

# 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)<sup>1</sup>.

## 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).

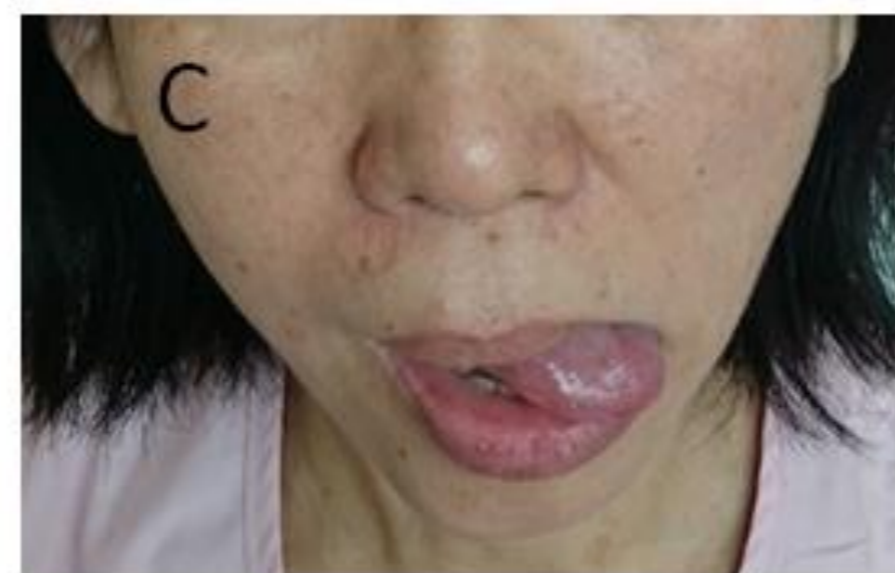
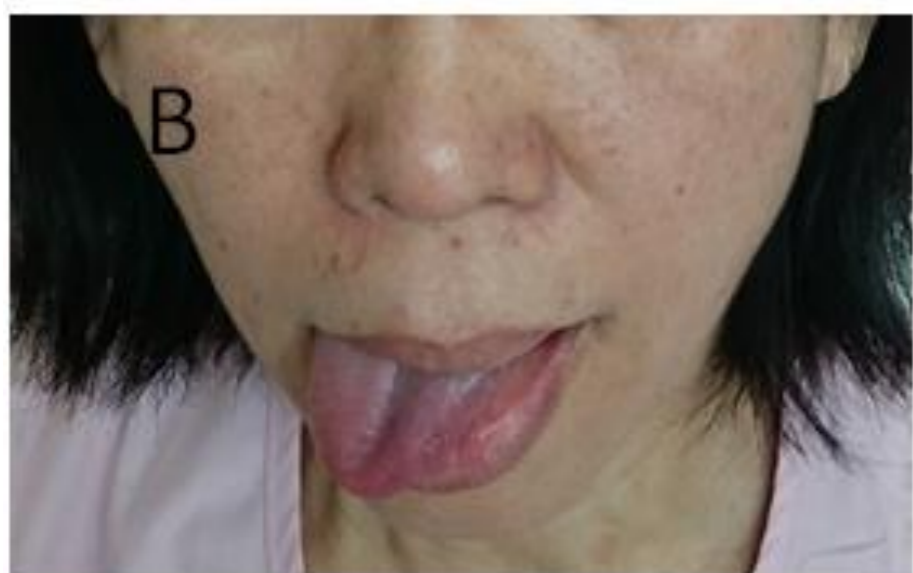
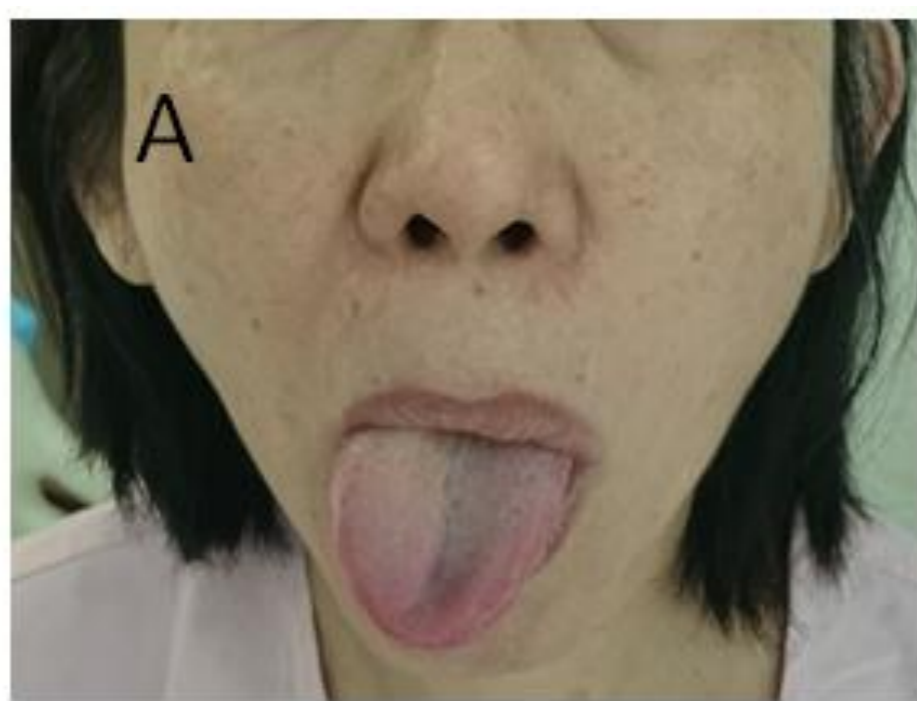


