Hypertrophic cardiomyopathy and anomalous origin of the left coronary artery: a rare coexistence

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Coexistence of hypertrophic obstructive cardiomyopathy (HOCM) with other structural heart anomalies have been described in numerous reports. However, few of them have reported on abnormal coronaries originating from opposite sinuses of Valsalva (SOV). Such a combination of both anomalies may additionally increase the risk of sudden cardiac death, especially when the anomalously originating coronaries are located between the arterial trunks with their subsequent compression.

We describe a case of HOCM coexisting with anomalous origin of the left main coronary artery (LMCA). Only a handful of individuals with such[1-4] or similar[5] combination of anomalies have been described so far.

A 35-year-old man with known HOCM was admitted for preinterventional work-up. Transthoracic echocardiography revealed asymmetric hypertrophy of the left ventricle, systolic anterior motion with moderate mitral regurgitation. Maximal gradient in the left ventricle outflow tract was 73 mm Hg at rest and increased up to 106 mm Hg during the Valsalva manouver. The peak oxygen consumption during cardio-pulmonary exercise test (Ramp protocol) was 21.8 ml/kg/min (50% of predictive value). Cardiac magnetic resonance showed asymmetrical left ventricular hypertrophy with the thickness of basal anteroseptal segments up to 21 mm (Supplementary material, *Figure S1A* and *S1B*). Invasive coronary angiography (ICA) showed LMCA trifurcation, myocardial bridging above the proximal segment of the left anterior descending coronary artery; there were no other significant coronary lesions. Selective intubation of the right coronary artery, however, was not possible. In order to unequivocally show the coronary tree, computed tomography angiography was performed, which revealed both left and right coronaries originating above the SOV (FIGURE 1A) and LMCA originating above the commissure between the left and right coronary cusp (FIGURE 1B and 1C). No LMCA compression between the aorta and the pulmonary trunk was visible.

As no appropriate septal branch for alcohol ablation was visible on computed tomography angiography or ICA, the patient was offered surgical treatment and underwent successful surgical myectomy.

Left coronary artery might have a potentially malignant course from the opposite site due to its possible compression between the ascending aorta and the pulmonary trunk. Fortunately, the "semi-opposite" LCA origin present in our patient excluded the interarterial course of the LMCA. The presence of additional branches originating from the LMCA division is a frequent angiographic finding: as high as 53% in a historical study. Nonetheless, no coexistence of LMCA-trifurcation with HOCM or with anomalous take-off of the LMCA was reported so far. From a practical point of view, identification of the appropriate target branch supplying exactly and exclusively the septal area involved in LVOT gradient formation is the key point for any consideration of alcohol ablation. Typically, such a branch arises from the left anterior

