

A Rare Case of Hypoglossal Nerve Palsy

Nathan Chan MB BChir MRCS

Introduction

Dural arteriovenous fistulas (DAVFs) are shunts connecting dural arteries to dural venous sinuses, meningeal veins or cortical veins. They account for 10-15% of intracranial arteriovenous malformations. Hypoglossal canal DAVFs (HCDAVFs) account for 3-4% of DAVFs and involve the anterior condylar confluence (ACC) and / or anterior condylar vein (ACV)¹.

Case

Ms Y, a 57 year old lady presented with a 1 week history of tongue deviation to the right. The history of presenting complaint also included minor dysarthria, dysphagia for solids and liquids as well as a 2-3 month history of pulsatile tinnitus affecting the right ear. Examination of cranial and peripheral nerves revealed a right XII nerve lower motor neuron lesion (Fig. 1).

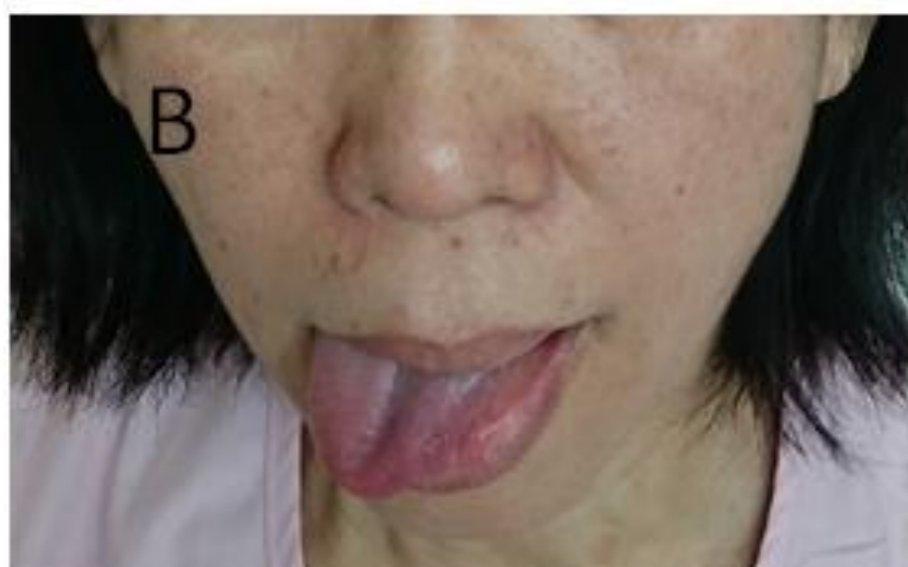
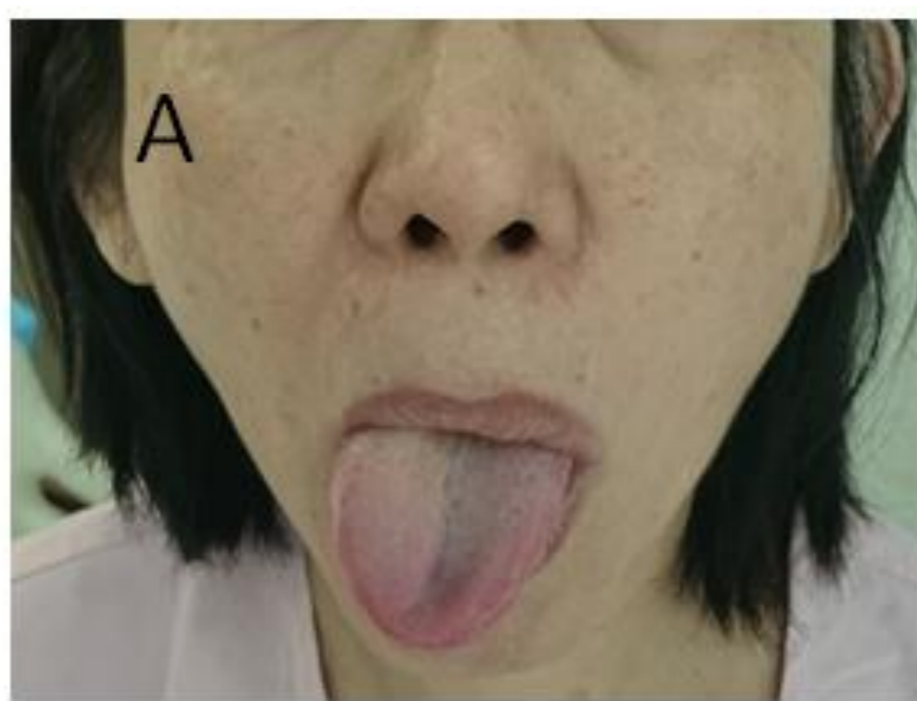


