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We read with great interest the recent article on the imaging features of orbital compartment syndrome (OCS) published in your esteemed journal.[1] The authors have provided valuable insight into the importance of CT in evaluating OCS. However, we would like to emphasize the potential benefits of favoring ocular ultrasound (US) over CT, especially in emergency settings, because OCS is an emergent, traumatic complication that requires rapid detection and intervention.

Ocular US is a noninvasive, real-time imaging technique that has distinct advantages over CT in emergency settings. First, it poses no risk of radiation exposure, making it safer for patients, particularly in cases in which multiple imaging studies may be needed. Second, its portability allows bedside assessment in emergency departments, facilitating rapid diagnosis and management of OCS without having to transport the patient to a radiology suite.[2] This can be crucial in time-sensitive situations such as OCS, in which delays in diagnosis and treatment can result in permanent vision loss. B-scan US can effectively evaluate the globe, extraocular muscles, optic nerve, and other soft-tissue structures within the orbit.[2] It can detect key findings related to OCS, such as retrobulbar hemorrhage, a leading cause of OCS, and subperiosteal hematomas, which may contribute to the condition.

Ocular US serves as an essential diagnostic tool in detecting critical signs associated with OCS. The guitar pick sign, a notable finding in OCS cases, corresponds to globe tenting observed in CT scans.[2] Globe tenting occurs when the shape of the eye becomes distorted due to increased intraorbital pressure, causing it to resemble the triangular form of a guitar pick. This eponymous sign when detected on ocular US indicates elevated pressure within the orbit and the potential presence of OCS. Swift identification of the "guitar pick" sign is vital for timely intervention and the prevention of possible vision loss. In addition to identifying the "guitar pick" sign, ocular US can also effectively diagnose other OCS-related findings. For instance, it can determine the presence of proptosis and a smaller superior ophthalmic vein in the affected orbit,[3] which may be a sign of altered blood flow due to increased intraorbital pressure. Furthermore, retinal ischemia, a serious consequence of OCS, can be diagnosed with color flow Doppler and pulsed wave Doppler.[2] These diagnostic capabilities make ocular US an indispensable instrument in the evaluation and management of OCS. During emergency situations, patients with local orbital trauma can opt for US due to its faster assessment process in comparison with CT scans, which involve multiple steps like image acquisition and consulting a radiologist, among others. However, CT scans are still the preferred method for evaluating patients with multiple injuries, given their superior capability to assess fractures, intracranial hemorrhages, and other conditions.

Another limitation of ocular US is its use in cases of globe rupture. In some situations, globe rupture can be easily identified clinically, while in others, it may be more difficult to diagnose and may necessitate CT or US for verification. Although ocular US is typically seen as a relative contraindication because of globe rupture, it can still be valuable. By minimizing changes in intraocular pressure (IOP) and using a plastic shield, the risk of increased IOP can be further reduced. A clinical review of 8 globe rupture cases showed that US had a 100% sensitivity and 99% specificity in detecting the condition.[4]

Despite these limitations, US offers valuable diagnostic insight into ocular conditions beyond trauma evaluation. US not only serves as a diagnostic tool for OCS-related findings but also proves useful following orbital decompression procedures. By assessing the postdecompression status of the eye, ocular US can help identify other potential conditions, such as retinal detachment, vitreous detachment, or vitreous hemorrhage.[2] This additional utility ensures that clinicians can provide comprehensive care for patients, effectively addressing any complications that may arise after orbital decompression surgery.

In conclusion, US might demonstrate imaging characteristics comparable with those of CT scans in diagnosing OCS. To facilitate faster and more accurate diagnoses in emergency departments, further research and clinical studies could help establish the role of US in diagnosing and monitoring patients with OCS.

Disclosure forms provided by the authors are available with the full text and PDF of this article at www.ajnr.org.

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