

Case Lessons

Embolization treatment for Intracranial Dural Arteriovenous Fistulae

Oneda Cibuku, Mirel Grada, Eugen Enesi, Arben Rroji, Mentor Petrela

Introduction: Intracranial intracranial arteriovenous fistulas (DAVFs) are rare lesions that account for 10-15% of all intracranial arteriovenous lesions. DAVFs that drain back into the cortical veins are aggressive lesions that can cause intracranial hemorrhage, seizures, intracranial hypertension, and neuropsychiatric symptoms¹. Endovascular treatment is now the first-line choice for all DAVFs. Techniques, hardware, and treatment strategies for DAVFs have advanced rapidly².

Case presentation: 48 years old male without any previous comorbidities and head trauma, presented with history of the onset of the disease on 1th of February with transient left motor deficit. MRI of the head reveals a right frontal ischemic lesion with minimal restriction in DWI.

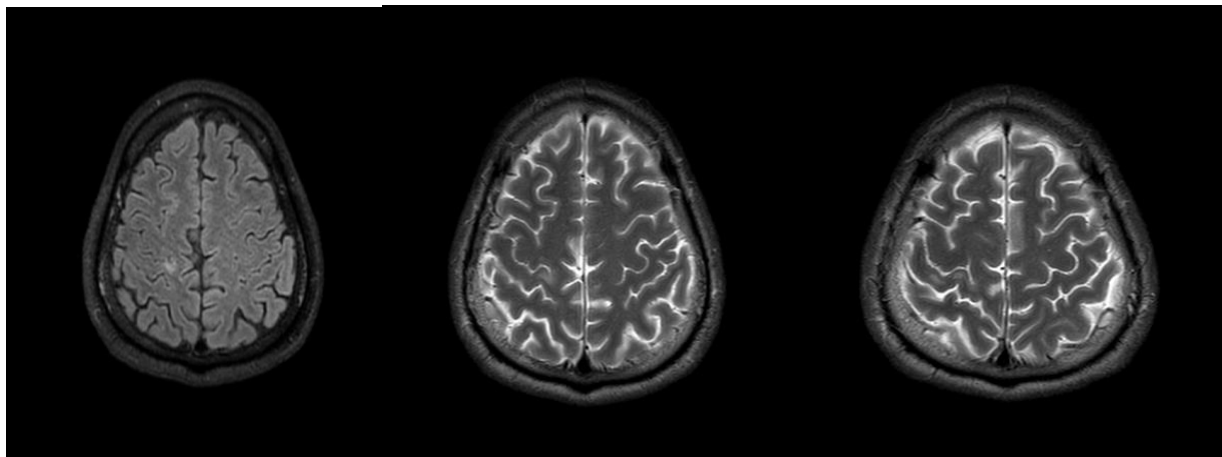


Fig 1: Brain MRI (DWI SW) showing right cortical prerolandic ischemic lesion

On 22th of February, the patient had a focal left brachio-facial motor seizure. On 3T MRI a vascular lesion is suspected which is confirmed on arteriography that revealed a right parietal arteriovenous fistula.

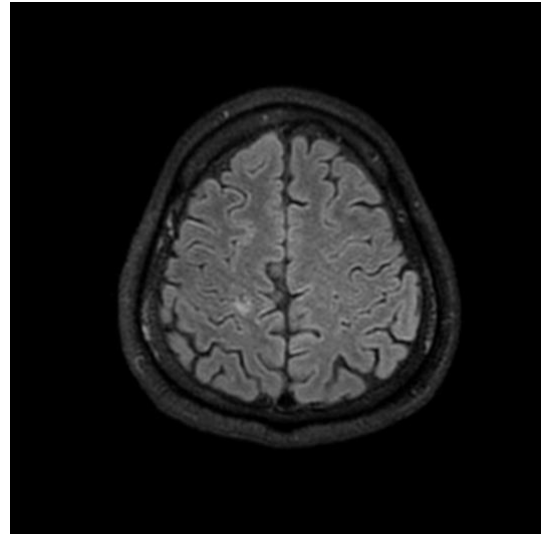
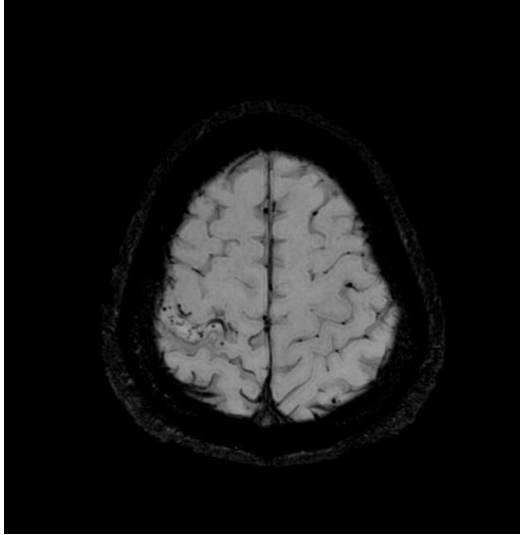


