

A case of air pollution-induced Valsalva retinopathy

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Abstract

This is a case of Valsalva retinopathy during the season of annual transboundary haze pollution in Sarawak. A 22-year-old man with no known medical illness developed sudden onset of painless visual acuity loss preceded by persistent cough. Left eye fundus showed dense preretinal haemorrhage covering optic disc extending inferiorly with breakthrough vitreous haemorrhage. The patient underwent pars plana vitrectomy, endolaser, and fluid gas exchange in view of persistent dense vitreous haemorrhage after a month of conservative management. In conclusion, pars plana vitrectomy can be considered as a safe and effective treatment option for patients with Valsalva retinopathy developing extensive premacular haemorrhage.

Keywords: haze, pars plana vitrectomy, premacular haemorrhage, Valsalva retinopathy

Abstrak

Ini merupakan kajian kes mengenai retinopati Valsalva yang berlaku pada musim jerebu tahunan di negeri Sarawak. Seorang lelaki dewasa yang berumur 22 tahun tanpa kormobiditi dirujuk dengan masalah pengaburan penglihatan yang akut selepas mengalami batuk yang teruk. Fundus mata kiri pesakit menunjukkan pendarahan preretinal yang padat meliputi cakera optik dan sambungan di bawahnya dengan pendarahan vitreous. Pendarahan vitreous pesakit didapati berterusan selepas rawatan konservatif selama sebulan. Oleh sebab itu, pesakit menerima rawatan pembedahan pars plana vitrectomy, endolaser dan fluid gas

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exchange. Kesimpulannya, rawatan pars plana vitrectomy boleh dilihat sebagai salah satu pilihan rawatan yang selamat dan berkesan untuk pesakit yang mengalami retinopati Valsalva dengan pendarahan premakula.

Katakunci: jerebu, pars plana vitrectomy, pendarahan premakula, retinopati Valsalva

Introduction

With the increase of global demand for agricultural and urban spaces, slash-and-burn deforestation has become a popular method to clear forests for cultivable land. In September 2019, Sarawak suffered a rather critical transboundary haze that reached a hazardous level of 402 in the Air Pollutant Index as a result of rampant forest fires. Haze has been known to cause significant impact on respiratory and ocular health.

A rare condition, Valsalva retinopathy case is scarcely reported during the haze season. Valsalva retinopathy is an induced premacular retinal haemorrhage due to increased pressure on the retinal venous system caused by sudden increases in intrathoracic pressure. The Valsalva manoeuvre, a forcible exhalation effort against a closed glottis causing a sudden rise in intrathoracic pressure, was first described by 17th century physician Antonio Maria Valsalva. There are no valves in the venous system rostral to the heart hence causing a sudden surge of reflux venous pressure in the head and neck region. Common causes of Valsalva retinopathy include vomiting, weightlifting, vigorous sexual activity, and coughing. Here, we report a case of Valsalva retinopathy with dense preretinal haemorrhage induced by air pollution.

Case presentation

A 22-year-old working class man with no known medical illness presented with painless sudden onset of acute visual loss in the left eye preceded by a bout of cough. Visual acuity in the left eye was hand movement, the anterior segment was unremarkable, and intraocular pressure was 14 mmHg. Fundus examination showed dense preretinal haemorrhage covering the optic disc extending inferiorly with breakthrough vitreous haemorrhage (Fig. 1). B scan showed subhyaloid blood tracking inferiorly and anteriorly to the ora serrata. After 1 month, visual acuity remained hand movement and the fundus revealed extensive vitreous haemorrhage (Fig. 2). Full blood count /peripheral blood film, coagulation profile, blood urea, serum electrolytes, erythrocyte sedimentation rate, and autoimmune workup were done and yielded normal results. Pars plana vitrectomy, endolaser,

