

Full-Thickness Retinal Hole After Nd:YAG Laser Hyaloidotomy Treatment of Subhyaloid Hemorrhage Secondary to Valsalva Maneuver

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ABSTRACT

This report represents a rare complication of retinal hole after Nd:YAG laser hyaloidotomy in a case of Valsalva retinopathy secondary to vaginal strain from labor. The retinal hole spontaneously closed during follow-up.

Keywords: Valsalva maneuver, Nd:YAG laser, Retinal defect, Hyaloidotomy.

INTRODUCTION

Valsalva retinopathy refers to bilateral or unilateral, painless, sudden loss of vision due to premacular hemorrhage after Valsalva maneuver. Thomas Duane first introduced Valsalva retinopathy in 1972.¹ Sudden increase in intrathoracic or intra-abdominal pressure may result in a rapid increase in venous pressure with spontaneous rupture of superficial retinal capillaries. Confirmed risk factors of Valsalva retinopathy include pregnancy.²

In this case report, a rare complication of retinal hole according to Nd:YAG laser hyaloidotomy after Valsalva retinopathy as a result of strained vaginal labor is presented. The retinal defect spontaneously closed during follow-up.

CASE REPORT

A 21-year-old female patient presented with sudden loss of visual acuity for two days in her right eye. Her medical history included normal spontaneous vaginal delivery (NSVD) without any complication two days ago. Complete blood cell count, urea, electrolytes, glucose, and coagulation tests were within normal limits. Her blood pressure was 120/70 mmHg. Best corrected visual acuity (BCVA) was hand motion in the right eye and 20/20 in the left eye.

Fundus examination of the right eye revealed premacular hemorrhage (Figure 1) and left eye was normal. Anterior segment examination and intraocular pressure were normal in both eyes. Spectral-domain optical coherence

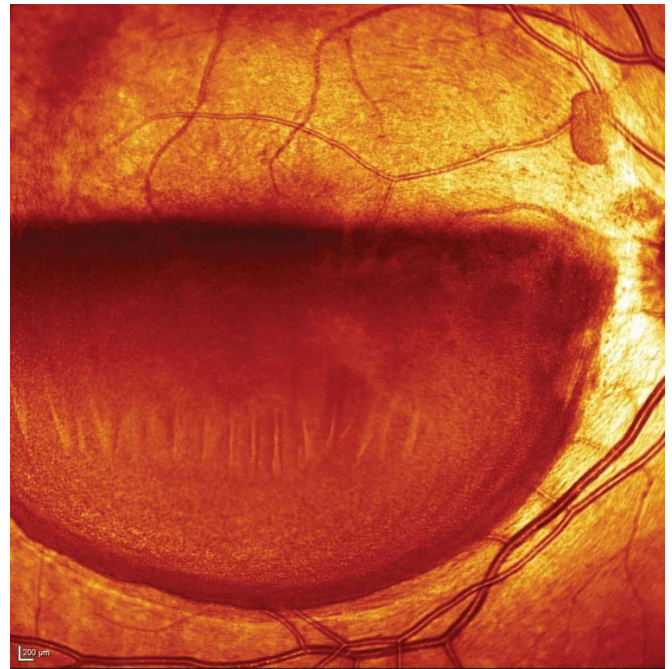


Figure 1: Premacular hemorrhage.

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tomography (SD-OCT) revealed a dome-shaped elevated lesion with a hyperreflective surface and hyporeflective area under the right eye (Figure 2). The patient was diagnosed as Valsalva retinopathy. Nd:YAG (neodymium-doped yttrium aluminum garnet) laser hyaloidotomy was planned to puncture the posterior vitreous. Before Nd:YAG laser (VISULAS YAG III, Carl Zeiss, Germany) hyaloidotomy contact laser lens (Volk Fundus laser lens, OH, USA) was placed on the right eye. Laser was applied in single shots to the hyaloid at 8.6 mJ energy level. After the laser shots subhyaloid hemorrhage was rapidly released into the vitreous cavity. One week after the procedure the patient's BCVA was increased to 20/20 and hemorrhage was completely resolved. Two weeks after the procedure a full-thickness retinal hole was observed at inferonasal part of the foveola. A distinct separation/crack between the two sides of whole retina (from ILM to RPE is clearly seen on OCT image). (Figure 3). Weekly follow-up was advised to the patient without any intervention. Three weeks after the laser procedure SD-OCT revealed that the retinal hole was spontaneously closed and the normal retinal contour was reformed (Figure 4).

