Dynamic left ventricular obstruction evoked by exercise: importance of outflow tract size

We have read with interest the article by Zywica et al. recently published in an issue of the European Journal of Echocardiography. The authors analysed, in 300 patients referred for exercise echocardiography, the prevalence and predictive factors of dynamic left ventricular outflow tract obstruction on immediate post-exercise echocardiographic examination.

This phenomenon, which appears in 5% of patients in the Zywica et al. series, has been previously described in others works, with frequencies ranging from 1.8 to 13.4%, reaching even 30.4%. These differences may be attributable to patients selection.

As previously published by our group using the same cut-off value of 25 mmHg to define as significative a dynamic gradient, the work of Zywica et al. shows how some echocardiographic parameters such as wall thickness and left ventricle diameter are related with the development of dynamic left ventricle outflow tract obstruction (DLVOTO). Nevertheless, in our series of 211 patients with unexplained dyspnea or ischaemia in the parasternal long-axis image, the left ventricle size of the L VOT at the aortic annulus at end-systole was smaller in their patients who developed dynamic LVOT obstruction; a potential cause of dyspnea in the elderly.

In our patients, LVOT was measured in 275 patients (92%). However, the diameter of the LVOT—even if it was indexed—was not predictive of exercise induced LVOT obstruction. Therefore, we did not include these data. The LVOT geometry also appears important. In our patients, LVOT was measured in 275 patients (92%).

Dynamic left ventricular obstruction evoked by exercise: importance of outflow tract size: reply

We thank the authors for their letter regarding our article. Their interesting observation that the size of the left ventricular outflow tract (LVOT) was smaller in their patients who developed dynamic LVOT obstruction was confirmed by another study by Nakatani et al. In 50 patients with non-obstructive hypertrophic cardiomyopathy, parameters predicting a provocable gradient of >40 mmHg with amyl nitrite included a larger angle between the ejection flow and the mitral valve and a small LVOT diameter of <2 cm.

Thus, the size of the LVOT does indeed seem to be an important factor which may predict the occurrence of dynamic LVOT obstruction. LVOT geometry also appears important.

References


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obstruction, are of great interest, we think that the absence of measurement of the left ventricle outflow tract means an important limitation which could partially affect their conclusions.

We thank the authors for their letter regarding our article. Their interesting observation that the size of the left ventricular outflow tract (LVOT) was smaller in their patients who developed dynamic LVOT obstruction was confirmed by another study by Nakatani et al. In 50 patients with non-obstructive hypertrophic cardiomyopathy, parameters predicting a provocable gradient of >40 mmHg with amyl nitrite included a larger angle between the ejection flow and the mitral valve and a small LVOT diameter of <2 cm.

Thus, the size of the LVOT does indeed seem to be an important factor which may predict the occurrence of dynamic LVOT obstruction. LVOT geometry also appears important.

In our patients, LVOT was measured in 275 patients (92%). However, the diameter of the LVOT—even if it was indexed—was not predictive of exercise induced LVOT obstruction. Therefore, we did not include these data. The LVOT diameter of patients with dynamic obstruction was 2.4 ± 0.2 vs. 2.3 ± 0.2 mm in those without (P = 0.42). The indexed values were 9.1 ± 1 mm in patients with 9.2 ± 1 mm in patients without dynamic obstruction (P = 0.78). What could explain the difference? We measured the size of the LVOT at the aortic annulus at end-systole. Nakatani et al. measured the LVOT at the onset of systole by measuring the minimal distance between the left side of the interventricular septum and the initial systolic echo of the anterior mitral leaflet in the parasternal long-axis image. Cabrera Bueno et al. described the measurement as measured in the longitudinal plane during systole as the shorter distance between the anterior mitral valve and the interventricular septal valve. Both