Images in Cardiovascular Disease

Doppler Echocardiography Detection of Post Aortic Valve Replacement Coronary Ostial Pinching

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Conflict of Interest

The authors have no financial conflicts of
 interest.

A hypertensive, non-diabetic woman in her 80s with a previous history of aortic valve replacement six months prior was concerned about her class III exertional angina despite optimal medical management. Her pre aortic valve surgery angiogram was normal. General examination was unremarkable except for a short ejection systolic murmur. Electrocardiography showed changes in concentric left ventricular hypertrophy. Two-dimensional echocardiography showed normal left ventricular systolic function with a fairly well functioning aortic bio prosthesis. Color Doppler study showed a mosaic turbulent flow pattern in the proximal right coronary artery (RCA) on parasternal long axis view (**Figure 1A, Movie 1**). Pulse wave Doppler showed increased flow velocities in the proximal RCA which was suggestive of stenosis (**Figure 1B**). Systolic and diastolic velocities in the proximal RCA were 1.0 and 0.8 m/s respectively.

Figure 1. (A) Turbulent flow at the RCA ostium, (B) Doppler signal at the RCA ostium suggestive of ostial obstruction, (C) selective coronary angiogram showing RCA critical ostial lesion, (D) pressure tracing during RCA angiogram suggesting critical narrowing. Ao: aorta, LA: left atrium, LV: left ventricle, RCA: right coronary artery.

The patient's classical angina and previous aortic valve replacement surgery caused us to suspect RCA ostial pinching. Color and pulse wave Doppler findings further strengthened our suspicion. As a result, we performed a selective coronary angiogram which showed significant ostial stenosis of the RCA with pressure dampening (**Figure 1C and D, Movie 2**) and mild left main coronary disease (**Movie 3**).

Coronary ostial pinching is not rare in patients with transcatheter aortic valve replacement, but it can also happen with surgical aortic valve replacement.¹⁾ Although Doppler is not standardized for coronary stenosis assessment, proximal ostial lesions can be picked up with reasonable accuracy by Doppler signals.²⁾

In future, due to improved standardization of echocardiography and Doppler criteria, this post-surgical complication can be avoided by intra-operative trans-esophageal Doppler assessment of coronary ostia.

SUPPLEMENTARY MATERIALS

Movie 1

[Click here to view](#)

Movie 2

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Movie 3

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Supplementary Figure 1

(A) Two-dimensional (2D) image showing ostial pinching of the right coronary artery (white arrows), (B) 2D image with color Doppler showing turbulent flow (white arrow).

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