Fig 1 – Ms Y's tongue position when instructed to protrude her tongue (A), images below illustrate extent of lateral movement to the right (B) and left (C).

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.

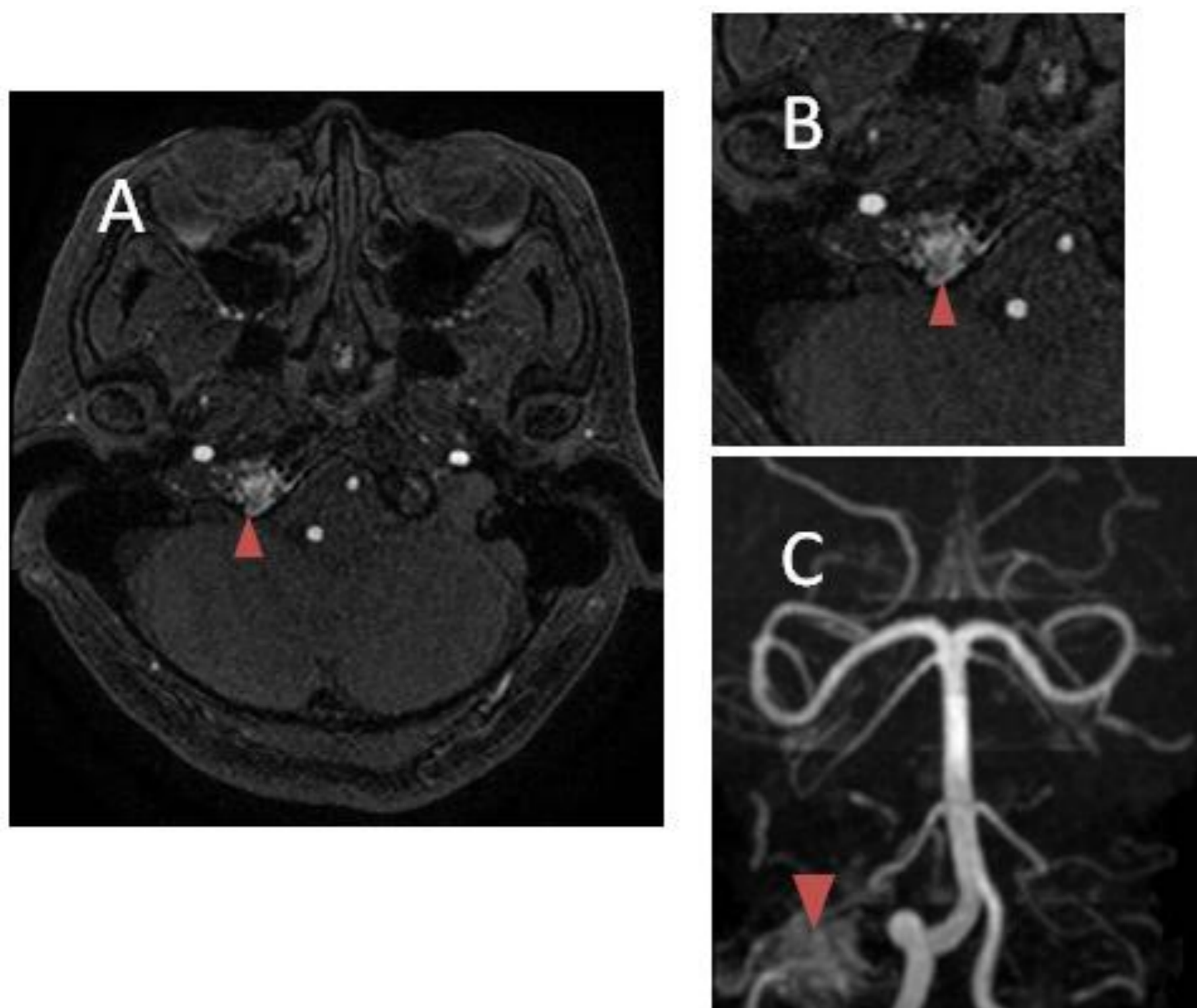


Fig 2 – MRI / MRA axial (A), magnified view (B) and 3D reconstruction of MRA (C), showing the HCDAVF (red arrowhead)

