

Case Report

Valsalva Retinopathy after a Vomiting Episode

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Keywords

Valsalva retinopathy · Macular hemorrhage · Retinal hemorrhage treatment · Nd:YAG laser

Abstract

This case presents a minimal invasive alternative for the treatment of subhyaloid hemorrhages. Young, female, 32 years old, with no regular medication and with no personal or ophthalmological history, reports a sudden and profound decrease in visual acuity after an episode of vomiting, with 2 days of evolution. After funduscopic observation and complementary diagnostic tests, subhyaloid hemorrhage was detected and laser hyaloidotomy was performed, with restoration of visual acuity after 1 week. Nd:YAG laser treatment made it possible to quickly restore the visual acuity of the patient after following diagnostic procedures, avoiding other types of treatments, such as pars plana vitrectomy. This case reports a Valsalva retinopathy with clinical presentation in the form of subhyaloid hemorrhage after an episode of self-limited vomiting, effectively treated with Nd: YAG laser.

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Introduction

The term hemorrhagic retinopathy of Valsalva (HRV), described by Duane as the rupture of superficial capillaries secondary to an increase in retinal venous pressure, following a sudden change in intrathoracic or intra-abdominal pressure [1]. Along with the rapid rise of intraocular venous pressure, spontaneous rupture in the superficial retinal capillaries may occur, leading to a sudden and painless decrease in visual acuity in a previously healthy eye [2]. In everyday life, there are several involuntary movements that can mimic an involuntary Valsalva maneuver, without any clinical repercussions. This article tests a case of HRV after an episode of vomiting.

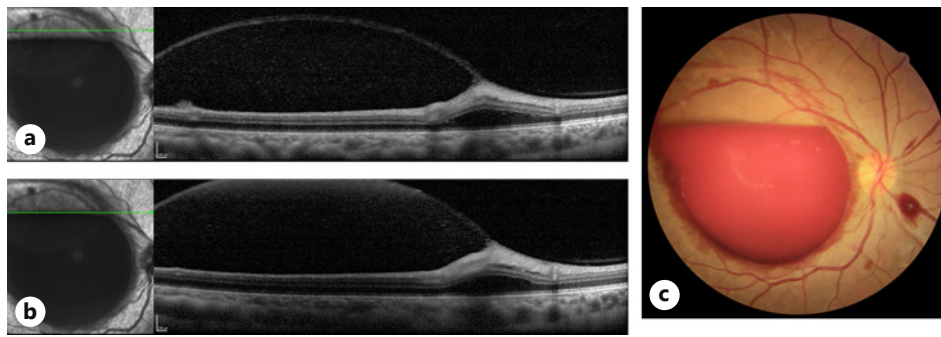


Fig. 1. Macula SD-OCT at presentation (**a**, **b**) and fundus photography at presentation, MultiColor 55° ART [HR] (**c**).

Case Report/Case Presentation

A Caucasian 32-year-old woman, without previous medication or prior ophthalmological or personal history. No relevant family history was identified. She came to an ophthalmology appointment complaining of a sudden-onset painless vision loss with 2 days of evolution, after an episode of self-limited vomiting. On objective examination, she had a best-corrected visual acuity of 85 Early Treatment Diabetic Retinopathy Study (ETDRS) letters (20/20) in the left eye and 10 ETDRS letters (20/160) in the right eye. Biomicroscopy did not detect any alterations in the normal pattern nor were any relative afferent pupillary defects or deficits on the oculomotor examination seen. On the mydriatic fundus, no changes were found in the left eye. In the right eye, a “boat-shaped” subhyaloid hemorrhage was observed between the supero and inferotemporal arcades. Several other minor intraretinal hemorrhages were seen in the posterior pole, without other significant fundus changes (shown in Fig. 1).

To aid in diagnosing the spectral domain – an optical coherence tomography (OCT) (Spectralis® OCT, version 1.10.2.0; Heidelberg Engineering, Heidelberg, Germany) was done and allowed to reveal changes in the right eye with the presence of an extensive hyporeflective area in the macular region between the posterior hyaloid and the internal limiting membrane (ILM) (shown in Fig. 1). In order to quickly resolve this hemorrhage with consequent restoration of visual acuity and retinal anatomical changes, a neodymium-doped yttrium aluminum garnet (Nd:YAG) laser hyaloidotomy (Valon 5G® Multispot Laser; Meridian Medical Oy, Meridian AG, Switzerland) was performed with the aid of a Mainster® lens (focal grid with a laser spot magnification of $\times 1.05$), in the most protuberant part of the subhyaloid hemorrhage (lowerly) with drainage of the hematic fluid by gravitational action (shown in Fig. 2). As parameters, a spot size of 50 μm , a pulse duration of 100 ms, and an initial power of 300 mW were used, with no therapeutic success at first. Thus, the power was gradually intensified (with increases of 50 mW) with the rupture of the posterior hyaloid occurring at a final power of 500 mW and with both the spot size and pulse duration kept unchanged.

One week after the procedure, the patient had a substantial improvement in visual acuity, with a best-corrected visual acuity of 85 ETDRS letters (20/20) in the right eye. Fundoscopy revealed only a slight inferior hemovitreal and a delimitation of the former hemorrhage, without the presence of blood in the macular area or other de novo findings (shown in Fig. 3) or any adverse events observed. Macular spectral domain-OCT revealed a disruption at the level of the posterior hyaloid in the infero-macular region and the preservation of foveal depression, with rare intraretinal hyper-reflective spots (shown in Fig. 3).



Fig. 2. Fundus photograph with hematic drainage, 2 min after ND:YAG laser hyaloidotomy, MultiColor 55° ART [HR].

