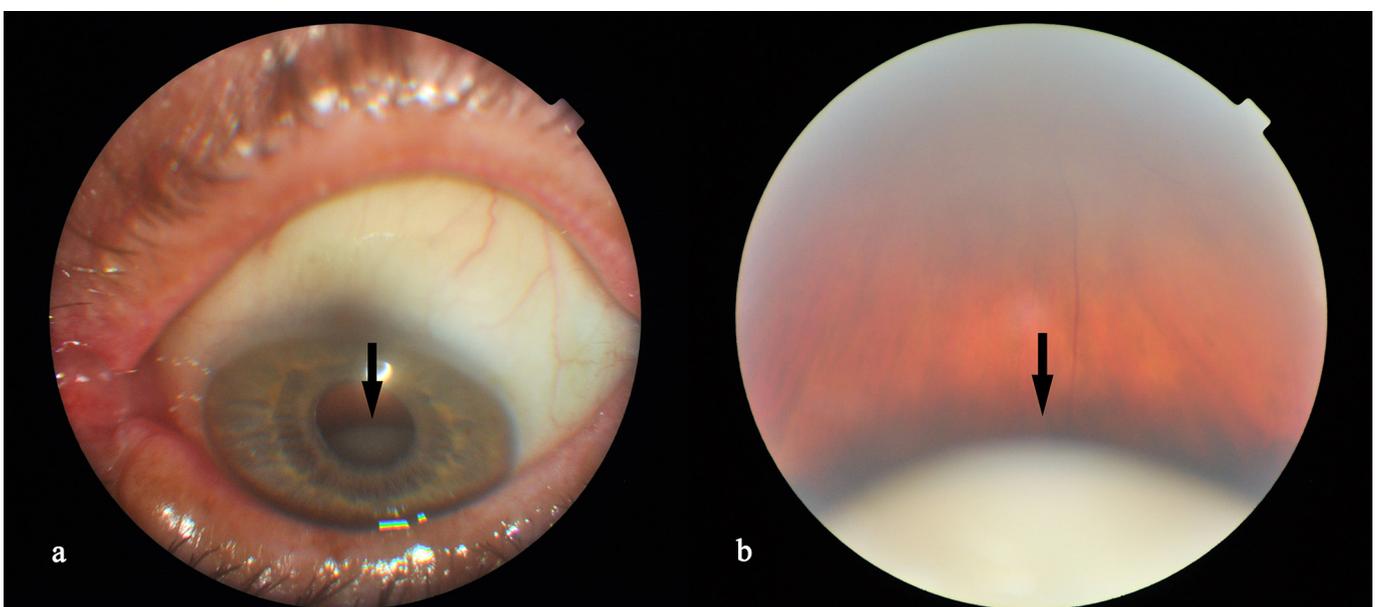


Figure 2: a-b) Crystalline lens dislocated to the vitreous cavity (arrows).

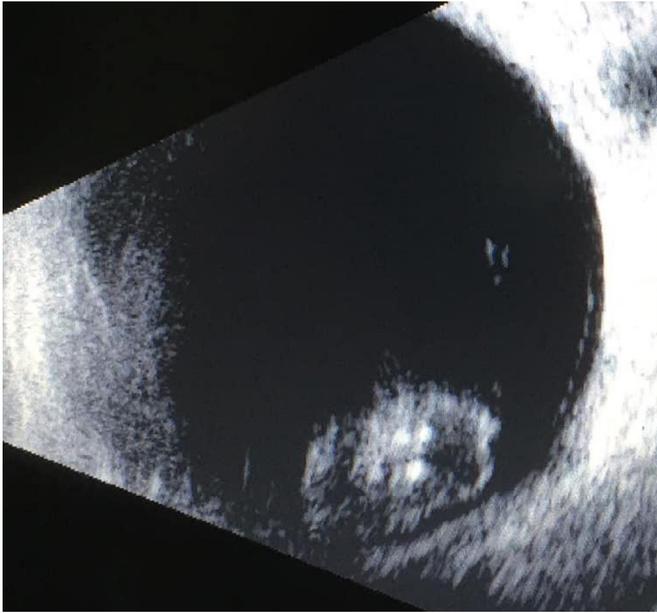


Figure 3: B-Mode ultrasonographic view of the crystalline lens.

