

Learning Objectives

- Invasive Cryptococcosis is a rare opportunistic infection with significant morbidity and mortality in organ transplant recipients.
- Therapeutic lumbar punctures (LP) decrease mortality irrespective of baseline opening pressures.
- Optic nerve sheath diameter assessment can potentially be used to reduce need for frequent LPs.

Case description

A 69-year-old man presented to the emergency department after unwitnessed fall and was found to have cryptococcal meningitis requiring admission to the intensive care unit.

Past medical history: Orthotopic liver transplantation, paroxysmal atrial fibrillation, pulmonary embolism, and coronary artery disease.

Physical examination: Vital signs SpO₂ 96% on room air, BP 116/60 mmHg, HR 83 bpm, and RR 18 bpm. Lethargic, minimally responsive to physical stimuli, scattered ecchymosis over bilateral upper and lower extremities.

Diagnosics and Management:

- **Brain CT:** Worsening ventriculomegaly and communicating hydrocephalus. See Figure 1.
- **Lumbar punctures:** *Cryptococcus neoformans* positive cerebrospinal fluid cultures, normal initial opening pressure (OP) 14 (normal < 25 cm H₂O), however due to lack of clinical improvement repeat LPs performed with OP increasing to 36 cm H₂O.
- **Ocular ultrasound:** Performed daily to assess intracranial pressures (ICP), ranged from 6-8 mm (normal < 5 mm). See Figure 2.
- **Antibiotics:** Treated with Amphotericin and Flucytosine for three weeks before switching to Fluconazole.
- Ventriculopleural (VP) shunt placed due worsening hydrocephalus.

Figures

Figure 1. Brain CT demonstrating worsening ventriculomegaly and communicating hydrocephalus

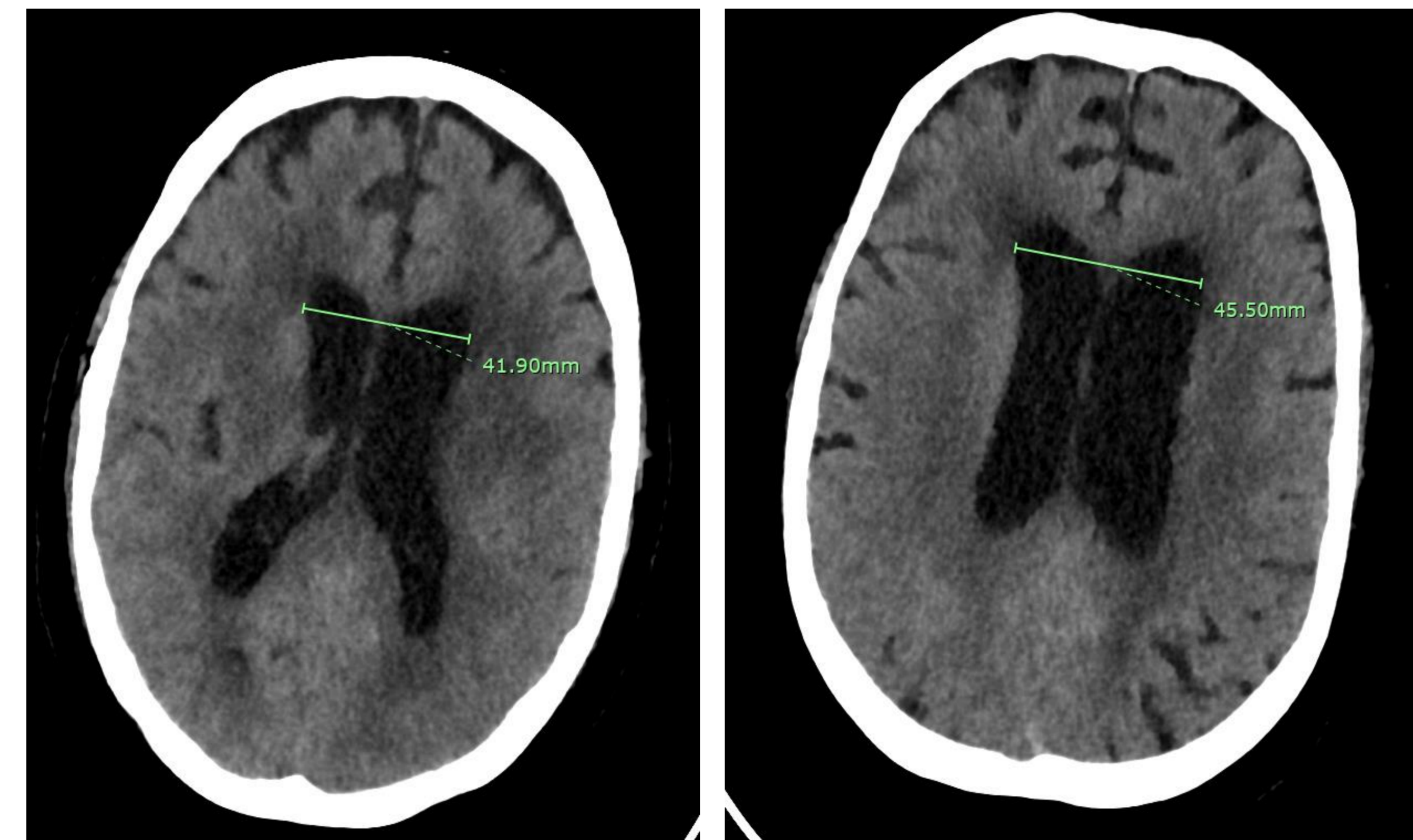


Figure 2. Bedside ultrasound with optic nerve sheath diameter 6 mm (normal < 5 mm) suggestive of elevated ICP.



Follow-up

- Patient was extubated and marginal improvement in neurological status.
- After six weeks of inpatient care, patient was discharged to an acute rehabilitation facility to continue neurological recovery.

Discussion

- Cryptococcal meningitis has a high mortality risk (nearly 50%) in immunocompromised patients.
- *C. neoformans* tend to obstruct the normal CSF flow leading to increased ICP and hydrocephalus.
- Current professional guidelines recommend serial LPs when baseline opening pressure > 25 cm H₂O.
- In the presented case, serial LPs were performed despite normal baseline opening pressure due to lack of clinical improvement which demonstrated progressive worsening opening pressures ultimately requiring VP shunt placement.
- Furthermore, daily bedside ocular ultrasounds were performed to measure optic nerve sheath diameter as a non-invasive assessment for intracranial pressure and can be used to avoid unnecessary LPs.
- Studies have demonstrated mortality benefit in serial therapeutic LPs for Cryptococcal meningitis in HIV patients but not transplant patients.
- Investigation role of serial LPs in management of ICP in cryptococcal meningitis in post transplant patient is warranted.

References

1. John R. Perfect and others, Clinical Practice Guidelines for the Management of Cryptococcal Disease: 2010 Update by the Infectious Diseases Society of America, Clinical Infectious Diseases, Volume 50, Issue 3, 1 February 2010, Pages 291–322, <https://doi.org/10.1086/6498583>.
2. Rolfes MA, Hullsiek KH, et al. The effect of therapeutic lumbar punctures on acute mortality from cryptococcal meningitis. Clin Infect Dis. 2014 Dec 1;59(11):1607-14. doi: 10.1093/cid/ciu596. PMID: 25057102; PMCID: PMC4441057
3. World Health Organization. Guidelines for diagnosing, preventing and managing cryptococcal disease among adults, adolescents and children living with HIV. 2022. <https://www.who.int/publications/i/item/9789240052178>.