

## Bilateral serous retinal detachment in association with preeclampsia



Preeclampsia is a multisystem disorder characterized by the onset of hypertension and often accompanied by significant edema and proteinuria.<sup>1</sup> The clinical spectrum may range from mild to severe preeclampsia; eclampsia involving seizures and hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome.

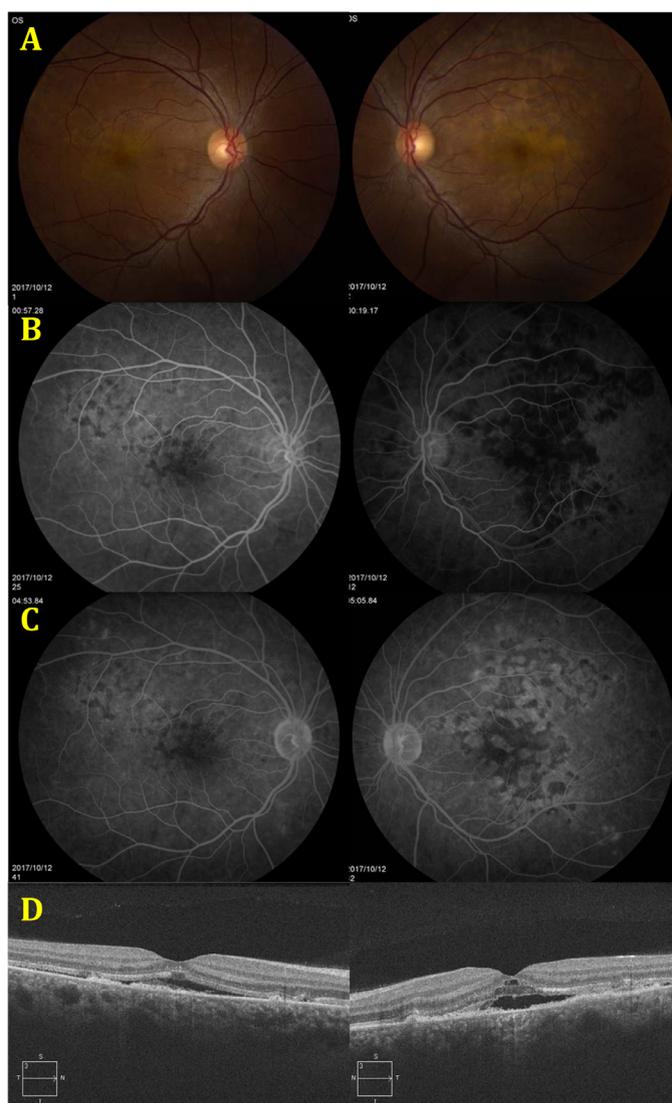
### CASE REPORT

We describe a case of a 33-year-old female who was seen by the ophthalmology service for complaint of decreased central

vision bilaterally in the post-partum period in the setting of severe preeclampsia and low platelets.

This patient underwent a spontaneous vaginal delivery. She was noted in the antenatal period to have severe preeclampsia and low platelets. She also experienced significant postpartum hemorrhage with blood loss of 2 L. This required an oxytocin infusion, a dose of carboprost tromethamine, and misoprostol. Following her delivery, she complained of decreased vision with central loss of visual field, floaters, and metamorphopsia.

The patient had no previous ocular concerns and was not on any ocular medications. She was given labetalol to control her blood pressure in the antenatal period. She had no other significant past medical history. Her bedside physical examination revealed a best corrected visual acuity with a hand-held Rosenbaum screener of 20/400 in the right eye and 20/200+1 in



**Fig. 1**—A, colour fundus photographs of right and left eye showing presence of macular deep subretinal hypopigmented placoid lesions. B, early intravenous fluorescein angiography images showing presence of hypofluorescence in macular region corresponding to placoid lesions. C, late intravenous fluorescein angiography images showing presence of hyperfluorescence at margin of placoid lesions likely consistent with staining. D, optical coherence tomography images of right and left eye revealing evidence of subretinal fluid.

the left eye. Pupils were equal and reactive to light with no relative afferent pupillary defect. Intraocular pressure in both eyes was 13. A gross anterior segment examination of both eyes was unremarkable. A dilated fundus examination of the right eye revealed no vitreous opacification with a cup-to-disc ratio of 0.3 and subretinal fluid in the macular region consistent with a serous retinal detachment. The vessels were within normal limits and no retinal hemorrhages were noted. Examination of the left eye revealed a cup-to-disc ratio of 0.3 with a similar serous retinal detachment involving the temporal aspect of the retina and extending into the macula. The vessels were again within normal limits, with no hemorrhages or tears noted.

