Acute coronary syndrome due to extrinsic left main compression

Dominik Maj[1], Tomasz Kopiec[1], Małgorzata Wieteska[2], Aleksandra Gąsecka[1], Bartosz Rymuza[1], Arkadiusz Pietrasik[1]

[1]1st Chair and Department of Cardiology, Medical University of Warsaw, Warszawa, Poland
[2]Chair and Department of Epidemiology and Clinical Research Methodology, Medical University of Lublin, Lublin, Poland

Correspondence to:
Aleksandra Gąsecka, MD, PhD, 1st Chair and Department of Cardiology, Medical University of Warsaw, Banacha 1A, 02–097, Warszawa, Poland, phone: +48 518 343 599, e-mail: aleksandra.gasecka@wum.edu.pl

Kardiol Pol. 2021; 79 (9): 1034–1035; DOI: 10.33963/KP.a2021.0045

Received: March 16, 2021

Revision accepted: June 20, 2021

Published online: June 22, 2021

Left main (LM) compression syndrome is defined as the LM stenosis due to extrinsic compression, triggering symptoms of myocardial ischemia. The prevalence is 5%–44% in patients with pulmonary arterial hypertension (PAH) [1]. The diagnostics and treatment algorithms in LM compression syndrome are not clearly defined.

We report here a 49-year-old male with atrial septal defect (ASD) type 2 and PAH, who was admitted to the emergency department because of typical symptoms of the acute coronary syndrome (ACS). The electrocardiogram revealed features of myocardial ischemia. Echocardiography showed a reduced ejection fraction (30%), enlarged right ventricle (52 mm) and left atrium (46 mm), elevated systolic pulmonary pressure (80 mm Hg), and bidirectional flow in ASD type 2 (Figure 1A). Coronary angiography raised suspicion of significant stenosis in the proximal segment of LM (Figure 1B). Intravascular ultrasound (IVUS) demonstrated the elliptical shape of LM without atherosclerotic lesions (Figure 1C, Supplementary material, *Video S1*). Computed tomography revealed significant dilation of the pulmonary trunk compressing the LM, hence confirming the diagnosis (Figure 1D–E). Due to the symptoms of overt heart failure, a decision to pursue invasive treatment was made. An intra-aortic balloon pump was implanted and IVUS-guided LM percutaneous coronary intervention was performed (bare-metal stent 4.5/15 mm; Figure 1F). Post-intervention IVUS showed good stent expansion and no features of LM compression. Further clinical course was uneventful. During a follow-up hospitalization, right heart catheterization confirmed the Eisenmenger syndrome. The 5-year follow-up was uneventful regarding recurrent ACS.

Considering the non-specific symptoms of LM compression, the diagnosis is challenging. The most effective non-invasive imaging methods are cardiac computer tomography and cardiac magnetic resonance imaging [2]. If the imaging suggests abnormalities, it is necessary to perform coronary angiography followed by intravascular imaging [2]. In our case, since IVUS clearly demonstrated the extrinsic LM compression, and given a strong correlation between IVUS and fraction flow reserve, the latter was not performed. Considering that LM compression syndrome is not common, there is insufficient research to establish the gold standard treatment. Some authors suggest that coronary artery bypass grafting should be performed [3]. However, surgical treatment is associated with the high risk of mortality in severe PAH patients, and our patients had previously rejected the proposed surgical treatment of ASD [4]. There have been several reports of successful percutaneous coronary intervention (PCI) with either bare-metal stents (BMS) or drug-eluting stents in LM compression, showing comparable results regardless of stent type up to 3 years [2, 5]. Considering the large vessel diameter, no evidence of atherosclerotic plaque, the risk of hemoptysis, and potential treatment with prostacyclin agonist or anticoagulants due to Eisenmenger syndrome, BMS was selected, with a good clinical result during 5-year follow-up.

In conclusion, LM compression syndrome is a rare entity that can lead to ACS, acute heart failure, and sudden cardiac arrest. The non-invasive medical imaging in conjunction with angiography and IVUS/FFR makes diagnosing it possible. The line of treatment has not been clearly defined, but our case demonstrates that LM compression syndrome can be successfully managed by percutaneous treatment of the compressed vessel.

