

IMAGES IN EMERGENCY MEDICINE

Neurology

An unexpected ultrasound finding in a woman who passed out

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1 | PATIENT PRESENTATION

A 35-year-old female presented to the emergency department (ED) in pulseless electrical activity arrest after suddenly losing consciousness during intercourse. In the ED, return of spontaneous circulation was obtained but the patient remained obtunded. Point-of-care ocular ultrasounds were obtained to evaluate for optic nerve sheath swelling as an acute intracranial process was highly suspected. Bilateral ultrasounds revealed well-defined, echogenic material just anterior to the optic disk, which itself appears to be bulging into the posterior chamber (Figure 1; Video 1).

2 | DIAGNOSIS

A non-contrast computed tomography (CT) of the head confirmed the diagnosis of diffuse subarachnoid hemorrhage with intraventricular extension and also visualized the hyperdense material in the posterior globes that were seen on bedside sonography (Figures 2 and 3). This patient's ocular ultrasounds had sonographic findings consistent with Terson syndrome, which is the presence of intraocular hemorrhage secondary to intracranial hemorrhage or traumatic brain injury. Roughly 15% of patients with intracranial hemorrhage will have associated Terson syndrome, and it is often undiagnosed for months after initial neurological injury and can result in permanent changes in vision.¹ It typically develops within a few hours of the initial insult, but in some cases can occur days to weeks later. The pathophysiology of Terson syndrome is still up for debate, but is likely caused by a rapid increase in intracranial pressure resulting in retinal venules rupturing or from direct blood communication from the brain to the orbit through the optic nerve sheath.^{2,3} The gold standard for diagnosing Terson syndrome is through fundoscopy, but if direct visualization is not possible,

the next best way to make the diagnosis is through ultrasound, followed by CT.⁴ Ultrasound findings include varying degrees of hyperechoic areas in the posterior chamber. The ophthalmic prognosis for Terson



FIGURE 1 Ocular ultrasound of the left eye. A hyperechoic density (arrow) consistent with hemorrhage and clot can be seen in the posterior pole of the eye overlying the optic nerve (ON). Bulging of the optic disk, known as the crescent sign, was also noted (asterisk)

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FIGURE 2 Hyperdense material consistent with hemorrhage adjacent to the optic disks can be seen in the posterior aspect of the eyes (arrows) on this non-contrast computed tomographic image of the head

syndrome patients is often good, because the hemorrhages typically resolve on their own over several months to years.² In more severe cases, vitrectomy may be required, which still results in a favorable prognosis if caught early.⁵

DISCLAIMER

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FIGURE 3 Non-contrast computed tomographic image demonstrating this patient's diffuse subarachnoid hemorrhage

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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