

Dural arteriovenous fistula in a child presenting with decompensating esophoria

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Background

- Intracranial dural arteriovenous fistulas (DAVFs) are abnormal shunts between dural arteries and dural venous sinuses.
- Paediatric DAVFs are rare.
- Previous reports of association with developmental delay or congestive cardiac failure.

Objectives & Methods

- Case report of a child with no medical history of note presenting with decompensating esophoria
- Interesting clinical presentation with subsequent investigations revealing a DAVF

Initial presentation

- 7-year-old boy
- Presented to Eye Casualty with horizontal diplopia
- No headache, nausea or vomiting
- Orthoptic examination: no abduction deficit, 30PD base out left esotropia
- Refraction:
 - Right eye: 0/-0.25 x150
 - Left eye: +0.25/-0.50 x 70

2 months later

- Worsening esotropia
- Blood investigations: autoimmune or inflammatory screen negative
- Serial head imaging

Imaging investigations

Figure 1. Initial MRI Orbit

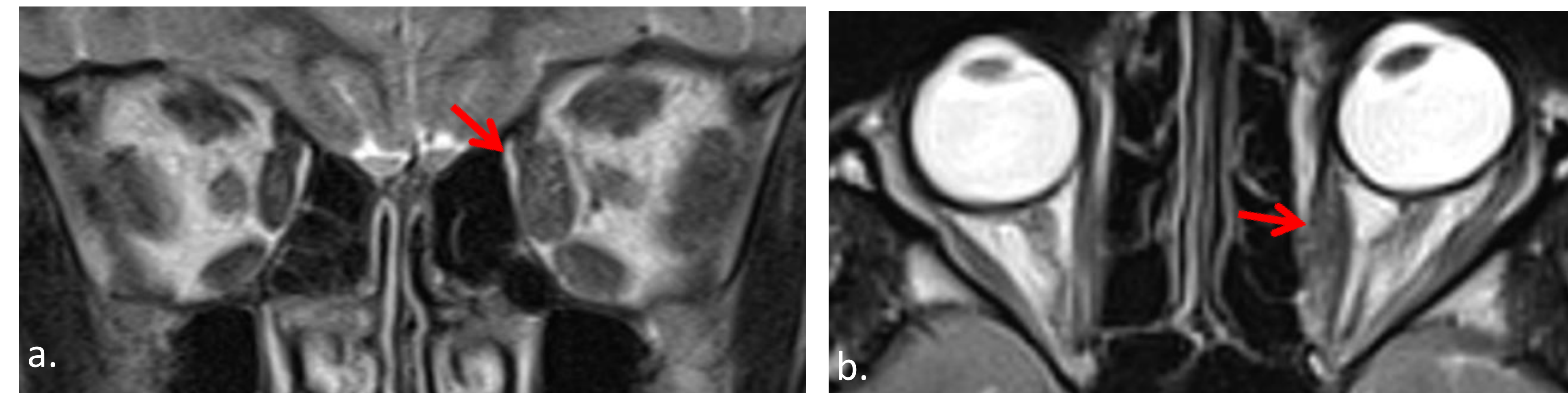


Figure 1. (a) coronal T1 and (b) axial T2 of the orbits demonstrating enlarged left extraocular muscles, most notably the left medial rectus muscle (red arrows).

Initial plan to have left medial rectus muscle biopsy and therefore repeated MRI.
 Management changed after the second MRI (figure 2 below)

