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Valsalva Retinopathy in Ibadan, South West Nigeria

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Abstract:

We report the cases of three patients who presented to our retinal outpatient clinic over a 3-year period with sudden visual loss and features suggestive of subhyaloid or sub-internal limiting membrane haemorrhage characteristic of Valsalva (VS) retinopathy. The first patient was a 14-year-old male student with sudden visual loss in the left eye of 2 days with a history of cough. His best-corrected visual acuity (BCVA) was 6/5 and counting fingers, respectively, in the right and left eyes. Our second patient was a 21-year-old primigravida at the gestational age of 32 weeks who presented with sudden visual loss in the right eye of 9-day duration associated with a history of vomiting and BCVA of counting fingers and 6/6 right and left eyes, respectively, whereas the third case was a 30-year-old $P2^{+0}$ (2 alive) female with poor vision in the right eye post-delivery of a live neonate through vaginal delivery with BCVA of counting fingers and 6/6, respectively, in the right and left eyes at presentation. The patients' demographics, presentation and risk factors for VS retinopathy are discussed. All patients in this series were managed conservatively.

Keywords:

Constipation, cough, labour, pregnancy, subhyaloid haemorrhage, Valsalva retinopathy

Introduction

Valsalva (VS) retinopathy is a pre-retinal haemorrhage, usually subhyaloid or sub-internal limiting membrane (ILM) in nature, which occurs spontaneously due to rupture of small superficial capillaries from a rise in venous pressure.[1,2] The most common presenting complaint is sudden visual loss which could be debilitating. This retinopathy is so named because of the characteristic retinal lesions which occur due to a rise in venous pressure from a sudden increase in intra-abdominal or intrathoracic pressure against a closed glottis. VS retinopathy may occur secondary to various aetiology ranging from coughing, vomiting, straining, ear popping, prolonged talking, post-coital, parturition, anaemia and compression injuries to mention a few.[1-3]

VS retinopathy may resolve spontaneously within weeks to months with conservative management. However, a majority of vitreoretinal surgeons will intervene at patients' initial presentation as it is believed that leaving the sub-retinal blood *in situ* for a prolonged period may lead to photoreceptor damage.[1,4] Known modalities of treatment include Nd:Yag laser hyaloidotomy, pars plana vitrectomy, use of tissue plasminogen activator with the pneumatic displacement of the subhyaloid or sub-ILM haemorrhage.[5-7] Complications of these procedures include retinal holes, macula holes and failure of Nd:Yag hyaloidotomy.[3,8,9]

Case Reports

Case 1

The first case was that of a 14-year-old male secondary school student with sudden visual loss in the left eye of 2-day duration. There was a history of cough 3 days before the onset of visual symptoms. There was no constipation, lifting heavy objects nor concurrent systemic illnesses. There was no antecedent history of trauma.

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His haemoglobin genotype was AA. At presentation, the best-corrected visual acuity (BCVA) was 6/5 and hand movement, respectively, in the right and left eyes. Anterior segment examination of both eyes was essentially normal. The intraocular pressures by Goldmann applanation tonometry were 14 mmHg bilaterally. Binocular indirect ophthalmoscopy and slit-lamp biomicroscopy with 78 dioptre lens revealed a large, round, well-circumscribed, subhyaloid haemorrhage at the macula of the left eye with a satellite haemorrhage just above the superotemporal arcade [Figures 1b and 2a]. The right fundus was essentially normal with cup–disc ratio of 0.3, normal vessels, macula and flat retina [Figure 1a]. An assessment of left VS retinopathy was made. A full blood count was ordered, which was essentially within normal limits with a packed cell volume of 42%, white blood cell count of 8700 mm^3 and platelet count of 118,000, whereas the erythrocyte sedimentation rate was 05 mm/h by the Westergren method. His mother, who is a health personnel at a nearby teaching hospital, was advised on the various modalities of treatment, including Nd: YAG hyaloidotomy and conservative management. She opted for conservative management, which subsequently resulted in a good visual outcome. At the follow-up visit 2 month post-diagnosis, the visual acuity in the left eye had improved to 6/9. Radial wrinkling of the ILM was observed as the haemorrhage resolved [Figure 2b] in addition to yellow, altered de-haemoglobinised blood inferiorly [Figure 2c]. By the 3rd month of follow-up, BCVA in the left eye was 6/6. The patient was followed up for over a year with no adverse ocular sequelae observed. His BCVA was 6/5 at the last follow-up visit.

