Valsalva maculopathy: To treat or not to treat

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Abstract:
To discuss diagnostic strategies and management options in cases with suspected valsalva maculopathy (VM), to optimize visual outcome. We describe six cases with suspected VM. The preretinal hemorrhage resolved spontaneously in four out of six patients, without any intervention. One patient underwent neodymium-doped yttrium aluminum garnet hyaloidotomy and the other proceeded to have a vitrectomy for persistent diffuse vitreous hemorrhage. Considering the evidence available and the outcomes of our patients, we have devised a treatment algorithm for treating VM, which is elaborated in this article.

Keywords:
Neodymium-doped yttrium aluminum garnet laser, pars plana vitrectomy, Valsalva maculopathy

Introduction

Valsalva maculopathy (VM) is characterized by sudden, painless loss of vision or central scotoma. It is caused by rupture of superficial retinal capillaries, due to increased intraocular venous pressure, secondary to an increase in intrathoracic or intra-abdominal pressure.\(^1\)

The hemorrhage occurs at the macula and, in most cases, resolves spontaneously without compromising visual acuity (VA).\(^2\) However, even a small hemorrhage may take months to clear and significantly reduce a patient’s quality of life. In such cases, treatment needs to be considered.

We present six cases of VM [Table 1], with an aim to describe when and how best to treat, to optimize visual outcome.

Case Reports

We followed six consecutive cases of Valsalva retinopathy presenting to the eye casualty over a period of 1 year from March 2014 to March 2015 [Figure 1]. The details of the cases are outlined below, and the results are summarized in Table 1.

Case 1
A 45-year-old female presented to eye casualty with a 10-day history of a sudden decrease in vision. On examination, her VA was 6/24 right eye (OD) and 6/6 left eye (OS). Fundoscopy showed a large central subinternal limiting membrane (ILM) hemorrhage associated with a subhyaloid hemorrhage inferior to the fovea and a breakthrough vitreous hemorrhage. Three weeks later, her vision deteriorated further 2/60 secondary to a rebleed. However, the hemorrhage resolved spontaneously after 6 weeks her vision improved to 6/6 OD.

Case 2
A 25-year-old male presented with a 2-day history of sudden painless loss of vision in the right eye. On examination, the VA was 6/60 OD, and he was noted to have a central subhyaloid and sub-ILM hemorrhage which resolved after 3 months without treatment. His vision at discharge was 6/5 OD.

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Case 3
A 29-year-old female presented with sudden loss of vision in the left eye following strenuous exercise in the gym. On examination, her VA was hand movements (HMs) OS. Fundoscopy revealed a subhyaloid hemorrhage in front of the fovea. She underwent a left yttrium aluminum garnet (YAG) laser hyaloidotomy following which her vision improved to 6/6. Lu pulsa Q-switched laser, distributed by Litechnica, was used with a starting energy of 3mJ, increasing by 1–2 mJ and aiming at the inferior most point away from the fovea with a central Abraham lens. A total of 6 mJ was required to puncture the ILM in this case. The patient had a residual vitreous hemorrhage, which resolved spontaneously.

Case 4
A 29-year-old female presented with a 2-week history of sudden loss of vision in the right eye. On examination, her VA was 5/60 OD. Fundoscopy showed a large subhyaloid hemorrhage over the right macula. At her follow-up appointment 6 weeks later, her vision had improved to 6/36 OD, and there was a significant absorption of the subhyaloid hemorrhage. Six months later, the hemorrhage had cleared completely and her vision improved to 6/4 OD.

Case 5
A 36-year-old male presented with a 9-day history of sudden loss of vision. On examination, his VA was HM OD. Fundoscopy showed a diffuse vitreous hemorrhage. Ultrasound B-scan revealed a flat retina and evidence of subretinal hemorrhage. The patient was monitored closely by the virtual reality team, but unfortunately, his vision remained poor due to a persistent vitreous hemorrhage at 2 months. As a result, he proceeded to have a vitrectomy of the right eye. His vision improved to 6/9 OD postoperatively.

Case 6
A 59-year-old male presented with sudden loss of vision in the right eye following a bout of wretching. On examination, his vision was counting finger OD. Fundoscopy showed a large sub-ILM and subhyaloid hemorrhage. Follow-up visit 6 weeks later, his vision improved to 6/6 OD.

