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Case Report

Effect of Partial Pars Plana Vitrectomy in Two Cases: Removal of Intraocular Foreign Body and Intraocular Lens Dropped Into Vitreous

Mehmet Demir, Egemen Karataş, Doğukan Aslan, Abdurahman A. Arslan

Department of Ophthalmology, Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, Turkey

Abstract

The aim of this case study was to present the effect of partial pars plana vitrectomy (PPV) in two cases that is due to the presence of an intraocular foreign body (IOFB) and intraocular lens (IOL) that has dropped into the intravitreal area. The first case was a 30-year-old man with IOFB in the right eye, and the second case was a 34-year-old woman whose IOL was dropped into vitreous after trauma. In cases, IOFB and IOL were extracted from vitreous performed by partial PPV without complication. Partial PPV was effective despite without complete vitrectomy. With minimal/partial vitrectomy approach, most of the vitreous tissues was left in place. We believe that this approach will reduce the rate of complications, such as cataract and retinal detachment.

Keywords: Dislocated intraocular lens; intraocular foreign body; minimal; partial; pars plana vitrectomy.

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Pars plana vitrectomy (PPV) was performed by Robert Machamer for the first time and is currently used as the main treatment method in many ophthalmologic pathologies, such as removal of intraocular foreign bodies (IOFBs), dislocated intraocular lens (IOL), and treatment of endophthalmitis, intravitreal hemorrhage, and complicated retinal detachments.[1–4]

The basic approach in PPV is to enter into the intravitreal space with triple sclerostomies through the pars plana and to extract the peripheral vitreous and core as much as possible. Using PPV, almost all of the vitreous material is extracted completely. After PPV, retinal detachment, glaucoma, iatrogenic retinal rupture, and cataract are important complications not infrequently seen, requiring secondary operations, which can cause visual loss.[5]

In this case study, we aimed to present two cases of partial PPV where most of the vitreous tissue is spared instead of standard PPV to IOL, extract, and IOFB dropped into the intravitreal space

Case Report

Case 1 – Removal of IOFB by Partial PPV

A 30-year-old male patient was referred to our eye clinic from an external center with an IOFB in his right eye. A small piece of iron shaving sprung into his right eye while he had been striking a nail with a hammer. He had been told that he had a foreign body in his eye and that he should have undergone vitrectomy; thus, 1 mg vancomycin+2 mg cef-

Address for correspondence: Mehmet Demir, MD. Sisli Hamidiye Etfal Egitim ve Arastirma Hastanesi, Goz Hastaliklari Anabilim Dali, Istanbul, Turkey
Phone: +90 530 203 71 24 **E-mail:** drmehmetfe@hotmail.com

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tazidime was injected into his eye.

On ophthalmologic examination, visual acuity in his right eye was 0.2 (Snellen), and a lamellar corneal cut with negative Seidel test in the right cornea in the area corresponding to the upper edge of the pupil was observed. Perforation on the anterior capsule of the crystalline lens and opacification of the lens material that protruded from the capsule to the anterior chamber were observed. The details of the ocular fundus were not selected.

Retinal detachment was not observed in Ultrasonography. On orbital tomographic examination, an image of 1.5×1.5 mm consistent with a metallic object was observed in the intraocular area, close to the equator (Fig. 1). The left eye was emmetropic without loss of its visual acuity. Moxifloxacin eye drops (8×1/d) and oral ciprofloxacin (500 mg tb bid) were given to the patient. Under general anesthesia (UGA) cataract surgery, IOL placement and PPV were planned in the same session for removal of IOFB. UGA after local antisepsis, blepharostat was placed to keep the eyelids open. The conjunctival sac was irrigated with 5% povidone–iodine solution. Transconjunctival sclerotomies were prepared from 3.5 mm away from the limbus using a 23-gauge trocar. Corneal side accesses were performed at the 10 and 2 o'clock positions using a 20-gauge MVR. The anterior capsule was stained with trypan blue after air was insufflated into the anterior chamber.

