Case Report

Idiopathic submacular hemorrhage in a young

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ABSTRACT

Submacular hemorrhage (SMH) is a visually devastating complication typically associated with age-related macular degeneration or other retinal vascular disorders. However, SMH can also occur in younger individuals without underlying systemic conditions. Here, we present a case of idiopathic SMH in a young, otherwise healthy patient, discussing the clinical presentation, diagnostic evaluation, management strategies, and visual outcomes. A 24-year-old male presented with painless, sudden onset of central red scotoma and gross diminution of vision in his right eye of 2 days duration. On examination, his best-corrected visual acuity was counting fingers at 2 m in the right eye and 6/6 (Snellen's chart) in the left eye. Fundus examination of both eyes revealed myelinated nerve fibers over the superior and inferior poles of the optic disc and the right eye showing 1 disc diameter horizontally oval yellowish looking elevated lesion with red margins suggestive of SMH obscuring the fovea. Further etiological workup was within normal limits and diagnosis of right eye idiopathic SMH was made. He was managed conservatively with close follow-up and showed good visual recovery 6/6² over 8 weeks with resolution of submacular hemorrhage thus highlighting the option of observation as a management strategy in small submacular hemorrhage.

Key words: Idiopathic, Submacular hemorrhage, Valsalva, Young

Submacular hemorrhage (SMH) is defined as the presence of blood in the space between the retinal pigment epithelium (RPE) and the neurosensory retina at the macular area arising from choroidal and retinal vessel abnormalities. SMH may complicate numerous ocular diseases, including neovascular age-related macular degeneration (nAMD), polypoidal choroidal vasculopathy, retinal arterial macroaneurysm, pathologic myopia, tumors, choroidal neovascularization of various etiology, and trauma. Patients with SMH exhibit large variations in terms of age, causes, clinical manifestations, and visual acuity at the first presentation to an ophthalmologist. The natural history and visual outcomes of SMH resulting from AMD are typically poor, whereas, SMH from other causes have been reported to be associated with better visual prognosis [1]. A particular form of retinopathy, pre-retinal, and hemorrhagic in nature, and secondary to a sudden increase of intrathoracic pressure (against a closed glottis), the well-known Valsalva maneuver, has been described. Valsalva maneuver-like stress is a part of day-to-day life. Young individuals can generate sufficiently high reflux venous pressure which can lead to rupture of capillaries and has been reported to occur with various forms of Valsalva stress such as weight lifting, physical exercise, balloon blowing, birth labor, etc. Valsalva retinopathy is typically seen in young males [2].

This report is of a young patient with a small submacular hemorrhage that was managed conservatively.

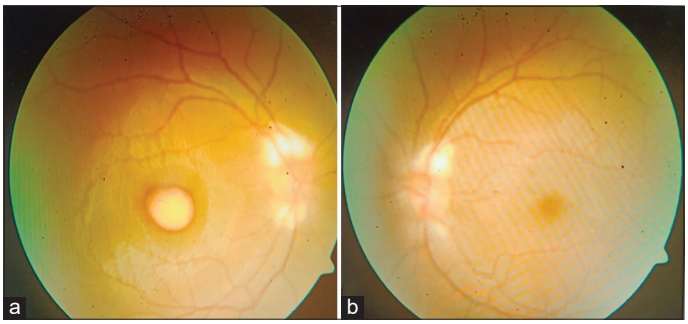

Figure 1: (a) Right eye fundus photograph showing submacular hemorrhage; (b) Left eye fundus photograph at presentation

CASE REPORT

A 24-year-old otherwise healthy male presented to the retina clinic of our center with painless, sudden onset of central red scotoma and gross diminution of vision in his right eye of 2 days duration. There was no recent history of trauma or strenuous physical activity in the form of Valsalva maneuvers. He reported

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no significant past ocular, or medical history, including no known history of systemic hypertension, or diabetes. The patient denied any use of anticoagulant medications or illicit drugs or any past trauma.

General and systemic physical examination was within normal limits. On ocular examination, his best-corrected visual acuity (BCVA) was counting fingers at 2 m in the right eye and 6/6 in the left eye. Anterior segment examination of both eyes was normal. Fundus examination of the right eye revealed myelinated nerve fibers over the superior and inferior poles of the optic disc and 1 disc diameter (DD) elevated horizontally oval yellowish-looking lesion with red margins suggestive of SMH obscuring the fovea. The surrounding retina appeared normal, with no evidence of drusen or other retinal pathology. Left eye fundus examination also revealed myelinated nerve fibers over the superior and inferior poles of the optic disc with rest of the fundus within normal limits (Fig. 1). Spectral-domain optical coherence tomography (Carl Zeiss Meditec, Inc spectral domain optical coherence tomographyoptical coherence tomography [OCT]) through fovea revealed well defined moderately reflective sub- internal limiting membrane lesion with back shadowing with central macular thickness 467 um which confirmed the presence of subretinal blood accumulation beneath the macula without any obvious underlying vascular abnormalities left eye was normal (Figs. 2 and 3).

