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Sonographic Consensual Pupillary Reflex

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Patients suffering from severe orbital trauma are at risk for numerous complications, including orbital compartment syndromes. This can result in an afferent pupillary defect, which must be evaluated for on physical examination. Unfortunately, these at-risk patients are often challenging to examine properly due to surrounding edema. Point-of-care ultrasonography can be used as an adjunct to the standard examination in this situation. [West J Emerg Med.]

A 25-year-old male presented to the emergency department after being assaulted outside of a bar by a bare-fisted assailant resulting in significant head trauma and right periorbital swelling and pain. On physical examination, he was unable to open his eye and his ability to execute extraocular movements was uncertain. There was marked periorbital swelling and ecchymosis preventing adequate visualization of the pupil.

Point-of-care ultrasonography was employed—given that a pupillary examination, assessment for entrapment, and evaluation for retinal integrity are fundamental in the evaluation of ocular trauma. A large amount of ultrasound gel was placed over the closed, affected eyelid, and the pupil was then visualized by having the patient look down while a high-resolution linear array ultrasound transducer (Sonosite M-Turbo with L25x 13-6MHz transducer, Sonosite, Bothell, WA) was directed transversely across the superior-most portion of the orbit and aiming caudally. A light was shone in the unaffected eye to perform a sonographic consensual pupillary reflex assessment, which as shown in the figure, was normal.

The consensual pupillary reflex assesses the integrity of the retina, optic nerve, portion of the midbrain, and the oculomotor nerve in one examination maneuver.¹ Abnormalities of this reflex arc assist in the rapid diagnosis of intracranial hemorrhage, retrobulbar hematoma and other emergent conditions.² We describe a novel technique for performing this physical examination maneuver that is useful for patients with orbital edema, injury, or pain that limits proper examination otherwise.

Video. Sonography of pupillary constriction.

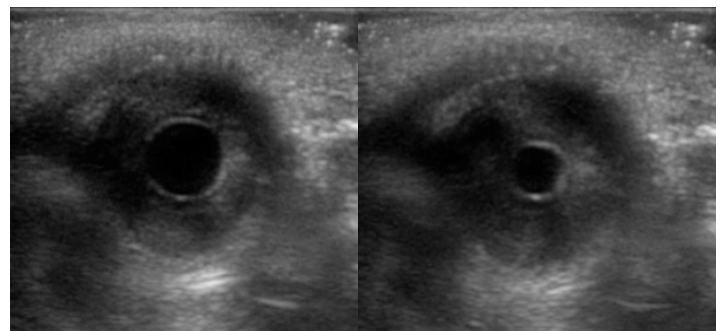


Figure. B-mode view of pupil without light administration (left). B-mode view of pupil during light administration (right).

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