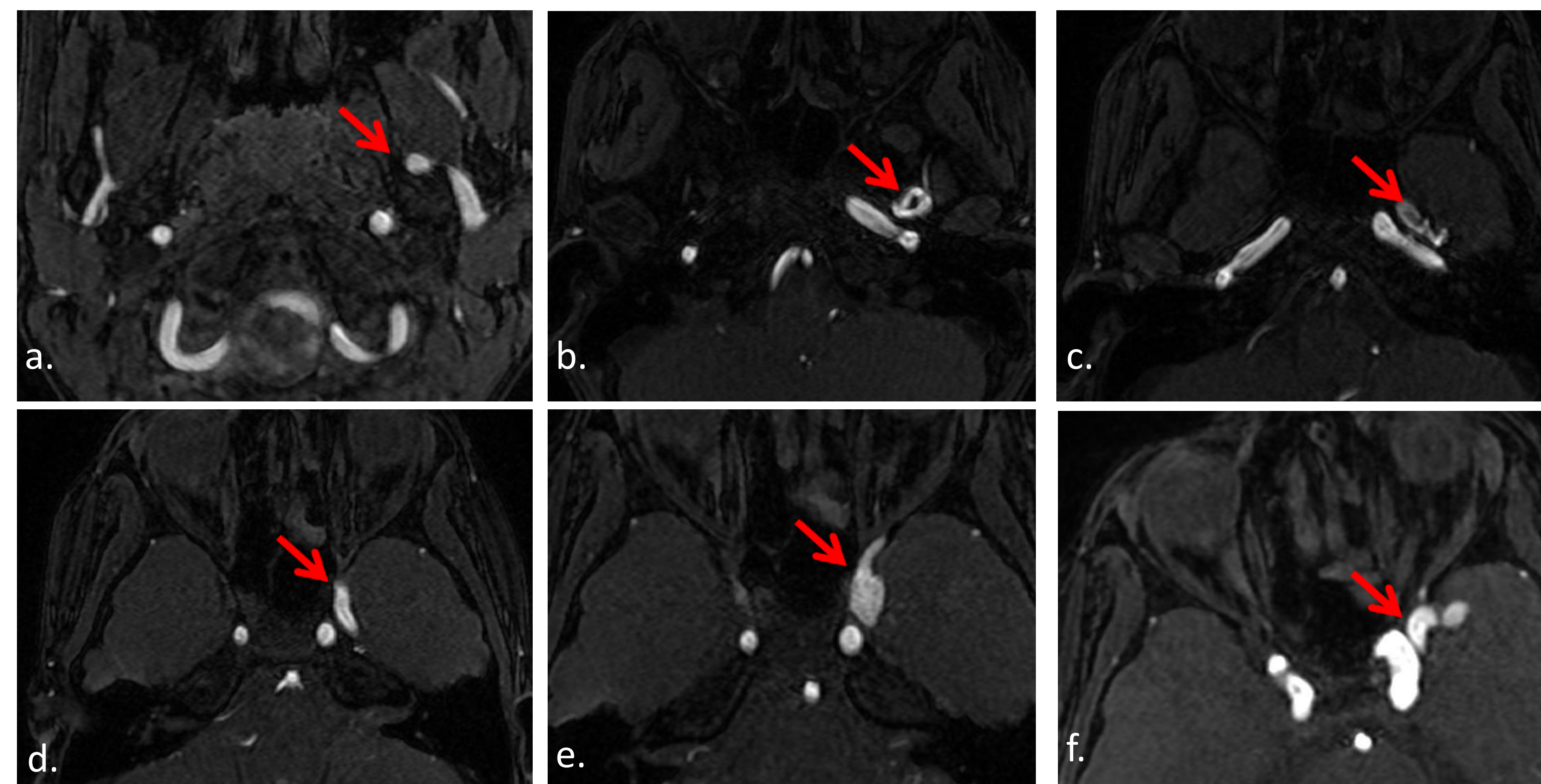
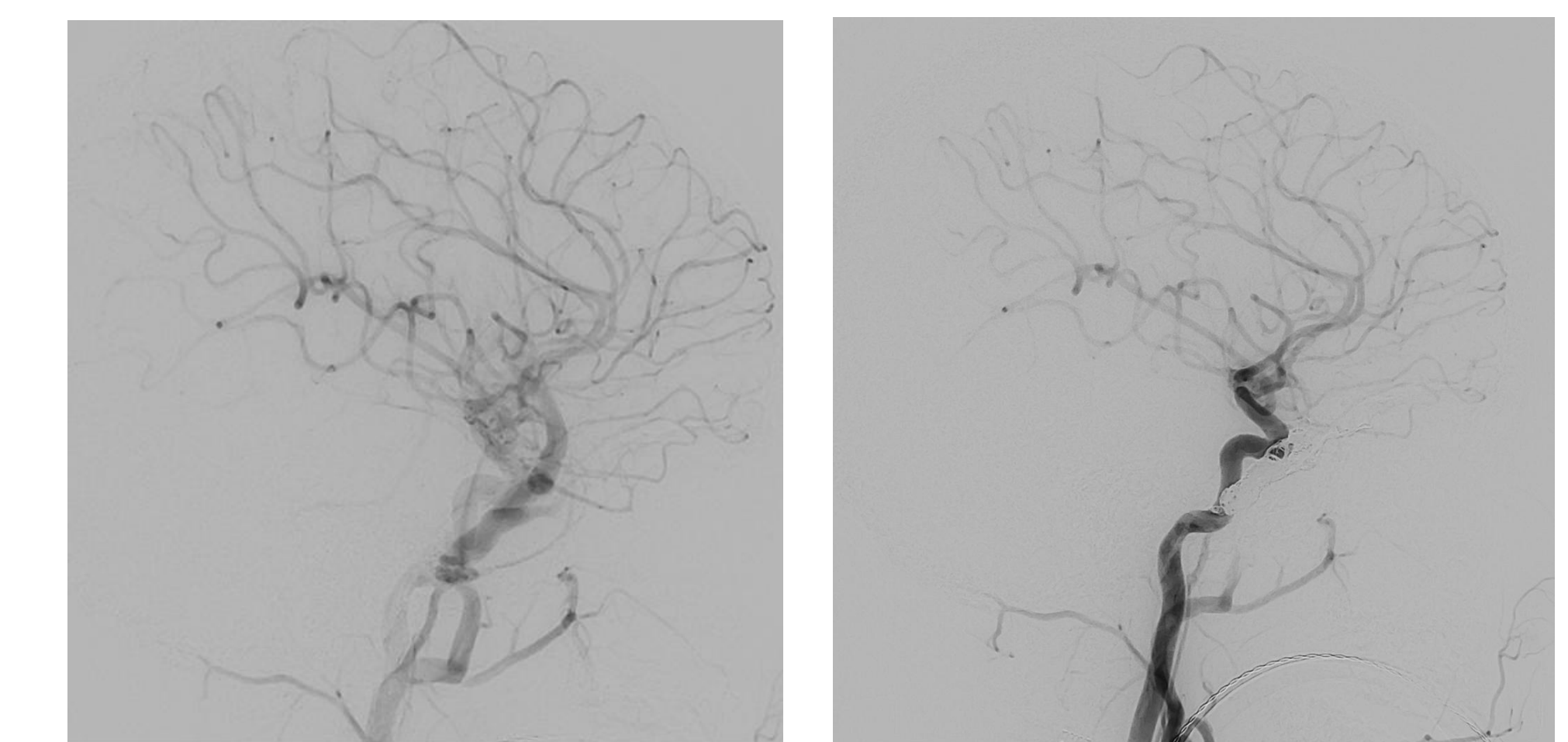


