Vitrectomy and Internal Limiting Membrane Peeling for Bilateral Vitreous and Sub-ILM Hemorrhages Associated with Trauma

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ABSTRACT

Objective: To evaluate the surgical outcomes of vitrectomy and internal limiting membrane (ILM) peeling in a case of bilateral vitreous hemorrhage and sub-ILM hemorrhages following head injury in a 17-year-old boy.

Methods: A 17-year-old boy presented with diminution of vision since 20 days following head injury with loss of consciousness. There was no history of direct ocular trauma. BCVA was 1/60 in right eye and finger counting close to face (FCCF) in left eye. Fundus examination revealed vitreous hemorrhage obscuring retinal details in both eyes. Computed tomography (CT) scan did not reveal any intracranial hemorrhage but was suggestive of neuronal contusion. Hence, the diagnosis of Terson’s syndrome could not be confirmed. Ultrasound scan showed mild thickening of retinochoroidal coats in macular area and few vitreous echoes suggestive of premacular hemorrhage, bilaterally. Flash VEP showed reduced amplitude with normal P2 latency, in both eyes. The patient underwent 23 G TSV (trans-scleral sutureless vitrectomy), ILM peeling and evacuation of sub-ILM blood in both eyes.

Results: Six weeks after surgery, both eyes revealed healthy macula; BCVA improved to 6/6, N6. Multifocal ERG revealed minimally reduced central ring responses in right eye and normal ring responses in left eye. Microperimetry showed normal mean retinal sensitivity in both eyes.

Conclusion: Early vitrectomy with ILM peeling in case of sub-ILM hemorrhages secondary to trauma allows complete aspiration of the hemorrhages and may help in early and better visual recovery.

Keywords: Vitreous hemorrhage, Sub-ILM hemorrhage, Terson’s syndrome, Trauma, Vitrectomy, Surgery.

INTRODUCTION

Preretinal hemorrhages usually occur at the interface between the posterior hyaloid and inner limiting membrane (ILM). They are also located, less frequently, in the superficial retina between the ILM and the retinal nerve fiber layer.1,2 These sharply demarcated, dome shaped hemorrhages with a predilection for the macular region, lead to severe visual impairment. Predilection to the macula is explained by the absence of firm attachments of the ILM to the retina at the posterior pole peripheral from the macular fovea.1

Sub-ILM hemorrhages have been associated with different causes, the most common being valsalva retinopathy3 and Terson’s syndrome.4 In addition, such hemorrhages may occur secondary to vascular diseases, such as arteriosclerosis, hypertension, retinal artery or vein occlusion, diabetic retinopathy, retinal macroaneurysm, chorioretinitis, blood disorders, shaken baby syndrome, age-related macular degeneration trauma and on occasion, can also occur spontaneously.

CASE REPORT

A 17-year-old boy presented with diminution of vision since 20 days. He had a history of head injury with loss of consciousness and the vision loss was detected on recovery from head injury. There was no history of direct ocular trauma. The patient was on anticonvulsant therapy. The patient underwent a detailed examination including best corrected visual acuity (BCVA), intraocular pressure (IOP) with applanation tonometry, extraocular motility testing, pupillary evaluation, slit lamp biomicroscopy of the anterior segment and indirect ophthalmoscopic fundus examination. BCVA was recorded 1/60 in the right eye and finger counting close to face (FCCF) in the left eye. Intraocular pressures in the right and left eyes were 5 and 6 mm Hg respectively. Fundus examination revealed the presence of vitreous hemorrhage obscuring the visualization of retinal details in both eyes (Fig. 1, upper left and upper right). Intraocular pressures in the right and left eyes were 5 and 6 mm Hg respectively. Fundus examination revealed the presence of vitreous hemorrhage obscuring the visualization of retinal details in both eyes (Fig. 1, upper left and upper right). However, fundus of the right eye did afford some view of the posterior pole, which revealed the presence of sub-ILM/subretinal hemorrhages. The peripheral retina was attached and a provisional diagnosis of Terson’s syndrome was considered in both eyes. However, the CT (Brain) scan did not reveal any intracranial hemorrhage but was suggestive of neuronal contusion. Hence, the diagnosis of Terson’s syndrome could not be confirmed. The patient underwent ultrasound B scan (Fig. 1, lower left and lower right) and visual evoked potential (VEP) test (Fig. 2, upper left and upper right) in both eyes to
Fig. 1: At presentation, upper left: Color fundus photograph of the right eye revealing vitreous hemorrhage and retinal hemorrhages over the posterior pole. The peripheral retina was attached. Upper right: Color fundus photograph of the left eye revealing vitreous hemorrhage and obscuring the retinal details. Lower left (right eye) and right (left eye): Ultrasound B scan shows retina attached throughout with mild thickening of retinochoroidal coats in macular area with few dot like vitreous echoes suggestive of premacular hemorrhage in both eyes.

