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Letter to Editor

Saved by the bell: Point of care ocular ultrasound in raised intracranial pressure

Shweta S Naik[1], Mathangi Krishnakumar[1], Mouleeswaran Sundaram[1], Amit Goyal[2]

[1]Department of Neuroanaesthesia and Neurocritical Care, National Institute of Mental Health and Neurosciences, Bengaluru, Karnataka, [2]Department of Neuroanaesthesia and Neurocritical Care, Medanta-The Medicity, Gurugram, Haryana, India.

Dear Editor,

A 24-year-old woman presented to our outpatient clinic with complaints of decreased hearing in the left ear for the past 6 months and headache for the past 3 months. On evaluation, she was diagnosed with the left vestibular schwannoma with hydrocephalus. Patient did not have any visual disturbance and fundoscopy evaluation by ophthalmologist was normal. She was planned for decompression of lesion in the right lateral decubitus position. The induction of anesthesia, positioning of the patient, and decompression of the lesion were uneventful until she developed sudden brain bulge before dural closure. Additional dose of mannitol was given and skin closure was done. Muscle relaxant was reversed, but there was no awakening. Arterial blood gas, hemodynamic parameters, and blood sugar levels were within normal limits. Four channel frontal electroencephalogram did not reveal any epileptiform discharges. The treating anesthesiologist did point-of-care ultrasound (POCUS) ocular ultrasound. A 7.5 MHz linear array probe of Sonosite 180 plus ultrasound machine with configuration set to small parts was placed over the closed eyes in axial plane.

POCUS revealed features of papilledema (optic disc elevation and an optic nerve sheath diameter (ONSD) of 6.5 mm in the left eye and 5.7 mm in the right eye). [Figure 1a and b][1] Intracerebral or extradural hemorrhage was suspected and an emergency computerized tomography (CT) scan done revealed diffuse cerebral edema.

The patient was shifted to intensive care unit (ICU), ventilated, and sedated with an infusion of propofol. In addition, as hyperosmolar therapy and antiepileptic were given. On POD 1, ONSD was 5.2 mm in the left eye and 4.7 mm in the right eye [Figure 1c and d]. She was weaned off sedation and patient was obeying commands with no motor deficits. She was extubated and discharged from ICU. Subsequent CT scan on 4th POD showed resolution of cerebral edema with open basal cisterns; however, patient was not cooperative for ocular ultrasound. The patient underwent a fundoscopic examination after 1 month at follow-up, which revealed a pale disc in the left eye but no elevation and the right eye was normal. Her visual acuity was normal in both the eyes.

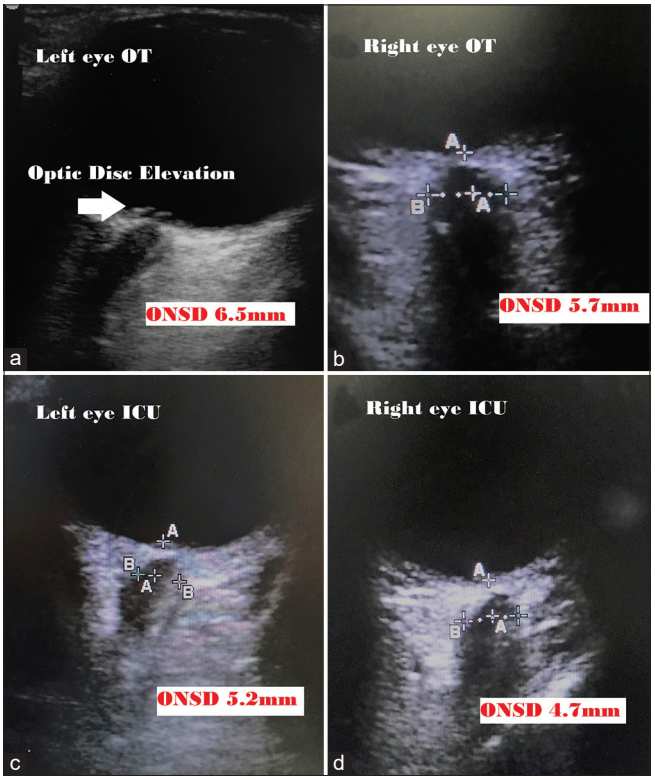

Figure 1: (Arrow in figure 1a- Papilledema) Point-of-care ultrasound ocular ultrasound showing changes between OT (a,b) and ICU (c,d) measurement. Point A – 3 mm behind the globe. Point B – optic nerve sheath diameter.

***Corresponding author:** Mathangi Krishnakumar, Department of Neuroanaesthesia and Neurocritical Care, National Institute of Mental Health and Neurosciences, Bengaluru, Karnataka, India. mathz89@gmail.com

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POCUS can identify signs of increased intracranial pressure (ICP) such as optic disc elevation and increase in ONSD measurements.[1] Papilledema is caused by swelling of the optic disc due to raised ICP. Visual loss is a potential morbidity of untreated papilledema.[2]

The sensitivity and specificity of the detection of optic disc elevation for diagnosis of papilledema with ocular ultrasound are 82% and 76%, respectively. ONSD has sensitivity and specificity of 88% and 93%, respectively, to diagnose ICP <20 cm H_2O.[3,4]

Our patient made a complete recovery with no deficits or visual disturbances. This emphasizes that a timely detection of raised ICP using POCUS is pertinent to initiate timely management, which will improve outcome. Availability of pre-operative POCUS findings would have aided in monitoring the trend of change, which is important to identify false positives.

POCUS is an effective and repeatable non-invasive method, which can be used to monitor progression or resolution of features of raised ICP. This can reduce the need for repeating CT scan in a resource limited setting.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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