

Iris Hooks for Phacoemulsification in Vitrectomized Eyes

Vitrektomize Gözde Fakoemulsifikasyon İçin İris Kancaları

Selçuk SIZMAZ¹, Ebru ESEN¹, Nihal DEMİRCAN¹

ABSTRACT

We aim to present a case describing a novel approach for phacoemulsification in eyes those previously underwent pars plana vitrectomy. Iris - lens diaphragm retropulsion occurred as the phaco tip was introduced into the anterior chamber and did not respond to reducing the bottle height. Four perilimbal openings were made approximately 90 degrees apart at 10, 1, 4, and 7 o'clock positions via which four iris hooks were introduced into the anterior chamber and engaged beneath the capsulorhexis edge. The operation was completed with a stable anterior chamber, with no further fluctuation. No intraoperative or postoperative complication occurred. Stabilization of the iris-lens capsule complex with iris hooks appear to be effective in preventing complications, offering promising surgical outcome in phacoemulsification of vitrectomized eyes.

Key Words: Phacoemulsification, vitrectomized eye, iris-capsule retropulsion, iris hooks.

ÖZ

Pars plana vitrektomi geçirmiş gözlerde fakoemulsifikasyon için yeni bir yaklaşım tarif eden bir olguyu sunmayı amaçlıyoruz. Fako ucunun ön kamaraya girmesi ile birlikte iris-lens diyaframı arkaya doğru yer değiştirdi ve bu durum, şişe yüksekliğinin düşürülmesine rağmen düzelmedi. Birbirinden 90 derecelik açı uzaklıkta saat 10, 1, 4 ve 7 kadrantlarında 4 perilimbal giriş yapıldı, bu girişlerden ön kamaraya uzatılan iris kancaları kapsüloreksis kenarının altına tutturuldu. Fakoemulsifikasyon, ön kamarada derinleşme olmaksızın, fako-chop yöntemi ile tamamlandı. Ameliyat sırasında ve sonrasında komplikasyon meydana gelmedi. İris-lens kapsülü kompleksinin iris kancaları ile stabilize edilmesi, komplikasyonları önleyerek, vitrektomize gözlerde fakoemulsifikasyon cerrahisinin başarısını arttırabilir.

Anahtar Kelimeler: Fakoemulsifikasyon, vitrektomize göz, iris-kapsül retropulsiyonu, iris kancaları.

INTRODUCTION

Cataract development and/or progression are a well-known shortcoming of pars plana vitrectomy (PPV) with an incidence of nearly 100% in a 2-year period post-vitrectomy.¹ The cataractogenic effect of PPV was attributed to advanced patient age, light toxicity, diabetes, intraoperative oxidation of lens proteins, intraocular tamponades, mechanical trauma, and the duration of exposure to irrigating solutions. On the other hand, phacoemulsification in a vitrectomized eye could be challenging with higher complication rates.^{1,2} Posterior capsular rupture and iris-lens diaphragm retropulsion syndrome (ILDRS) were reported to be encountered with higher rates in these cases; hence, previous studies advocated PPV with combined phacoemulsification.^{1,3} This would be a reasonable option in eyes with vitreoretinal diseases and

co-existing cataract, yet in presbyopic eyes with diminished accommodation even without lens opacities. However, in particularly young patients with preserved accommodation, combined procedures would be demanding. Thus, despite the complication rates are increased, sequential phacoemulsification in previously vitrectomized eye would be inevitable in such cases.

Herein, to manage iris-lens capsule retropulsion syndrome, we describe a technique which was previously suggested for phacoemulsification of subluxated lens.⁴

CASE REPORT

A 62-year-old male patient who previously underwent 23-gauge PPV, fluid-air exchange and C₃F₈ tamponade

1- Doç. Dr., Çukurova Üniversitesi, Göz Hastalıkları AD, Adana, Türkiye

2- Prof. Dr., Çukurova Üniversitesi, Göz Hastalıkları AD, Adana, Türkiye

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Yazışma Adresi / Correspondence Address:

Selçuk SIZMAZ

Çukurova Üniversitesi, Göz Hastalıkları AD, Adana, Türkiye

Phone: +90 322 3386060

E-mail: selcuk.sizmaz@gmail.com

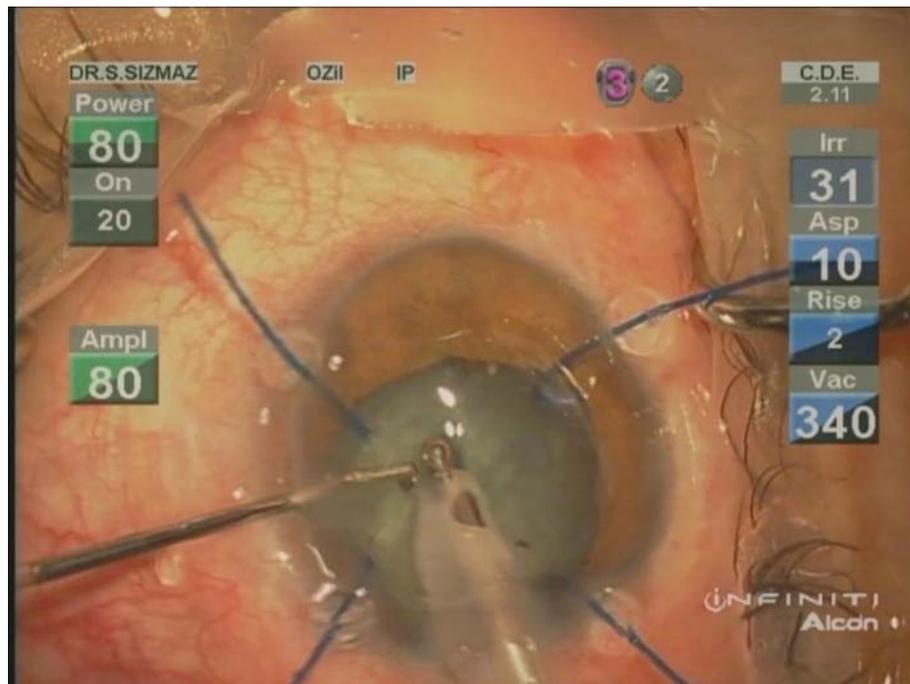


Figure. Intraoperative image of the case. The lens was suspended with the iris hooks. Note the anterior chamber depth is normal.

for rhegmatogenous retinal detachment in his right eye subsequently developed cataract. Reviewing the medical charts, it was evident that following PPV, which was nearly 2 years ago, he achieved 20/40 vision. However, during follow-up, the vision deteriorated.

In the right eye the visual acuity was 20/200 that did not improve with correction. His intraocular pressure was normal. Slit lamp biomicroscopy revealed normal findings but 3+ nuclear and posterior subcapsular cataract. Fundus was hardly visible; the retina seemed attached in ultrasonography. His medical history was unremarkable, except PPV.

Under paralytic block, two side-port incisions were made at 6 and 12 o'clock quadrants. The anterior chamber was filled with ophthalmic viscosurgical device (OVD) of 1.4% sodium hyaluronate. A 2.75 mm clear corneal temporal incision was made. Following continuous curvilinear capsulorhexis, hydrodissection and hydrodelineation were performed in the routine manner. When the phaco tip was introduced into the anterior chamber, the anterior chamber deepened resembling ILDRS. This posterior depletion of the iris-lens diaphragm did not resolve with reducing the bottle height. The tip was taken out and OVD was reinjected. Four stab incisions were made at 10, 1, 4, and 7 o'clock quadrants approximately 90 degrees apart. Iris hooks were introduced via the incision to engage the capsulorhexis margin; thus, the iris-lens capsule remained stable throughout the procedure. The lens was emulsified by quick-chop technique and the cortex remnants were removed with irrigation/aspiration tip.

No further fluctuation was noticed in the anterior chamber. The capsular bag was refilled with OVD and a capsular tension ring (CTR) was implanted for further stabilization. A foldable hydrophilic intraocular lens (IOL) was injected in the capsular bag. The OVD was thoroughly aspirated and the iris hooks were removed. Watertightness of the wounds was checked. The surgery was finished without complications.

DISCUSSION

Iris-lens diaphragm retropulsion syndrome was described as an extremely deepening of the anterior chamber due to the posterior placement of the diaphragm with fluctuations. The condition was also associated with intraoperative miosis. Another disadvantage that complicated the situation was corneal distortion, which was caused by the movement of the phaco tip in the deep anterior chamber. The incidence was reported to vary between 0% and 100%, and the causative mechanism was proposed to be the lack of vitreous support and the leak of low-viscosity vitreous fluid into the anterior chamber which caused a volume alteration in the vitreous cavity.^{1,3} Moreover, we consider that, during removal of peripheral vitreous with the assist of indentation – which should be absolute in retinal detachment cases - mechanical trauma to the lens zonules in the preceding surgery might play a role. This can lead to an extensive weakness of the zonules and even zonular dehiscence.

Several methods were described to prevent ILDRS; reducing the bottle height and using low flow rate being the most

common. On the other hand, in post-vitrectomy cataract cases nuclei are reported to be harder than expected.³ A case with a hard nucleus and a very deep anterior chamber would be challenging. However in our case, at the very beginning of phacoemulsification, ILDRS occurred and did not resolve with the reduction in bottle height. Although the nucleus was also significantly hard in our case, with the stability the iris hooks provided, we were able to perform vertical chop technique in a very stable anterior chamber and did not face a complication like posterior capsule rupture or zonular dehiscence.

Stabilizing the crystalline lens with iris hooks was first described in 1997 by Novak to enlarge the capsulorhexis opening; the technique was further improved for phacoemulsification in lens subluxation.^{5,6} In this current case, the use of iris hooks significantly helped to prevent ILDRS and associated conditions like anterior chamber fluctuations, posterior capsular rupture, intraoperative miosis, corneal distortion, and zonular dehiscence. The technique appears to be safe, giving the opportunity to work in a stable anterior chamber. Additionally, pain due to posterior movement of the iris-lens diaphragm was eliminated. Although we preferred a parabolbar block, topical anesthesia could be preferred with enhanced patient comfort.

We placed the CTR to prevent late postoperative complications, as preexisting zonular weakness is likely due to the formerly discussed causes. We believe CTR also helped prevent a floppy posterior capsule with further stabilization of the IOL in the bag and diminishing the risk of late posterior capsule opacification.

As the iris was also engaged while the capsule was suspended, one might consider an enhanced inflammation. Besides, four additional corneal incisions might seem to be compromising. We believe these suspected shortcomings related to this technique are comparable to the potential complications arising from ILRDS. With small chance, the hook might tear the capsulorhexis margin; hence, capsular hooks that support the lens from the equator might provide a safer surgery.⁷

In conclusion, stabilizing the iris-lens diaphragm with iris hooks seem to offer promising outcome with diminished complications in phacoemulsification of previously vitrectomized eyes.

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