Retained Nuclear Fragment Appearing after Nd:YAG Laser Capsulotmy

Nd:YAG Lazer Sonrası Ortaya Çıkan Nükleus Bakiyesi

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Case Report *Olgu Sunumu*

ABSTRACT

A 71-year-old male patient who had undergone uneventful phacoemulsification surgery for a cataract one year previously developed posterior capsule opacification and Nd:YAG laser capsulotomy was performed. After three days the patient was readmitted with decreased vision. A retained nuclear fragment was noted in the inferior anterior chamber angle causing a wedge-shaped corneal edema. After the removal of the nuclear fragment corneal edema resolved, and best corrected visual acuity improved to 1.0. During the 20-month follow-up period no other complication occurred.

Key Words: Retained nuclear fragment, Nd:YAG, capsulotomy.

ÖZ

Bir yıl önce komplikasyonsuz fakoemülsifikasyon cerrahisi geçiren 71 yaşındaki erkek hastaya arka kapsül kesafeti gelişmesi üzerine Nd:YAG lazer kapsülotomi yapıldı. Hasta üç gün sonra görme keskinliğinde azalma şikayetiyle tekrar başvurdu. Alt ön kamara açısında lokalize olan ve kama şeklinde kornea ödemine neden olan nükleus bakiyesi tespit edildi. Nükleus bakiyesi cerrahi olarak temizlendikten sonra kornea ödemi düzeldi ve en iyi düzeltilmiş görme keskinliği 1.0 düzeyine ulaştı. Yirmi aylık takip süresi boyunca ek komplikasyon gelişmedi.

Anahtar Kelimeler: Nükleus bakiyesi, Nd:YAG, kapsülotomi.

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INTRODUCTION

Many complications may occur during phacoemulsification, which is the preferred technique for cataract removal. Retained lens material is one of the complications that can lead to chronic inflammation with diagnostic and treatment challenges. Most reports found in the literature concern intravitreal lens materials.[1-6]

A retained nuclear fragment in the anterior chamber is a rare complication following uncomplicated phacoemulsification. Reports concerning this condition are limited (total of 21 cases). In these cases medical treatment did not reveal the clinical picture and surgical removal was required. Three patients required keratoplasty for refractory corneal edema.[7-12]

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CASE REPORT

A 71-year-old male patient who had undergone uncomplicated left phacoemulsification surgery and posterior chamber Intraocular Lens Implantation (IOL) in February 2008 presented with decreased vision in February 2009. In his left eye both uncorrected (UCVA) and best corrected visual acuities (BCVA) were 0.1. The intraocular pressure (IOP) measured by Goldmann applanation tonometer was 12 mmHg.

The cornea was clear except for a grade II pterygium, the anterior chamber (AC) was normal, the pupil IOL was centralized. The posterior capsule was opacified. Axial length was 25.4 mm. The mean keratometry reading was 45.5 diopters. Data for preoperative refraction were not available.

In his fellow eye UCVA and BCVA were 0.5 and 1.0, respectively. The IOP was 12 mmHg. The cornea was clear, AC was normal, IOL was centralized. The posterior capsule was clear. The posterior segment was normal. Axial length was 25.3 mm. The mean keratometry reading was 45.5 diopters.

One hour after the admission of one drop brimonidine tartrate (Alphagan, Allergan Inc.) Neodymium: Yttrium Aluminium Garnet (Nd:YAG) laser capsulotomy in a circular fashion was performed (35 shots, 1.2 mJ, Nidek Co., Ltd).

Topical brimonidine bid was continued and topical dexamethasone qid (Maxidex, Alcon Laboratories, Inc.) was added to the treatment schedule. On the following day UCVA and BCVA were 0.6 and 1.0, respectively. IOP was 13 mmHg. The pupillary axis was clear.

After three days the patient was readmitted with decreased visual acuity. Visual acuity was 0.1. By slit-lamp biomicroscopy inferior wedge-shaped corneal edema (Figure) and a retained lens fragment, easily seen through the edematous cornea, were noted in the inferior AC, which had remained hidden in the eye for one year.

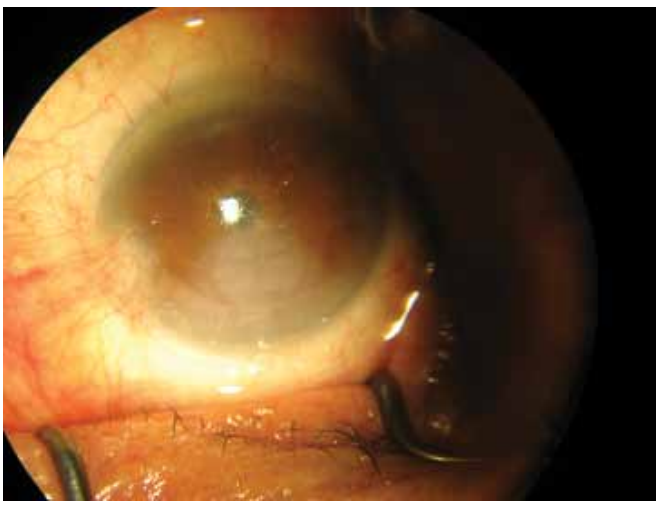

Figure: Wedge shaped corneal edema.