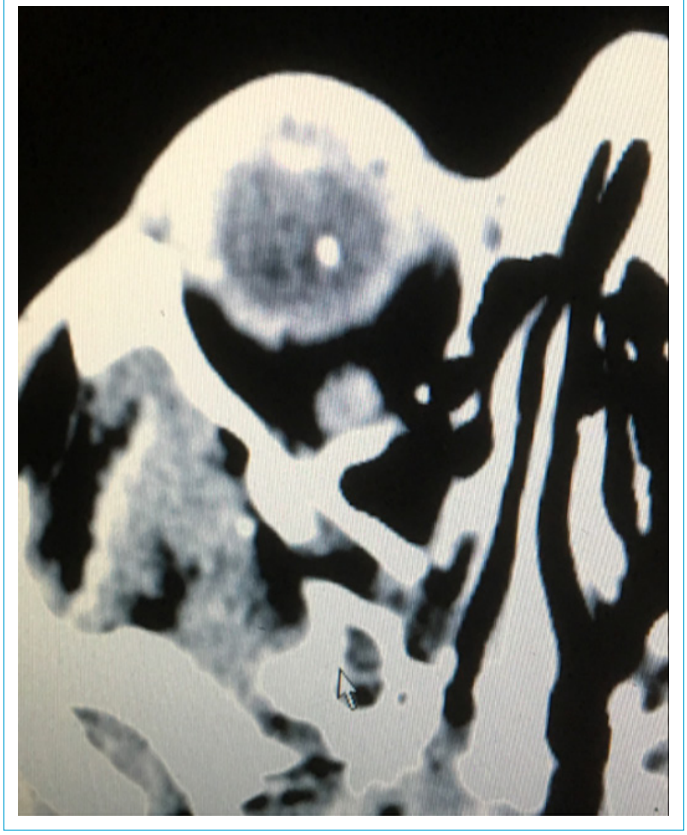

Figure 1. IOFB in orbital computed tomography.

The anterior chamber was filled with a viscoelastic (VES) material. It was entered with a clearcorneal incision at the 12 o'clock position. Anterior capsulectomy was performed, and the opacified lens material was removed by aspiration/irrigation. A 2×2 mm gap was detected in the posterior capsule. A foldable IOL was placed inside the capsule. The main corneal incision was closed with a 10/0 nylon suture. The anterior chamber was completely cleared from VES. An infusion cannula was inserted into the previously placed trocar in the inferior temporal region. During PPV used a wide field visualizing system (EIBOS). An IOFB on the equatorial region hanging close but not touching the retina was observed without haze in the vitreous. With the aid of endoillumination through the trocar in the upper temporal area, an ocutome was passed through the trocar in the upper nasal area into the vitreous area. So as not to cause traction during the removal of IOFB, the vitreous tissue around the IOFB was scraped to create a tunnel-shaped cavity between the ocutome, trocar tip, and IOFB in the vitreous tissue. After removal of the trocar in the upper nasal region and dilation of the sclerotomy site, the foreign body was picked up and extracted through the enlarged sclerotomy path. With this approach, approximately 1–2/8 parts of the vitreous were extracted, and 6–7/8 parts of it were left in situ. Retinal tamponade was not used. After removal of the foreign body with dimensions of 1.5×1.5×0.5 mm, sclerotomies were closed with 8/0 vicryl sutures, and subconjunctival injections of gentamicin and onadron were performed. The patient was discharged with a prescription of eye drops of moxifloxacin (0.5%, 8×1/d)+prednisolone sodium phosphate (10 mg/ml, 4×1/d) and tropicamide (1%, 1×1). Doses of drug therapy were gradually reduced and discontinued after 35 days. On postoperative months 1, 3, 7, and 30 and 2, 3, and 4, the pupil was regular, the IOL was centralized (Fig. 2), the retina was attachedand the fundus, and the macula was observed naturally (Fig. 3). Endophthalmitis or severe inflammation were not observed. Intraocular pressure was 17 mm Hg.Visual acuity was −1.50 to 10/10 at all visits.

Case 2 – Removal and Replacement of the IOL in Partial PPV

A 37-year-old female patient who had undergone cataract surgery and an IOL implantation in her left eye 1 year ago was implanted to our clinic with a complaint of a decrease in her vision 3 days after her friend's hand hit her left eye.

