ORIGINAL ARTICLE

Intravitreal Injection of Recombinant Tissue Plasminogen Activator and Pneumatic Displacement of Submacular Haemorrhage

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SUMMARY

We report a case of a patient with hypertension and ischaemic heart disease on anti-platelet treatment, who developed uniocular profound visual loss from a submacular haemorrhage secondary to valsalva retinopathy. He was treated with a combination of intravitreal recombinant tissue plasminogen activator (rtPA) and sulphur hexafluoride (SF6) gas followed by strict prone positioning. He demonstrated significant displacement of the haemorrhage and improvement of vision postoperatively.

KEY WORDS:
Intravitreal Tissue Plasminogen Activator, Pneumatic Displacement, Submacular haemorrhage, Valsalva Retinopathy.

INTRODUCTION

Submacular haemorrhage is a common presentation of a range of ocular pathologies affecting the retina and the choroid. In valsalva retinopathy, submacular haemorrhage is a relatively uncommon presentation compared to the more classical finding of haemorrhage under the internal limiting membrane. The outcome of a long standing submacular haemorrhage is poor due to the toxicity of the subretinal blood. There are various treatment options for this condition. Here we illustrate a successful treatment using recombinant tissue plaminogen activator (rtPA).

CASE REPORT

A 64-year-old man presented with sudden onset of visual loss in his left eye of one week duration. He gave a history of high myopia but denied any trauma to the eye. Detailed history revealed that he had been coughing and sneezing heavily for a few days prior to his presentation. He was on treatment for hypertension and ischaemic heart disease and had been on anti-platelet treatment (clopidogrel 75mg od) for the past seven years. Previously, the patient's visual acuity was good in both eyes.

On examination, the best corrected visual acuities (BCVA) were 6/9 (right eye) and hand movement (left eye). Slit-lamp evaluation of anterior segments and intraocular pressures were normal in both eyes.

Both fundi showed features of high myopia with tilted optic discs and peripapillary atrophy. The examination of the right macula was unremarkable but the left macula showed an extensive submacular haemorrhage (Fig. 1).

After informed consent was taken from the patient, an intravitreal injection of recombinant tissue plasminogen activator (20µg in 0.01ml) was performed on the left eye followed 30 minutes later by an intravitreal injection of 100% sulphur hexafluoride gas (0.4ml) combined with anterior chamber paracentesis on the left eye. Strict face-down positioning was carried out for one day.

By the next day, the submacular haemorrhage in the left eye was significantly displaced from the macula and the left BCVA improved to 6/60. A fluorescein angiogram performed on the left eye excluded any evidence of a choroidal neovascular membrane. The antiplatelet therapy was discontinued for two weeks. The patient developed a breakthrough vitreous haemorrhage in the left eye on post operative day 6 but the left eye vision was maintained at 6/60. Three months later, the left BCVA improved to 6/24 and the left vitreous haemorrhage had completely cleared with no signs of recurrent of submacular haemorrhage (Fig. 2).

DISCUSSION

During a valsalva manoeuvre, an increase in intrathoracic pressure against a closed glottis can lead to a rise in intraocular venous pressure which can cause rupture of retinal or choroidal vessels. As this patient had a history of heavy coughing and sneezing prior to the submacular haemorrhage and being hypertensive and on antiplatelet therapy, he was at risk of developing this complication.

The natural history of submacular haemorrhage is poor mainly due to the underlying pathology as well as the toxicity of subretinal blood. The subretinal blood induces damage to the retina by creating a diffusion barrier for nutrients between the retina and pigment epithelium, by providing toxins via its iron content and by causing traumatic insult to the outer photoreceptor segments secondary to fibrin contraction[1]. The aim of treatment is therefore to displace the blood from the fovea as soon as possible in an attempt to improve upon the outcome of the disease and to allow better visual rehabilitation.