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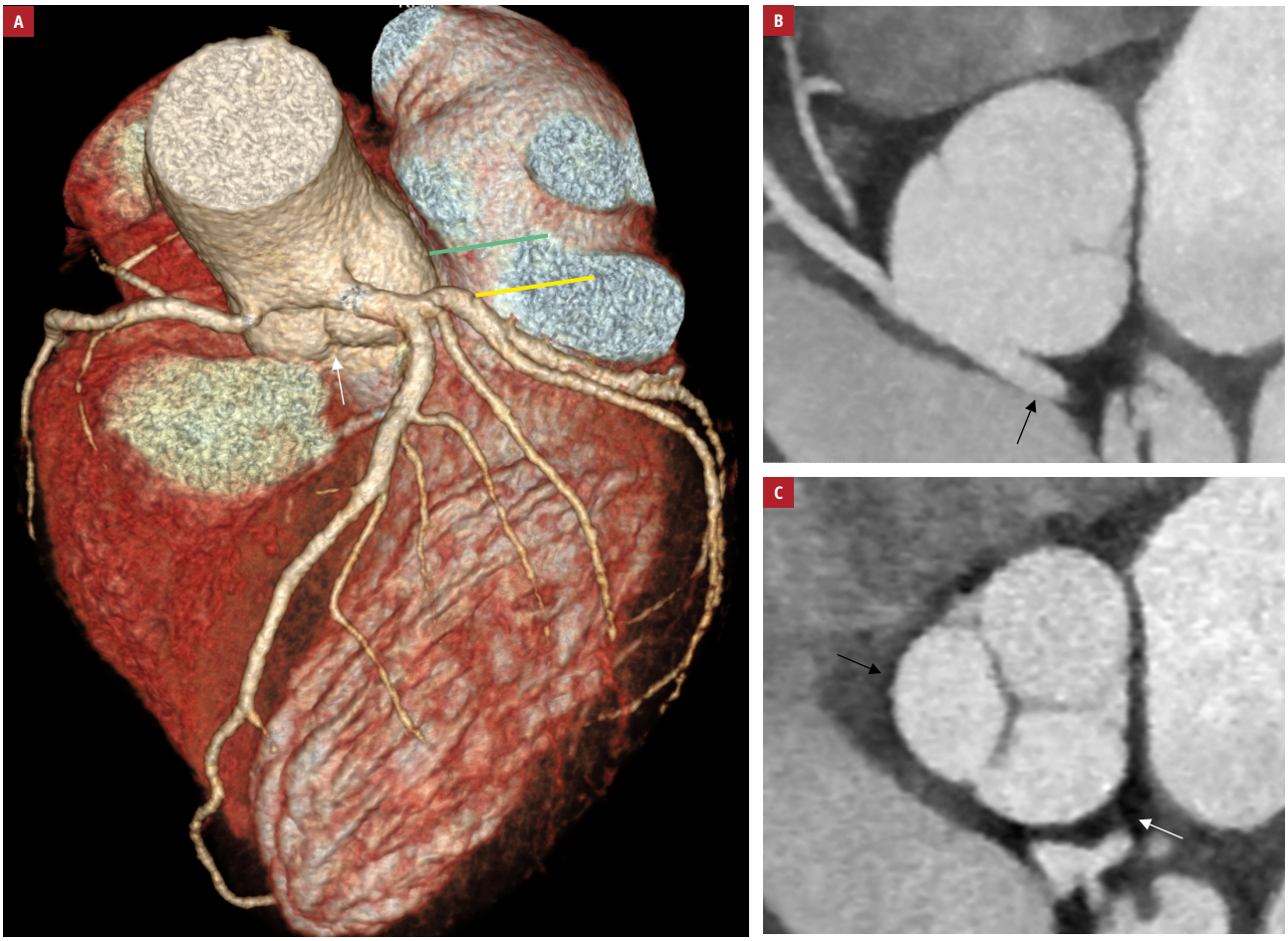

FIGURE 1 Computed tomography angiography: **A** – the left main coronary artery taking off above the commissure between the left and right coronary cusps (white arrow); **B** – cross-section of the sinus of Valsalva at the level of the coronary origins, corresponding to the green line from panel **A**. The black arrow indicates the left main coronary artery; **C** – cross-section of the sinus of Valsalva at the level of the coronary cusps, corresponding to the yellow line from panel **A**. The blue arrow indicates the right coronary cusp and the withe arrow, the left coronary cusp.

descending coronary artery or, less often, the diagonal branch. Although few reports described alcohol ablation of the branch originating from other coronaries, like the intermediate branch, no such coronary branch was present in our patient. Finally, difficulties in selective engagement of the right coronary artery during ICA highlight ICA limitations in detecting coronary anomalies. More attempts to engage the anomalous take-off of the coronary arteries may increase risk of iatrogenic aortic dissection (the RAID registry). Computed tomography angiography may be a complimentary imaging modality in such cases. In conclusion, this case illustrates casuistic coexistence of anomalous take-off of the left coronary artery in a patient with HOCM.

SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/kardiologiapolska.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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