Given the patient's young age and absence of pre-disposing systemic conditions, further investigations were carried out to find out the underlying etiology of the submacular hemorrhage and to rule out any occult retinal vascular disorders or pre-disposing factors.

Laboratory investigations, including complete blood count, coagulation profile, and erythrocyte sedimentation rate, were within normal limits. Computed tomography brain and orbits was done to rule out intra-ocular cysticercosis. Additionally, a

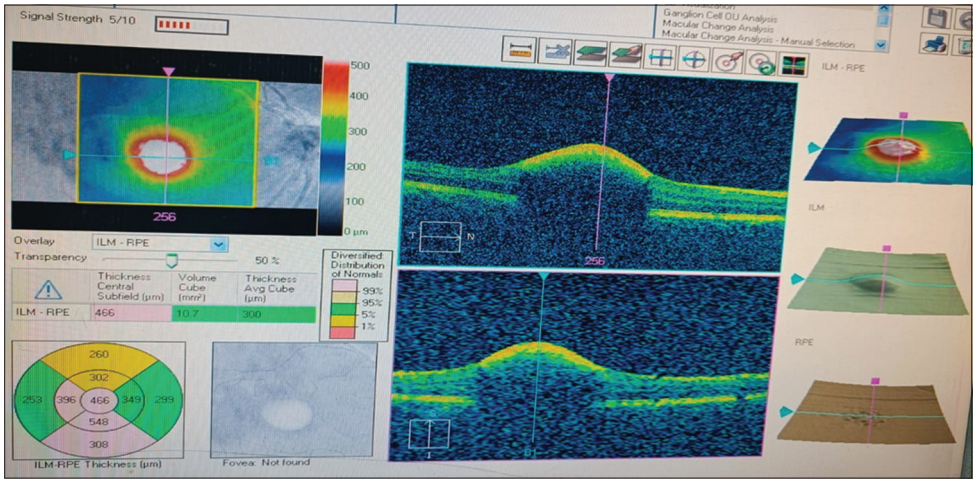

Figure 2: Right eye optical coherence tomography image at presentation showing backshadowing due to submacular hemorrhage

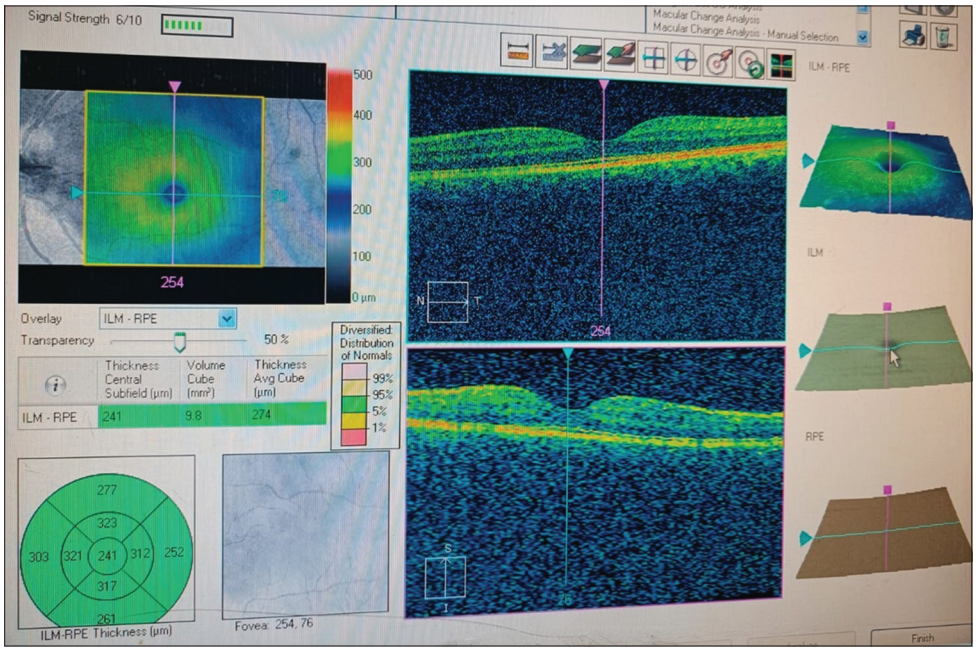

Figure 3: Left eye spectral domain optical coherence tomography image at presentation

comprehensive review of systems revealed no systemic symptoms suggestive of an underlying inflammatory or infectious etiology.

