

Fibrin Membrane Induced Pupillary Block Glaucoma Treated With Nd:YAG Laser After Uncomplicated Cataract Surgery

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Abstract

Fibrin pupillary-block glaucoma is a rare complication after uneventful cataract surgery. We aimed to share our treatment approach with Nd:YAG laser fibrin membranotomy. A 68-year-old man, whom does not have any systemic comorbidity developed acute elevation of intraocular pressure with a shallow anterior chamber 7 days after uneventful cataract surgery. Right visual acuity (VA) was 0.1 and intraocular pressure (IOP) was 48 mmHg. There was a fibrin membrane that completely closed the pupillary distance and with 360 degrees of peripheral iridocorneal touch. An Nd:YAG laser was used to create an opening in the superior margin of the membrane. Perforation of the membrane led to rapid deepening of the anterior chamber, permitting a sequential argon-Nd:YAG peripheral iridotomy to be performed at the same sitting. Although the fibrin membrane seen after uneventful cataract surgeries usually suggests that an inflammation is triggered, these results can sometimes occur even before the disease is present.

Keywords: Fibrin Membrane, Pupillary Block Glaucoma, Cataract Surgery, Nd: Yag Laser.

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INTRODUCTION

Complications related to cataract surgery are gradually decreasing, depending on the development of technology and techniques used. Despite all these advances in surgical technique, fibrin membrane-bound pupillary block glaucoma (PBG) is a rare complication seen after uneventful phacoemulsification cataract surgeries and can be seen rarely (1). Fibrin-derived PBG is the clinical picture with peripheral angle closure and increased intraocular pressure (IOP) due to the fact that the pupillary cavity is completely covered by the fibrin membrane (2). Severe corneal edema due to increased IOP hinders biomicroscopic examination and complicates early diagnosis. However, the presence of fibrin membrane in the pupillary space after uneventful cataract surgery suggests PBG.

We present a case of fibrin pupillary block glaucoma in a patient who was successfully treated with primary Neodymium YAG (Yttrium Aluminum oxide Garnet (Nd:YAG) Nd:YAG laser.

CASE REPORT

On January 10, 2022, the patient was admitted with the complaint of low and blurred vision in the right eye. His visual acuity (VA) was 0.3 in the right eye and 1.0 in the left eye. IOP was 13 mmHg and 14 mmHg in the right and left eyes, respectively. Corneas were clear in both eyes, and the depth of the anterior chamber was normal. Nuclear cataract and pseudophakia were detected in the right and left eyes, respectively. There was no systemic comorbidity. After an uneventful phacoemulsification cataract surgery, intracapsular hydrophobic acrylic intraocular lens (IOL) (Acruva-VSY) was placed. In the examination performed on the first postoperative day, the right eye VA was 0.8 and IOP was 14 mmHg. The depth of the anterior chamber was normal, and there was a mild inflammation in the anterior chamber (1+ cell reaction), and clear cornea. In the control examination performed on the first postoperative day, it was observed that there was no leakage at the wound site. Moxifloxacin eye drop six times a day (Moxai, Abdi İbrahim) and prednisolone eye drop eight times a day (Pred Forte, Allergan) were prescribed after discharge. The patient was called for control examination after 1 week. On the control day, the patient was admitted to our hospital with sudden onset of pain, redness, and low-vision in the operated eye. His right VA was 0.1

and IOP was 48 mmHg. Congestion was observed in the conjunctiva. The depth of the anterior chamber was too decreased, despite the fact that it could not be evaluated with certainty due to an intense corneal edema. The patient was initiated 300 cc. intravenous mannitol 20%, systemic acetazolamide 4times/day, topical dorzolamide-timolol maleate 2x1 (tomec, Abdi İbrahim), and topical Brimogut (Brinzolamid, Bilim) were initiated. Although corneal edema regressed slightly after treatment, pain did not change. His right VA was 0.1 and IOP was 48 mmHg. IOP was not changed. When the corneal edema decreased, it was observed that there was a fibrin membrane that completely closed the pupillary distance and with 360 degrees of peripheral iridocorneal touch (Figure 1).

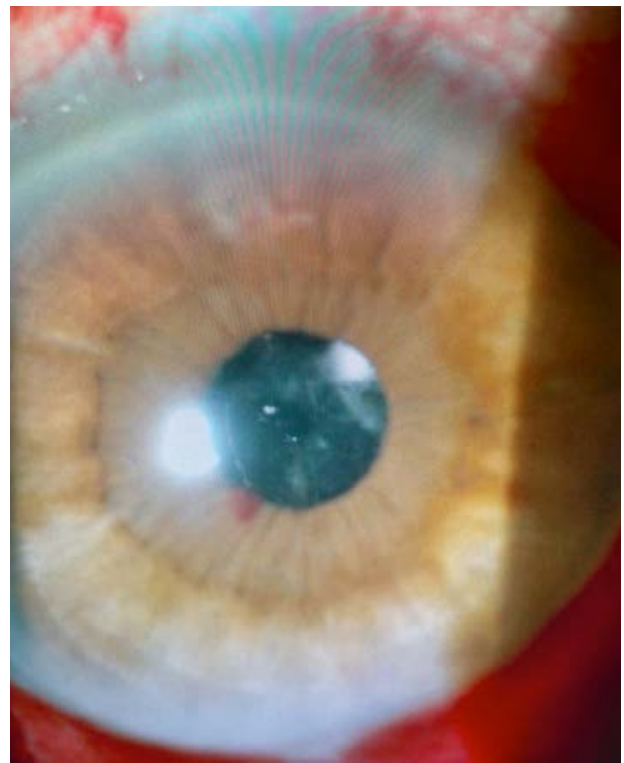


Figure 1: Fibrin membrane that completely closed the pupillary distance and with 360 degrees of peripheral iridocorneal touch.

