Case of the mysterious signal

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A 76-year-old man underwent direct aortic CoreValve® (Medtronic Inc., Minneapolis, MN, USA). After successful implantation of the CoreValve, a transoesophageal echocardiogram showed mean and peak gradients of 5 and 14 mmHg, respectively, along with mild valvular and paravalvular aortic regurgitation.

Prior to discharge from the hospital, a trans-thoracic echocardiogram using a two-dimensional imaging probe from apical views confirmed well-seated prosthesis and a mean gradient of 7–8 mmHg, but a nonimaging probe from the right supraclavicular view showed abnormal peak systolic flow of 4–5 m/s. The patient then underwent catheterization to exclude complications, such as intraprosthesis stenosis, prosthesis migration, or intramural haematoma of the ascending aorta. The cardiac catheterization showed a well-positioned aortic valve prosthesis without evidence of migration (Panel A). The most striking finding was a severe stenosis at the ostium of the innominate artery, which explained the gradient seen on supraclavicular Doppler interrogation.

Systolic ejection time (SET) interval on continuous-wave (CW) Doppler trace obtained from an apical five-chamber view was compared with the SET interval on the CW Doppler curve recorded from the right supraclavicular view. While SET was 377 ms on the former curve (Panel B), it was 347 ms on the latter, revealing a delay of 30 ms (Panel C).

Systolic ejection time intervals invasively measured in external carotid arteries are significantly lower than those obtained in central aorta. This emblematic case highlights that careful measurement of ejection time intervals is crucial for an accurate evaluation of Doppler curves.

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