

All in All Anterior to Posterior Segment Ocular Diseases in a Single Individual: A Case Report

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ABSTRACT

Significance:

Anterior to posterior ocular diseases in the eye is possible, although rare. Visual disturbances and ocular discomfort may contribute to several factors.

Purpose:

The purpose of this case report was to describe the possibility of multiple ocular diseases that may present in the eye, making it imperative for optometrists to perform a comprehensive eye examination daily.

Case report:

A 57-year-old, female presented with a severe gritty sensation in the right eye. The patient underwent Laser Assisted In-situ Keratomileusis (LASIK) 30 years ago and her medical history reveals newly diagnosed Hypertension. The patient has mild bilateral blepharoptosis, and on slit lamp examination with fluorescein staining, the ocular surface reveals multiple Superficial Punctate Keratitis (SPK) possibly due to Post-LASIK. Further, mild clouding of the crystalline lenses was noted suggestive of Nuclear Sclerosis (NS). Dilated eye examination, reveals tiny multiple yellowish-white reflecting particles which were Asteroid Hyalosis (AH) and flame-shaped hemorrhages extended from the optic disc to the macula that is suggestive of Central Retinal Vein Occlusion (CRVO). All in all anterior to posterior segment ocular diseases in this patient were managed accordingly by Optometrist and Ophthalmologist. The diagnosis made were bilateral aponeurotic ptosis, severe dry eyes, NS, AH, and CRVO. The patient was treated with topical cyclosporine and Anti-vascular endothelial growth factor (anti-VEGF) scheduled.

Conclusion:

This case demonstrates the role of patient history, clinical findings, diagnosis, and treatment of blepharoptosis, chronic dry eye, NS, AH, and

CRVO. It emphasizes the importance of evaluating the anterior to posterior segment ocular structures and managing such cases requires close collaboration and teamwork with ophthalmologists. Careful examination and systemic evaluation are vital in such a scenario. It is important to educate patients that any sudden vision loss is not normal and they should consult an eye care professional immediately.

Keywords: Ptosis, Superficial Punctate Keratitis, Nuclear Sclerosis, Asteroid Hyalosis, Central Retinal Vein Occlusion.

I. INTRODUCTION

The presence of anterior to posterior segment ocular disease in one single individual is rare but makes it possible and imperative to analyze and examine each structure closely and carefully. Blepharoptosis is a condition where the upper eyelid droops over the eye and may affect one or both eyes simultaneously.^{1,2} Dry eye disease (DED) is a multi-factorial ocular surface disease that commonly results in symptoms of discomfort, visual disturbances, and tear film instability.³ The symptoms are common for Post-Laser assisted in-situ keratomileusis (LASIK) individuals as it might alter the ocular surface.⁴ Ocular surface disease caused from dry eye has a main sign of superficial punctate keratitis (SPK), which is also known as punctate dots on the ocular surface.⁵ Asteroid hyalosis (AH) is a common degenerative process in which varying sizes of white opacities are found within the vitreous humor. It's refractive properties give rise to the appearance of asteroids.⁶ Nuclear Sclerosis is a type of cataract in which the crystalline lens appears to be cloudy, hardened, and yellowed in the central region known as the nucleus.⁷ Central Retinal Vein Occlusion (CRVO) is one of the leading vascular diseases that is caused by thrombosis of the central retinal vein, resulting in macular edema and anterior and retinal neovascularization if it is left untreated.⁸ This case report outlines the discussion,

findings, treatment as well as management of the case presented.

II. CASE REPORT

A 57-year-old female, Chinese patient presented to the clinic on 12th April 2023 with complaints of severe gritty sensation and discomfort in the right eye for the past two weeks. She hasn't been using any topical eye drops so far.