Based on clinical presentation and investigative findings, the patient was diagnosed with right eye idiopathic SMH. Given the absence of an identifiable underlying cause and the potential for spontaneous resolution of small (1DD) SMH, a conservative management approach was initially adopted. The patient was advised by strict observation with close follow-up to monitor for any changes in visual acuity or hemorrhage size. In the absence of significant improvement or if further visual deterioration occurred, consideration of more invasive treatment modalities such as pneumatic displacement, tissue plasminogen activator assisted clot lysis, intravitreal anti-vascular endothelial growth factor (anti-VEGF) therapy, or vitrectomy with submacular clot evacuation was planned.

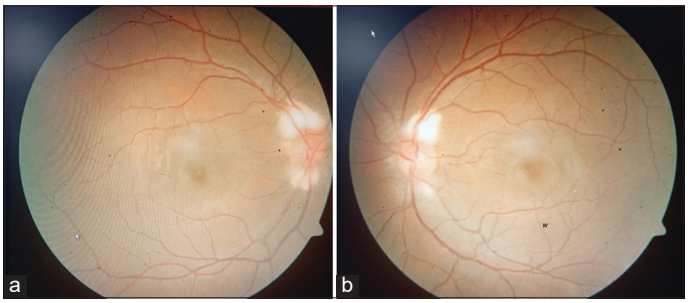

Figure 4: (a) Right eye fundus photograph showing resolution of hemorrhage after 8 weeks; (b) Left eye fundus image after 8 weeks

Over the course of the following 8 weeks, the patient reported gradual improvement in visual symptoms. Repeat OCT imaging showed resolution of the hemorrhage with no evidence of persistent subretinal fluid or significant macular distortion (Fig. 4). At the 2-month follow-up visit, his BCVA improved to 6/6[2] in the affected