Fig 2: 3T Brain MRI aberrant vessels on right prerolandic region

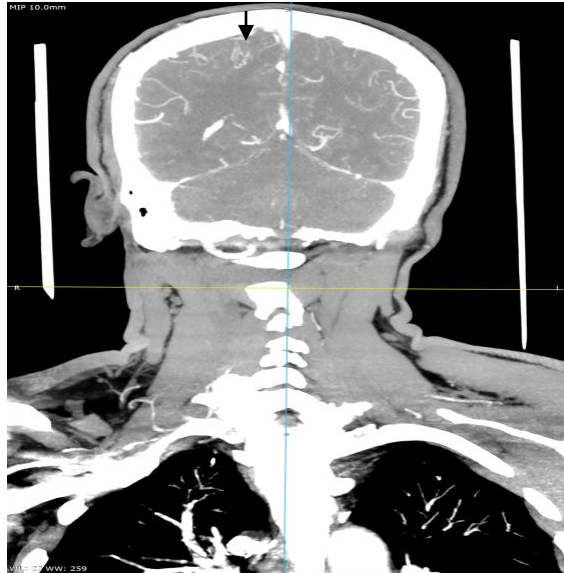


Fig 3: MPR reconstruction of CTA showing aberrant vessels

Endovascular procedure: GA; femoral access was performed and the 8F introducer was placed. The right ECA was catheterized through the introducer and the Chaperon 6F retention catheter was placed in the proximal part of the ECA. A-P, lateral and oblique right ECA projections were performed. A dural fistula is noted through the MMA and epidural veins. The micro-catheter/microguide system is passed in the distal part of the feeding artery. The procedure continues with Squid embolization of the fistula and the veins of the left side of the fistula.

The control at the end of the procedure evidences the optimal closure of the parietal DAVF.

Optimal embolization of right parietal DAVF was achieved.

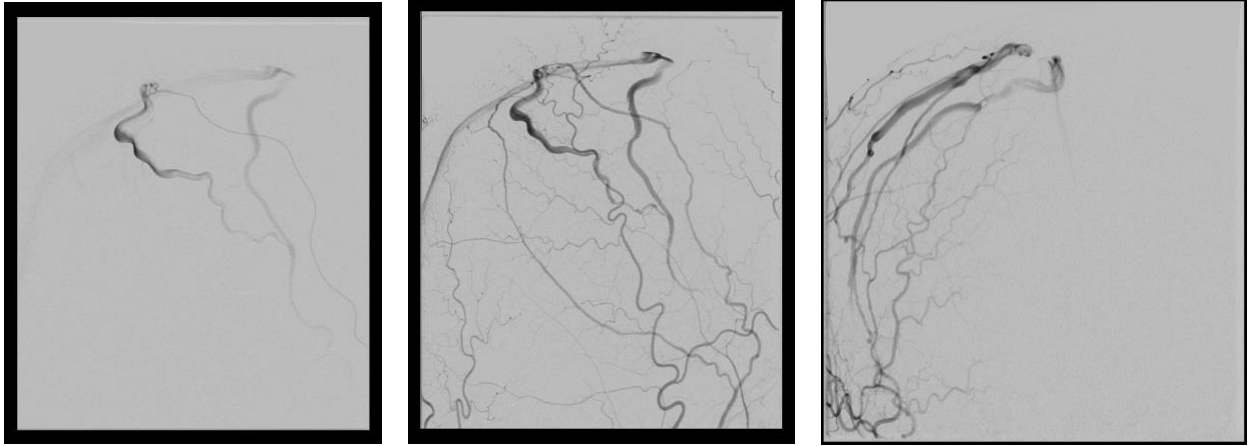


Fig 4: Arteriography with A-P, lateral and oblique right ECA projections were performed. A dural fistula is noted through the MMA and epidural veins

