Visualization of an anomalous left main coronary artery stenosis using transthoracic Doppler echocardiography

Makoto Saito1, Hiroe Morioka1, Toyofumi Yoshii1, Go Hiasa1, and Hideki Okayama2*

1Department of Cardiology, Kitaishikai Hospital, Ozu, Japan and 2Department of Cardiology, Ehime Prefectural Central Hospital, Matsuyama, Ehime 790-0024, Japan

* Corresponding author. Tel: +81 89 947 1111, Fax: +81 89 943 4136, Email: c-hokayama@eph.pref.ehime.jp

The ectopic origin of the left main coronary artery from the right sinus of Valsalva is a rare congenital anomaly. Thus far, little has been published regarding the detection of coronary flow using transthoracic Doppler echocardiography in patients with an anomalous coronary artery. In our case, careful observation in the region of the proximal coronary artery revealed the ectopic accelerated coronary flow, allowing us to detect the presence of the anomalous coronary artery and its stenosis.

A 62-year-old man was referred to our hospital because of effort angina. Transthoracic echocardiography demonstrated normal left ventricular function without asynchrony. However, colour Doppler imaging in the parasternal short-axis view at the aortic level showed a vessel of anomalous origin. The flow originated from the right sinus of Valsalva and travelled between the aortic root and the left atrium (white arrowheads) and showed colour flow aliasing at the mid-point of the vessel (white arrow; Panel A: proximal, Panel B: mid-point, and Panel C: distal). Those flow signals were mainly observed during diastole, suggesting that the vessel was a coronary artery of anomalous origin. Cardiac computed tomography performed on a different day showed that the left coronary artery originated from the right sinus of Valsalva and that the mid-point of the angulated left main coronary arterial trunk had 50% luminal stenosis (white arrow; Panels D and E). The coronary angiogram showed similar findings (white arrow; Panel F). The fractional flow reserve of the stenosis was 0.75. Percutaneous coronary intervention was performed and the patient’s angina resolved.

When a stenosis is present, the coronary flow velocity is accelerated at the stenotic site and exceeds the velocity range, resulting in colour flow aliasing. Thus, careful observation in the region of the proximal coronary artery could reveal the ectopic accelerated coronary flow, allowing us to detect the presence of the anomalous coronary artery and its stenosis.