

## Valsalva Retinopathy: A Case Report

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### Abstract

Valsalva retinopathy is characterised by pre-retinal haemorrhage which presents with unilateral, sudden, painless diminution of vision. Pre-retinal haemorrhage caused by sudden rise in venous pressure was first termed as Valsalva haemorrhage by Duane TD in 1972. It is caused by rupture of superficial retinal capillaries due to increased intra-ocular venous pressure following increase in intra-thoracic or intra-abdominal pressure. It resolves in few weeks or month and vision returns to normal depending on the location of the bleed on the retina. Observation, Nd:YAG (neodymium-doped yttrium aluminium garnet) laser and Argon laser hyaloidotomy, vitrectomy are effective treatment options for eyes with Valsalva retinopathy. Here we present a case of a 32 year old female with Valsalva retinopathy with subhyaloid haemorrhage after an episode of vomiting who was treated with Nd:YAG laser hyaloidotomy with a good visual outcome. The novelty of this case report lies in the fact that although conservative management is practiced more often with similar prognosis, early intervention by Nd:YAG laser hyaloidotomy can benefit the patient with marked improvement and rapid recovery.

**Key words:** Valsalva retinopathy, subhyaloid haemorrhage, Nd:YAG laser hyaloidotomy.

### Introduction

Valsalva retinopathy was first described by Thomas Duane in 1972 as “a specific form of retinopathy, pre-retinal haemorrhage or sub-hyaloid haemorrhage secondary to sudden rise in intra-thoracic pressure”.<sup>1</sup> The incidence of Valsalva retinopathy is difficult to ascertain considering the rare nature of the condition and therefore its exact incidence has not been reported worldwide.<sup>1</sup> It is frequently unilateral, but may be bilateral and often occurs in young healthy adults (although any age can be affected) without any sex and racial predilection. It is associated with heavy weight lifting, coughing, straining during defecation or vomiting. Valsalva retinopathy classically manifests as pre-retinal haemorrhage secondary to rupturing of superficial retinal vessels caused by physical exertion. It represents a “double ring sign”, in which outer ring signifies sub-hyaloid bleeding and inner one signifies sub-internal limiting membrane bleeding.<sup>2</sup> Biomicroscopic examination reveals dome shaped

acute macular haemorrhage, but anatomical level of haemorrhage is not detected ophthalmoscopically. Optical coherence tomography (OCT) images are very useful in identifying the location of haemorrhage, which shows dome shaped hyper-reflectivity due to haemorrhage with shadowing effect and two membranes (double ring sign). The most common presenting symptom is sudden vision loss or central scotoma. The severity of the symptoms depend on the thickness, size and anatomical level of haemorrhage. There are several treatment modalities depending on the thickness, size and anatomical location of haemorrhage such as observation, Nd:YAG laser/ Argon laser hyaloidotomy, pneumatic displacement of haemorrhage and vitrectomy.<sup>3,4,5</sup> The novelty of our case report lies in the fact that although conservative management is practiced more often with similar prognosis, early intervention by Nd:YAG laser hyaloidotomy can benefit the patient with marked improvement and rapid recovery.

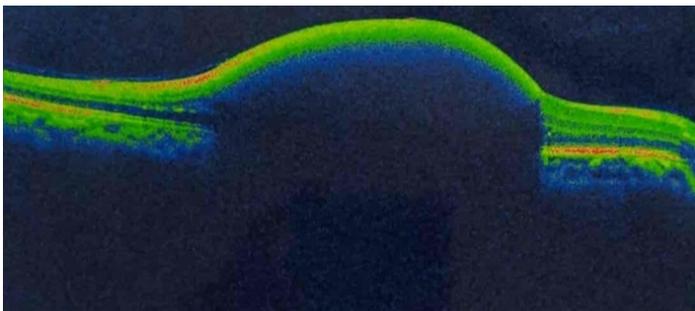
### Case Report

A 32 year old female presented to us with sudden, painless loss of vision in right eye since 8 days. She had no other ocular history. Patient had an episode of vomiting and retching after which she developed diminution of vision. Patient had no systemic illness, no significant personal and family history.

On examination, patient's unaided vision in right eye (RE) was counting finger one meter and 6/9 in left eye (LE) on Snellen's chart. Best corrected visual acuity in RE counting finger one meter, in LE 6/6. The anterior segment was within normal limits. Fundus examination of RE by indirect ophthalmoscope revealed a sub-hyaloid haemorrhage over posterior pole involving the macular area approximately 8 – 9 disc diameter (DD) in size, 1 DD temporal to margin of disc (Figure.1).



**Figure.1: Right eye fundus showing sub hyaloid haemorrhage over macular area**



**Figure.2: Posterior segment optical coherence tomography showing dome shaped hyper-reflectivity suggestive of haemorrhage with shadowing effect**

LE fundus examination was within normal limits. Intraocular pressure measured by non-contact tonometry in RE was 20 mmHg and in LE 18 mm Hg. Blood investigations (Haemoglobin- 11.5gm%, WBC- 7600cells/cu.mm, ESR- 8mm/h, RBS –86mg/dl, HIV and HBsAg - non reactive) were within

normal limits. Fundus photography was done. Posterior segment optical coherence tomography (PSOCT) of RE showed dome shaped of hype-reflectivity suggestive of haemorrhage with shadowing effect (figure.2).PSOCT in LE was within normal limits.

