

Premacular hemorrhage treated with (Nd): YAG laser hialoidectomy

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ABSTRACT

Purpose: To report a case of premacular hemorrhage treated with Neodymium (Nd): YAG laser hialoidectomy.

Material/Methods: A 78-year-old female came to the emergency room with sudden vision loss in the right eye (best-corrected visual acuity: 20/400). One circumscribed vitreoretinal hemorrhage was seen in fundoscopy and a diagnosis of prefoveal hemorrhage was established after some exams, eventually due to a macroaneurysm. A puncture with one single impact of 5 mJ (Nd): YAG was performed. After 2 months, exams showed a clear pre-macular area with preserved foveal contour and after 3 months, the patient was asymptomatic.

Conclusions: Retinal arterial macroaneurysms are acquired abnormalities related with cardiovascular risk factors. Their progression is unpredictable, being premacular hemorrhage one of the vision-threatening complications. There are no standard guidelines for hemorrhage treatment. (Nd): YAG laser is a non-invasive, inexpensive and safe out-patient method. In this case, it allowed a rapid recovery without significant macular damage.

Keywords: (Nd): YAG laser; hialoidectomy; premacular hemorrhage; macroaneurysm; treatment.

RESUMO

Objetivo: Apresentar um caso de hemorragia pré-macular tratada com hialoidectomia por Neodímio (Nd): YAG laser.

Materiais/Métodos: Uma mulher de 78 anos recorreu ao Serviço de Urgência com perda súbita de visão no olho direito (máxima visão corrigida: 20/400). Observou-se uma hemorragia na interface vítreo-retina no exame de fundo de olho compatível com o diagnóstico de hemorragia pré-foveal após alguns exames, possivelmente devido a um macroaneurisma. Realizou-se um punção com um impacto de 5 mJ de (Nd): YAG. Após 2 meses, os exames mostraram uma área pré-macular limpa com contorno foveal preservado e depois de 3 meses, a paciente estava assintomática.

Conclusões: Os macroaneurismas arteriais retinianos são anomalias adquiridas, relacionadas com fatores de risco cardiovascular. A sua progressão é imprevisível, sendo a hemorragia pré-macular uma das complicações que comprometem a visão. Não há normas para o tratamento da hemorragia. O laser (Nd): YAG é um método não invasivo, económico e seguro. Neste caso, permitiu uma recuperação rápida sem dano macular significativo.

Palavras-chave: Laser (Nd): YAG; hialoidectomia; hemorragia pré-macular; macroaneurisma; tratamento.

INTRODUCTION

Premacular hemorrhage is a rare cause of painless vision loss with accumulation of blood under internal limiting membrane (ILM) or between ILM and hyaloid face, in or near the macular area.^{1,2} Macroaneurysms, Valsalva retinopathy, trauma, proliferative diabetic retinopathy, polypoidal choroidal vasculopathy or vein occlusion are possible etiological factors.³

Retinal arterial macroaneurysms (RAM), more frequent among elderly females,^{4,5} are acquired retinal vascular abnormalities that present as an monocular isolated saccular or fusiform lesion typically located in superior temporal retinal arterioles,⁵ close to foveal area. Blood hypertension is the major risk factor,⁵ follow by arteriosclerosis and other cardiovascular risk factors.^{1,2} Retinal vein macroaneurysm is another entity not discussed in the present work. RAM progression are unpredictable, evolving spontaneous occlusion, exudative retinopathy or bleeding,⁶ being one of the most common causes of premacular hemorrhage.⁷ Although spontaneous resolution occurs within weeks or months, there is a risk of irreversible macular damage dependent on iron and fibrin toxicity after 2 weeks, with subsequent atrophy or epiretinal membrane formation.^{8,9} Thus, prompt diagnosis and treatment of premacular hemorrhage are critical for a good outcome.

There are still no standard treatment guidelines for premacular hemorrhage due to RAM.^{6,10}

The aim of the present work is to present a premacular hemorrhage treated with (Nd): YAG laser hyaloidectomy (NYH).

MATERIAL AND METHODS

Retrospective descriptive study of a case report based on information from clinical records, patient observation and analysis of complimentary diagnostic tests.

The study and data accumulation were carried out with approval from the ethical board of the Hospital.

CASE REPORT/FINDINGS

A 78-year-old female came to the Emergency Department of a secondary hospital with sudden darkness of her central vision in the right eye (RE), without eye pain, diplopia, redness, headache, photopsias, floaters or metamorphopsias. The patient had uncontrolled arterial hypertension and no ophthalmologic background. On examination, best corrected visual acuity (BCVA) was 20/400 in the RE and 20/25 in the left eye. There was no afferent pupillary defect. Biomicroscopy and intraocular pressure were normal. RE funduscopy revealed a circumscribed hemorrhage in the vitreoretinal interface, centered on the foveal area. Fluorescein angiography showed a RE mask effect caused by the premacular accumulation of blood and SD-Spectralis® optical coherence tomography (OCT) revealed a collection of blood with disappearance of the foveal depression. A diagnosis of pre-foveal hemorrhage was established, eventually due to a macroaneurysm.

