

Value of 3D-TOF MR angiography and 4D-dynamic contrast-enhanced MRI in the assessment of spontaneous posterior cavernous sinus dural arteriovenous fistula

Valor da angiografia por ressonância magnética 3D-TOF e RM 4D-dinâmica pós-contraste na avaliação de fístula arteriovenosa espontânea do seio cavernoso

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A 46-year-old female patient presented symptoms of complete right oculomotor nerve palsy without proptosis. Orbital magnetic resonance (MR) imaging showed no abnormalities (Figure 1). 3D time-of-flight MR angiography revealed high signal intensity in the right cavernous sinus (Figure 2). This isolated finding has a 10–15% rate of false-positive in the diagnosis of dural arteriovenous fistula (DAVF)¹. Additional 4D-dynamic contrast-enhanced MR angiography evidenced an early asymmetric enhancement of bilateral cavernous sinus, mainly on the right, draining downward through the inferior petrous sinus (Figure 3)^{2,3,4,5}.

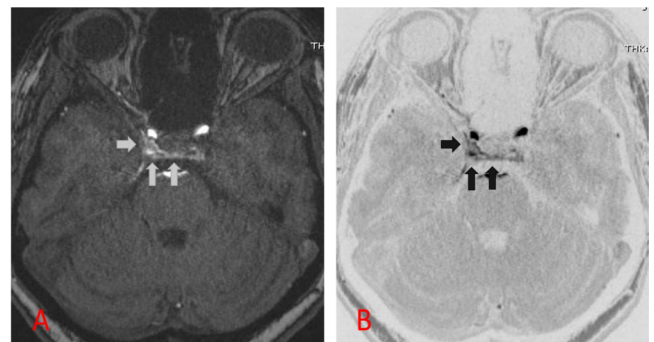


Figure 2. 3D time-of-flight MR angiography (A) and the inverted window of this sequence (B) showed a subtle enlargement of the right cavernous sinus and parasellar high signals (arrowhead).

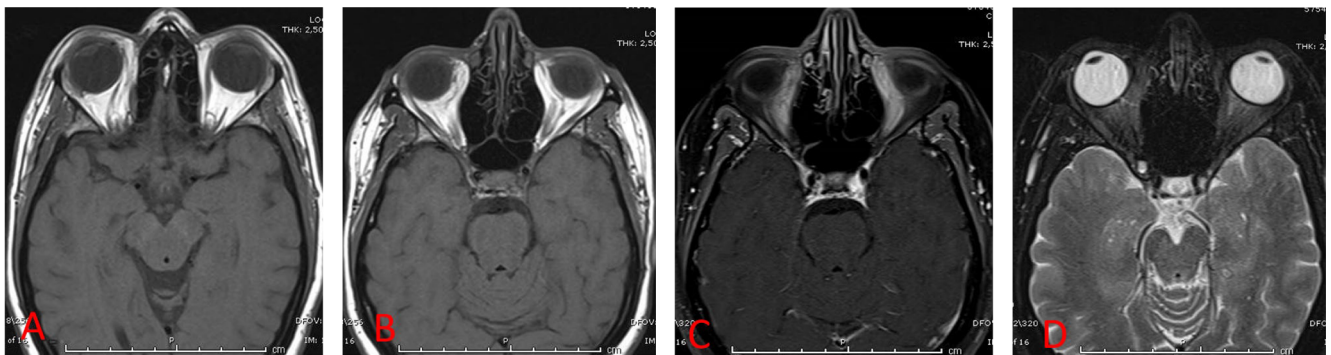




Figure 1. T1-weighted spin-eco (A and B), T2-weighted fat-saturated (A), and post-contrast T1-weighted (B) images from the orbital MR imaging showed no abnormalities. Of note, there are no signs of ocular proptosis or superior ophthalmic vein dilatation.



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Digital subtraction angiography confirmed a posterior cavernous sinus DAVF, and endovascular treatment was prescribed (Figure 4).

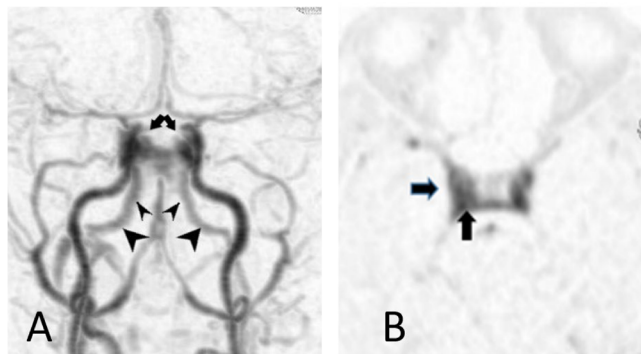


Figure 3. 4D-dynamic contrast-enhanced MR angiography in early arterial phase (A) disclosed a slight asymmetric enhancement of bilateral cavernous sinus (arrows), mainly on the right (arrows), in the subsequent phases (B). This cavernous sinus dural arteriovenous fistula is draining downward through the inferior petrous sinus (A: arrowhead) and not upward through the superior ophthalmic vein, which is present in 9–12% of all cavernous sinus dural arteriovenous fistulas.

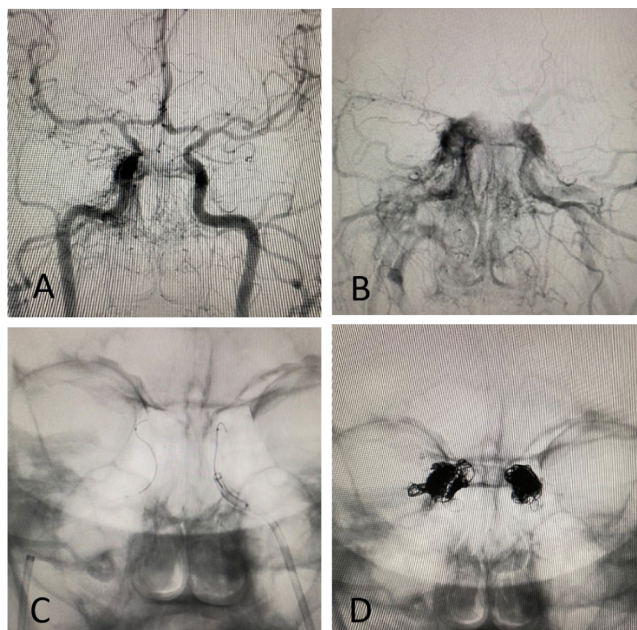


Figure 4. Digital subtraction angiography revealed a bilateral slow-flow posterior cavernous sinus dural arteriovenous fistula, mainly on the right (A and B). Cavernous sinus dural arteriovenous fistula was successfully treated by venous approach (C). Post-embolization of the cavernous sinus was performed through the inferior petrous sinus, using coils and liquid embolic agents (Phil®) (D).

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