The patient revealed that she have done Laser vision correction which is Laser Assisted In-situ Keratomileusis (LASIK) 30 years ago. Her pre-LASIK shortsightedness was OD: -8.00/-1.50x180 and OS: -7.50/-2.00x180. She has no history of previous ocular trauma or any ocular infection. The patient is a non-contact lens wearer and in fact, has never worn one before. The patient also revealed that she is newly diagnosed with Hypertension six weeks ago by General Practitioner. The patient is currently not on any oral medications as the patient is keen on lifestyle and dietary modification. Blood Pressure was measured and it was 170/100 mmHg. No evidence of Diabetes, Cholesterol, and other medical illnesses. Social history was negative for tobacco, alcohol, or recreational drug abuse and allergy history was unremarkable.

Under general observation, she was seen to have drooping of the upper eyelid in both eyes. [Figure 2] Marginal reflex distance (MRD) 1 was +2 mm on both

eyes. Vertical palpebral aperture (VPA) was 9mm on both eyes. Preliminary examinations were conducted before refraction and slit lamp examination. Visual Acuity (VA) was taken using Snellen Chart, it revealed that the VA of the patient was 6/18 and 6/7.5 on the right and the left eye respectively. Pupillary reflex examination reveals that the patient has no Anisocoria and both pupils are equally round and reactive to light. Extraocular muscles were then assessed and fortunately, it shows no abnormalities in the mortality. The patient's color vision was tested using Pseudoisochromatic Ishihara plates monocularly and the patient was able to appreciate differences in color from each plate. This was done to ensure that the patient does not have any neurological deficit in regards to ptosis.

Manifest refraction revealed to be -0.25 DS / - 0.25 DC × 90 (OD) and - 0.25 DS / - 0.50 DC × 90 (OS). Best corrected visual acuity (BCVA) were 6/18 and 6/6 for the right and the left eyes respectively.

Anterior segment evaluation by slit-lamp examination with the fluorescein stain revealed multiple superficial punctate keratitis (SPK) on both eyes' cornea. **[Figure 1]** It is suggestive of chronic dry eyes due to post-LASIK. Intraocular pressure (IOP) at 3:35 PM was 11 mmHg (OD) and 12 mmHg (OS) by using Goldmann Applanation Tonometer (GAT). The anterior segment was evaluated and IOP was measured before dilation to avoid any complications of pupillary block.

Dilated eye examination and Optical coherence tomography (OCT) macula and optic nerve head (ONH) were suggested given both eyes' crystalline lenses were equally yellowish suggestive of equal stages of cataract on both eyes but VA wasn't tallying with each other. Additionally, OCT macula would be helpful to detect and diagnose retinal vascular diseases. Pupils then were dilated with mydriacyl (tropicamide) 1%.

On lens inspection, both eyes' lenses show yellowish of the central region of the lens, Nuclear Sclerosis. **[Figure 3]** Nuclear sclerosis is a type of cataract that is considered to be a normal aging process that is

progressive throughout life and it is the most common type of cataract.

On the inspection with Volk lens 90 D, multiple reflective, and opaque particles floated and scattered in the vitreous cavity making it quite challenging to access the fundus which is suggestive of Asteroid Hyalosis (AH) that is known to be a degenerative eye condition, and it is often asymptomatic which correspond with this patient. **[Figure 4]**

Both eyes' retinas were examined carefully to look for signs of vascular abnormalities in association with systemic diseases which is particularly Hypertension in this case.

The cup-to-disc ratio was 0.3 (OU) and the right optic disc seemed to be edematous but the left eye disc was normal with a distinct margin. The right eye fundus shows a flame-shaped hemorrhage extended from the optic disc to the macula. Mild venous tortuosity and dilation are present. No cotton wool spots were present. All the clinical findings suggested that the patient was having a Central Retinal Vein Occlusion (CRVO). On the other hand, no abnormalities were found in the left eye. Again the iris was carefully examined to look for new vessels to confirm the type of CRVO is Non-Ischemic. OCT macula, ONH, and fundus photos were taken using Heidelberg Spectralis OCT.