A diagnosis of bilateral serous retinal detachments in the setting of preeclampsia was made. The patient was observed, as this condition is usually self-resolving and carries a favorable prognosis. The patient was seen 1 week later by the retina service in outpatient follow-up with intravenous fluorescein angiogram and optical coherence tomography imaging (Figs. 1,2).

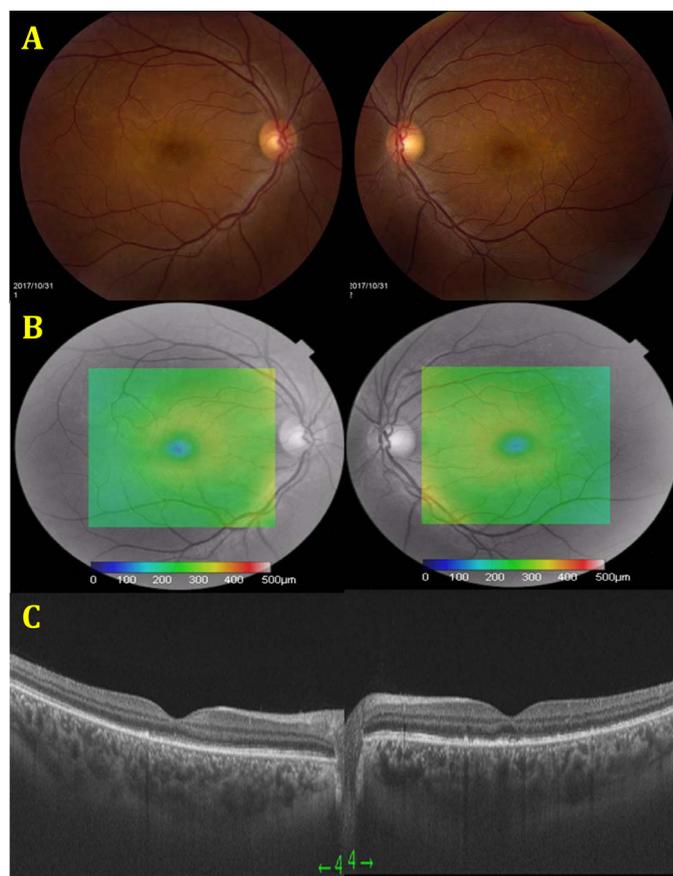
## DISCUSSION

In preeclampsia, the underlying abnormality is thought to be severe generalized vasospasm, postulated to be secondary to increased sensitivity to circulating

prostaglandins.<sup>1</sup> The exact mechanism of serous retinal detachment in cases of preeclampsia is unknown. It is hypothesized that choroidal dysfunction occurs following arteriolar vasospasm. This choroidal dysfunction, particularly choriocapillaris ischemia, leads to damage of the retinal pigment epithelium and breakdown of the blood-retinal barrier. The compromised fluid and ion-transport leads to accumulation of subretinal fluid and subsequent serous detachment.<sup>2-4</sup> In the case of HELLP syndrome, hemolysis of the red blood cells may further contribute to focal ischemia caused by way of capillary obstruction.