any complications result with spontaneous absorption.⁷ By the development of vitrectomy systems, heavy fluids and imaging systems, pars plana vitrectomy and phaco fragmatoma usage in the posterior segment has become the preferred surgical method. However, there are some risks associated with the usage of fragmatoma in the posterior segment. The most important of these is the retinal tears that may occur due to the suction power of the fragmatoma and ultrasonic flow.⁸ The mature and one-piece crystalline lens in the vitreous cavity would cause higher ultrasound energy usage and prolong the surgery time. Therefore, we did not use fragmatoma. It has been reported that in some cases which were not appropriate for the fragmatoma usage, or surgeon did not prefer fragmatoma, crystalline lens was taken to the anterior chamber with perfluorocarbon and cataract extraction was performed with a large corneal incision.⁹ A large corneal incision requires corneal suturing and complicates secondary IOL implantation. Using

perfluorocarbon, we floated the crystalline lens to the posterior chamber and emulsified it with a phaco-chop technique through a small 2.8 mm corneal incision in its normal anatomic position. Thus, we had the opportunity to perform primary IOL implantation without corneal suturing.

Various treatment approaches are available to eliminate the visual problems caused by aphakia. Secondary IOL implantation methods in aphakic eyes without capsular support are anterior chamber IOL implantation, iris-fixed IOL implantation and scleral-fixed posterior chamber IOL implantation (SF-IOL).⁶ Corneal and iridocorneal angle trauma caused by lenses placed in the anterior chamber or fixed to the iris pupil block causes the risks of secondary glaucoma, iritis, pigment dispersion and cystic macular edema. SF-IOL implantation applied by using suture brings suture-related complications with it such as suture erosion and breakage. While the various techniques appear to have equivalent visual acuity results and safety profiles, each technique has its own postoperative complication risk profile.¹⁰ Posterior chamber secondary IOL implantation is more preferred to minimize complications due to IOL implantation.¹¹ Although some surgeons prefer sutured scleral fixation methods, we preferred the modified Yamane technique in terms of its advantages such as being microinvasive, rapid postoperative recovery, and having no suture-related complications.^{6,12} Thus, we performed all surgical manipulations such as lens extraction and IOL implantation through a 2.8 mm corneal incision without using corneal or scleral sutures.

In conclusion, with the advancement of technology and the development of surgical methods, different surgical approaches for dislocated lens cases lead us for microinvasive treatments. Functional and anatomic success of transconjunctival intrascleral haptic fixation IOL implantation with pars plana vitrectomy method usage for treatment of a patient with crystalline lens dislocation

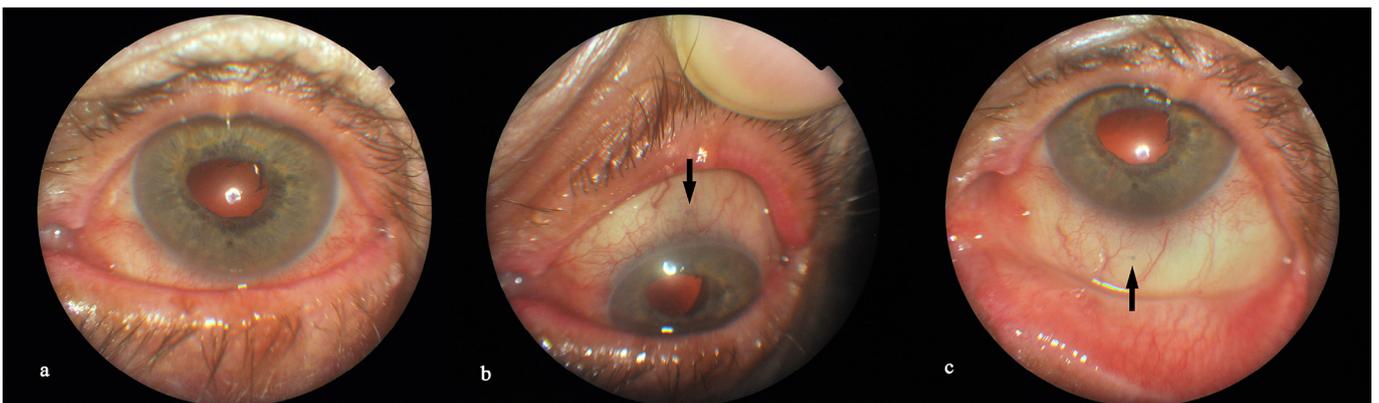


Figure 4: a) Pupil is irregular due to iris hook usage, but IOL is well centered. b-c.) Appearance of haptics (arrows).

into the vitreous cavity in this case report shows that it can be preferred surgical technique.

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