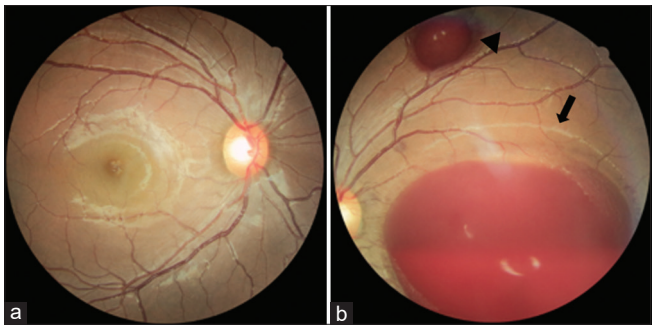

Figure 1: The normal right fundus in (a) while (b) shows the subhyaloid haemorrhage in the left fundus with a satellite retinal haemorrhage (black arrowhead) above the superotemporal arcade and the edge of the hyaloid membrane (black arrow) in the first case of a 14-year-old male

Case 2

The second case is a 21-year-old primigravida student at a gestational age of 32 weeks who presented with sudden visual loss in the left eye of 9-day duration and positive history of hyperemesis gravidarum and constipation in this pregnancy. Her haemoglobin genotype was AS. She is neither a known hypertensive nor diabetic patient. The BCVA at presentation was 6/6 and counting fingers, respectively, in the right and left eyes. The anterior segment examination of both eyes was essentially normal. There was no antecedent history of trauma. The intraocular pressure was 11 mmHg in both eyes by Goldmann applanation tonometry. Binocular indirect ophthalmoscopy and slit-lamp biomicroscopy of the left eye revealed a pink disc with cup–disc ratio of 0.3 with a large, well-circumscribed, subhyaloid haemorrhage at the macula. The right fundus was unremarkable [Figure 3]. Systemic examination was essentially normal, and blood pressure was within the normal limits. A diagnosis of right VS retinopathy was made.After adequate counselling on the treatment options, her decision was for conservative management. She was subsequently lost to follow-up.

Case 3

Our third case was a 30-year-old female teacher G2 $P1^{+0}$ (2 alive) who presented with a 10-day history of poor vision in the right eye post-vaginal delivery of a live neonate. She is a known hypertensive, diagnosed 2 years before the presentation but is not compliant with medications. She is not a known diabetic patient, and there was no antecedent history of trauma.

Another possible risk factor for VS retinopathy elicited from this patient was a positive history of manually drawing water from a well. Her haemoglobin genotype was AS. She was also very pale clinically, and her blood pressure measured 160/90 mmHg at presentation. A full blood count was ordered on account of the pallor but not done as she defaulted from follow-up. The BCVA at presentation was counting fingers and 6/6 in the right and left eyes, respectively. The anterior segment

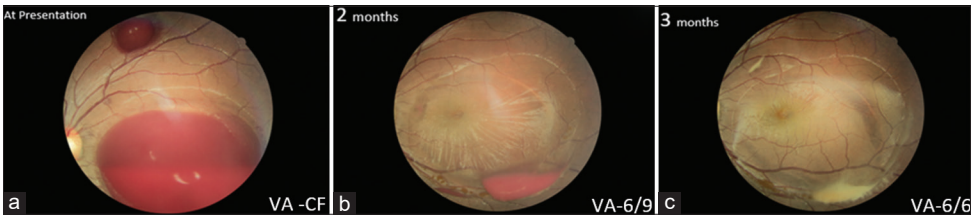

Figure 2: a is the left fundus photograph of the first patient at initial presentation showing a subhyaloid haemorrhage and a satellite haemorrhage above the superotemporal arcade while b shows resolving haemorrhage with wrinkling of the internal limiting membrane after 2 months of conservative management and c shows almost complete resolution of the subhyaloid haemorrhage with a yellow streak of altered haemorrhage beneath the inferotemporal arcade 3 months after initial presentation

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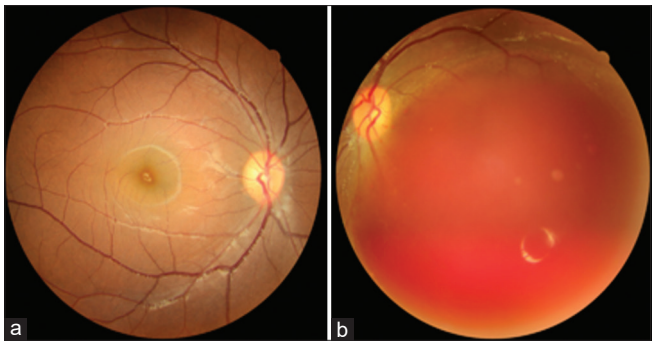

Figure 3: Fundus photographs of the second case, a 21-year-old primigravida with (a) showing the normal right fundus and (b) the left fundus with a large subhyaloid haemorrhage

examination in both eyes was essentially normal. A round, well-circumscribed subhyaloid haemorrhage was seen in the right eye, whereas the left fundus was normal. Due to the clinical findings, a diagnosis of right VS retinopathy was made. After counselling on the various treatment modalities, she opted for conservative management but defaulted after the first follow-up visit, at which the visual acuity had improved to 6/60. She was contacted through her mobile number and she reported that she felt she had no need for further follow-up visits to the eye clinic as her vision had progressively improved over time.