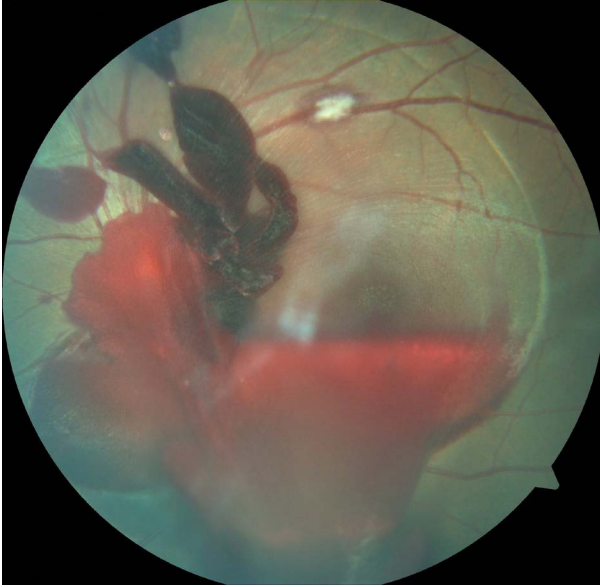


Fig. 1. Left eye fundus with dense preretinal haemorrhage with breakthrough vitreous haemorrhage inferiorly obscuring optic disc and posterior pole during presentation.

Fig. 2. Left eye fundus showing persistent vitreous haemorrhage after 1 month of conservative management with visual acuity of hand movement.

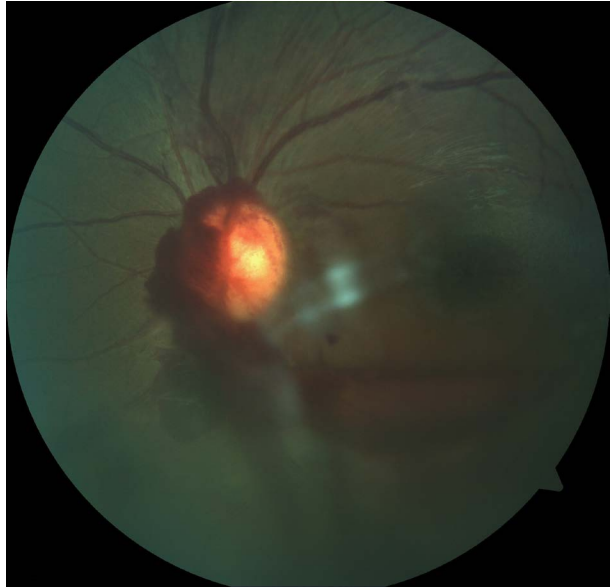




Fig. 3. Left eye fundus at the 2-month postoperative review.

and fluid gas exchange were performed in view of persistent vitreous haemorrhage. Postoperative follow-up at 2 months revealed best-corrected visual acuity of 6/7.5. Fundus examination revealed minimal old vitreous haemorrhage with flat posterior pole (Fig. 3). However, the patient developed early cataract as the complication of the surgery.

Discussion

Vitreous haemorrhage is a common sign of various ocular diseases. It is known to cause permanent visual damage such as haemosiderosis bulbi, proliferative vitreoretinopathy, and ghost cell glaucoma. Hence, our management aim was to restore vision and expedite the patient's recovery with minimal complications. Many procedures have been reported, such as puncturing the posterior hyaloid face with Nd-YAG,¹ pneumatic displacement of the haemorrhage with an intravitreal injection of gas with or without recombinant tissue plasminogen activator,² and pars plana vitrectomy.³

García *et al.*³ reported six cases of Valsalva retinopathy in which five required pars plana vitrectomy after 3–4 weeks of observation, whereas one patient recovered without intervention as the haemorrhage was minimal with a diameter of one

disc. One of the cases that underwent pars plana vitrectomy developed cataract postoperatively and required cataract surgery. Successful Nd:YAG laser hyaloidotomy for Valsalva premacular haemorrhage with the size of more than three disc diameters and enough haemorrhage pocket depth was also been reported by Mehdi *et al.*⁴ However, the challenge of performing Nd:YAG laser hyaloidotomy is the proximity to the retinal surface, which may cause macular hole⁵, retinal detachment, and epiretinal membrane formation. Our patient was treated with pars plana vitrectomy as his vitreous and preretinal haemorrhage was noted to be more than one disc diameter which did not resolve after 1 month. However, he developed early cataract postoperatively, which may require cataract surgery later.

Conclusion

Pars plana vitrectomy is the more effective and safer treatment for extensive premacular haemorrhage compared to other treatment modalities. However, known surgical associated complications such as cataract may develop, as reported in our case.

Declarations

Ethics approval and consent to participate

Not required.

Consent for publication

The patient provided informed consent for the publication of this case report.

Competing interests

None.

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