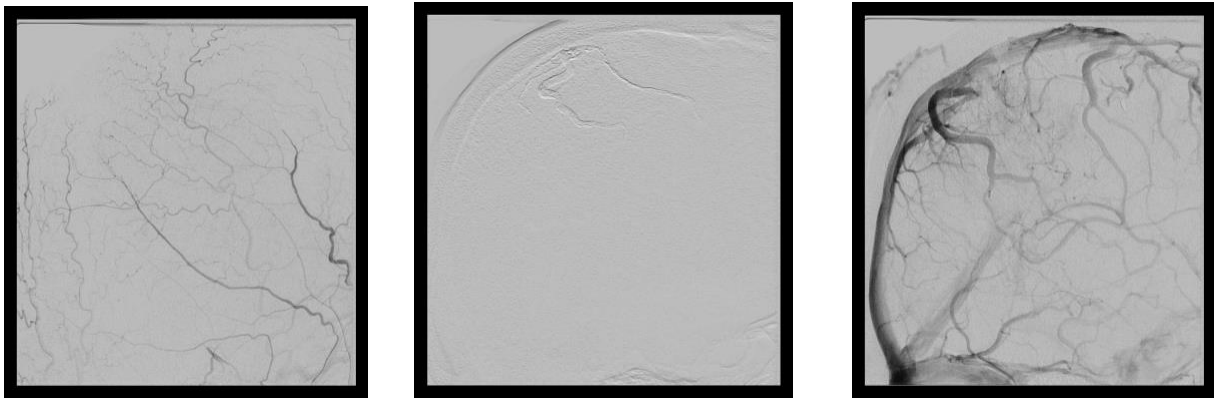


Fig 5: Squid embolization of the fistula and the veins of the left side of the fistula. Optimal embolization of right parietal DAVF was achieved.

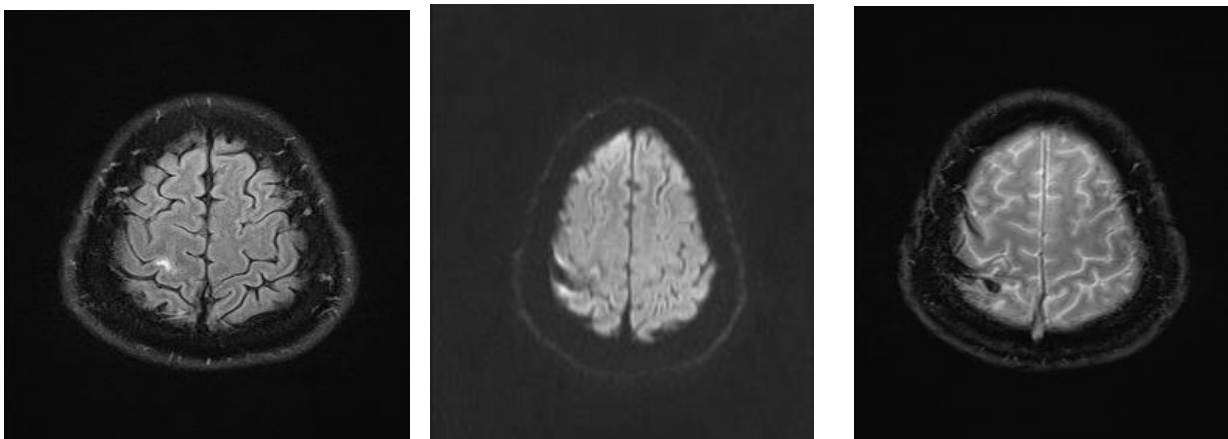


Fig 6: Control brain (post procedure) MRI DWI-ADC, hemi, and FLAIR sequences: No new events are observed. Embolizing material is observed in the epidural vessels.

Discussion: The general principle of endovascular treatment is permanent closure of the DAVF and normalization of venous outflow with at least elimination of cortical venous reflux. Depending on the vascular geometry and angioarchitecture of the DAVF, transarterial or transvenous access, or a combination of the two, may be chosen as an optional approach¹.

References:

1. Endovascular treatment of Intracranial dural arteriovenous fistula with cortical venous drainage: New Management using ONYX. *AJNR Am J Neuroradiol.* 2008;29:235–41.
2. Endovascular Treatment of Intracranial Dural Arteriovenous Fistulas: A German Single-Center Experience *Cerebrovasc Dis Extra* (2020) 10 (2): 84–93.<https://doi.org/10.1159/000509455>