

Unilateral Cranial Nerve Six Palsy following Epidural Analgesia for Uncomplicated Pregnancy Treated with Epidural Blood Patch

Thomas Li, DO; Shengping Zou, MD; Steven Calvino, MD

NYU Langone Health

Department of Anesthesiology, Perioperative Care, and Pain Medicine

Introduction

Epidural analgesia is a standard practice in managing pain during labor and delivery. Post-dural puncture headache (PDPH) is a common complication from accidental dural puncture during the procedure. The cerebrospinal fluid (CSF) leakage may cause brain parenchymal sagging, which further stresses the bridging veins and cranial nerves (CN). The abducens nerve (CN VI) is the most commonly affected, perhaps due to its long, fixed course as it passes through the subarachnoid space and an intradural space called Dorello's canal. Epidural blood patch is a common interventional treatment for PDPH. As in this case, this intervention could also be considered as a potential treatment for CN VI palsy caused by intracranial hypotension from CSF leak.

Case Description

38 year old G1P1 female was transferred to our hospital with postural headaches and diplopia for one week after uncomplicated vaginal delivery with epidural catheter. Her headaches initially resolved with Fioricet, and she was discharged home. She returned to the emergency room three days later with recurrence of headaches and new diplopia. Her left eye exhibited limited abduction and strabismus indicative of CN VI palsy. MRI Brain without contrast demonstrated pituitary enlargement measuring 1.2 cm in craniocaudal dimension, which prompted the transfer. Under neurosurgery, patient received MRI Pituitary with/without contrast, which showed pituitary gland anterior lobe enlargement with enhancement, uniform pachymeningeal enhancement and engorgement of dural venous sinuses, possibly due to intracranial hypotension; MRI total spine with/without contrast demonstrated thin epidural fluid in lower lumbar spine and interspinous space. Although her positional headache was subsiding, her major complaint was visual impairment. Given the evidence of CSF leak as the likely cause of CN VI palsy and after discussion with neurosurgery, an epidural blood patch was performed at bedside. Following the procedure, she reported resolution of post-dural puncture headache and improvement in her visual symptoms.