On the same day surgical bimanual aspiration of the fragment, which appeared to be a nuclear fragment, was performed through 20 Gauge side port incisions. On the first postoperative day the corneal edema resolved. At the first postoperative week BCVA was 1.0, IOP was 13 mmHg, the cornea was clear, the AC was quite, and the posterior segment was normal. After 20 months the clinical findings were stable.

DISCUSSION

Most reports concerning retained lens fragments are about intravitreally dislocated pieces. Some of them are noted intraoperatively and removed instantly or subsequently, or left for self-resorption. Lens fragments can be noted while evaluating postoperative chronic inflammation, IOP elevation, corneal edema, and retinal detachment.[1-6]

Retained nuclear fragment in the AC is a rare complication following uncomplicated phacoemulsification. There are limited reports in the literature concerning this condition.[7-12] Besides lens fragments cilia,[13,14] IOL haptic,[15] ointment,[16] and a broken chopper[17] retained in the AC were reported.

Between 1977 and 2010 only 21 cases with retained nuclear fragments in the AC were reported. The average time that elapsed from the cataract removal to the identification of fragments was 38 days (ranging from 1 to 128 days).[10] Only Braude[9] reported a case that became symptomatic one year after the surgery.

Our case is the first report of a retained nuclear fragment in the AC occurring after Nd:YAG laser capsulotomy. In addition, after remaining quiet for 30-40 years, retained lens material can appear masquerading as iris tumors.[18-20] This leads to the conclusion that retained lens material can cause symptoms as early as one day later and as late as 40 years later.

General findings in cases reported to date were persistent corneal edema (diffuse or wedge-shaped), mild to moderate anterior segment reaction and visual reduction (hand motions-20/30), and normal or rarely increased IOP.[7-12] Nuclear fragments were retained in the inferior portion of the AC in nearly all cases as in our case. Only in two cases reported by Hui[10] were fragments found in the temporal angle and superior angle (blocking the sclerostomy).

Most of the nuclear fragments can be detected by slit lamp biomicroscopy (62.5%) and gonioscopy was required in 37.5% of cases.[10] Wedge-shaped corneal edema is a strong indication of any foreign body or lens fragment in the inferior AC and can guide the proper diagnosis. However, in the presence of diffuse corneal edema and persistent anterior segment inflammation gonioscopy should be used to rule out any retained lens material.

Even when the gonioscopy is negative the AC should be irrigated, because in one of Hui's cases a nuclear remnant was found during the irrigation. Negative gonioscopy does not necessarily disclose the presence of an entrapped nuclear fragment. In our case the nuclear fragment was easily seen by slit-lamp biomicroscopy without the need for gonioscopy.

When retained lens material is 'cortical' the inflammation usually resolves with anti-inflammatory therapy and the material is resorbed.[10] However, when the fragment is 'nuclear' it does not resolve with corticosteroid treatment and requires surgical removal. In all reported cases the improvement was achieved after complete surgical removal of the nuclear fragment.[7-12]

Gedde[8] and Hui[10] suggested preoperative pharmacological pupillary constriction to keep fragments in the AC. Alternatively Braude[9] and Goodfellow[11] recommended preoperative pupillary dilation in order to find possible second fragments hidden behind the iris.

The mechanism of wedge-shaped corneal edema is controversial. There are different hypotheses that attempt to explain this characteristic morphology. A sequestrated nuclear fragment in the posterior chamber either spontaneously or by the effect of the laser's shock waves gets access to the anterior chamber and lodges in the inferior AC. This leads to localized endothelial dysfunction. The direct mechanical trauma and AC inflammation can be the cause of the edema.[7] Furthermore, a cross antigenic reaction between the lens and endothelial antigens is possible. According to histopathologic studies a granulomatous and/or eosinophilic reaction occurs around uncapsulated lens material.[8,21,22]

Long axial length, myopia, steep cornea, and deep AC are suggested risk factors for retained nuclear fragments.[10] In most of Hui's[10] cases, Goodfellow's[11] case, and in our case the axial lengths were relatively long.

In order to prevent this complication at the end of surgery, the main and side port incisions should be irrigated to reveal sequestrated lens material. Furthermore, in the presence of persistent corneal edema (localized or diffuse) gonioscopy should be used to rule out any sequestrated lens material.

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