Discussion

VS retinopathy occurs secondary to different aetiology associated with the Valsalva manoeuvre. The patients in this series comprised of a gravid female, another who was peripartum and a young male. The possible risk factors in these patients include vomiting (hyperemesis gravidarum), constipation, anaemia, hypertension and labour during childbirth as seen in the peripartum patients and coughing in the young male which has also been documented in various reports.[3,4,10-12] Other known predisposing factors and associations of VS retinopathy include exercise, coitus and exposure to general anaesthesia.[4,10-13]

In the first case of the 14-year-old boy, the likely precipitating factor for VS retinopathy was coughing episodes prior to the onset of his ocular symptoms.[1] He was managed conservatively and followed up over a 1-year period with good visual outcomes. Though rare, VS retinopathy may occur in paediatric patients.[14] A similar case of VS retinopathy precipitated by weightlifting in a 14-year-old adolescent and treated with Nd: Yag hyaloidotomy has been previously reported.

Two of the patients in this series were peripartum and similar reports of VS retinopathy in pregnancy have been documented in twin pregnancy, pregnancy induced hypertension and during labour amongst others scenarios.[4,13,15] Our gravid patient presented with sudden visual loss at the gestational age of 32 weeks. She had symptoms of hyperemesis gravidarum which was still persistent at presentation to the eye clinic and a recent history of constipation before onset of ocular symptoms. Similar cases of pregnant women with VS retinopathy have been reported in the literature.[2-4,15] The risk factors in this patient were hyperemesis gravidarum and constipation. The second patient, who was gravid opted for conservative management, which yielded good visual outcomes.[2,3] A case of VS retinopathy in pregnancy associated with hypertension was initially treated with Nd: Yag hyaloidotomy with failure of the procedure. Hence, the patient was subsequently managed conservatively just like our index patient. However, the patient was lost to follow-up and could not be contacted despite multiple attempts.

The peripartum patient presented 10 days after the spontaneous vaginal delivery of a female neonate. The pregnancy and birth were uneventful. On clinical examination she was very pale. A full blood count was ordered but patient defaulted from follow-up. The possible risk factors for VS retinopathy, in this case, include labour, hypertension and anaemia.[1,3,4,11] Anaemia has been documented as a possible cause of VS retinopathy in the earliest reports of this ocular disorder.[1] Labour and probably anaemia were the most feasible predisposing factors in this patient.

Haemorrhage in VS retinopathy is usually subhyaloid or sub-ILM.[1,4] Subhyaloid haemorrhages are characteristically boat shaped while sub-ILM bleeds may be recognised by the presence of striae on the surface membrane and a glistening reflex.[16] Tersons' syndrome is a possible differential for VS retinopathy as the site of the haemorrhage is also sub-ILM This was ruled out as there was no history of head trauma nor other significant clinical history. The history and clinical findings in our patients were classical for VS retinopathy.[17,18] Systemic comorbidities such as diabetes mellitus and blood dyscrasias, which may cause similar features, were also ruled out.

Conservative management of VS retinopathy yields good visual outcomes. Early intervention is advocated to prevent damage to the photoreceptors. Visual impairment may arise from pigmentary macular changes, epiretinal membranes or retinal damage due to extended contact with haemoglobin and iron.[19] Nd: Yag hyaloidotomy, pars plana vitrectomy and pneumatic displacement are other modalities of treatment for VS retinopathy. Nd: Yag hyaloidotomy appears to be the most common modality of treatment and is recommended for fresh cases or early presentation.[4-6,16,17] However, complications of Nd: Yag hyaloidotomy, such as macula and retinal holes may occur.

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The risk for VS retinopathy be reduced by prompt identification and treatment of known predisposing risk factors. Optical coherence tomography scan is a more objective way to assess the effect of VS retinopathy on the photoreceptors.[20] Fundus fluorescein angiography may be beneficial in eliminating new vessel formation from differentials such as diabetic retinopathy, sickle cell retinopathy and Purtscher's retinopathy.

Conclusion

Pregnancy appears to be a more common predisposing factor for VS retinopathy, as two of the three patients in this series were peripartum. Conservative management for VS retinopathy may give good visual outcomes. OCT scans are a useful tool in assessing the effect of VS retinopathy on the photoreceptors and retinal layers. A larger series with regular follow-up of patients and subsequent monitoring with OCT scans would be more informative on the long-term effect of VS retinopathy on the macula.

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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Nil.

Conflicts of interest

There are no conflicts of interest.

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