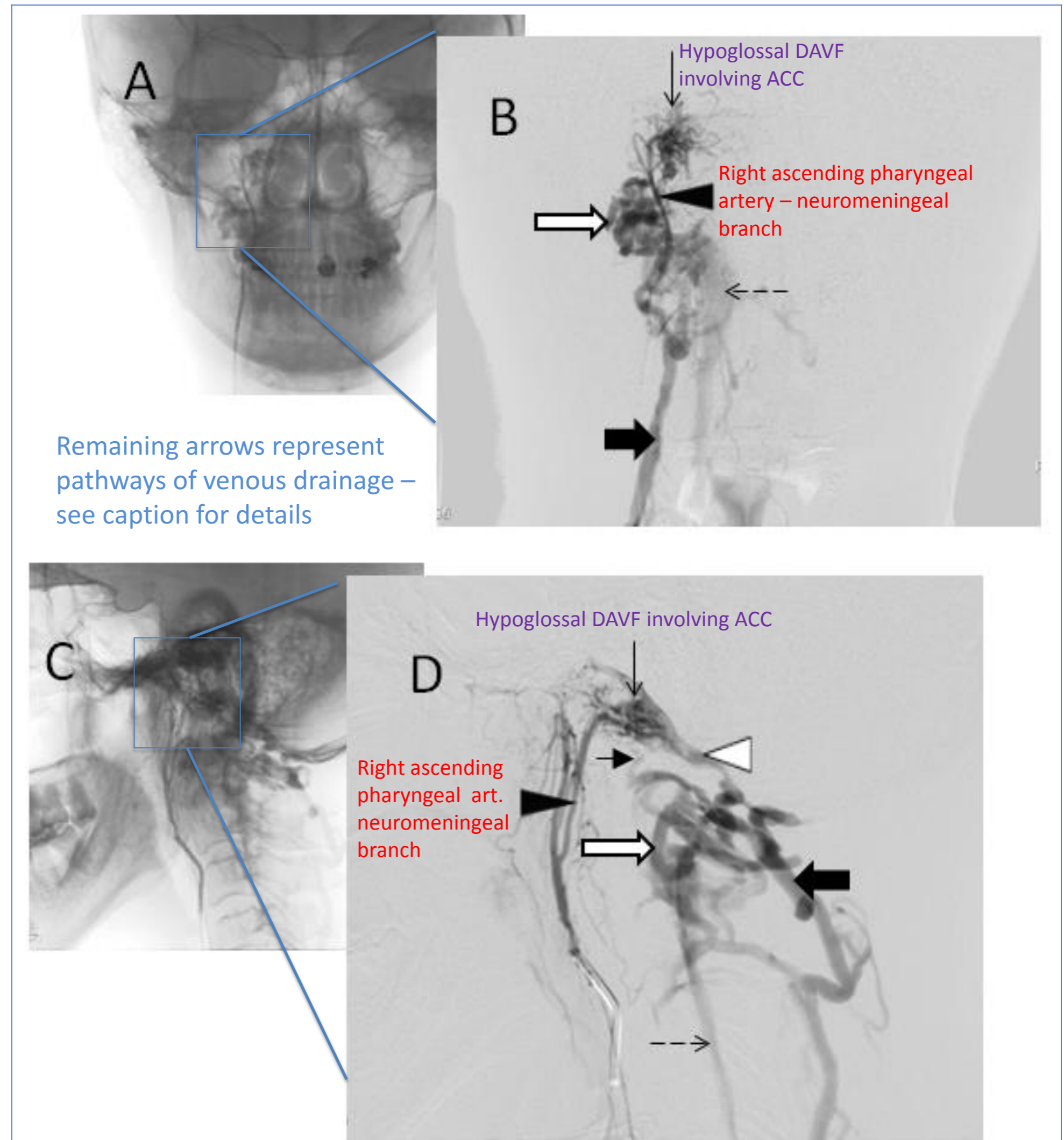


Fig 3 – Right ascending pharyngeal artery injection AP (B), with skull overlay (A) and lateral views (D) with skull overlay (C) demonstrate a HCDAVF (←), arising from the meningeal branch of the ascending pharyngeal artery (▶), draining via the anterior condylar vein (◁) and lateral condylar veins (►) 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 craniocervical junction is a complex area<sup>2,3</sup> 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.