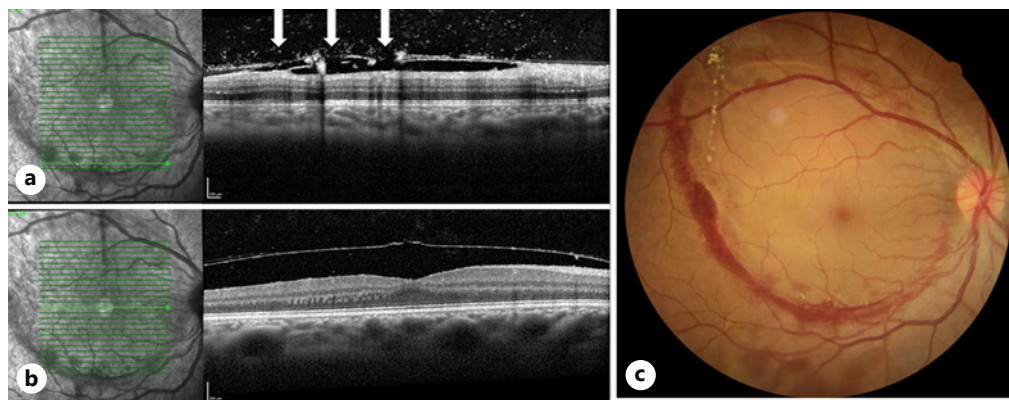


Fig. 3. One week after procedure: macular SD-OCT, with posterior hyaloid disruption (a) (indicated by upper arrows at the top of the image) and good foveal depression (b) and fundus photography, MultiColor 55° ART [HR] (c).

Discussion/Conclusion

The Valsalva maneuver, first described in the 17th century by Antonio Maria Valsalva [3], is one of the causes of preretinal hemorrhage, which is characterized by a sudden, usually unilateral, decrease in visual acuity – designated HRV – and first described in 1972 by Duane [4]. The location of the hemorrhage can be in the ILM or subhyaloid [3], and in general, healthy patients develop this clinical picture in the course of various situations including vomiting, sexual activity or physical exercise, balloon blowing, or labor [2, 3].

This situation emerges from the increase in intrathoracic or intra-abdominal pressure which, associated with the absence of valves in the venous system rostral to the heart [3], provides an increase in intraocular venous pressure, with consequent rupture of superficial retinal capillaries [2]. Overall, preretinal hemorrhages secondary to the Valsalva maneuver are self-limited and may last from a few weeks to months until complete resolution [2]. However, given a slow resolution of the hemorrhage, there is a close and prolonged contact between the inner retina and hemoglobin or iron, causing damage associated with its toxicity.

This process results, for example, in the decomposition of the ILM, with subsequent migration and proliferation of glial cells into the vitreous cavity and subsequent formation of the epiretinal membrane, resulting in a decrease in long-term visual acuity [2, 5].

In cases of premacular hemorrhage and ILM hemorrhage, it has been described since 1980 that drainage can be performed using Nd:YAG laser [2, 3]. This method is used for the treatment of premacular subhyaloid hemorrhages in the context of Valsalva maneuver, proliferative diabetic retinopathy, retinal artery macroaneurysm, branch retinal vein occlusion, among others [2], especially when the bleeding area exceeds 3 disc diameters [2].

This method of treatment allows for quick intervention at the time of diagnosis, enabling a rapid improvement in visual acuity without the need to expose the patient to the risks and adverse events associated with blood stasis (if a more expectant attitude is chosen) or for an early surgical intervention, using pars plana vitrectomy (such as cataract and risk of endophthalmitis), especially in young patients like the one in this case. The use of this laser, in turn, is associated with the development of ocular pathologies, such as macular hole, retinal detachment, and epiretinal membrane [2–4].

In this case, a rapid improvement in visual acuity was found after treatment with Nd:YAG, which is in line with the aforementioned literature [2]. The application of this therapy to a young patient allowed the rapid restoration of full visual acuity, without exposing this patient to pars plana vitrectomy (and its risks) and an expected cataract in the near future.

The time interval between the onset of vision loss and treatment with Nd:YAG varies. Nonetheless, on the one hand, some reports in the literature suggest that this treatment is indicated for patients with symptoms no longer than 3–4 weeks [2, 6] from which it is difficult to drain hemorrhages. On the other hand, patients with symptoms for more than 45 days have been successfully treated [7]; hence, the status of the blood in the premacular area is more important than the duration of symptoms [7]. Drainage is unlikely when the hemorrhage turns yellowish (as a result of the degeneration of hemoglobin), even despite a well carried out treatment [6].

In short, Valsalva retinopathy is characterized by preretinal hemorrhages, often large in size, and a careful anamnesis in this case can be the key to a more accurate diagnosis. Nd:YAG laser treatment is a fast, safe, and effective treatment [8], promoting both an immediate blood drainage and the rapid restoration of visual function (especially important in patients with poor vision in the fellow eye), without the need for more invasive procedures, thus enabling an early assessment and prompt treatment of the macula (when justified) [7, 8].

Statement of Ethics

Ethical approval is not required for this study in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of this case report and any accompanying images. The patient's informed consent was obtained during the assessment visits.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

Nothing to declare.

Author Contributions

João Leite combined the data, analysis, manuscript drafting, and finalized the manuscript. Angelina Meireles conducted the manuscript critical review. Nuno Alves Correia combined the data acquisition and analysis, performed the laser treatment, conducted the follow-up of the patient, and critically reviewed the manuscript. All the authors approved the final version of the manuscript and are accountable for all aspects of the work. All the authors attest that they meet the current ICMJE criteria for authorship.

Data Availability Statement

The clinical data that support the findings of this clinical case are available in the electronic hospital register of CHUPorto. All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.

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