On eye examination, her right eye was normal, and her vision was 1.0. In the left eye, aphakia, visual acuity of +12.00+1.50 with 30*, and vision of 0.4 were observed. Pupillar edges were regular, and posterior capsular support was not at the

Figure 2. Appearance of the anterior segment at postoperative month 3.

Figure 3. Appearance of the macula at optical coherence tomography angiography obtained at postoperative month 3.

nasal side of the 6–12 o'clock line, but it was present at the temporal aspect of this line. Intraocular pressure was 14/15 mm Hg. Fundus examination revealed normal attached retina, and intravitreal IOL in the lower half of the globe and mild intravitreal hemorrhage were observed in the left eye.

Left-sided PPV, removal of the IOL, and its replacement with sclera suture fixation UGA were planned. The eyelids were kept open with a blepharostat placed after local antisepsis. The conjunctival sac was irrigated with 5% povidone–iodine solution. The conjunctiva on the nasal side was debrided, the scleral flap was elevated from the nasal aspect of the eye, and 23-gauge transconjunctival trocars were placed 3.5 mm away from the pars plana and through the 10 and 2 o'clock positions in the lower temporal region. Corneal side access tract was enlarged up to 2 mm, and through this access tract, cohesive VES material was injected under the endothelium to prevent potential contact with the endothelial layer.

An infusion cannula was inserted into the trocar placed in the inferior temporal region with the aid of illumination through the left upper trocar and under the guidance of the EIBOS imaging system, and then an ocutome was entered into the vitreous through the right upper trocar. Using the ocutome inserted through the trocar, the part of the vitreous up to the lens haptic was extracted so as to form a tunnel-shaped cavity in the vitreous. Thus, vitreous densely surrounding the upper haptic of the IOL was excised. Therefore, approximately 80% of the vitreous was left in place, and 20% of it was removed with vitrectomy. The IOL was pulled out with a forceps through the anterior chamber. One haptic was extracted through corneal incision, and SC-5 prolene suture was rotated twice around and on the haptic. With the help of the needle, the SC-5 needle was rotated inside out and passed under the scleral flap 1.5 mm behind the limbus. Temporal haptic was placed in the sulcus using the capsular support, whereas the haptic near the nose was fixed with sutures. After the scleral flap was sutured and knotted to the scleral haptic with the suture pulled out from behind the flap, the excess suture was cut, the scleral flap was closed with 10/10 nylon, and the conjunctiva was closed with 8/0 vicryl sutures. Vitreous fibrils in the pupillary area visualized with triamcinolone were cut with ocutome, the trocars were removed without the use of an eye tamponade, and sclerostomies were closed with 8/0 vicryl sutures. The corneal incision was closed with hydration. Subconjunctival injections of gentamicin and onadron were performed.

The patient was discharged with prescription of prednisolone sodium phosphate (10 mg/ml, 6×1/d) and ofloxacin (0.3%, 4×1/d) containing eye drops. The treatment was discontinued after 30 days. In the postoperative follow-up examinations performed at months 1, 3, 10, and 30 and 2 and 3, normal pupillas, flat retina, and intraocular pressures within normal limits were observed (Fig. 4). At the last visit, visual acuity of the left eye was found to be +1.00 with 20*. Macular structure was observed to be normal on optical coherence tomography examination. Intraocular pressure was measured as 16 mm Hg (Fig. 5).

Discussion

The vitreous is a transparent gel-like formation in the globe and situated between the lens and the retina and consti-

