The ''guitar pick'' sign: a novel sign of retrobulbar hemorrhage

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ABSTRACT

Retrobulbar hemorrhage is a rare complication of blunt ocular trauma. Without prompt intervention, permanent reduction in visual acuity can develop in as little as 90 minutes. We report a novel bedside ultrasound finding of conical deformation of the posterior ocular globe: the ''guitar pick'' sign. In our elderly patient, the ocular globe shape normalized post–lateral canthotomy and inferior cantholysis. Identifying this sonographic finding may add to the clinical examination when deciding whether to perform decompression.

RÉSUMÉ

Une hémorragie rétrobulbaire est une complication rare d'un traumatisme oculaire pénétrant. Si l'on n'intervient pas rapidement, une réduction permanente de l'acuité visuelle peut se produire en aussi peu que 90 minutes. Nous présentons un nouveau cas d'échographie au chevet du patient présentant une déformation conique du segment postérieur du globe oculaire que nous avons baptisé le signe du « pic de guitare ». Chez notre sujet âgé, le globe oculaire a repris sa forme normale après une canthotomie latérale et une cantholyse inférieure. L'utilisation de l'échographie pour identifier ce signe peut constituer un outil complémentaire à l'examen clinique visant à déterminer l'indication de décompression.

Keywords: bedside ultrasonography, guitar pick sign, retrobulbar hemorrhage, ultrasonography

Traumatic retrobulbar hemorrhage is a true sight-threatening emergency. Without prompt intervention, permanent reduction in visual acuity can develop in as little as 90 minutes.[1] In the trauma patient, identifying retrobulbar hemorrhage can be very challenging, especially in the context of extensive facial trauma, leading to delays in performing a lateral canthotomy and inferior cantholysis. We report the bedside use of ultrasonography in the emergency department (ED) to support the diagnosis of traumatic retrobulbar hemorrhage and describe a novel ultrasonographic sign for this condition.

CASE REPORT

An 85-year-old female presented to the ED by ambulance after sustaining a fall from standing height in the hallway of her nursing home. Paramedics reported no loss of consciousness and no hemodynamic instability. The patient complained of diffuse pain to the left side of her face, inability to open her left eye, and severe discomfort to her visibly deformed left wrist. The patient was initially assessed at a peripheral hospital and transferred emergently to our regional trauma centre for a suspected retrobulbar hemorrhage, based on clinical and computed tomographic (CT) findings.

Physical examination on arrival revealed a very large facial hematoma extending from the left supraorbital rim inferiorly to the mandible. The left eyelid was severely swollen, and the palpebral fissue was only 2 mm wide. Intraocular pressure (IOP) was between 70 and 80 mm Hg (Tono-Pen Avia, Reichert Inc., Depew, NY) on three consecutive measurements performed directly on the cornea.

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Immediately prior to lateral canthotomy and inferior cantholysis, sterile ultrasound conductive gel was gently applied over the patient's left eyelid and her eye was imaged using a high-frequency (13-5 MHz) broadband linear transducer. Ultrasound imaging revealed a conical deformation of the posterior aspect of the ocular globe (Figure 1), consistent with the CT images (Figure 2) obtained at the referring hospital.

Lateral canthotomy and inferior cantholysis were technically very difficult and were performed with the help of the ophthalmology team. Immediately post-procedure, the IOP decreased to 50 mm Hg. A repeat ocular sonogram demonstrated normalization of the shape of the posterior globe (Figure 3).

Given the persistently elevated IOP, the ophthalmology team recommended an emergent surgical decompression in the operating room, but the patient and her family declined, given her advanced age and medical comorbidities. Vision was ultimately lost in the affected eye, but the patient made an otherwise unremarkable functional recovery.

DISCUSSION

Retrobulbar hemorrhage is a rare complication of blunt ocular trauma, occurring in 0.3% of orbital wall fractures.[2] The clinical findings of exophthalmos, restriction of extraocular movements, and decreased visual acuity are of limited value when severe swelling prevents eyelid retraction.[3] Similarly, measurement of IOP or evaluation for an afferent pupillary defect can be inaccurate, technically challenging, or impossible in such a situation. In addition, confounding injuries or medical comorbidities may cause patients to minimize ocular complaints.

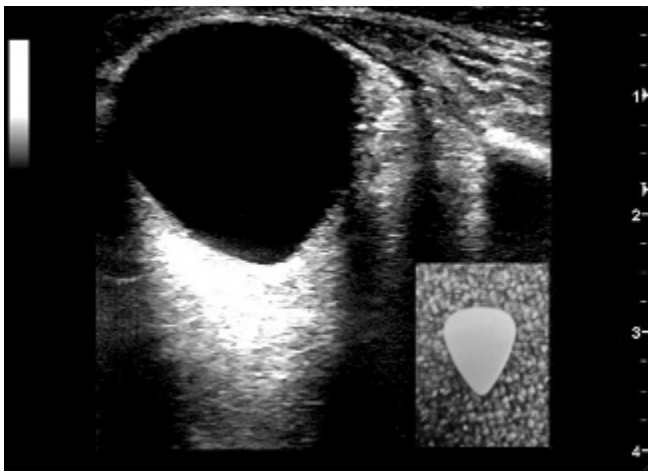

Figure 1. Ultrasound image demonstrating conical deformation of the left posterior ocular globe, mimicking the shape of a guitar pick (*insert*).

Figure 2. Computed tomographic scan of the orbits demonstrating conical deformation of the left posterior ocular globe.

The role of bedside ultrasonography in the diagnosis and management of traumatic retrobulbar hemorrhage remains to be defined. Review of the literature identified reports listing ultrasonography as a diagnostic entity for retrobulbar hemorrhage, but no

Figure 3. Normalization of the posterior ocular globe shape on a sonogram following lateral canthotomy and inferior cantholysis.

sonographic criteria were described for the diagnosis.[4] To the best of our knowledge, this is the first report of conical deformation of the posterior ocular globe by ultrasonography, a new finding we are naming the "guitar pick" sign. This conical deformation corresponds to the appearance on CT, and its disappearance after the lateral canthotomy and inferior cantholysis strongly suggests that this finding is caused by retrobulbar hemorrhage deforming the globe. The guitar pick sign, when present and in the right clinical context, may be an adjunct to the physical examination. The differential diagnosis of posterior deformation of the globe should include retrobulbar hemorrhage, globe rupture, and posterior staphyloma, a bulging of the sclera at the posterior pole. Further study should be performed to clarify the sonographic findings in retrobulbar hemorrhage.

LIMITATIONS

Although our patient had an extreme elevation of IOP, a retrobulbar hemorrhage can be present with a pressure as low as 30 mm Hg. The guitar pick sign may develop only with extreme IOP elevations. Owing to transfer delays, lateral canthotomy and inferior cantholysis could not be performed within 90 minutes of the accident. Moreover, the patient's visual outcome was poor. The guitar pick sign may manifest only after irreversible injury has occurred.

CONCLUSION

In this report, we described the use of ocular sonography as a bedside diagnostic adjunct when the history and physical examination are of limited reliability. The presence of the guitar pick sign could add to the clinical examination in the decision to perform a lateral canthotomy and inferior cantholysis.

Competing interests: None declared.

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