The OCT macula image shows right eye central macula thickness (CMT) of 973 μm which is outside of the normal limit and left eye CMT was 255 μm which is within the normal limit. **[Figure 5]** The right eye CMT was suggestive of central macula edema. **[Figure 6]**

The OCT retinal nerve fibre layers indicate optic disc swelling and the fundus image shows flame-shaped hemorrhage in all quadrants. **[Figure 7]**

Final diagnoses:

- Mild refractive error (OU)
- Aponeurotic ptosis (OU)
- Chronic Dry Eye Disease (DED) (OU)
- Early-stage cataract → Immature Nuclear Sclerosis (OU)
- Asteroid Hyalosis (OU)

- Non-Ischemic Central Retinal Vein Occlusion (CRVO) (OD)

The patient was then prescribed non-preservative artificial tears and topical cyclosporine prescribed to relieve the symptoms of dry eyes. Patients were scheduled for a few loading doses of Anti-vascular endothelial growth factor (anti-VEGF) Ranibizumab for the right eye because of macula edema with the association of Non-Ischemic CRVO under an Ophthalmologist within the practice. Fundus Fluorescein Angiography (FFA) will also be performed whenever needed or when VA is not improving in between the anti-VEGF doses. Additionally, the Patient was given a referral to a primary care physician for a tight systemic control as the blood pressure measured was outside the normal limit.

III. DISCUSSION

Blepharoptosis (ptosis) is the most common disorders of the upper eyelid which is described as drooping of the upper eyelid. It can affect one or both eyes and can be present at birth or develop later in life. It's classification is rooted in various criteria, such as age of onset, etiology, severity, and levator function. Based on etiology, ptosis may have a myogenic, neurogenic, aponeurotic, mechanical, or traumatic cause. According to severity, ptosis may be minimal or mild (1 – 2 mm), moderate (3 – 4 mm), or severe (> 4 mm). When the ptosis is severe, it can create a mechanical obstruction to the visual field; resulting in the need to tilt their head back into a chin-up position, lift their eyelid. The constant effort of the forehead and scalp muscles may further cause tension headaches and eyestrain.² As for the management of ptosis, it can be corrected by surgery known as ptosis surgery and blepharoplasty.⁹ In this case, the patient was given the option for the ptosis surgery as the severity of the ptosis is mild and it does not obstruct the vision.

Transient, bilateral, coarse corneal epithelial defects, without associated of stromal involvement or corneal

edema, were first known as Thygeson's superficial punctate keratitis (TSPK) in 1950. Since then, further studies have illustrated the onset of TSPK in patients of all ages; its chronic nature is characterized by exacerbations and remissions.¹⁰ The dry eye workshop society (DEWS) report revealed that dry eye has been characterized as a multifactorial disease, which cannot be distinguished by a single process, sign, or symptom. In medical terms, multifactorial is described as having or stemming from, several different interacting causes or influences, as is the case in DED.¹¹ As LASIK is one of the causes of the DED, the signs and symptoms of LASIK-induced dry eyes tend to resolve after surgery but this disorder tends to be more common and severe in patients with pre-existing dry eye disease. Management includes patient education with an emphasis on the dry eye being a chronic disease, treatment as a long-term process, and may be slow to take effect due to the possible pre-existing dry eyes before LASIK. Treatment for dry eye disease involves a step-by-step approach corresponding to disease severity and must take into account.¹² Artificial tears are the central component for all severity grades of dry eye as it increases tear film stability and it is followed by the prescription of cyclosporine and corticosteroid which are proven for it's effectiveness.¹³ A common cause of visual impairment in older adults is age-related cataracts, which are sub-categorized as nuclear, cortical, or sub-capsular in type. The overall incidence is 29.7%, 22.9%, and 8.4% for nuclear, cortical, or posterior cortex.¹⁴ Among these, nuclear cataract is most common among the aged. As a person becomes older, the nuclear fibers become more compact and cause increased light scattering. Clinically, when it's left to mature, the sclerotic nuclear lens changes color from a clear translucent material to yellow or orange and eventually brown or black as it ages. The increased color is due to protein aggregation in the nuclear lens, which reduces its transparency and leads to various symptoms, including visual impairment, reduced contrast sensitivity, dull color perception, and myopic changes.¹⁵