A variety of treatment options for submacular haemorrhage are available. Combined three-port pars plana vitrectomy with either surgical removal of subretinal blood or injection of rtPA into the subretinal space generally offers limited success[2]. Pneumatic displacement alone without rtPA has been shown

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to be effective in displacing dense submacular haemorrhage and in facilitating visual improvement[3].

Heriot first described the method of using intravitreal rtPA for thrombolysis and pneumatic displacement of blood combined with face-down positioning4. His initial experience suggested a high anatomic success rate with limited complications. Recombinant tissue plasminogen activator was initially used as a thrombolytic agent in acute myocardial infarction. It has been shown that rtPA is able to penetrate the retina via microlesions caused by subretinal haemorrhage[5].

Pneumatic displacement combined with intravitreal injection of rtPA was performed on this patient because it is a minimally invasive procedure and can be performed in an outpatient setting. Because of concerns about toxicity, a low dose of rtPA (20µg) was used. We observed tremendous improvement in 24 hours and we would recommend urgent treatment for such cases in order to salvage vision as the outcome of this condition is generally very poor.

CONCLUSION

Extensive submacular haemorrhage secondary to valsalva retinopathy can be effectively and safely displaced with the use of low dose intravitreal rtPA combined with pneumatic displacement and face-down posturing. This should be done urgently in order to achieve optimal visual recovery.

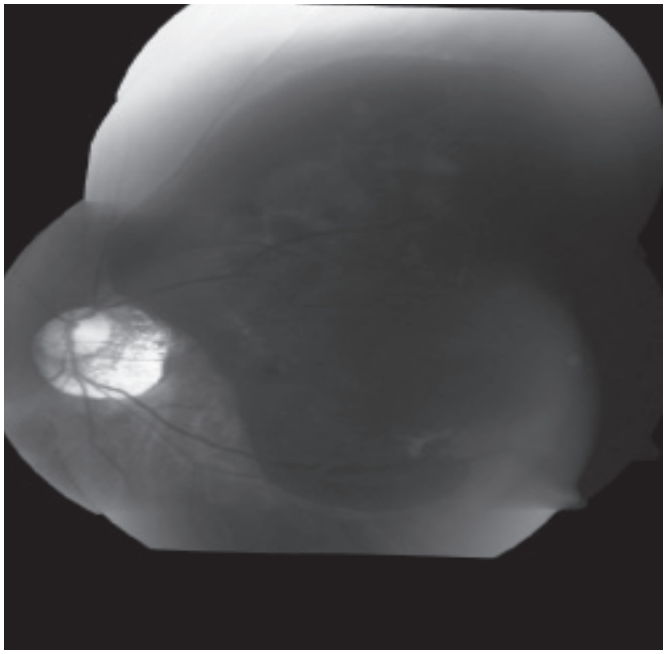

Fig. 1: Fundus photo of the left eye showing extensive submacular haemorrhage covering the macula.

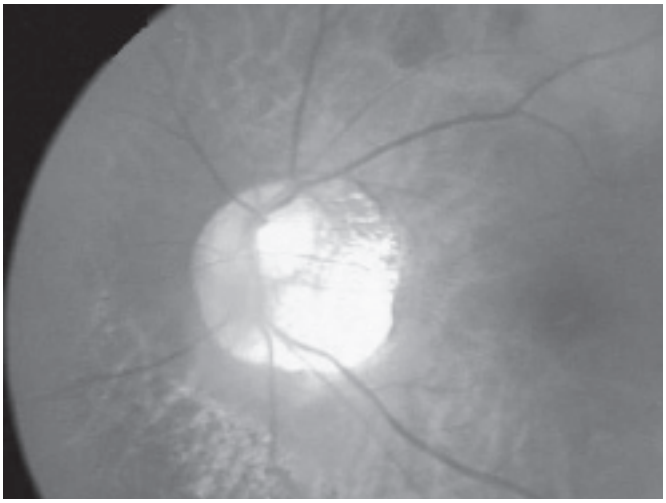

Fig. 2: Fundus photo of the left eye showing no residual submacular haemorrhage three months after injection.

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