

Vertebral Doppler Bunny Waveform

Suggesting Subclavian Stenosis and Influencing
Coronary Artery Bypass Technique

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A 73-year-old man presented with acute coronary syndrome and 3-vessel coronary disease and underwent carotid ultrasonography before surgical revascularization. His medical history included right carotid stenting and iliofemoral bypass. He had no substantial blood pressure differences between arms, and no obvious subclavian or carotid bruits.

A pulsed-wave Doppler ultrasonogram revealed a “bunny” waveform pattern of the left vertebral artery. This pattern, characterized by a systolic peak, a midsystolic dip, and a more blunted systolic peak (Fig. 1), suggested left subclavian stenosis.¹ Computed tomographic angiograms showed irregular plaque, constituting 60% to 70% stenosis of the left subclavian artery and extending toward the origin of the left vertebral artery (Figs. 2 and 3).

To avoid the effect of upstream subclavian stenosis and possible coronary subclavian steal after revascularization,² we prepared a left internal mammary artery bypass to the left anterior descending coronary artery as a free graft.

Comment

The bunny waveform resembles a rabbit’s profile. It is thought to be caused by post-stenotic pressure decrease resulting from high-velocity turbulent flow through the ste-

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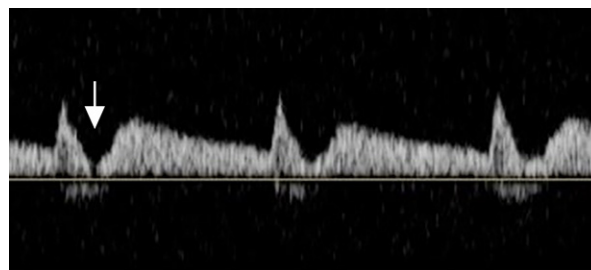


Fig. 1 Pulsed-wave Doppler ultrasonogram of the left vertebral artery shows a “bunny” waveform: a midsystolic dip (arrow), a first systolic peak (the rabbit’s ears), and a second blunted systolic peak (the rabbit’s rump), suggesting left subclavian stenosis.



Fig. 2 Reconstructed computed tomographic angiogram shows irregular plaque, constituting 60% to 70% stenosis of the left subclavian artery (arrowhead) and extending toward the origin of the left vertebral artery (arrow).

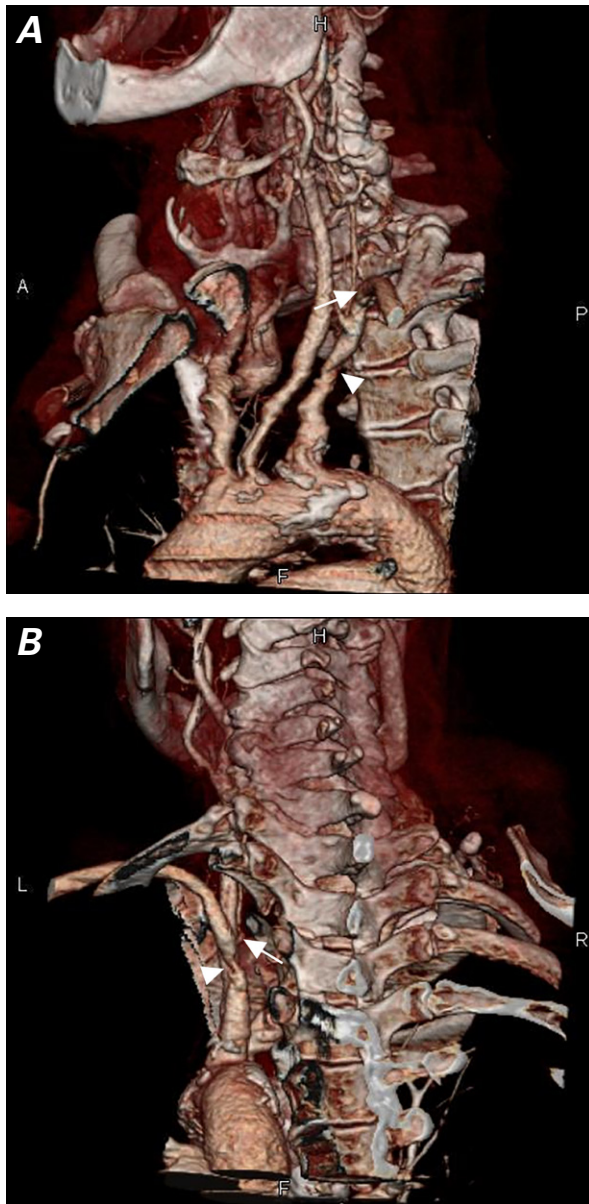


Fig. 3 Computed tomographic angiograms (3-dimensional reconstruction) in left **A**) anterolateral and **B**) posterolateral views show irregular plaque, constituting 60% to 70% stenosis of the left subclavian artery (arrowheads) and extending toward the origin of the left vertebral artery (arrows).

nosis during systole. The degree of midsystolic velocity decrease, which is associated with the severity of subclavian stenosis, indicates a “pre-steal” state that precedes systolic flow reversal seen in more advanced disease.

The usefulness of carotid ultrasonography before surgical revascularization is debated.³ Current guidelines rate the need for cerebrovascular duplex examination before cardiac surgery as “uncertain” in all clinical situations, particularly in asymptomatic patients before coronary artery bypass grafting.⁴ More research is needed in this area.

Recognizing the vertebral Doppler bunny waveform pattern in our patient led to the diagnosis of clinically unsuspected subclavian stenosis and to an important change in our surgical approach to revascularization.

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