Table 1: Summary of cases

| Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 |
|--------|--------|--------|--------|--------|--------|
| **Age/sex** | 45/female | 25/male | 29/female | 29/female | 59/male |
| **VA at presentation** | 6/24 OD | 6/60 OD | HM OS | 6/60 OD | HM OD |
| **Fundoscopy Findings** | Large sub-ILM hemorrhage inferior to fovea and breakthrough VH | Central subhyaloid and sub-ILM hemorrhage | Prefoveal subhyaloid hemorrhage | Central subhyaloid hemorrhage | Diffuse vitreous hemorrhage |
| **Other ocular investigation** | None | None | None | Ultrasound B-scan revealed flat retina and subretinal hemorrhage | None |
| **Treatment** | Resolved spontaneously in 6 weeks | Resolved spontaneously in 3 months | Nd:YAG laser hyaloidotomy | Resolved spontaneously in 6 months | Vitrectomy under general anesthesia |
| **Final VA** | 6/6 OD | 6/5 OD | 6/6 OS | 6/4 OD | 6/9 OD |

ILM = Internal limiting membrane, VH = Vitreous hemorrhage, VA = Visual acuity, Nd = YAG = Neodymium-doped yttrium aluminum garnet, HM = Hand movement
horrhage over the right macula. He was reviewed in the macula clinic 3 days postpresentation and his vision improved to 6/18. The hemorrhage cleared spontaneously in 6 weeks, and his vision in the affected eye was 6/6 at discharge [Figure 2].

**Discussion**

Premacular hemorrhage may be idiopathic but is commonly associated with VM, proliferative diabetic maculopathy, macroaneurysms, retinal venous occlusion, and blood dyscrasias. Therefore, at presentation, these patients need thorough investigations to exclude vascular disorders.

The main treatment options reported for VM are observation, laser hyaloidotomy, laser membranectomy, pneumatic displacement of the hemorrhage by intravitreal injection of gas with or without recombinant tissue plasminogen activator, and pars plana vitrectomy.

Our case series highlights the fact that preretal hemorrhage and sub-ILM hemorrhage resolves spontaneously in most cases with good visual outcome. In our opinion, laser or surgical intervention is not essential unless the patient wants faster visual recovery or there is breakthrough vitreous hemorrhage. Intravitreal tissue plasminogen activator with gas may be beneficial in cases where the hemorrhage is deeper in the retinal tissue.

Several reports have been published describing drainage of premacular hemorrhage with various laser systems using a range of energies. For neodymium-doped YAG (Nd:YAG) laser hyaloidotomy, 3.6–50 mJ has been used. In our case, we started with 3 mJ increasing by 1–2 mJ focusing on the posterior hyaloid surface at the inferior most point, away from fovea.

The long-term complications of Nd:YAG laser include macular hole, retinal detachment, and epiretinal membrane formation. Sharma et al. have reported using a combination of argon green-Nd:YAG laser for hyaloidotomy utilizing subthreshold energy levels of Nd:YAG laser of 2.0 mJ to reduce energy-related complications. However, for optimal efficacy, treatment should be carried out as soon as possible, to avoid clotting of the hemorrhage.

**Conclusion**

Considering the evidence available and the outcomes of our patients described above, we recommend that treatment of VM should be tailored to the cause, duration, and severity of symptoms and the effect it has on individual patients. All patients without a clear history of Valsalva maneuver presenting with macular hemorrhage should have a thorough systemic workup to rule our other vascular causes and blood dyscrasias. Once diagnosis is established since most VM resolve spontaneously, it is reasonable to monitor patients under close follow-up by the retina team for a period of 2–3 months. Fundoscopy must be performed at each follow-up visit, and B-scan ultrasound must be performed if the retinal view is obscured to exclude other retinal pathology. If vitreous hemorrhage persists, it is reasonable to consider vitreoretinal surgery to clear the hemorrhage after discussion with the patient. On the other hand, if patients are symptomatic treatment can be offered depending on the location of the bleed. For central, preretal hemorrhage which is obscuring the fovea Nd:YAG hyaloidotomy is an option. Our treatment algorithm is outlined in Flow chart [Figure 3].

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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