The treatment of cataracts remains surgical. No medications are known to prevent or eliminate cataracts. The criteria for cataract removal is not decided by looking at a specific VA but it's functional. In general, visual acuity of 20/50 or worse with glare testing is considered to be a surgical level of dysfunction.¹⁶

Asteroid hyalosis (AH) is a relatively common vitreous opacities and the differential diagnosis for other pathologies that may mimic AH is synchysis scintillans, vitritis, amyloidosis, and malignancy, particularly lymphoma and metastatic carcinoma. During head and eye movement, the round white bodies of AH move with vitreous displacement but it does not appear to cause any problems for most patients in terms of visual discomfort. AH rarely affects the VA but instead, it obscured the clear view of the fundus. Even in severe cases that render fundus examination impossible, vision is often unaffected by AH.¹⁷

Central retinal vein occlusion (CRVO) is a common cause of unilateral visual loss. Although it was originally described over 150 years ago by Richard Liebreich.¹⁸ There are two categories of CRVO: non-ischemic (perfused) and ischemic (nonperfused). In the central vein occlusion study (CVOS), approximately 2/3 are classified as non-ischaemic, and 1/3 are classified as ischaemic.¹⁹ Hypertension, stroke, advanced age, sex, and hyperlipidemia are all significant risk factors and their exact mechanisms for disease contribution are intriguing. Specifically, CRVO is thought to interact more with the cardiovascular system because of its increased mortality in the cardiovascular system.^{20,21} Many treatment modalities have been demonstrated through high-quality clinical trials to be safe and efficacious in the treatment of CRVO's clinically significant sequelae. These treatments may lead to significant improvements in vision, as well as improved quality of life for patients with CRVO. There is sufficient level-1 evidence to suggest anti-inflammatory corticosteroids and anti-VEGF

treatments play a significantly beneficial role in the treatment of CRVO.²²

IV. CONCLUSION

This case demonstrates the role of patient history, clinical findings, diagnosis, and treatment of ptosis, chronic dry eye, nuclear sclerosis, asteroid hyalosis, and central retinal vein occlusion. Eyelid ptosis can be objectively monitored by measuring the MRD. Since dry eye is a chronic disease, precaution treatment should be taken including avoidance of external risk factors. It is crucial to keep the eyes lubricated, as this could lead to further complications such as corneal ulcers. Cataracts should be also monitored to observe their progression. Although vision is seldom affected in AH, optometrists may experience difficulty examining the fundus. To avoid difficulty, fluorescein angiography, ultrasonography, and optical coherence tomography are useful for funduscopy evaluation. Most importantly, CRVO should be managed and treated immediately regardless of the etiology, the patient should regularly follow up with their ophthalmologist and primary care provider to help control risk factors and prevent future complications. It is important to educate patients that any sudden vision loss is not normal and they should consult a medical professional immediately.

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VI. REFERENCES

- [1]. Koka K, Patel BC. Ptosis Correction. Treasure Island (FL): StatPearls Publishing 2023 Jan.
- [2]. Finsterer J. Ptosis: Causes, Presentation, and Management. *Aesthetic Plast Surg* 2003 May-Jun;27:3:193-204.

