

# SIMILAR MORPHOLOGY, BUT DIFFERENT FUNCTION: ACUTE IMPROVEMENT OF MYOCARDIAL LONGITUDINAL STRAIN AFTER PERCUTANEOUS TRANSCATHETER AORTIC VALVE IMPLANTATION THERAPY IN A SEVERE AORTIC STENOSIS PATIENT

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Left ventricular systolic function can be worsened as a result of long standing pressure overload in patients with aortic stenosis (AS). Two-dimensional speckle tracking echocardiography can detect decreased global longitudinal strain (GLS) even in patients with preserved left ventricular ejection fraction.<sup>1)</sup> Transcatheter aortic valve implantation (TAVI) is a newly introduced therapy for elderly patients with severe AS with high perioperative risk.<sup>2)</sup> Because the TAVI is free from an additional cardiac injury during cardioplegia or myocardial incision, the comparison of strain values before and after the procedure can demonstrate the effect of increased pressure gradient on myocardial function more accurately. We want to show the acute effect of the decompression on the GLS in a patient underwent the TAVI procedure.

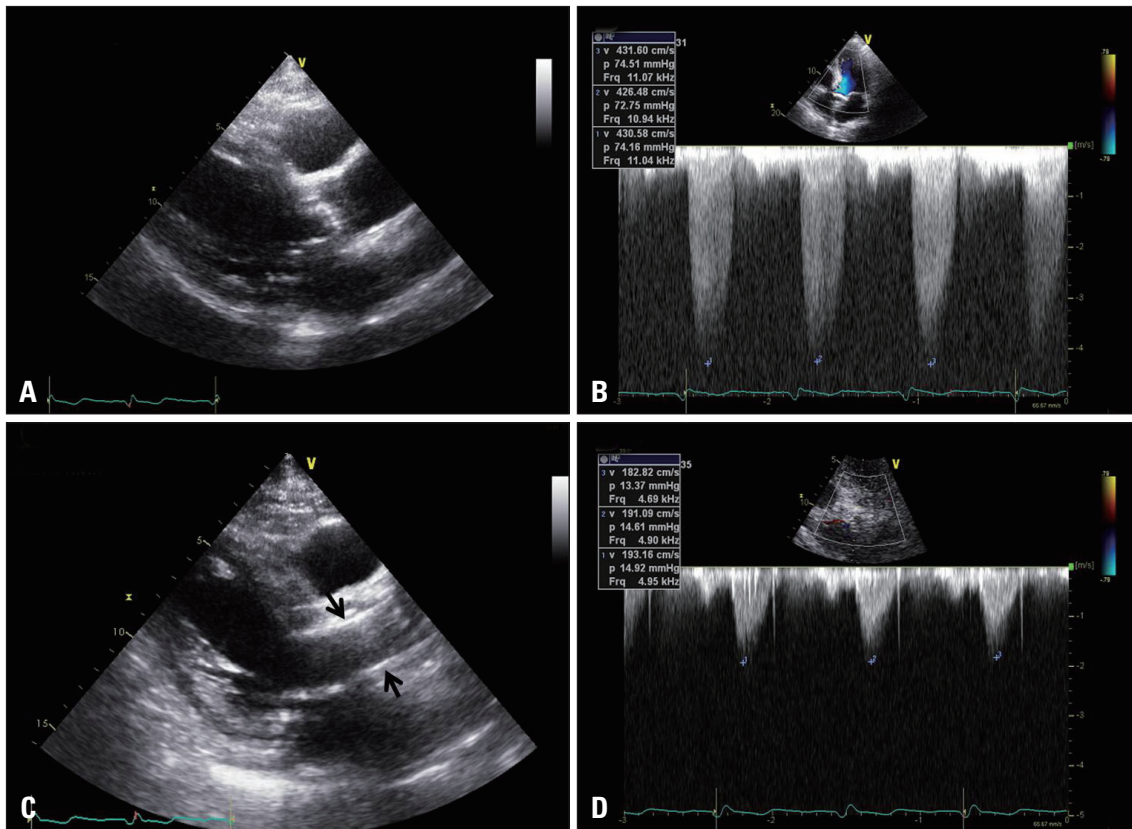
A 87 years old man was admitted to our hospital due to recurrent chest discomfort and syncope during exercise. Standard transthoracic echocardiography with Doppler analysis was done with Vivid E9 and M4S transducer (GE Vingmed, Horten, Norway). The baseline echocardiogram showed severe degenerative AS with preserved left ventricular systolic function (57%) (Fig. 1A and B) and his coronary angiography was normal. Because of the increased perioperative risk, the

