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RESOLUTION OF TRAUMATIC RETINAL DETACHMENT WITH INTRAVITREAL BEVACIZUMAB: A CASE REPORT

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Abstract

Introduction*: Traumatic retinal detachment (RD) without an observable break following ocular trauma is rare.*

Case Report*: A 14-year-old male who suffered from traumatic RD following an explosive injury. Initial examination revealed iridodialysis, vitreous haemorrhage, and impaired visual acuity in the right eye. One week later, the patient developed a macula-off retinal detachment secondary to subretinal exudation without an identifiable retinal break, and a decision was made to trial intravitreal injection (IVI) of bevacizumab before considering surgical intervention. Two days after IVI, significant improvements in subretinal fluid (SRF) were observed, and the retina remained attached during follow-up. The patient's visual acuity and anatomical outcomes improved, and no choroidal neovascularization (CNV) was detected at the 7-month follow-up.*

Discussion*: A rare instance of traumatic RD associated with choroidal rupture, and without an observable retinal break. While the majority of post-traumatic RD is due to pathological breaks, our case highlights the possibility of detachment secondary to exudation resulting from extensive haemorrhage and choroidal ruptura.*

Conclusion*: This case demonstrates the potential efficacy of anti-VEGF therapy in traumatic RD secondary to significant subretinal exudation and offers a less invasive treatment option for select cases, warranting further investigation and long-term studies for a larger patient cohort.*

Keywords: Retinal Detachment; Bevacizumab; traumatic detachment

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INTRODUCTION

Retinal detachment (RD) following ocular trauma has an incidence reported as high as 30%, and is frequently associated with poor visual prognosis [1]. Almost all traumatic RD are rhegmatogenous, with nearly 84% of eyes that develop retinal breaks following ocular trauma subsequently developing RD [2]. Despite the vast majority of post traumatic RD being related to pathological breaks, exudative retinal detachment can occur in rare instances, with only a few reported cases in the literature. Most cases of traumatic RD have occurred secondary to choroidal retinal rupture or to chorioretinitis scleopetaria. Similarly to rhegmatogenous RD, traumatic RD without observable breaks can occur months or even years after inciting events [3].

Subretinal exudation can result from extensive haemorrhage, choroidal neovascular membrane formation (CNVM), or simply from extensive choroidal rupture. Other proposed mechanisms include leakage from the choroid through Bruch's membrane and retinal pigment epithelium (RPE) rupture. The transient dysfunction of the outer blood-retinal barrier in the RPE has also been suggested as a mechanism contributing to poor subretinal fluid removal[4]. Furthermore, choroidal rupture and extensive vitreous haemorrhage have been shown to trigger extensive inflammatory processes and up-regulation of vascular endothelial growth factor (VEGF)[5]. The VEGF overload contributes significantly to subretinal fluid (SRF) accumulation, consequently leading to serous detachment and subretinal haemorrhage in approximately 20% of affected eyes[6].

Surgical intervention, such as pars plana vitrectomy (PPV), is the conventional approach for fixing traumatic RD. Management of traumatic RD secondary to significant subretinal exudation remains poorly understood, often leaving patients with poor visual outcomes. While cryopexy around the tear site benefits cases with evident Bruch's membrane breaks or RPE tears, it may not always resolve RD. For eyes with substantial SRF, sclerectomy and sclerostomy have been used, showing gradual RD improvement over months[3].

In this case report, we present a case of traumatic RD with exudation and haemorrhage and no observable break, in which successful reattachment of the retina was achieved through a single intravitreal injection (IVI) of bevacizumab. Remarkably, the patient did not require subsequent surgical intervention, highlighting the potential efficacy of this minimally invasive approach in select cases.

CASE REPORT

We describe the case of a 14-year-old male who presented following an explosive, traumatic injury to his right eye (RE) after mixing bicarbonate soda and vinegar to create a bottle-rocket, which had exploded and backfired. Initial examination revealed inferior iridodialysis, 180-degree zonular dehiscence, and VH (Figure 1). Choroidal rupture with overlying subretinal haemorrhage was seen on OCT (Figure 2 [A]). VA in the patient's RE at this time was hand motion and IOP of the RE was 22 mmHg.