Fig 1 – Ms Y's tongue position when instructed to protrude her tongue (A), images below illustrate extent of lateral movement to the right (B) and left (C).

MRI / MRA demonstrated a DAVF in the region of the right hypoglossal canal (Fig. 2). She underwent a cerebral angiogram, which confirmed a hypoglossal DAVF with predominant supply from the neuro-meningeal branches of the right ascending pharyngeal artery (Fig. 3). She was counselled regarding treatment options and taught tongue exercises prior to discharge. A month later she had a repeat angiogram which further characterized the venous drainage of the HCDAVF. She has been able to cope with her symptoms and remains on active surveillance.

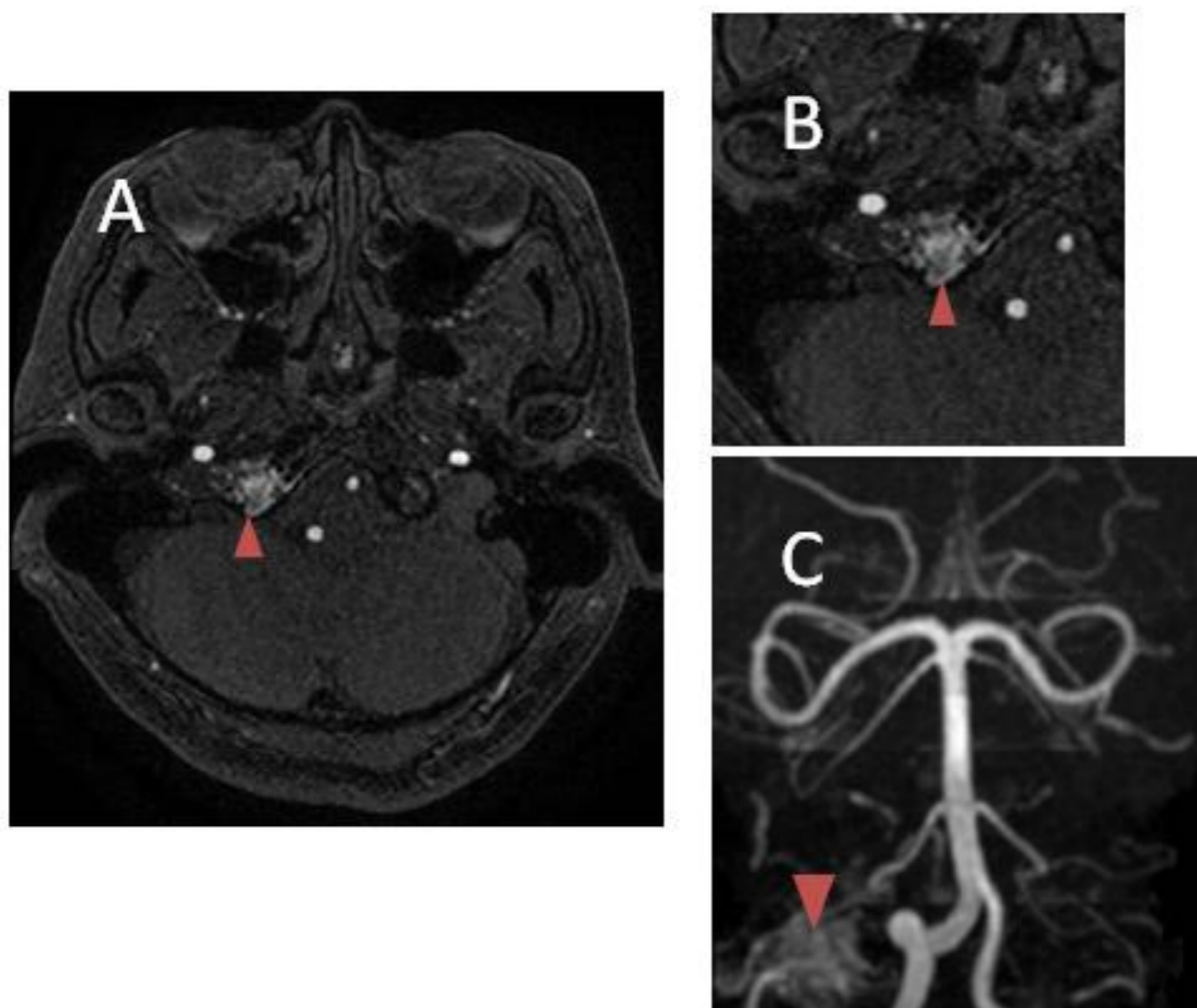


Fig 2 – MRI / MRA axial (A), magnified view (B) and 3D reconstruction of MRA (C), showing the HCDAVF (red arrowhead)

