Background

Intracranial hypotension “brain sag” leading to extreme changes in neurological exam remains an uncommon event seen during neurosurgical training. Angiographic findings of brain sag after aneurysm clipping with pre-operative placement of a lumbar drain has been described in the literature. We suggest there is diagnostic utility of angiography in the setting of a neurologically declining patient with suspicion of CSF hypovolemia.

Case

A 47-year-old female with neurofibromatosis type 2 (NF-2), bilateral acoustic neuromas with resultant deafness, multiple intracranial tumors requiring resection, and focal epilepsy presented with urinary incontinence and gait/balance difficulty. The patient was found to have a T3 intradural extramedullary tumor, so thoracic laminectomies were performed at T3 and T4 for excision of the lesion.

On post-operative day nine, she presented with acute nausea, vomiting and decreased level of consciousness with a Computed Tomography (CT) head demonstrating acute downward herniation with effaced basal cisterns. The imaging findings in conjunction with her clinical presentation was initially concerning for intracranial hypertension. Rapid improvement in her clinical exam with trendelenburg positioning and subsequent documented normal ICPS after placing an external ventricular drain led to the diagnosis of intracranial hypotension. MRI total spine was unrevealing for a CSF leak site and an angiogram revealed significant kinking of the basilar artery (Figure 1-B).

Based on clinical concern for CSF hypovolemia, a CT myelogram was performed, which did in fact show a ventral leak from the prior thoracic surgery. She underwent re-exploration of the thoracic wound, and a ventral durotomy was noted and repaired.

Conclusion

This case highlights the importance of differentiating intracranial hypotension from severe intracranial hypotension which although can have similar presentations have dramatically different treatment algorithms. Here, we report a unique case of a patient with CSF leak after a thoracic intradural tumor resection with downward herniation found to have a kinked basilar artery on angiography.

Figure Legend

Preoperative imaging. Sagittal CTA slice (A) demonstrating basilar artery prior to CSF hypotension and cerebral angiogram (B) during CSF hypotension demonstrating cobra sign with acute kink in the basilar artery with subsequent sagittal CTA slice (C) post resolution of CSF hypotension depicting interval straightening of the basilar artery.