- [3]. Shtein RM. Post-LASIK Dry Eye. *Expert Rev Ophthalmol* 2011 Oct;6:5:575-582.
- [4]. Cohen E, Spierer O. Dry Eye Post-Laser-Assisted In Situ Keratomileusis: Major Review and Latest Updates. *J Ophthalmol* 2018 Jan; 28;2018:4903831.
- [5]. Ha, Minho, Young-Gyu Kim, and Tae-Hyoung Park. Stain Defect Classification by Gabor Filter and Dual-stream Convolutional Neural Network, 2022.
- [6]. Mishra C, Tripathy K. Asteroid Hyalosis. Treasure Island (FL): StatPearls Publishing 2023 Jan.
- [7]. Samarawickrama C, Wang JJ, Burlutsky G, et al. Nuclear Cataract and Myopic Shift in Refraction. *Am J Ophthalmol* 2007 Sep;144:3:457-9.
- [8]. Bell, Daniel, and David Carroll. "Central Retinal Vein Occlusion. Radiopaedia.org 2019.
- [9]. Bacharach J, Lee WW, Harrison AR, Freddo TF. A Review of Acquired Blepharoptosis: Prevalence, Diagnosis, and Current Treatment Options. *Eye (Lond)* 2021 Sep;35:9:2468-2481.
- [10]. Nagra PK, Rapuano CJ, Cohen EJ, et al. Thygeson's Superficial Punctate Keratitis: Ten Years' Experience. *Ophthalmology* 2004 Jan;111:1:34-7.
- [11]. Craig JP, Nichols KK, Akpek EK, et al. TFOS DEWS II Definition and Classification Report. *Ocul Surf* 2017;15:3:276-283.
- [12]. Wilson SE. Laser In-situ Keratomileusis-induced (presumed) Neurotrophic Epitheliopathy. *Ophthalmology* 2001 Jun;108:6:1082-7.
- [13]. Messmer EM. The Pathophysiology, Diagnosis, and Treatment of Dry Eye Disease. *Dtsch Arztebl Int* 2015 Jan 30;112:5:71-81; quiz 82.
- [14]. Klein BE, Klein R, Lee KE, Gangnon RE. Incidence of Age-Related Cataract over a 15-year Interval the Beaver Dam Eye Study. *Ophthalmology* 2008 Mar;115:3:477-82.
- [15]. N Aliancy, JF Mamalis. "Crystalline Lens and Cataract." National Center for Biotechnology Information August 15, 2017.
- [16]. Johnson, Karin, and Steven Record. "Visual Impairment and Eye Problems." *Primary Care Geriatrics* 2007, 344-49.
- [17]. Khoshnevis M, Rosen S, Sebag J. Asteroid Hyalosis - A Comprehensive Review. *Surv Ophthalmol* 2019 Jul-Aug;64:4:452-462.
- [18]. Liebreich R. Ophthalmoskopische Notizen: Ueber die Farbe des Augengrundes. *Albrecht Von Graefes Arch Ophthalmol* 1855; 1: 333-56.
- [19]. McAllister, Ian L. "Central Retinal Vein Occlusion: A Review." *Clinical & Experimental Ophthalmology* 40 2011 no. 1 48-58.
- [20]. Woo SC, Lip GY, Lip PL. Associations of Retinal Artery Occlusion and Retinal Vein Occlusion to Mortality, Stroke, and Myocardial Infarction: A Systematic Review. *Eye (Lond)*. 2016 Aug;30:8:1031-8.
- [21]. Cugati S, Wang JJ, Knudtson MD, et al. Retinal Vein Occlusion and Vascular Mortality: Pooled Data Analysis of 2 Population-based Cohorts. *Ophthalmology* 2007;114:3:520-524.
- [22]. Patel A, Nguyen C, Lu S. Central Retinal Vein Occlusion: A Review of Current Evidence-based Treatment Options. *Middle East Afr J Ophthalmol* 2016 Jan-Mar;23:1:44-8.

FIGURE LEGENDS

Figure 1. Multiple superficial punctate keratitis with fluorescein staining.

Figure 2. The patient's right eye was captured under the slit lamp and it shows mild aponeurotic ptosis.

Figure 3. Nuclear sclerosis in a patient with dilated pupil.

Figure 4. Asteroid Hyalosis captured under the slit lamp by using Volk lens 90 D.

Figure 5. OCT macula shows Central Macula Edema OD and no abnormalities on OS.

Figure 6. OCT macula shows Central Macula Edema OD.

Figure 7. OCT ONH shows OD optic disc edema and OS normal. The Fundus photo shows flame-shaped hemorrhage and torturous veins.