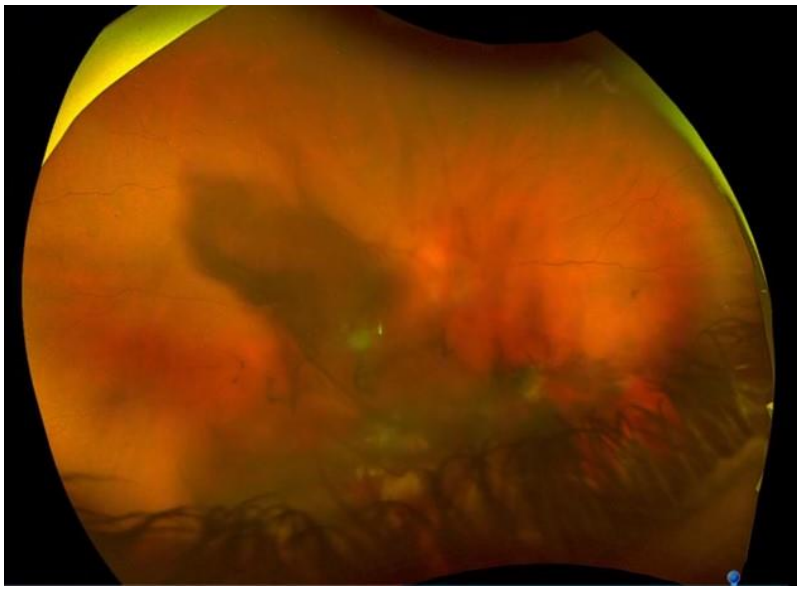

Figure 1 Inferior Iridodialysis, 180-Degree Zonular Dehisence, and Vitreus Haemorrhage