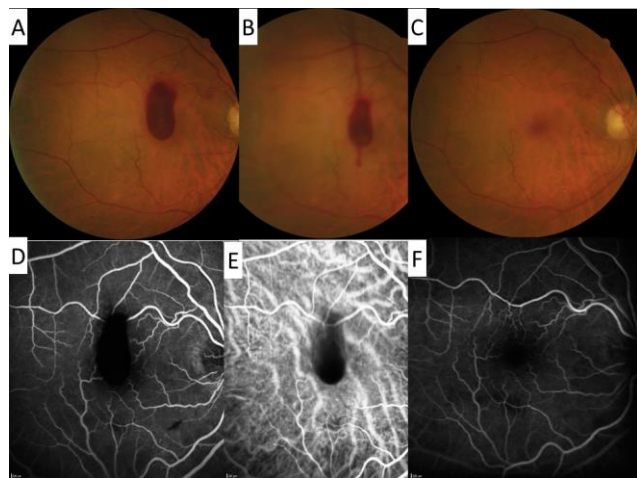


Figure 1 - Retinoscopy and Angiography. Retinoscopy showed a circumscribed hemorrhage in the vitreoretinal interface, centered on the foveal area (A). Fluorescein angiography showed a RE mask effect (D) and indocyanine green angiography showed absence of polyps or neovascular membranes in the choroid (E). Post-Nd: YAG laser revealed intravitreal drainage of blood into the vitreous cavity (B). Fluorescein angiography and retinography within 2 months showed vascular changes secondary to arterial hypertension (C and F).

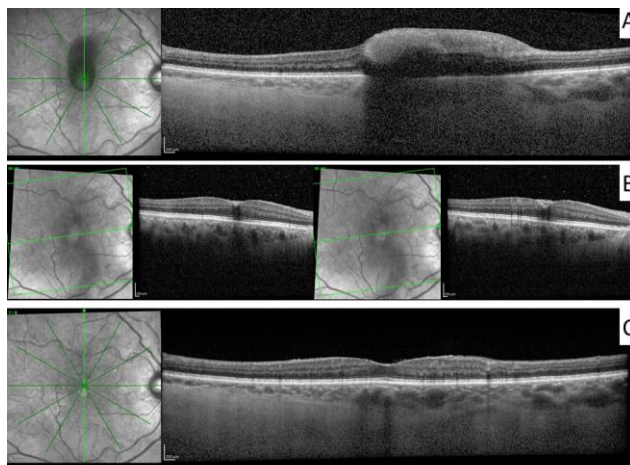


Figure 2 - SD-Spectralis® optical coherence tomography (OCT). OCT revealed a collection of blood at the inner thickness of the retina with disappearance of the foveal depression (A). After 2 weeks, OCT presented a pre-foveal shadow, possibly due to a small collection of blood/fibrin (B). OCT within 2 months showed a clear pre-macular area with preserved foveal contour (C).

RESULTS

A puncture with one single impact of 5 mJ (Nd): YAG was performed at the posterior hyaloid/internal limiting membrane, in the inferior edge of the hemorrhage. Post-NYH retinography revealed intravitreal drainage of blood. After 2 weeks, OCT presented a pre-foveal shadow, possibly due to a small collection of blood/fibrin. Angiography and retinography within 2 months showed vascular changes secondary to arterial hypertension (arteriovenous nicking, tortuous arterioles), pre-macular area was clear with preserved foveal contour. After 3 months, the patient was asymptomatic, with RE BCVA of 20/32.

DISCUSSION

The proposed treatment for premacular hemorrhage include pars plana vitrectomy with intravitreal tissue plasminogen activator plus/or with gas for dispersed hemorrhages,¹¹ pneumatic displacement with tissue plasminogen activator or submacular surgery for submacular hemorrhage.^{12,10} For a dense premacular hemorrhage, (Nd): YAG laser hyaloidectomy can be a non-invasive option. In the past, (Nd): YAG laser was associated with macular complications and poor outcomes,¹³ but consistent evidence reveals that (Nd): YAG laser hyaloidectomy is a safe out-patient method with good results.^{1,2,6,8,10,14,15} Preretinal blood creates a buffer effect, protecting the underlying retina from laser energy.¹ There are important criteria for a secure laser delivery, including inferior hyaloidectomy location to drain blood to the vitreous cavity.⁶ Although intravitreal injection of anti-vascular endothelial growth factors (anti-VEGF) seems to be really effective as a therapeutic agent for RAM hemorrhage or edema^{7,9,12,16-18} it remains as an off-label approach,¹⁷ with good results only when compared with a non-treated/control group¹¹ or in addition to (Nd): YAG laser in exudative cases.⁶

CONCLUSIONS

In this case, retinal arterial macroaneurysm due to blood hypertension was the most reliable hypothesis for the premacular hemorrhage, since there were no remaining identifiable diseases at the fundus after the blood drainage.

MAR development can go through spontaneous resolution to vision threatening-conditions,¹⁴ as premacular hemorrhage.

In this context, (Nd): YAG laser puncture allowed a rapid recovery without significant macular damage.

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