An Nd:YAG laser was used to create an opening in the superior margin of the membrane. Perforation of the membrane led to rapid deepening of the anterior chamber, permitting a sequential argon-Nd:YAG peripheral iridotomy to be performed at the same sitting. The IOP was 26 mmHg after these procedures. In order for the pupillary opening to not close again, a 360-degree

ND:YAG laser was applied to the pupillary margin and the fibrin membrane was completely separated (Figure 2).

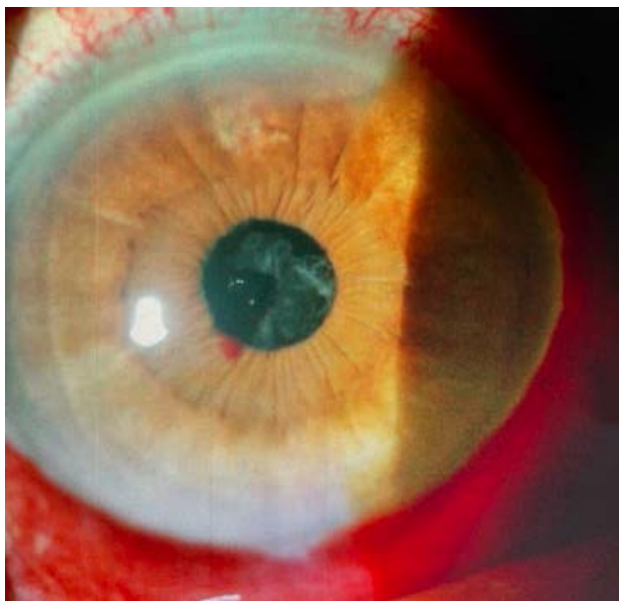


Figure 2: 360-degree ND:YAG laser was applied to the pupillary margin and the fibrin membrane was completely separated.

In the examination performed the next day, it was observed that the opening in the fibrin membrane started to close again, despite the hourly administration of 1% prednisolone acetate to the right eye. The laser iridotomy site was patent. Cyclopentolate and tropicamide (Tropamid 0.05%-Bilim) were added every 4 hours to prevent adhesion for pupil dilation. The fibrin eventually resolved without recurrence after 2 weeks of intensive topical steroid use; the IOP remained normal. VA had improved to 1.0 in the right eye and IOP was 15 mmHg, the anterior chamber remained deep and the cornea was clear (Figure 3). Fundus examination was normal. Consent was obtained from the patient before all procedures and to share this case.



Figure 3: The fibrin eventually resolved, the anterior chamber remained deep and the cornea was clear.

DISCUSSION

The differential diagnosis for a shallow anterior chamber associated with elevated IOP after cataract surgery includes pupillary block (fibrin membrane, Soemmering's ring and posterior synechia, capsular block syndrome and malignant glaucoma) (2–6). Although fibrin membrane pupillary-block glaucoma is more common after pars plana vitrectomy, there are a few reports of fibrin membrane pupillary-block glaucoma after cataract surgery (7,8).

This case report describes how the Nd: YAG laser was used to successfully remove the fibrinous pupillary membrane that causes pupillary-block glaucoma. The development of fibrin pupillary-block glaucoma is dependent on the formation of an inflammatory membrane, which completely occludes the pupil. This results in redirection of fluid into a 'third space' cavity between the iris and intraocular lens, which leads to bowing of the iris and subsequent swallowing of the anterior chamber with resultant pupil block. The similar anatomical morphology to aqueous misdirection glaucoma may hinder early diagnosis (8).

The development of these fibrinous membranes is thought to be the outcome of an immune reaction in which the blood-aqueous barrier is broken, resulting in an increased proclivity to inflammation (9).

As a result, although the Nd:YAG laser procedure applied in our case with pupillary block glaucoma after cataract surgery eliminated the problem, it was not fully understood why this situation developed as a secondary reaction. Although we predict the most likely reason for this case as the inability of our patient to apply steroid drops regularly, other possible causes may be: secondary reaction to the viscoelastic material used or remaining intracapsular viscoelastic material.

After the successful operation in our case, the main treatment of fibrin pupillary block glaucoma, which was caused by the inability of our patient to use the drugs correctly, was performed with Nd:YAG laser. This is most likely related to the use of high-frequency topical steroids in combination with cycloplegia to minimize the inflammatory response to laser therapy, which was already exacerbated by the presence of a diagnosis of mixed connective tissue disease.

Declarations

The authors received no financial support for the research and/or authorship of this article. There is no conflict of interest.

Ethical Committee approval was not required. Informed consent was obtained from all participants

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