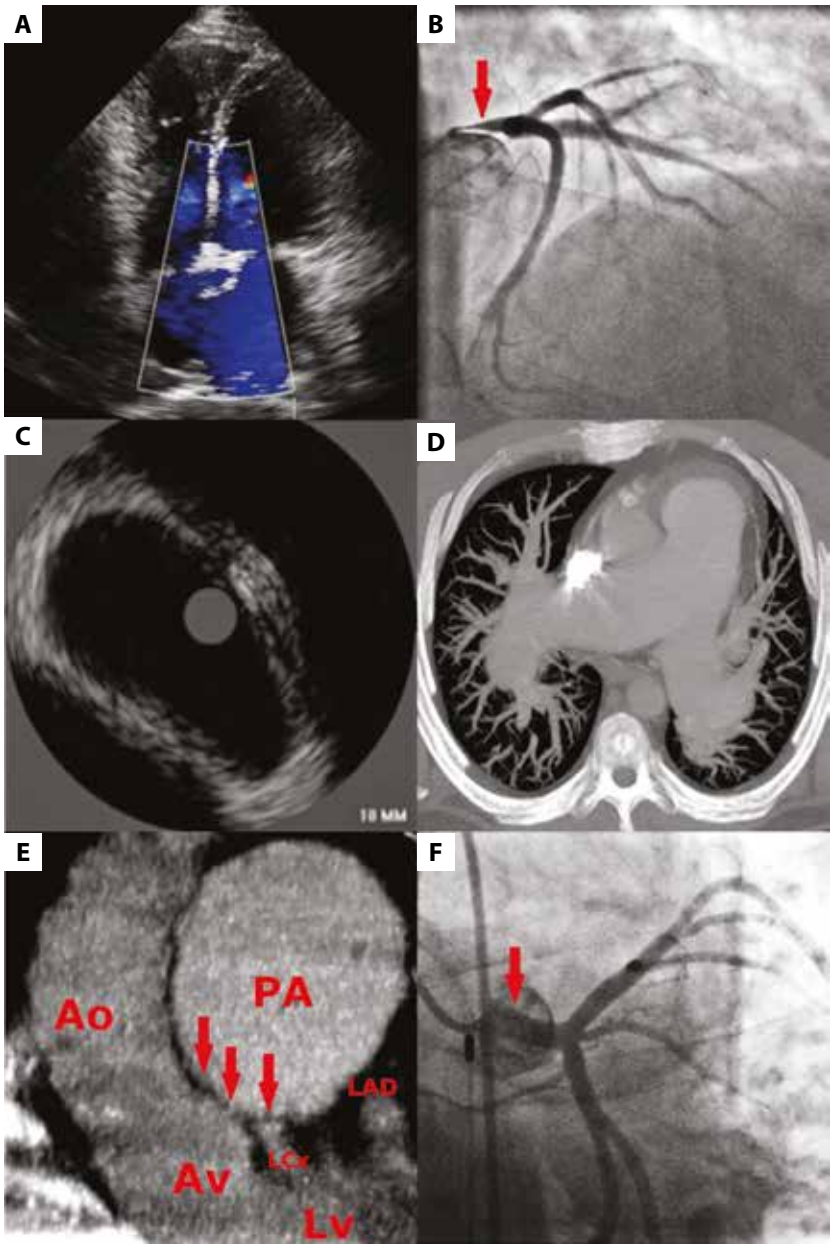

Figure 1. A. Echocardiography with color Doppler showing right ventricle enlargement and bidirectional flow in atrial septal defect type 2. **B.** Coronary angiography which raised suspicion of significant stenosis in the proximal part of the left main coronary artery (red arrow). **C.** Intravascular ultrasound demonstrating the elliptical shape of LM without atherosclerotic lesions. **D.** Computed tomography revealed enlargement of the pulmonary trunk (56 mm) and both pulmonary arteries (left 36 mm; right 51 mm). **E.** Computed tomography showing compression of the left main coronary artery against the sinus of Valsalva by the right pulmonary artery (red arrows) resulting in a subtotal occlusion, underlying acute coronary syndrome. **F.** Post-percutaneous coronary intervention angiography showing no features of left main compression (red arrow)

Abbreviations: Ao, aorta; AV, aortic valve; LAD, left anterior descending artery; LCx, left circumflex artery; LM, left main; LV, left ventricle; PA, pulmonary artery

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

Conflict of interest: None declared.

How to cite: Maj D, Kopiec T, Wieteska M, et al. Acute coronary syndrome due to extrinsic left main compression. Kardiol Pol. 2021; 79(9): 1034–1035, doi: 10.33963/KP.a2021.0045.

REFERENCES

1. Albadri K, Jensen JM, Christiansen EH, et al. Left main coronary artery compression in pulmonary arterial hypertension. Pulm Circ. 2015; 5(4): 734–736, doi: 10.1086/683690, indexed in Pubmed: 26697183.
2. Lindsey JB, Brilakis ES, Banerjee S. Acute coronary syndrome due to extrinsic compression of the left main coronary artery in a patient with severe pulmonary hypertension: successful treatment with percutaneous coronary intervention. Cardiovasc Revasc Med. 2008; 9(1): 47–51, doi: 10.1016/j.carrev.2007.07.003, indexed in Pubmed: 18206638.
3. Varela SG, Orbe PM, Villa JA, et al. Stenting in primary pulmonary hypertension with compression of the left main coronary artery. Rev Esp Cardiol. 2004; 57(7): 695–698, doi: 10.1016/s1885-5857(06)60294-6.
4. Batra K, Saboo SS, Kandathil A, et al. Extrinsic compression of coronary and pulmonary vasculature. Cardiovasc Diagn Ther. 2020, doi: 10.21037/cdt-20-155.
5. Ikegami R, Ozaki K, Ozawa T, et al. Percutaneous coronary intervention for a patient with left main coronary compression syndrome. Intern Med. 2018; 57(10): 1421–1424, doi: 10.2169/internalmedicine.9534-17, indexed in Pubmed: 29321426.