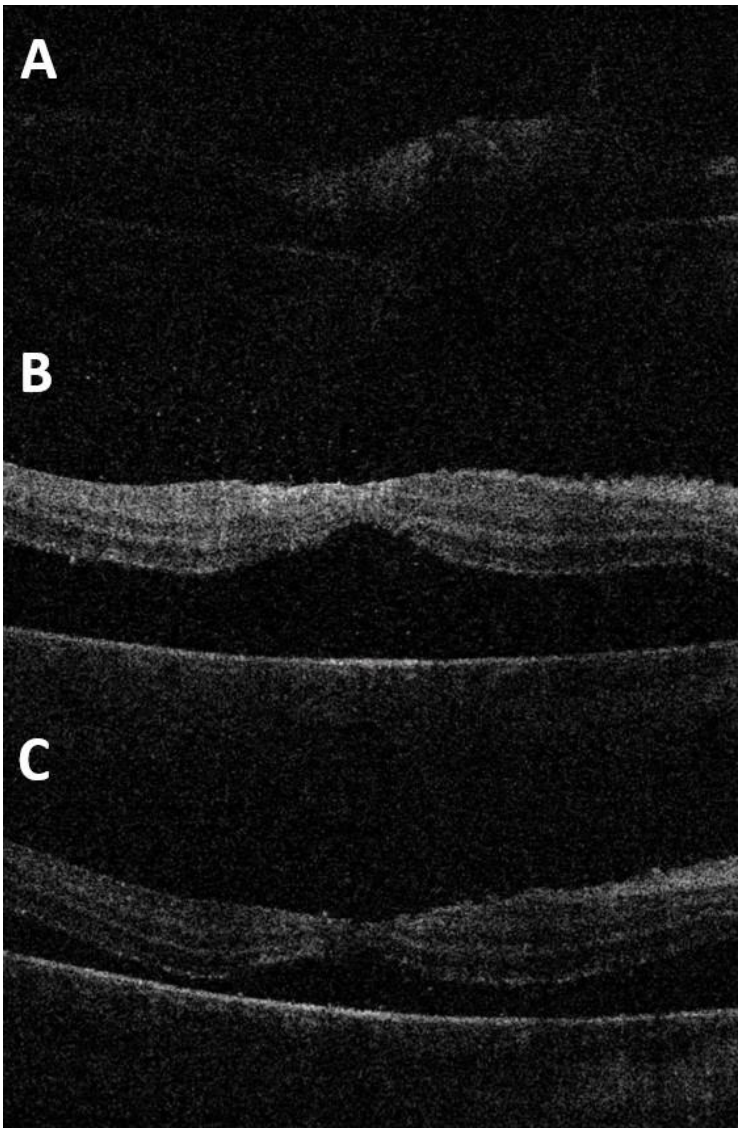

Figure 2 Macular Detachment Seen On OCT

One week later, during a follow-up visit, the patient was found to have inferior macula-off detachment with the retina remaining attached in the peripheral and inferonasal aspect (Figure 2 [B] and Figure 3). Significant accumulation of SRF was noted on the OCT. A causative break could not be identified, and the SRF was thought to be related to extensive choroidal rupture and haemorrhage. The eye was treated with intravitreal bevacizumab for exudative detachment related to extensive chorioretinal rupture. Surgical repair of retinal detachment was planned for 3 days later if no response was seen.

Upon review 2-days post IVI, OCT scans revealed significant improvements in SRF and a flat retina (Figure 2 [C]). During subsequent visits in the following month post IVI, there was no recurrence of SRF, and vision improved to 6/24 with no new symptoms or significant changes. Seven months post IVI, the patient remained well with vision (RE VA 6/36) and is now only on dorzolamide-timolol combination (Cosopt ®) drops BD (Figure 4).

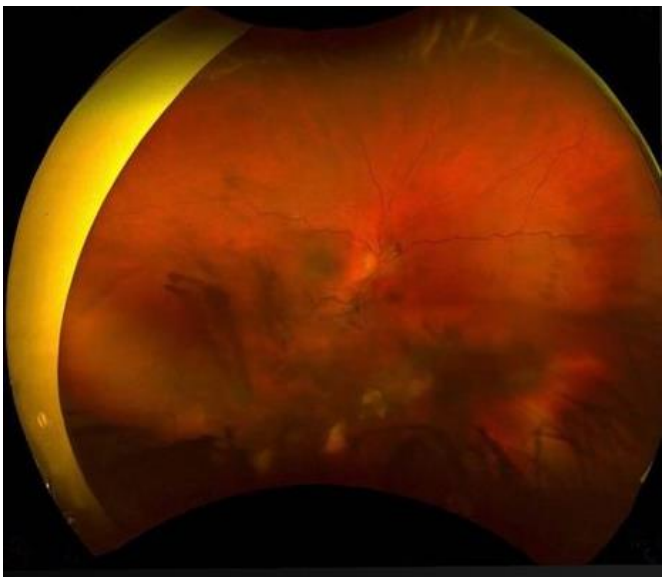

Figure 3 Inferior Macular Off Detachment With The Retina Remaining Attached In The Peripheral And Inferonasal