The overall choroidal thickness in preeclampsia associated malperfusion remains the same. However, the yellow-white focal lesions occur at the level of the retinal pigment epithelium presumably secondary to choriocapillaris infarction. Following resolution, these focal lesions diminish in size. The postulated mechanism for this would be return to baseline autoregulation of the retinal and choroidal vasculature. Scholfield et al. discussed the role of calcium ions in vessel tone and permeability with an excitatory role in initiating signals that regulate vessels.<sup>5</sup>

Vigil-De Gracia et al. described the largest review of 28 cases between 1990 and 2010 of serous retinal detachments in the setting of preeclampsia/eclampsia/HELLP syndrome. All patients in this series had full spontaneous



**Fig. 2—A.** colour fundus photographs of right and left eye showing smaller resolving placoid lesions. **B.** red free imaging of right and left eye in optical coherence tomography, revealing normalizing macular anatomy and thickness. **C.** optical coherence tomography images of right and left eye revealing evidence of no subretinal fluid.

resolution of their serous detachment within 2-12 weeks without any adverse sequelae.<sup>6</sup> These patients require observation, and medical treatment with systemic antihypertensive drugs may be helpful. Vision loss following delivery in the setting of preeclampsia should arise suspicion for possible serous retinal detachment.

### SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.jcjo.2018.07.003>.

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## Traumatic retinal dialysis resulting from Nerf foam bullet



Retinal dialysis is a common complication of blunt force ocular trauma.<sup>1</sup> Thirty percent of the retinal dialyses present in the inferotemporal quadrant, typically involving less than 3 clock hours of retina.<sup>2,3</sup> The majority of retinal dialyses are sequelae of significant trauma to the affected eye.<sup>1,4-8</sup> Here we discuss the presentation, management, and clinical course of a retinal dialysis caused by a small caliber Nerf foam bullet (Nerf N-Strike Elite dart; Hasbro, Pawtucket, R.I.) shot from a high-speed Nerf rifle (N-Strike Elite Rampage Blaster; Hasbro).

### CASE PRESENTATION

A 43-year-old female presented to a group retina practice after being struck to the nasal aspect of her left eye with a Nerf foam bullet fired from a distance of approximately 6 meters (Fig. 2). The patient complained of a new onset of floaters but denied flashes or deteriorating visual acuity. There was no previous history of ocular surgery or other ocular trauma.

Upon examination, visual acuity was 20/20 in each eye. Intraocular pressures were within normal limits (14 OD, 09 OS). Anterior segment examination showed no evidence of a macroscopic hyphema, although a few cells were identified in the aqueous of the left eye. Posterior segment examination of the right eye was unremarkable. Posterior segment examination of the left eye demonstrated a retinal dialysis of approximately 3 clock hours in the temporal periphery. Adjacent commotio retinae with intraretinal hemorrhage were also identified (Fig. 1A). The patient underwent same-day

encrclage of the dialysis with indirect argon laser retinopexy. The patient was seen 2 weeks later in follow-up. At that time the retinal dialysis was found to be well demarcated with laser with no additional retinal pathologies noted (Fig. 1B).

### DISCUSSION

High velocity projectile toys are relatively common in Canada. Airsoft guns and Nerf guns are 2 of the most popular such toys.

Airsoft gun pellets have been known to cause a variety of ocular injuries. In a case series of ocular trauma from airsoft gun pellets, anterior segment injuries included traumatic hyphema, corneal abrasion, lid contusion, traumatic iritis, and traumatic mydriasis. Commotio retinae has been described, although we could not find reports of retinal dialysis, tears, or detachments.<sup>9</sup> Airsoft guns shoot plastic pellets. These pellets measure 6.0 mm in diameter and their mass ranges from 0.12 to 0.25 g.<sup>9</sup> With speeds of 90-120 m/s, airsoft pellets can impact with a kinetic energy (KE) of anywhere from 0.5 Nm to 1.8 Nm.

There has been a single published report describing 2 cases of ocular injury caused by Nerf gun foam bullets.<sup>10</sup> In both cases, the patient presented with reduced vision from hyphema. In one case the hyphema was associated with corneal edema, anterior uveitis, localized angle recession, and commotio retinae. Neither case described retinal dialysis, tear, or detachment.

The potential for ocular injury from Nerf projectiles is greater today than in the past due to increases in potential energy density (0.22 Nm/cm<sup>2</sup>) that approaches the 0.25 Nm/cm<sup>2</sup> standard set by the American Section of the International Association for Testing Materials (ASTM