patient underwent TAVI procedure with a 31 mm sized Core-Valve (Medtronic, Minneapolis, MN, USA). After the procedure, the patient showed marked improvement of functional capacity. The follow-up echocardiogram showed well deployed prosthetic valve in the aortic valve area with normal left ventricular systolic function (Fig. 1C) and the increased pressure gradient was lowered up to 14 mmHg from 74 mmHg of the baseline echocardiogram (Fig. 1D). Longitudinal strain analysis was performed from the apical long axis, four- and two-chamber views with 60 frames per second using offline software (EchoPacPC, GE Vingmed, Horten, Norway). Global longitudinal peak systolic strain of the left ventricle was generated averaging peak systolic strain values of the three apical views and bull's eye view was used to demonstrate segmental strain values. The baseline GLS was -14.4% (Fig. 2A) and follow-up GLS was increased up to -16.5% at one week after the procedure (Fig. 2B). This acute improvement of GLS may be originated from the effect of the pressure overload. To demonstrate the effect of increased pressure gradient on the GLS objectively, we need more patients with severe AS undergoing TAVI procedure.

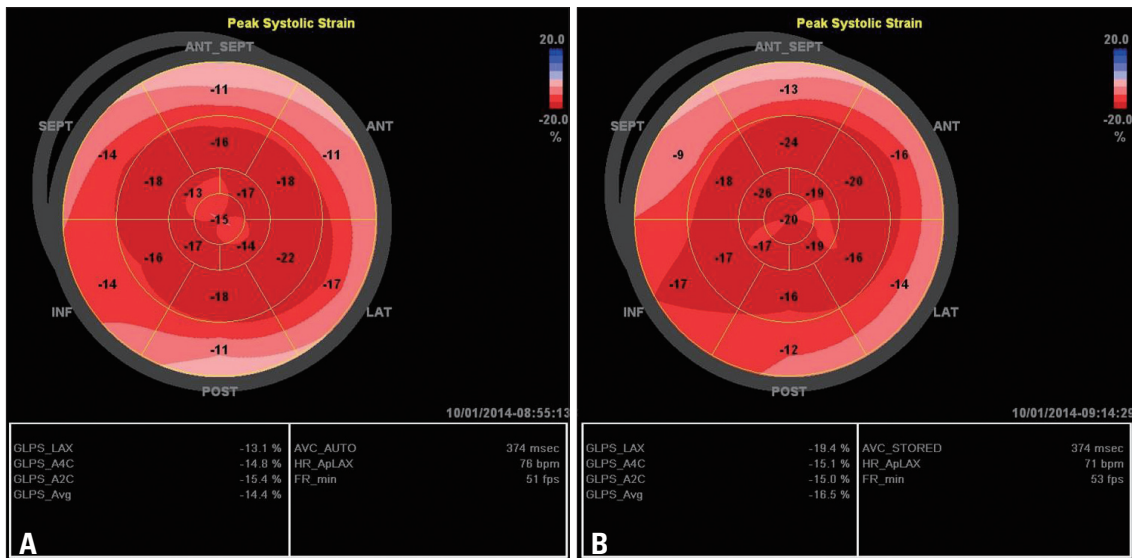
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**Fig. 1.** The baseline parasternal long axis view demonstrates severe calcified aortic valve (A) with increased transaortic valve maximal velocity up to 4.3 m/sec (B). After the procedure, prosthetic valve is inserted in to the aortic valve area (C, arrows) and transvalvular maximal velocity is measured up to 1.9 m/sec (D).



**Fig. 2.** Bull's eye diagram shows clearly visible improvement in global longitudinal strain after the transfemoral aortic valve intervention [before (A), and one week after (B) the procedure].

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