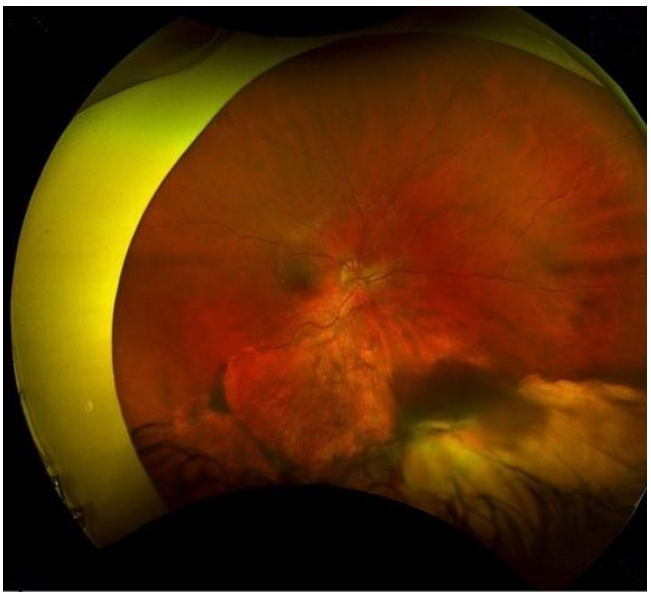

Figure 4 Fundus Photography After The Therapy

DISCUSSION

We present a rare instance of traumatic RD associated with choroidal rupture, and without an observable retinal break. While the majority of post-traumatic RD is due to pathological breaks, our case highlights the possibility of detachment secondary to exudation resulting from extensive haemorrhage and choroidal rupture. Previous studies have shown visual recovery in eyes with choroidal rupture is often very poor, with only 35% recovering a VA greater than 6/12[7]. The rationale for our approach is supported by precedence in the literature for the use of anti-VEGF in the setting of exudation related to choroidal rupture or CNV. The decision was further compounded by the diagnostic uncertainty regarding traumatic detachment secondary to exudation and haemorrhage, and the lack of clear management guidelines.

Several exudative conditions such as choroidal neovascular membrane (CNVM) of varied aetiologies, and extensive vitreous haemorrhage (VH), have been successfully treated with IVI bevacizumab[5,7]. Bevacizumab has shown success in treating CNVM due to choroidal rupture following blunt ocular trauma[6]. Some cases have also benefited from concomitant photodynamic therapy[8]. Previous cases of young eyes presenting with CNVM months after traumatic choroidal rupture have reported an excellent response to IVI anti-VEGF therapy[5]. Additionally, a previous case with air-bag associated blunt eye trauma presenting with massive persistent subretinal haemorrhage and VH without RD secondary to CNV achieved near total resolution of subretinal haemorrhage following single dose bevacizumab[9]. Our case suggests anti-VEGF therapy could be utilised in the acute setting prior to the development of CNV. Furthermore, bevacizumab has been shown to have a role in the prevention and eradication of CNV in eyes with high risk of disease, particularly those with CNVM secondary to choroidal rupture. This is supported by other cases which have shown single dose IVI bevacizumab treatment during very early stages of disease can eradicate CNV[10]. Our patient remains in absence of CNV 7 months after the single dose intravitreal bevacizumab. We acknowledge the potential for CNV to manifest even several years after inciting choroidal rupture, and therefore, necessitate regular follow-ups over long periods of time.

Notably, we could not find any cases of anti-VEGF therapy in the setting of chorioretinitis sclopetaria, with most of these eyes being managed surgically. Part of this may be that in spite of severe defects in the retina and choroid, RD is rare in chorioretinitis sclopetaria due to spontaneous retinopexy and scar formation. We recognize the possibility that in our case, the anti-VEGF treatment may not have directly contributed to disease eradication. Alternatively, spontaneous reattachment could have occurred as part of the natural history, or the use of dexamethasone, ketorolac, or dorzolamide-timolol drops might have played a role in the outcome. While studies have shown no difference in complication rates between old and young eyes using bevacizumab for long-term management of retinal conditions such as idiopathic CNV, there is a lack of data on its use in the context of traumatic RD in young eyes.

We could not find other reported cases of early bevacizumab administration for traumatic RD without an observable break resulting in rapid resolution of serous fluid and retinal haemorrhage accumulation. Similarly, we could not find other cases of intravitreal bevacizumab for choroidal rupture in the absence of CNV. The patient achieved favourable anatomic and functional outcomes 2 days post-injection with significant improvements in VA. This case highlights the potential role of anti-VEGF therapy in select cases of traumatic RD associated with exudation and haemorrhage.

Whilst IVI bevacizumab may offer a less invasive alternative to traditional surgical approaches, further studies and long-term follow-up are warranted to evaluate the efficacy and safety in larger cohorts of patients.

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