3-2-2018

Rare Case of Diffuse Spinal Arachnoiditis Following a Complicated Vertebral Artery Dissection

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Recommended Citation

Atallah, MD, Elias; Dang, Sophia; Rahm, Sage; Chalouhi, MD, Nohra; Tjoumakaris, Stavropoula MD; Rosenwasswer MD, Robert H.; and Jabbour, Pascal MD, "Rare Case of Diffuse Spinal Arachnoiditis Following a Complicated Vertebral Artery Dissection" (2018). *Department of Neurosurgery Posters*. 10.

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Spinal arachnoiditis (SA) is an extremely rare and delayed complication of intracranial subarachnoid hemorrhage (SAH). SA is an inflammatory process leading to chronic fibrosis of the spinal cord. Possible pathophysiology is a two-stage development of initial inflammatory reaction secondary to SAH, followed by a "late interval phase" prior to delayed adhesive phase (i.e., SA). The clinical course can be complicated and is the cause of major morbidity.

- 25 case reports since first described by Nelson in 1943. Ours is the 26th case reported.
  - Majority of cases occur in females (86%) between ages of 22 and 69 years old.\(^9\)
  - High prediction of SA at level of thoracic spine\(^4\)
  - 1825 had SAH after aneurysm rupture.
  - 16/18 involved posterior circulation arteries: 13 PICA\(^*\), 2 PCom\(^*\)
  - Our case involves the vertebral artery (VA)
  - SA can arise anytime from 1 month to 12 years after SAH.
  - SA complications include arachnoid cysts\(^1\), syringomyelia\(^2\), and spinal cord compression (e.g. cauda equina syndrome).\(^3\)
  - Little is still known about underlying inflammatory pathways and clinical pattern.

PICTA = posterior inferior cerebellar artery, PCom = posterior communicating artery, VA = vertebral artery

Clinical Case Report

**DAY 0-1**

- 47-year-old female complains of having the "worst headache" of her life and a grade 3 SAH.
- Past medical history: benign paroxysmal positional vertigo (BPPV)
- Diffuse Subtraction Angiography (DSA):
  - Ruptured dissection/dissecting fusiform aneurysm of V4 segment of left VA
  - Intact 1.7 x 1 mm aneurysm at proximal A1 segment of left ACA
- CT scan: diffuse SAH in the basal cisterns and posterior fossa extending through the foramen magnum.
- VA dissection was treated with flow diversion using pipeline embolization (PE).

**TWO WEEKS LATER**

- Patient ruptured her A1 ACA aneurysm and re-ruptured/re-bled from her VA dissection.
- A1 ACA aneurysm was treated with PE. VA dissection was re-treated with second PE.
- Hospital course complications:
  - Polymicrobial ventriculitis – treated with PICC-line broad spectrum antibiotics.

**SEVERAL MONTHS LATER**

- New onset of paraparesis and left-sided weakness, dizziness, positional nausea, and gait ataxia.
- MRI (Fig. A, B) showed thecal dural thickening from the cervicomedullary junction – C4 and from T5 extending circumferentially → sacrum.
- MRI (Fig. A) also showed various degrees of cord compression along inferior surface of cerebellum, anteriorly within cervical and thoracic canals, and T4-T6 syrinx with diffuse spinal edema.
- Ventricular shunt and decompression surgery of T5-T7 were performed.

**LATEST FOLLOW-UP**

- Patient had full strength with moderate gait instability and was weaning off of her thoracolumbosacral orthosis back brace. She currently ambulates with a cane.