Fig. 2: The patient’s flash VEP (above) shows reduced amplitude with normal P2 latency in both eyes, as compared to an age matched normal scan (below).
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Further assess the structural and functional status. Ultrasound B scan showed that the retina was attached throughout in both eyes with a mild thickening of retinochoroidal coats in the macular area and few vitreous echoes in its vicinity suggestive of premacular hemorrhage, bilaterally. Flash VEP showed reduced amplitude with normal P2 latency in both eyes. The patient was advised and underwent 23 G TSV (trans-scleral sutureless vitrectomy), ILM peeling (Fig. 3, left) and evacuation of sub-ILM blood in both eyes, within an interval of four weeks. On the last follow-up, six weeks after surgery, both eyes revealed an attached retina and a healthy macula (Fig. 3, right). OCT scan showed normal retinal thickness and foveal contour. BCVA improved to 6/6, N6 in both eyes. Multifocal ERG (Fig. 4) revealed minimally reduced central ring responses in the right eye and normal central, paracentral and perifoveal ring responses in the left eye. Microperimetry (Fig. 5) showed normal mean retinal sensitivity in both eyes.

DISCUSSION

Sub-ILM hemorrhage can occur due to a variety of causes as described above. Predilection of such hemorrhages to the macula is explained by the absence of firm attachments of ILM to retina at the posterior pole, peripheral from the macular fovea. Terson’s syndrome encompasses any intraocular hemorrhage associated with intracranial subarachnoidal hemorrhage and increased intracranial pressures. Premacular hemorrhages have been reported in up to 39% of cases of Terson’s syndrome, often with a location beneath the ILM. Kwok et al confirmed sub-ILM location of hemorrhage by histological examination of the membrane showing hemosiderin deposits within macrophages on the retinal side of the ILM in a case of vasaalva retinopathy. The hemorrhage may clear spontaneously but takes 1 to 2 months or longer and the resolution tends to be slow in the presence of extensive hemorrhages. Patients may experience a number of other complications, including cataract, retinal detachment, amblyopia, epiretinal membranes and other macular abnormalities. In cases of hemorrhage obscuring macula, the treatment is one of either observation or pars plana vitrectomy. In bilateral cases, early rehabilitation is recommended. Also, absorption tends to be slow in cases of sub-ILM hemorrhage. Prolonged contact of the retina with hemoglobin and its catabolites can possibly cause toxic retinal damage, which may be irreversible or lead to formation of epiretinal membrane resulting in visual loss. In our case, we performed early vitrectomy which allowed early clearance of blood and good postoperative visual recovery. Hence, early vitrectomy with ILM peeling in case of sub-ILM hemorrhage secondary to trauma may help in early and better visual recovery.
Fig. 5: Microperimetry (Left: Right eye, Right: Left eye) reveals normal mean retinal sensitivity in both eyes at last follow-up.

REFERENCES


