

IMAGES IN INTERVENTION

An Unexpected Origin of Fluctuating Pulsatile Tinnitus

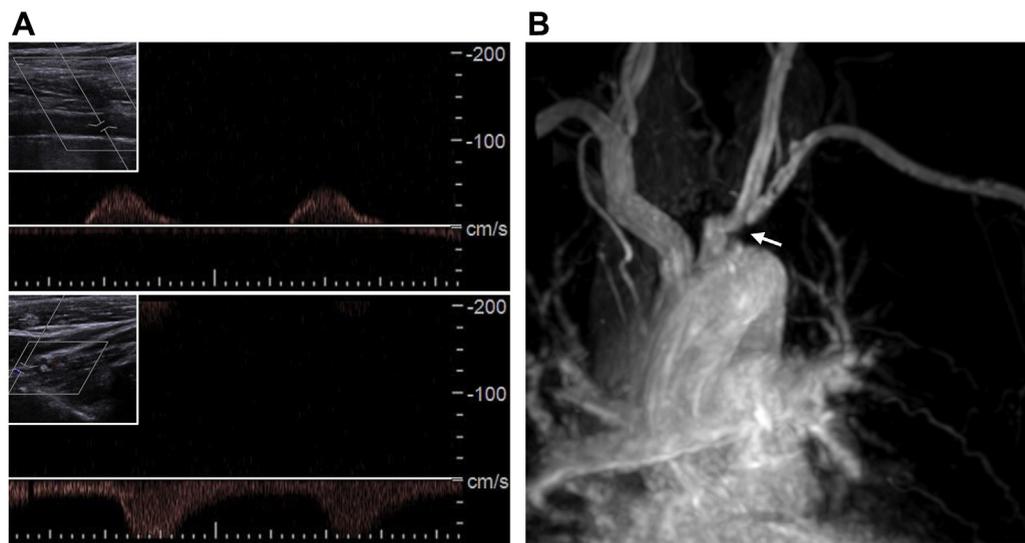


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We present the case of a 74-year-old man with progressive left-sided pulsatile tinnitus, mainly at rest, and exercise-induced heaviness of the left arm. Clinical examination revealed a midfrequency systolic murmur located in the left upper chest region and differing systolic blood pressures between the 2 arms (right 140/80 mm Hg, left 80/60 mm Hg). Doppler

ultrasound imaging demonstrated turbulent post-stenotic flow within the accessible left subclavian artery and blood flow reversal in the left vertebral artery consistent with subclavian steal syndrome (Figure 1A). Magnetic resonance angiography suggested total occlusion of the proximal left subclavian artery (Figure 1B) as a cause of the patient's claudication, but it insufficiently explained the tinnitus.

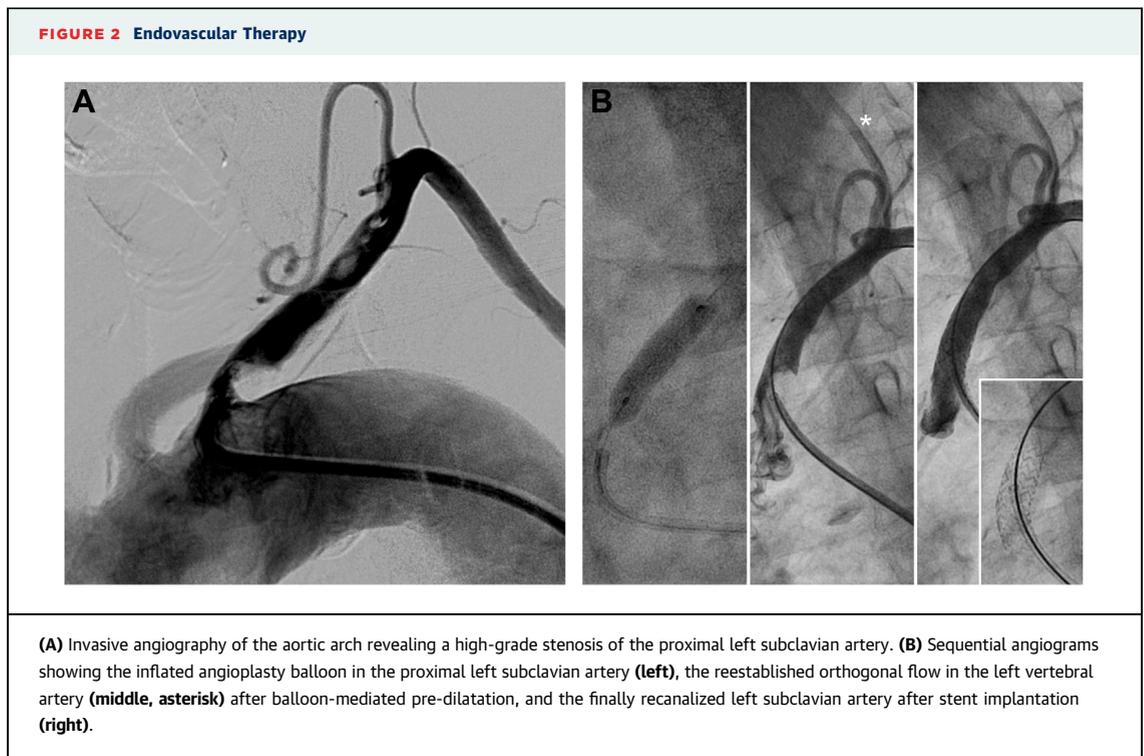
FIGURE 1 Noninvasive Imaging for Diagnostics



(A) Doppler ultrasound imaging of the left subclavian (top) and vertebral (bottom) artery. (B) Magnetic resonance angiography demonstrating a total occlusion of the proximal left subclavian artery (arrow).

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Subsequently, the patient was scheduled for endovascular therapy, which in turn demonstrated a high-grade stenosis of the proximal left subclavian artery (**Figure 2A**). Upon pre-dilatation using a 5.0 × 20 mm balloon (**Figure 2B**, left), the pulsatile tinnitus instantly disappeared, thus confirming its vascular origin. Moreover, orthogonal blood flow was reestablished in the left vertebral artery (**Figure 2B**, middle). The lesion was finally covered using a 9.0 × 29 mm balloon-expandable stent, and the patient experienced no further symptoms (**Figure 2B**, right).

Even though tinnitus is a common otologic symptom with an estimated prevalence of 10% to 15%, pulsatile tinnitus suggesting a vascular etiology is rarely seen (1). Dural arteriovenous malformations, usually involving branches of the external carotid

artery (occipital and greater auricular branches) and the transverse sinus, are the most common cause described in published research. Because of close anatomic proximity between the inner ear and arteriovenous malformations of the skull base, a pathological flow sound is easily transferred through bone conduction. This case, however, is remarkable because it depicts a far distant, extracranial stenosis of the proximal left subclavian artery as an origin of a pulsatile ear sound.

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