Endovascular treatment of transverse sinus aneurysm presenting with occipital headache

A 44-year-old woman presented with a 2-month history of right occipital headache and shooting pain in the neck. Brain magnetic resonance imaging (MRI) and magnetic resonance venography (MRV) revealed a vascular structure contiguous with the lumen of the right transverse sinus (TS) near the confluence of sinuses (Fig. 1).

Angiography revealed saccular enlargement of the right TS (20 × 10 × 10 mm), which was protruding extradurally (Fig. 2). Under general anesthesia and full heparinization, a 5-French catheter was navigated into the right internal carotid artery (ICA), while an 8-F catheter was introduced into the right jugular vein. A PRIMUS™ GPS™ 10 × 30-mm self-expandable stent (ev3 Endovascular, Plymouth, MN, USA) was introduced through an 8-F PE ORX guide catheter (BALT Extrusion, Montmorency, France), but could not be navigated through the tortuous sigmoid sinus. Via a Silver Speed™ 14 microguide wire (Micro Therapeutics, Irvine, CA, USA), an Echelon 14 microcatheter (Micro Therapeutics) was navigated into the aneurysm, and five coils (Tetris 3D 14 × 26 mm and 12 × 23 mm, Nexus Helix soft 7 × 30 mm, Morpheus 3D 6 × 20 mm and Helix standard 5 × 15 mm; Micro Therapeutics) were deployed and detached.

Control angiography showed complete occlusion of the aneurysm (Fig. 3). No complications occurred during the procedure. Following the procedure, the headache disappeared. The patient was clinically followed-up for 2 years. Brain MRV (Fig. 4) performed at 3 months and at 2 years showed complete occlusion.

Dural sinus aneurysms of the TS segment have been a recognized vascular cause of pulsatile tinnitus since being reported in 2000 by Houdart et al. [1], who used a simple coiling procedure for a narrow-neck aneurysm. Nine cases of TS aneurysms responsible for tinnitus have been reported [1–5]: two were not treated [2], and the remaining seven were managed by either surgery (4 cases) or an endovascular modality (3 cases). No case of TS aneurysm has been reported with symptoms other than tinnitus. Sanchez et al. [3] used an intravenous stent in a wide-neck aneurysm, Zenteno et al. [4] performed coiling with stent deployment in two sessions, Otto et al. [2] used a transmastoid approach for sinus reconstruction and Goloporsky et al. [5] performed surgery using U-shaped clips after coiling failed. All of the reported studies led to complete resolution of the tinnitus.

In the present case, our strategy to protect the neck with a stent failed due to the tortuous anatomy of the homolateral sigmoid sinus. Having no hypoplasia on the
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Figure 3 Post-procedural venous-phase lateral digital subtraction angiography shows complete occlusion of the aneurysm (arrow).

Figure 4 (A) Anteroposterior and (B) lateral control magnetic resonance venography of the brain at 2 years show complete occlusion of the right transverse sinus aneurysm with mild stenosis of the sinus (arrow).

contralateral side, it was decided to proceed with careful coiling and to abort the procedure if the coils migrated. The aneurysm was located near the confluence of the sinuses far from the sigmoid segment and inner ear, which might explain the absence of tinnitus. The sharp shooting headache in the present case was probably due to the aneurysm-mediated tension on the dura. The present study shows that TS aneurysms can present with symptoms other than pulsatile tinnitus and be successfully treated by coiling.

Conflict of interest statement

The authors report no conflict of interest.

References