

Balloon occlusion testing: A neglected investigation in the evaluation of venous pulsatile tinnitus

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Case report

A 42-year-old woman presented with a 7-year history of right pulsatile tinnitus. Examination was unremarkable except for right low frequency hearing loss.

Computed tomography demonstrated two small right sigmoid sinus diverticula. Occlusion testing was performed using a Copernic balloon via the left femoral vein. Inflation of the balloon within the jugular vein had no effect on the tinnitus, but inflation at the junction of the sigmoid sinus and jugular bulb resulted in immediate cessation of symptoms.

A cortical mastoidectomy was performed, the sigmoid sinus skeletonised, and the diverticula decompressed and cauterised. The patient experienced complete resolution of her tinnitus and a postoperative audiogram was normal.

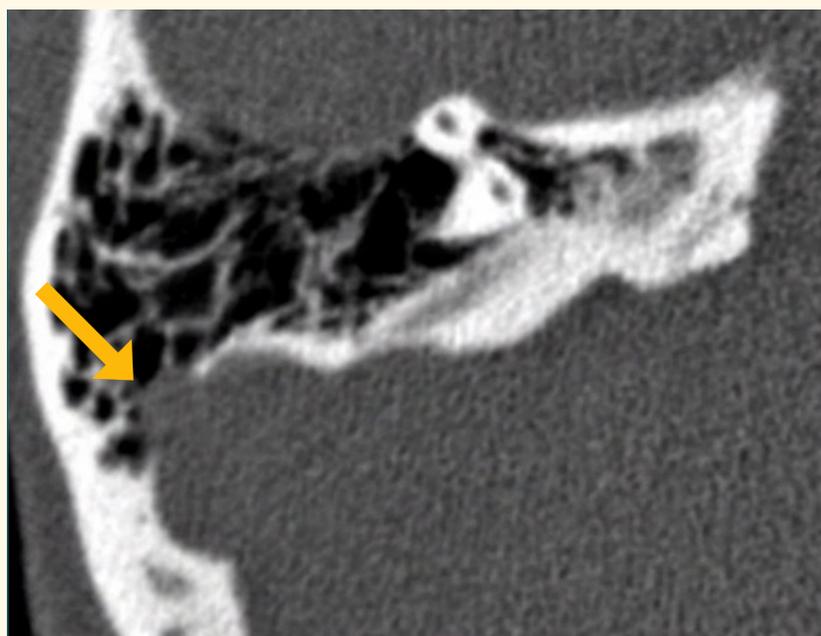


Figure 1: Axial CT showing right sigmoid sinus diverticulum (arrow).

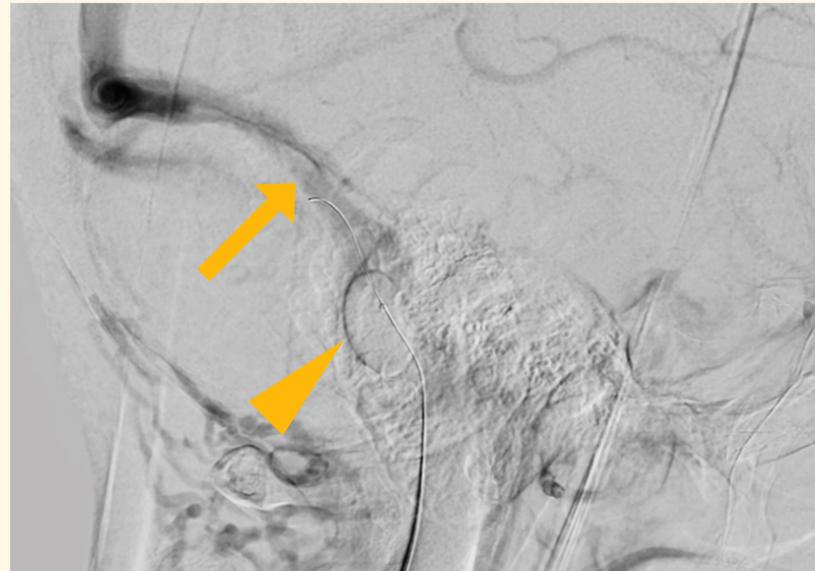


Figure 2: Fluoroscopic image from balloon occlusion testing showing contrast within the sigmoid sinus (arrow) and Copernic balloon at the junction of sigmoid sinus and jugular bulb (arrowhead).

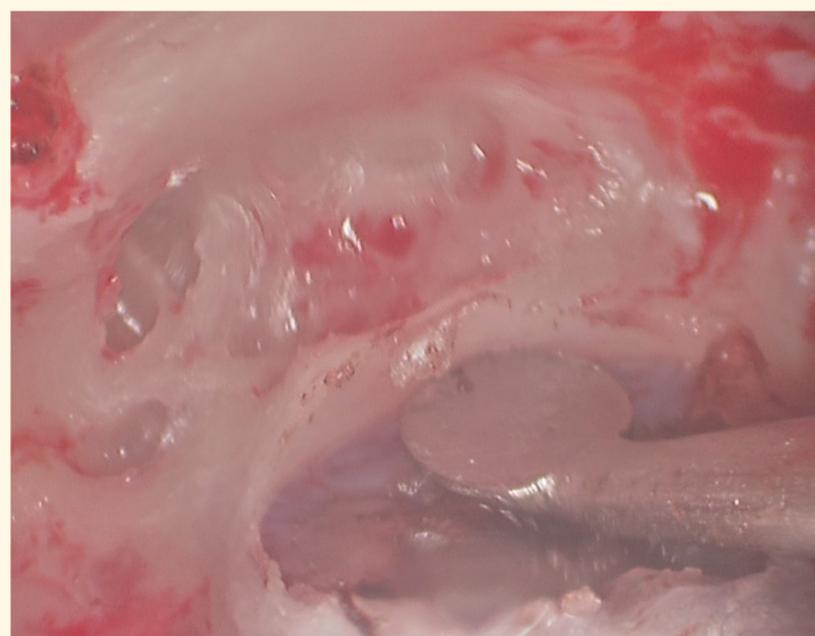


Figure 3: Endoscopic operative image showing the de-roofed diverticulum.

Discussion

Patients presenting with pulsatile tinnitus require thorough radiological investigation to exclude significant causes such as dural arteriovenous fistula or paraganglioma¹.

Sigmoid sinus diverticula are associated with pulsatile tinnitus²⁻⁴, but are also found incidentally in asymptomatic patients^{2,3}. In a 2015 case series of similar patients treated surgically, 68% experienced complete resolution of symptoms, but 20% had no change⁵.

Balloon occlusion testing for venous pulsatile tinnitus was described in 1975⁶ but is not found in modern investigation algorithms and review of the literature found no other cases. This procedure may help to identify those patients who would benefit from surgery.

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