








Paradoxical low flow-low gradient aortic stenosis – clinical challenges and multimodality imaging in detecting aortic stenosis

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Introduction: Low flow-low gradient aortic stenosis (LFLG AS) with preserved left ventricular ejection fraction (LVEF), also called "paradoxical" LFLG (PLFLG) is defined as AS with a mean gradient (mean PG) <40 mmHg (or peak velocity <4 m/sec), valve area (AVA) <1.0 cm² with preserved LVEF (>50%) but stroke volume index (SVi) <35 ml/m².^{1,2} Even after exclusion of measurement errors and other potential causes of the echocardiographic findings, diagnosing true severe AS in these patients still remains a challenge. Given that prior studies have shown worse prognosis in PLFLG severe AS patients compared to those with moderate AS and true severe AS, it is crucial to establish the correct diagnosis.³

Case report: 76-year-old female patient was referred to our institution due to symptoms of stable angina and echocardiographic parameters of severe LFLG AS with preserved LVEF. Coronary angiography revealed a subtotal proximal LAD stenosis. Initially, surgical aortic valve replacement and a LAD-LIMA bypass were planned. However, after reevaluation, due to borderline calculated AVA of 1 cm², peak aortic valve velocity 3 m/s, mean PG 21 mmHg, and SVi 32 ml/m², further tests were necessary before potential surgery. After confirming low flow state, AVA of 1.4 cm² was measured using transesophageal planimetry. Also, the aortic valve calcium score of 250 was calculated through computed tomography, thus excluding severe AS. Patient underwent percutaneous coronary intervention with successful LAD stenting using provisional technique and will be followed up regularly for AS progression.

Conclusion: PLFLG AS remains a challenging diagnosis. Even with additional testing, such as dobutamine echocardiography, it is unclear how to optimally distinguish pseudosevere and true severe AS. Transesophageal valve planimetry and quantification of valve calcification may add important information in this context. In any case, severe AS must be carefully confirmed before deciding on intervention.

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