Figure 2. (a) to (f). Time of flight MR angiogram, starting beneath the skull base and progressing to the intracranial compartment, demonstrating the connection between the external and internal carotid artery circulations. (a) & (b) Red arrow highlighting an asymmetrically dilated left maxillary artery and pterygoid plexus; (c) connection between the maxillary and internal carotid arteries with dilated pterygoid plexus; (d) dilated middle meningeal vessel/vein arising from cavernous sinus; (e) dilated superior ophthalmic vein connecting to the cavernous sinus; (f) asymmetrically enlarged left middle meningeal artery feeder.

Management- transarterial embolisation of left indirect CCF



Figure: Sequential coronal view of coils being placed



Post coil digital subtraction angiograms of internal and external carotid arteries

Outcomes

- Post transarterial embolisation: Persisting left esotropia 70PD at distance, full extraocular movement (EOM)
- Had Dysport injection to bilateral medial rectus
- 10 months from presentation: left esotropia 20PD at distance with full EOM

Conclusion

- This case demonstrated an unusual presentation of DAVF in a child with no other risk factors.
- Paediatric DAVFs can present as sudden onset decompensating esophoria, with a unilateral enlarged extraocular muscles elicited on imaging.

References

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2. Su X, Ma Y, Song Z, Ye M, Zhang H, Zhang P. Paediatric intracranial dural arteriovenous fistulas: clinical characteristics, treatment outcomes and prognosis. Stroke and Vascular Neurology. 2025 Feb 25;10(1).