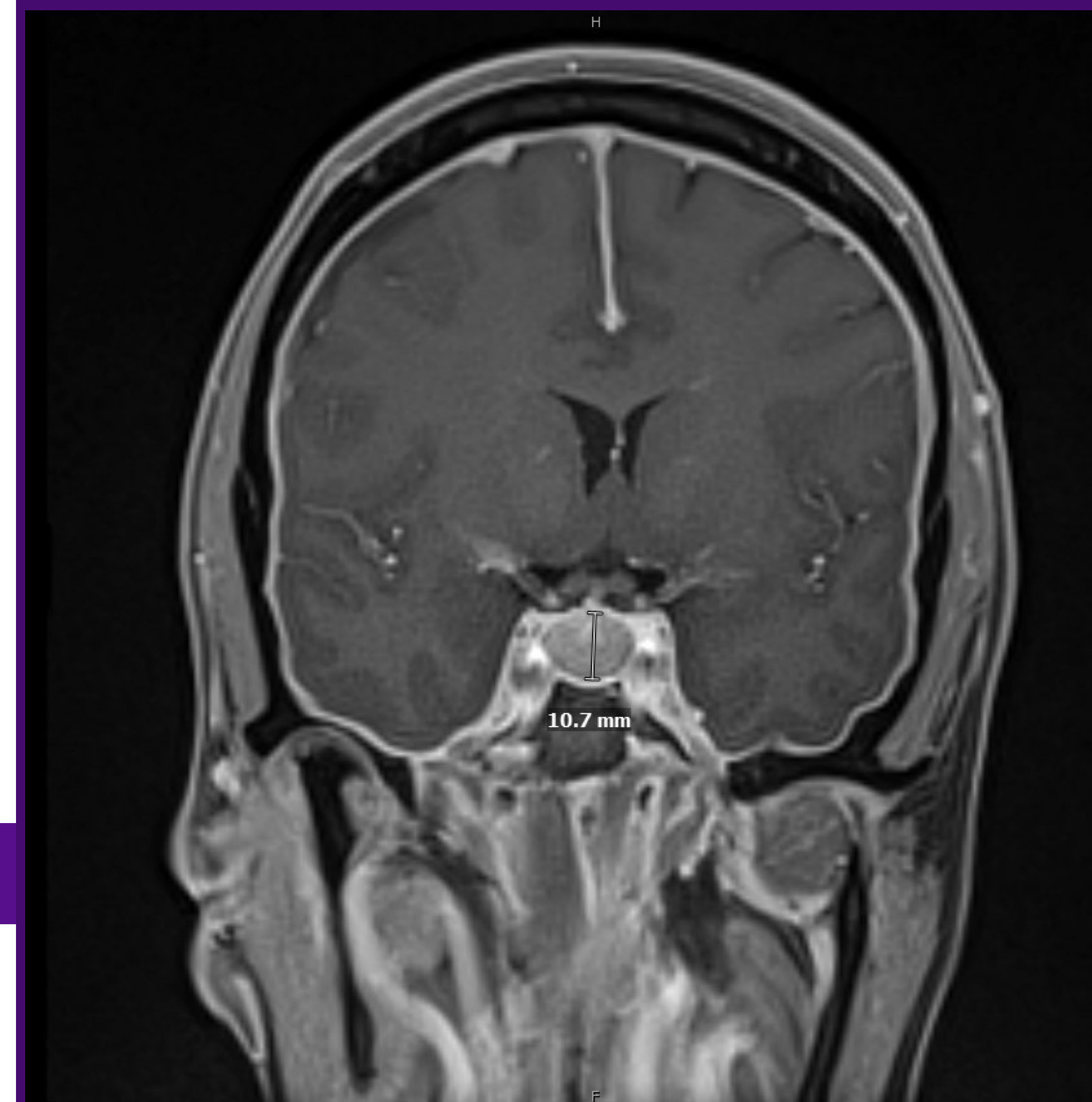


Fig. MRI Pituitary with and without contrast demonstrating pituitary enlargement with enhancement, pachymeningeal enhancement, engorgement of dural venous sinuses

References

1. Adakli, B., Ozgencil, E., Ozunlu, G. N., & Aybar, R. S. (2014). Unilateral sixth cranial nerve palsy following C/S as a complication of spinal anaesthesia. *Turkish Journal of Anaesthesiology and Reanimation*, 42(3), 151–153.
2. Kim, Y. A., Yoon, D. M., & Yoon, K. B. (2012). Epidural Blood Patch for the Treatment of Abducens Nerve Palsy due to Spontaneous Intracranial Hypotension -A Case Report-. *The Korean Journal of Pain*, 25(2), 112–115.
3. Olivarez, J., Gutovitz, S., & Arnold, C. (2023). Cranial Nerve Six Palsy After Vaginal Delivery with Epidural Anesthesia: A Case Report. *Journal of Emergency Medicine*, 66(3), e338–e340.
4. Tiak, H. S., & Zahari, M. (2023). Isolated abducens nerve palsy following spinal anesthesia. *Cureus*.

Discussion

The incidence of CN VI palsy after neuraxial anesthesia varies from 1:300 to 1:8000. Due to its long intracranial course, CN VI is especially vulnerable to traction fractures from caudal descension of the brain from intracranial hypotension. CN VI palsy can be bilateral or unilateral after lumbar puncture (LP), and typically emerges around 4-14 days after the procedure. Intracranial hypotension from CSF leak may also cause pituitary gland enlargement due to engorgement of venous plexuses near the gland. Uniform dural enhancement may also be seen on radiographic imaging, as seen in our case. Neoplasms, inflammatory or infiltrative lesions, infections, and vascular diseases should be considered first when confronted with these findings.

Many studies have described risk factors associated with PDPH following LP, including young age and female gender. The most common interventional treatment for PDPH is epidural blood patch (EBP). From previous studies, EBP has been described to completely improve PDPH but not entirely resolve cranial nerve (CN) function. However, EBP produces better results within 24 hours of CN symptom onset. Although 80% of cases demonstrate spontaneous resolution between 4 weeks to 4 months post-procedure, early EBP should be considered as it can reduce the downward displacement of CN VI and prevent development of persistent palsy.

Conclusions

Abducens nerve palsy is a rare complication that may develop following epidural analgesia due to accidental lumbar puncture, resulting in symptoms of diplopia and vertigo. Epidural blood patch, usually used to treat post-dural puncture headaches, should also be considered in interventional treatment of ocular palsy symptoms.