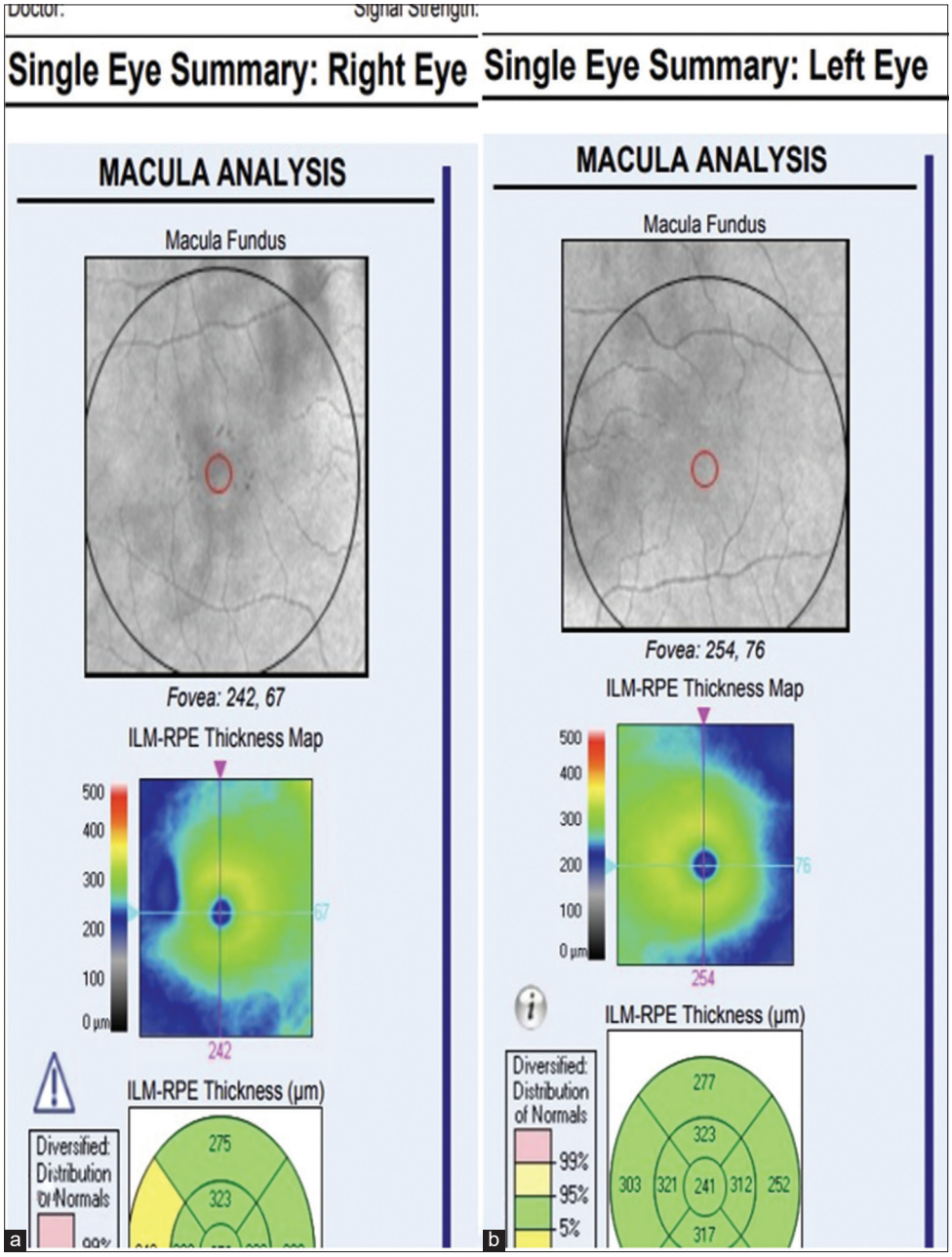

Figure 5: (a) right eye spectral domain optical coherence tomography (SD-OCT) after 8 weeks showing resolution of hemorrhage; (b) left eye SD-OCT after 8 weeks

eye, indicating significant visual recovery. The patient was counseled on the importance of continued monitoring and the possibility of further interventions in case of any visual deterioration (Fig. 5).

DISCUSSION

SMH can occur in young, otherwise healthy individuals without pre-disposing systemic conditions or retinal pathology. It is important to rule out pre-disposing risk factors, including diabetes, sickle cell disease, anemia, and other blood dyscrasias. Small hemorrhages may resolve spontaneously without any intervention as in our case however further strenuous activity should be avoided until the resolution of the hemorrhage [3].

Large SMH (>3 DD) of different etiologies including Valsalva retinopathy, macroaneurysms, retinal vein occlusions, and diabetic retinopathy may require management in the form of more invasive treatment modalities, such as Nd YAG laser hyaloidotomy, pneumatic displacement, tissue plasminogen activator assisted clot lysis, intravitreal anti-VEGF therapy, or pars plana vitrectomy with submacular clot evacuation [4].

Nd YAG laser hyaloidotomy which allows seepage of blood into the vitreous facilitating faster resolution however it is reserved for premacular subhyaloid hemorrhage of more than 3 disc diameters. Eyes with Valsalva retinopathy fare the best among the other etiologic factors owing to the lack of any underlying retinal pathology. Most of the patients with Valsalva retinopathy are young and otherwise healthy and may be observed instead of Nd: YAG laser treatment because of the close proximity of the posterior hyaloid face to the retinal surface and also the risk of complications, such as epiretinal membrane, macular hole, and retinal detachment must be borne in mind [5].

The final visual prognosis however, rests on the underlying cause of the submacular hemorrhage and any accompanying retinal changes as degeneration of the outer retina resulting from blood accumulation between photoreceptors and RPE, such as iron toxicity from erythrocyte degeneration, fibrin contraction, and fibro cellular scar formation, may lead to unfavorable visual prognosis even after hemorrhage has resolved [6].

While conservative management may be appropriate in select cases, close observation and consideration of intervention are essential to optimize visual outcomes in affected patients [7,8]. Further research is warranted to better comprehend the pathophysiology and optimal management strategies for idiopathic submacular hemorrhage.

CONCLUSION

Idiopathic submacular hemorrhage in young individuals is a rare and poorly understood condition that poses a significant risk to central vision. Thorough evaluation, close follow-up, and timely intervention are critical in preventing permanent visual impairment. While various treatment options, including anti-VEGF therapy, pneumatic displacement, and surgical intervention, can be considered, there is no standardized treatment protocol for idiopathic cases. Management should be tailored to the individual patient's clinical presentation and the severity of the hemorrhage. Further research and case studies are needed to enhance our understanding of the etiology, prognosis, and optimal treatment approaches for idiopathic SMH in this unique patient population. Reporting such cases will contribute to building a more comprehensive knowledge base and guiding future treatment strategies.

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The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name 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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