

B-Scan and Color Doppler in Retinal Detachment Associated with Asteroid Hyalosis

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Abstract

Purpose: To report a case that demonstrates the use of B-scan ultrasonography complemented with color Doppler imaging in the successful diagnosis of retinal detachment in a dense asteroid hyalosis presentation.

Methods: Retrospective case report.

Case Report: A 65-year-old Asian female, complained of decreased right eye vision 25 days prior to examination. Fundoscopy showed dense asteroid hyalosis, hindering an accurate assessment of the retinal status 10 MHz. B-scan ultrasonography (Aviso, Quantel®) at 10 MHz showed a bright, continuous, highly reflective membrane at A-scan. Kinetic evaluation revealed restricted movement, extending from the optic disc to the periphery at meridians 1 to 8 clock-hours. The main diagnostic hypothesis was superior nasal extended to inferior temporal retinal detachment. Differential diagnosis included a localized posterior vitreous detachment with a thickened hyaloid. A 15-MHz color Doppler ultrasound transducer (Esaote Mylab 60) detected arterial blood flow in the membrane identified during the B-scan ultrasound, confirming the diagnosis of localized retinal detachment.

Conclusion: Ocular ultrasound and a complementary evaluation with color Doppler can be useful in unusual presentations of asteroid hyalosis.

Keywords: Asteroid Hyalosis; Ocular Ultrasound; Retinal Detachment; Color Doppler

Introduction

Initially described in 1894 as Benson's Disease, asteroid hyalosis is an uncommon, usually unilateral condition that rarely causes visual disturbances [1-3]. However, its association with systemic diseases is unclear. Characteristic calcium hydroxyapatite-lipid complex deposits in the vitreous humor, which appear as yellowish white bodies, facilitate the diagnosis of the disease by a simple fundus exam. Their high adherence to the collagen matrix results in low hyaluronic acid breakdown and vitreous liquefaction and unusually leads to posterior vitreous detachment or retinal detachment [4,5]. In a few severe cases, dense presentation hampers posterior segment visualization, and the use of ocular ultrasound [6-8] is useful.

We report a case in which ocular B-scan ultrasound and color Doppler evaluation [9,10] were used to diagnose retinal detachment in a patient with dense asteroid hyalosis.

Case Report

65-year-old Asian female, complained of decreased right eye vision 25 days prior to examination. Past ocular history included complaints of occasional bilateral floaters and bilateral phacoemulsification with intraocular lens implantation 10 years previously. Diabetes and systemic hypertension were managed effectively with oral medication.

Best-corrected visual acuity in the right eye was hand motion with no sign of inflammation on biomicroscopy. Fundoscopy showed dense vitreous deposits, hindering an accurate assessment of the retinal status.

10 MHz B-scan ultrasonography at 10 MHz showed a bright, continuous, highly reflective membrane with a 95% reflectivity at A-scan. Kinetic evaluation revealed restricted movement, extending from the optic disc to the periphery at meridians 1 to 8 clock-hours. The main diagnostic hypothesis was superior nasal extended to inferior temporal retinal detachment. Differential diagnosis included a localized posterior vitreous detachment with a thickened hyaloid. The vitreous body presented small, highly reflective round particles that were more densely distributed close to the posterior membrane described, allowing wide movement on kinetic evaluation. An echo-free space was identified between the asteroid bodies and the continuous membrane, which is typical for asteroid hyalosis.

A 15-MHz color Doppler linear transducer detected arterial blood flow in the nasal membrane identified during the B-scan ultrasound. This finding confirmed the diagnosis of localized retinal detachment. Patient was submitted to pars plana vitrectomy, including fluid-air exchange, intraoperative endophotocoagulation and gas (C3F8).

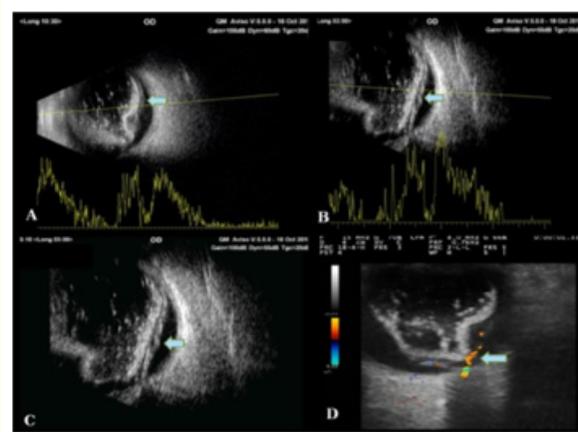


Figure 1: (A-C) 10-MHz transducer, A- and B-scans (Aviso, Quantel): (A) Arrow indicates an irregular, heterogeneous, and reflective superotemporal membrane, suggestive of posterior hyaloid; (B) and (C) Arrows indicate a linear, highly reflective continuous nasal membrane suggestive of segmental retinal detachment and (D) 7.5 - 15 MHz Color Doppler linear transducer (MyLab 30, Esaote): Arrow indicates the membrane colored in orange, confirming blood flow, which corroborates with the diagnosis of retinal detachment.

Discussion and Conclusion

In asteroid hyalosis, the creamy white spherical bodies aggregate onto vitreous collagen fibrils, which makes its liquefaction and posterior vitreous detachment unusual [5]. In this case, the posterior vitreous membrane is highly adherent to the eye wall. Thus, separating the posterior hyaloid membrane from the retina during posterior pars plana vitrectomy is harder than in normal eyes [4].

Besides the numerous bright particles clearly visualized in the vitreous membrane, no other symptoms or, if not, only mild myodesopsia usually characterize asteroid hyalosis. The smooth surface of these spherical forms may cause little scattering of stray light [5]. In cases with significant visual disturbances, posterior pars plana vitrectomy may be safely performed [11].

In a review of posterior pars plana vitrectomy [11] four of seven cases with dense hyalosis presentation and inconclusive previous fundus evaluation showed undiagnosed fundus diseases. Dense vitreous hemorrhage, synchysis scintillans, and an inflammatory conditions of the vitreous membrane might cause erroneous interpretations of sonographic images [12,13].

Retinal detachment is not commonly observed in the course of the disease. The present case reveals the importance of correct diagnosis to avoid permanent vision loss. We can conclude that ocular ultrasound and a complementary evaluation with color Doppler can be useful in unusual presentations of asteroid hyalosis.

Brief Summary Statement

Asteroid hyalosis is characterized by calcium hydroxyapatite-lipid complex deposits highly adhered to the vitreous collagen, rarely resulting in retinal detachment. We present a case in which ocular B-scan ultrasound coupled with color Doppler evaluation were employed to diagnose retinal detachment in a dense asteroid hyalosis presentation.

Declarations

Ethics approval and consent to participate; UNIFESP - Federal University of Sao Paulo Ethic Committee.

Consent for Publication

Applied.

Availability of Data and Materials

Department of Ophthalmology and Visual Sciences, UNIFESP - Federal University of Sao Paulo.

Competing Interests

None of the authors has any conflicting interests to disclose.

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Authors' Contributions

Each author has participated sufficiently in the intellectual content and the writing of the Work to take public responsibility for it. Each has reviewed the final version of the Work, believes it represents valid work, and approves it for publication.

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