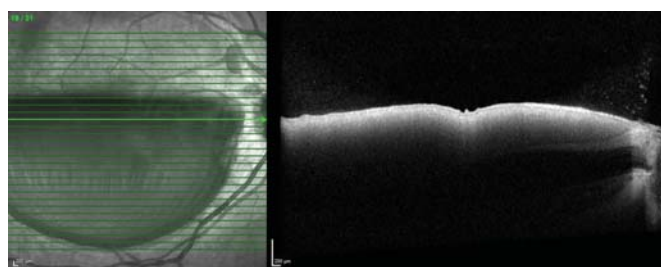


Figure 2: SD-OCT revealed a dome-shaped elevated lesion.

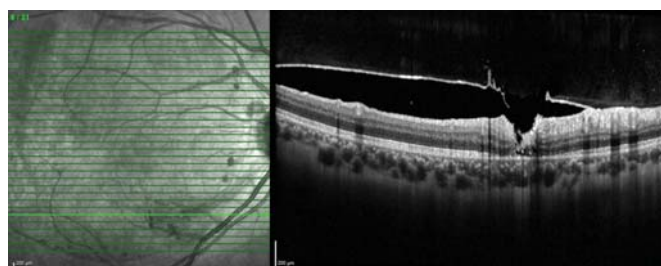


Figure 3: A full-thickness retinal defect was observed nasal and inferior to the foveola.

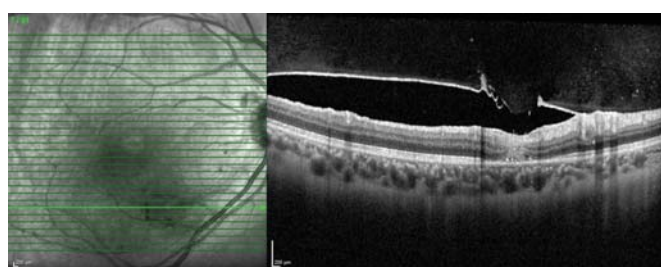


Figure 4: Normal retinal contour.

DISCUSSION

Various activities such as severe coughing, forced nose blowing, suffocating, crying, weightlifting, vomiting, hard straining, thoracic abdominal extrusion and forced delivery may cause Valsalva retinopathy.³ Several case reports were described Valsalva retinopathy during vaginal delivery.⁴ Increased intra-abdominal pressure during labor may cause significant rise in intravenous pressure. Elevated intravenous pressure increases the likelihood of retinal hemorrhage following Valsalva maneuver.⁵ Valsalva retinopathy can be treated by conservative management, vitrectomy, and laser membranectomy. However, spontaneous absorption is very slow and even a small premacular hemorrhage may take months to resolve. Although spontaneous absorption is slow and even a small premacular hemorrhage may take months to resolve in young population spontaneous resolution of retinal hemorrhage may last shorter. Nd-YAG laser application for vitreous drainage of premacular subhyaloid hemorrhage was first described by Faulborn in 1988.⁶ Blood that has accumulated in the subhyaloid space is drained into the vitreous through a small anterior puncture made by Nd-YAG laser shot. As a consequence the blood blocking the vision over the macula can be rapidly removed. Nd:YAG laser treatment is usually safe and effective.⁷ Celebi and Kükner in a study of six patients of subhyaloid hemorrhage reported no retinal damage after laser hyaloidotomy.⁸ However, complications of Nd:YAG include macular hole, retinal hole, retinal detachment, and epiretinal membrane formation.^{9,10} In our case the patient was agitated due to vision loss. We preferred Nd:YAG laser treatment and the drainage of hemorrhage quickly ensued which resulted in full recovery of the vision. However, after one week of the treatment a retinal hole relatively far from the fovea was seen on the SD-OCT. The hole was not vision threatening. Determination of the exact reason of the hole is difficult. One of the possible reason is direct effect of laser beam to the defected area. Other possible reason is degenerated internal limiting membrane (ILM) beneath the retina. Traction of degenerated ILM may cause retinal hole in posterior pole as a complication like in our case. In our patient the retinal hole was spontaneously resolved.

CONCLUSION

Nd:YAG laser is a treatment choice of vision threatening subhyaloid hemorrhage. Retinal hole following Nd:YAG laser treatment is a rare complication but spontaneous resolution can occur as in our case. To avoid complications, usage of low energy levels and membranectomy that performed away from the fovea are common recommendations.

Ethics approval and consent to participate: Written informed consent was obtained from patient. We confirm that a statement of consent *to publish* these findings and images were gathered from the patient.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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Consent for publication

Not applicable.

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