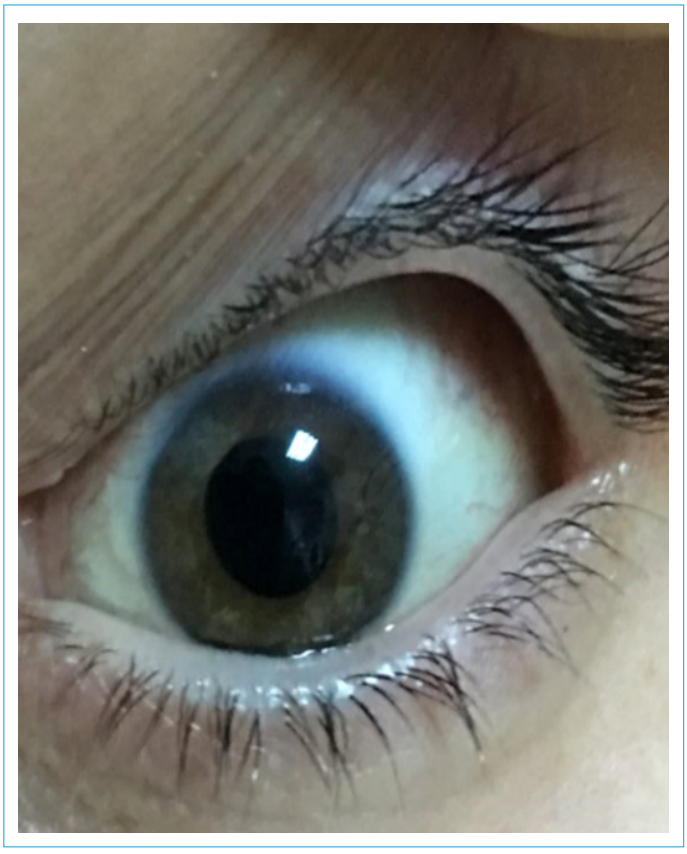

Figure 4. Appearance of the anterior segment at postoperative month 3.

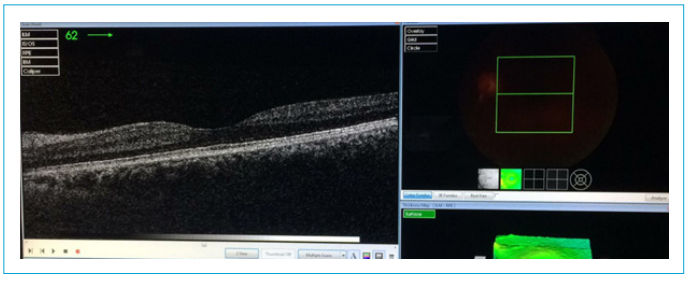

Figure 5. Postoperative optical coherence tomography angiogram.

tutes 4/5 of the globe volume. It consists of two main parts: the core and the periphery. It contains type II, V, XI, VI, and IX collagen; hyaluronic acid; opticin; hyaluronan; and fibrillin, and water comprises 90% of its volume. It also contains cell-like hyalocytes and fibroblasts. It weighs approximately 4 g in adults, its refractive index is between 1.335, and pH is 7.0–7.4.[6, 7] Physiologically, support for the retina serves as a barrier to the entry of cells and metabolites from the retina into the vitreous. Retinal detachment after loss of vitreous support and cataract formation at the early stage, contraction of the anterior segment, and development of glaucoma are among the known complications.[8, 9]

Conclusion

As mentioned above, we believe that the preservation of the vitreous having many important functions using partial (minimal) PPV instead of classical PPV is very important for eye health, unless pathologies, such as endophthalmitis, intense proliferative vitreoretinopathy, and long-term vitreous hemorrhage, are not present. Extraction of the vitreous leads in a short period to the development of cataract and necessitates secondary surgery for cataract. Cataract surgery causes loss of the accommodation used very often especially in young patients, which makes it necessary to use glasses to correct myopia and complicates reading, calculating, drawing, or painting activities. In addition, secondary intraocular surgery may predispose to complications, such as development of retinal detachment, endophthalmia, and macula edema that threaten visual acuity of the patient. In addition, peroperative complications, such as inadvertent rupture of the posterior capsule during cataract surgery and drop of lens into the vitreous, may be more frequently seen in patients without total vitreous support than in patients with vitreous support. Partial removal of the vitreous shortens the duration of the operation.

Successful results were achieved in these two cases in which partial PPV was performed for the removal of IOFB and IOL. To our knowledge, partial (minimal) PPV was performed for the first time for the removal of IOL and IOFB. Although successful results were obtained in these two presented cases, studies with greater number of cases and longer follow-ups are needed for more accurate results

Disclosures

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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Conflict of Interest: None declared.

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