We present the case of a 70-year-old woman who reported left ear tinnitus with a sudden onset and duration of various months.

The main characteristics were pulsatility, synchronicity with pulse and substantial deterioration in recent months.

The examination revealed a normal ear and otoscopy, with a pulsating, retroauricular mass of bluish colour and measuring 1 cm × 0.5 cm (Fig. 1).

We performed an audiometry which revealed binaural sensorineural hearing loss at high frequencies, symmetrical in both ears.

We requested a Doppler ultrasound study (Fig. 2) which revealed an anechoic image corresponding to a focal dilatation in the posterior auricular vein. It presented turbulent and pulsatile flow at very high speed (over 500 cm/s). Its spectrum chart presented a low-resistance, arterial pattern. It descended on the sternocleidomastoid, joined the temporomandibular vein and constituted the external jugular vein, which drained into the left brachiocephalic venous trunk.

The VR image of the CT scan with intravenous contrast (Fig. 3) showed a dilated vascular structure (1 cm calibre) in the left retroauricular region, corresponding to the upper segment of the posterior auricular vein. It became opaque in the arterial phase due to its anastomosis with a hypertrophic arterial branch arising from the ipsilateral vertebral artery.
These findings were compatible with left, retroauricular, arteriovenous fistula (AVF) of the scalp, with a non-traumatic origin.

The main symptom of patients with vertebral AVF is pulsatile tinnitus. The treatment of choice is endovascular occlusion. This case belonged to the small group of objective tinnitus or somatosounds, which represent only 5%-10% of the total.