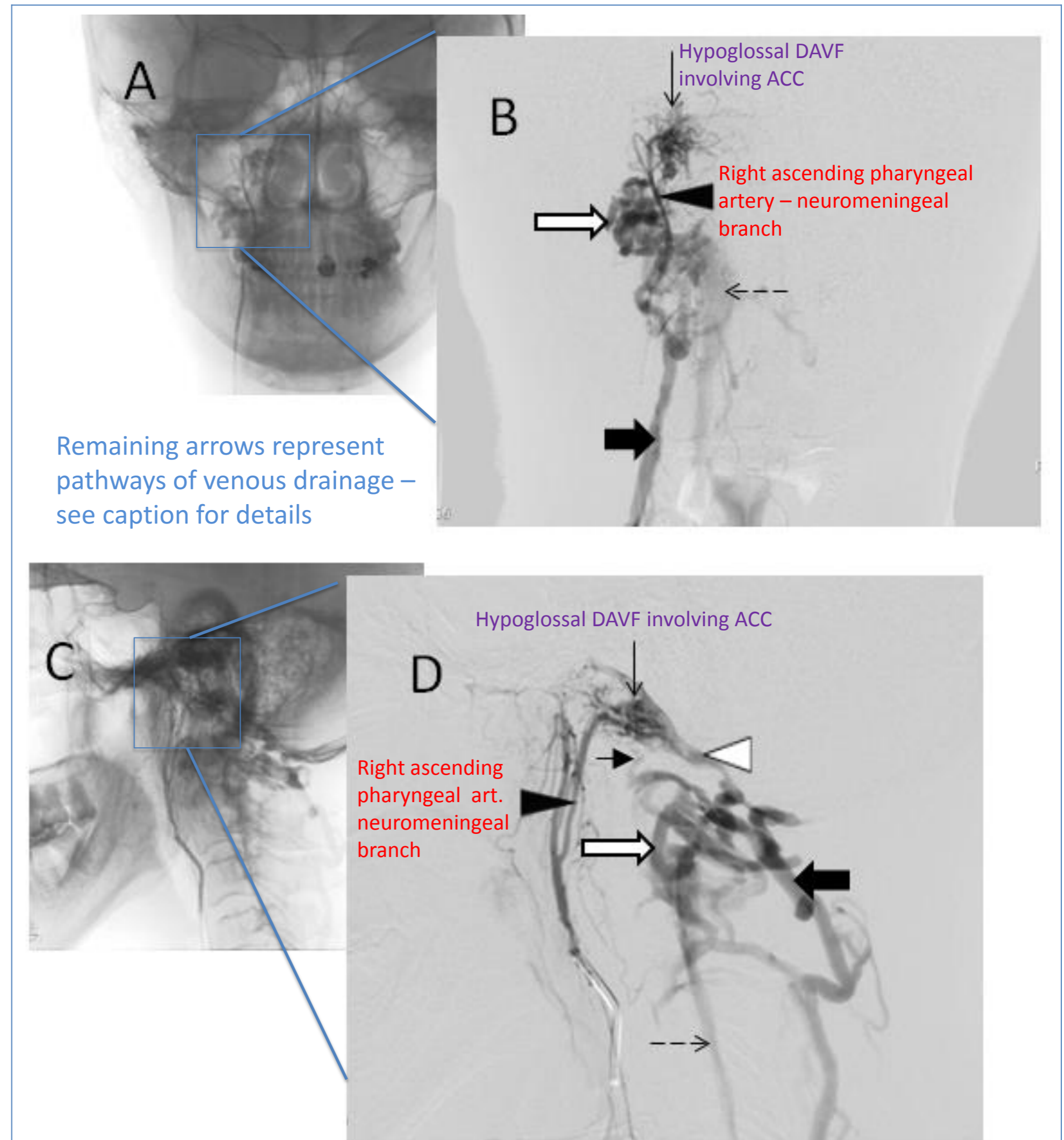


Fig 3 – Right ascending pharyngeal artery injection AP (B), with skull overlay (A) and lateral views (D) with skull overlay (C) demonstrate a HCDAVF (←), arising from the meningeal branch of the ascending pharyngeal artery (▶), draining via the anterior condylar vein (◁) and lateral condylar veins (►) into the vertebral artery venous plexus (⇔), the anterior internal vertebral venous plexus (→) and the deep cervical veins (←).

Inspirational aspects of the case

1. Highlighted how different modalities of imaging contribute to diagnosis
 - CT, MRI / MRA, catheter angiogram
2. Demonstrated the utility of imaging in diagnosis and staging of pathology
 - Diagnosis would have been impossible without imaging
 - The Cognard classification of staging is used for DAVFs
3. Illustrated the role of radiology in monitoring disease
 - 2 further angiograms have not shown a change in size of the fistula
4. Busted the myth that there is no patient contact or continuity of care in radiology
 - Ms Y has been seen every 3 months since discharge in Oct 2015
5. Showcased the dual role of radiology in diagnosis and intervention
 - The intervention offered to Ms Y was transvenous coil embolisation
6. Exemplifies the use of radiology in understanding complex anatomy
 - The venous anatomy of the crano-cervical junction is a complex area^{2,3} that is still not fully understood and has relevance to both interventional radiology and neurosurgery.

References

- Recent review of Hypoglossal DAVFs
- 1) Spittau, B., Millán, D., & El-Sherifi, S. (2014). Dural arteriovenous fistulas of the hypoglossal canal: systematic review on imaging anatomy, clinical findings, and endovascular management. *Journal of ...*, 122(April), 1–21. <http://doi.org/10.3171/2014.10.JNS14377>. Disclosure
- Key Anatomical studies:
- 2) Arnautović, K. I., al-Mefty, O., Pait, T. G., Krisht, a F., & Husain, M. M. (1997). The suboccipital cavernous sinus. *Journal of Neurosurgery*, 86(2), 252–262. <http://doi.org/10.3171/jns.1997.86.2.0252>
 - 3) Rúiz, D. S. M., Gailloud, P., Rufenacht, D. A., Delavelle, J., Henry, F., & Fasel, J. H. D. (2002). The craniocervical venous system in relation to cerebral venous drainage. *American Journal of Neuroradiology*, 23(9), 1500–1508.