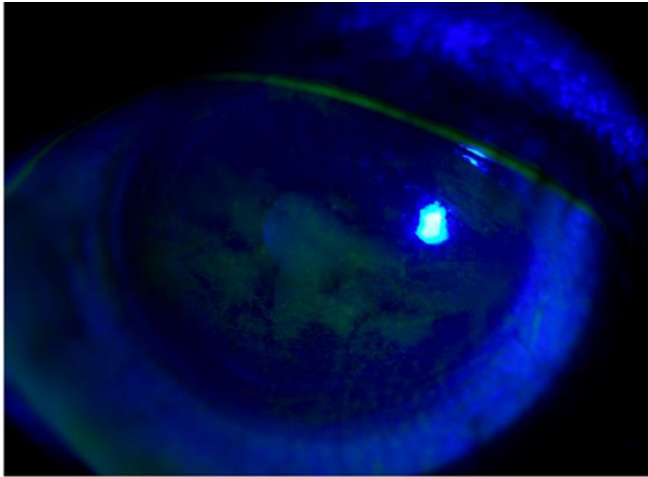


Figure 1



Figure 4



Figure 2

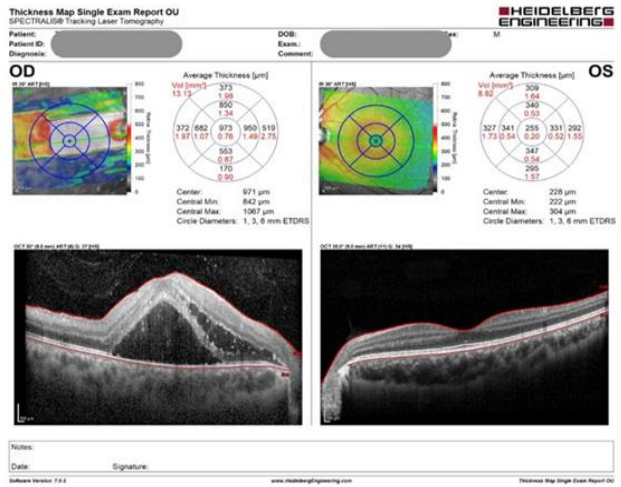


Figure 5



Figure 3

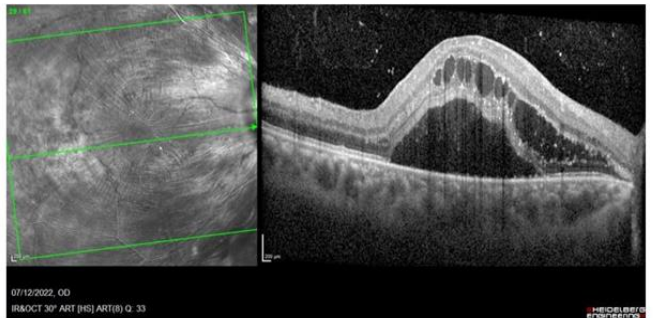


Figure 6

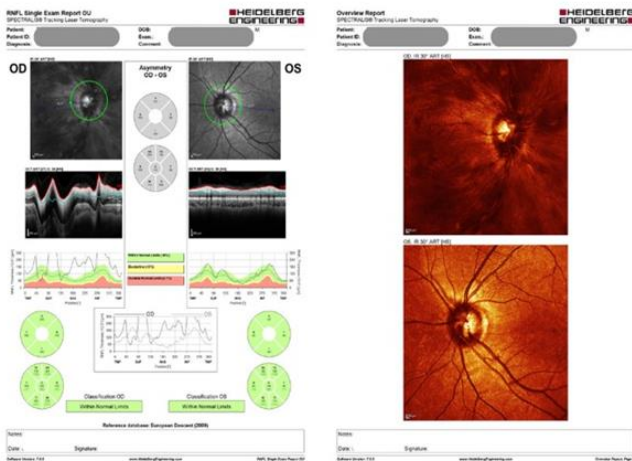


Figure 7

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