

## Intraventricular Hemorrhage: A Rare Complication Secondary to Traumatic Lumbar Puncture

Sir,

A 64-year-old woman with a past medical history of sarcoidosis, chronic renal disease, and recently diagnosed acute myeloid leukemia status post first cycle of chemotherapy treatment presented with neutropenic fever and altered mental status. Computed tomography (CT) of the brain on admission was unremarkable. Lumbar puncture (LP) was performed to rule out the central nervous system infection followed by initiation of empiric antibiotics. Due to lack of improvement in patient's mental status, follow-up CT and magnetic resonance imaging (MRI) of the brain were performed 5 days after the LP and revealed the presence of intraventricular hemorrhage (IVH) involving bilateral occipital horns [Figure 1a and b]. MRI angiogram was negative for any vascular anomaly. Given patient's poor neurological exam (Glasgow Coma Scale 4T) and presence of IVH, an external ventricular drain (EVD) was placed for intracranial pressure monitoring with an opening pressure of 16 cm H<sub>2</sub>O. Subsequent MRI of lumbar spine demonstrated early subacute spinal subdural hematoma [Figure 1c and d] consistent with the timing of the LP.

Intracranial hemorrhage is an uncommon but well-recognized complication of LP.<sup>[1]</sup> Subdural or epidural hematomas accounts for the majority of intracranial hemorrhages following LP, possibly due to intracranial

hypotension.<sup>[2]</sup> The occurrence of an IVH as a complication of LP is extremely rare with only a few reported cases in the literature.<sup>[1-5]</sup> Although the exact mechanism is not known given the rarity of the complication, possible etiopathogenesis may involve diffusion of blood into the ventricular system from the thecal sac after a traumatic tap while the patient is in the supine position<sup>[1]</sup> as was seen in our case. Even though sudden alteration in transmural pressure changes across the ventricular walls may also account for the development of IVH following an LP, a low opening pressure during EVD placement argues against that possibility. Irrespective of the exact pathophysiology, the present highlights the fact that IVH can occur after LP and may result in untoward clinical consequences with the need of follow-up imaging and further treatment depending on the severity of the IVH.

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### Conflicts of interest

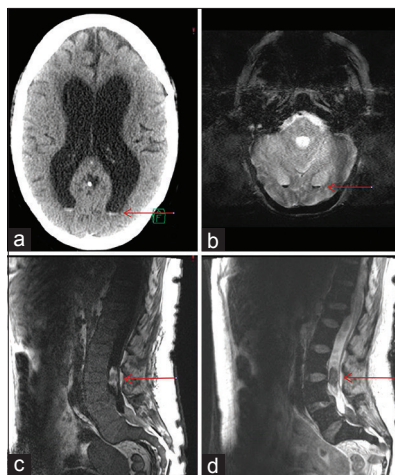
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**Figure 1:** Computed tomography (a) and gradient-echo magnetic resonance imaging sequence (b) of the brain demonstrating intraventricular hemorrhage involving bilateral occipital horns; T1-weighted (c) and T2-weighted (d) magnetic resonance imaging of lumbar spine demonstrating early subacute spinal subdural hematoma

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