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*Case Report*

# Global Longitudinal Strain/Speckle Tracking in Asymptomatic Severe Aortic Stenosis: A Case Report

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## Abstract

Clinical assesment and managemet of asymtomatic severe aortic stenosis (ASA) still remains challenging. Despite normal ejection fraction (EF), left ventricle global longitudinal strain (GLS) is commonly reduced in asymptomatic severe aortic stenosis. Information obtained by this reproducible echocardiography 2D method is very useful not only in assessing of timing for the early aortic valve replacement (AVR), but also in the risk stratification of patients undergoing planned cardiovascular intervention. We present a case of 65 year-old female patient with severe aortic stenosis and without clinically manifested symptoms.

## Keywords

Global Longitudinal Strain, Asymptomatic severe aortic stenosis, Echocardiography.

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## Background

The calcification of aortic valve is the most common in people aged from 60 to 70 years. The symptomatic aortic stenosis (SAS) is clear indication for any invasive intervention, but intervention of the asymptomatic aortic stenosis has been still debated. The exact evaluation could be challenging particularly in patients with normal EF. The GLS is based on the speckle-tracking method and can estimate the cardiovascular outcome and left ventricular function changes more reliable than EF [1,2]. Since the myocardial fibrosis may start early in ASA, the GLS may provide addtional useful information on myocardial deformation. The AHA/ACC guidelines recommend aortic valve replacement when EF is less than 50%, Peak Velocity ≥4m/sec and Mean Pressure Gradient is ≥ 40mm Hg. New ESC/EACTS guideline suggest early intervention to be considered in SAS if LV global longitudinal strain is abnormal [3].

## Case Report

An 68 year old female with severe asymptomatic aortic stenosis and past medical history of essential arterial hypertension, diabetes, and pacemaker implantation regarding second degree AV block in 2021 has been evaluated.

The five years ago, she was diagnosed on transthoracic echocardiography as significant aortic stenosis and was she has been periodically followed up. During recent the examination, patient was alert, well-oriented in all directions, afebrile, eupnoic and she denied any symptoms or complaints. The physical examination has

reveled systolic murmur with a grade of 4/6 over precordium and carotid arteries. Her heart rate was 80/minute and blood pressure was 140/80 mmHg. The lower extremity oedema was not observed. Laboratory results were within normal range and no dyslipidaemia was noticed. The ECG showed sinus rhythm with a frequency of 80/min and intermittent ventricular stimulatin by the AS-VP DDD pacemaker.

Transthoracic echocardiography demonstrated mild left ventricle enlargement (58mm) with a concentric left ventricular hypertrophy (14mm). The overall left ventricular function was normal (ejection fraction by bi-plane Simpson method was 55%). Diastolic function was impaired , suggestive of restrictive impaired dyastolic function with E/A ratio of 2,5.Trileaflet aortic valve was heavily calcified with a estimation of the valve area (AVA) of 1,01cm2 and AV (VTI) of 1,0cm2. The maximum velocity gradient over aortic valve (AVPG max) was 64mmHg and mean gradient (AVMPG) was 41,4 mmHgp with a peak jet velocity of 4,1m/s. The aortic root was normal in size, and no other abnormalities noted.

## Results

The Global longitudinal strain/speckle tracking (GLS/ST) analysis was notable reduced with -14% in average. Patient was presented to cardiovascular surgery and successfully operated.


**Figure 1:** Aortic valve area (AVA) by planimetry: 1.0cm².

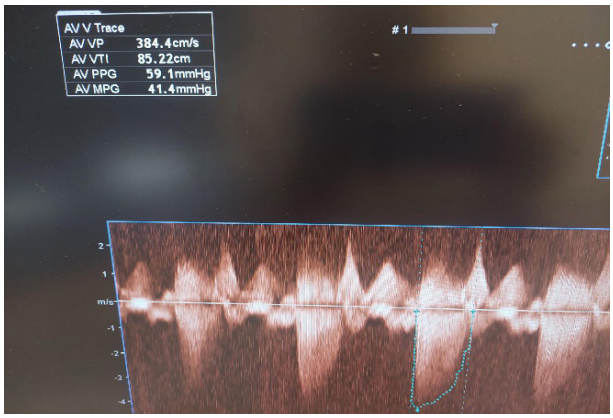


**Figure 2:** Continuous -wave Doppler. PG: 64mmHg, MPG: 41mmHg.

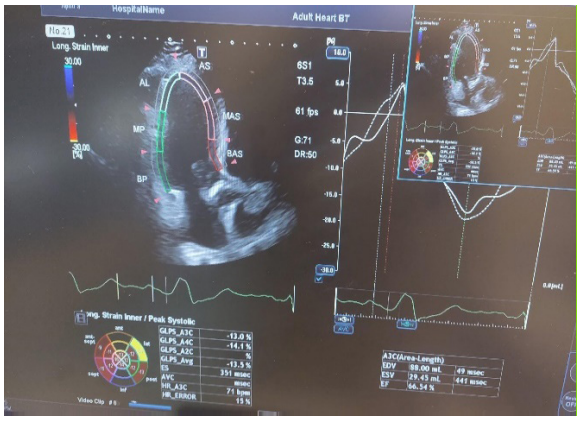

**Figure 3:** Global longitudinal strain (4 chamber view): -14 (average).

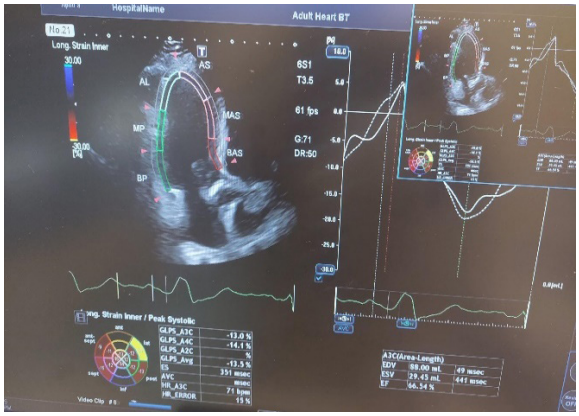

**Figure 4:** Global longitudinal strain (3 chamber view): -14 (average).

## Conclusion

The Global Longitudinal Strain/ Speckle Tracking analasys of asymptomatic severe aortic stenosis has shown the impaired ventricular function despite normal ejection fraction obtained by the routine transthoracic echocardiography exam. This case report has demonstrated that GLS/SC provided additional valuable clinical information in the estimation of optimal timing for the aortic valve replacement and may help in the risk stratification of patients undergoing cardiovascular surgery.

## References

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