Patient was diagnosed as RE Valsalva retinopathy. RE Nd:YAG laser hyaloidotomy was done. For this procedure APPA YAG LASER model 307 was used. After full pupillary dilatation and topical anaesthesia, a Goldmann contact lens was used to focus the Nd:YAG aiming beam and laser so that an opening in the posterior hyaloid membrane near the inferior edge of the subhyaloid haemorrhage could be performed, avoiding retinal blood vessels and fovea but keeping a reasonably sufficient underlying cushion of blood to shield the underlying retina. Nd:YAG laser power of 3.5mJ was used and total 4 shots were applied. Half hour post hyaloidotomy patient's vision in RE improved to 6/60 and best corrected visual acuity of 6/60 which did not improve with pin hole. Patient was then started on prednisolone acetate 1% eye-drops 4 times a day and tablet vitamin c 500mg 3 times a day, tablet prednisolone 40 mg once a day. On one week follow-up patient's vision improved to 6/12 unaided vision and best corrected visual acuity 6/6 on Snellen's chart. Fundus examination revealed regressing sub-hyaloid haemorrhage. (Figures 3 and 4)



**Figure.3:RE showing post hyaloidotomy displacement of sub-hyaloid haemorrhage inferiorly**



**Figure.4: RE showing regressing sub-hyaloid haemorrhage.**

## Discussion

Valsalva retinopathy was 1<sup>st</sup> described by Duane in 1972 as pre-retinal haemorrhage occurring as a result of sudden rise in venous pressure as seen in Valsalva manoeuvre.<sup>6</sup> It is an uncommon condition and occur with various forms of stress such as weight lifting, physical exercise, balloon blowing, birth labour, blowing musical instruments, after cardiopulmonary resuscitation etc. The present case developed Valsalva retinopathy following a bout of emesis. Ophthalmic examination reveals a circular haemorrhage which can be sub internal limiting membrane or sub hyaloid. Other ocular signs include subconjunctival haemorrhages, petechial haemorrhages of eyelids, superficial intraretinal haemorrhages, subretinal haemorrhages at the fovea due to the dissection of blood beneath the retina, retinal transduction, and breakthrough vitreous haemorrhages. Moderate myopes may rarely have choroidal haemorrhage after excessive vomiting. Patients describe symptoms as seeing a black spot (scotoma) in front of the eye, floaters, reddish hue of vision, blurring of vision to loss of vision depending on the severity and location of the bleed. So a careful history should be taken and it can clinch the diagnosis.

Duane postulated the mechanism for forward retinopathy (altered arterial circulation), backward retinopathy (altered venous circulation) and mixed retinopathy.<sup>7</sup> Valsalva retinopathy falls in 2<sup>nd</sup> category (altered venous circulation). The sudden increase in central venous pressure due to Valsalva stress is transmitted to the peri-foveal capillaries which are likely to rupture leading to pre-retinal haemorrhage in the macular region. Haemorrhages of <1 disc diameter tends to spontaneously resolve in a short period of

time and conservative approach is given. Observation is the standard treatment, however cases of massive bleed at the macula (sub-retinal) require early intervention like Nd:YAG laser/ Argon laser hyaloidotomy and vitrectomy. Although Valsalva retinopathy often leads to large pre-retinal haemorrhage or sub-hyaloid haemorrhage, prognosis remains good and vision usually returns to normal. The present case developed Valsalva retinopathy after episode of vomiting and developed sub-hyaloid haemorrhage which was treated by Nd:YAG laser hyaloidotomy and regained vision subsequently resolving haemorrhage. The prognosis is good and patient needs to be counselled to avoid any such Valsalva manoeuvre like stress to prevent recurrence in the future. Once the haemorrhage clears, the only sign seen in old or resolved Valsalva retinopathy includes cavity formation at the level of the bleed such as a sub-ILM cavity or serous detachment of the ILM. This appearance can be clinically confused as neurosensory detachment. A clinical clue to previous sub-ILM bleed is the presence of brown pigments (presumably blood products) at the margin of serous ILM detachment. This detached ILM usually reattaches with time. With time the sub-ILM haemorrhage may de-haemoglobinize giving a yellow and later white colour to the haemorrhage. S Waiker et al. reported a case Valsalva retinopathy in a young healthy individual following a bout of vomiting, in which he developed sub-hyaloid haemorrhage.<sup>7</sup> Patient was managed conservatively and complete recovery was achieved over a period of 6 weeks. A H Durukan et al. studied 16 patients with Valsalva retinopathy in which Nd:YAG laser hyaloidotomy was done to drain premacular sub-hyaloid haemorrhage.<sup>8</sup> All eyes showed marked improvement and rapid recovery in vision within span of 2 weeks.

### Conclusion

A careful history is key to diagnosis. Nd:YAG laser hyaloidotomy seems to be a safe and effective approach for Valsalva retinopathy. These approaches are cost saving, effective and safe out-patient treatment modalities when used for suitable patient with appropriate power setting. The size, volume and duration of the haemorrhage are the most crucial factors for treatment choice, success and complications.

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