The prognostic value of lung ultrasound in aortic stenosis

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Background: Aortic stenosis (AS) is a progressive disease and once symptomatic and heart failure (HF) develops is associated with poor prognosis. The degree of the pathophysiological and structural changes in AS are associated with poor survival. Pulmonary congestion is an almost universal finding in patients with HF. Lung ultrasound (LUS) evaluation of B-lines has been proposed as a simple, non-invasive tool to assess pulmonary congestion.

Aim: To assess pulmonary congestion with LUS in patients with AS and to define the prognostic value of B-lines.

Methods: 84 consecutive patients (43 women, mean age 74 ± 9 years) with moderate or severe AS were enrolled. Exclusion criteria were as follows: moderate or severe aortic regurgitation, moderate or severe mitral regurgitation, cardiomyopathies, pulmonary disease, renal failure. At baseline, all patients underwent comprehensive echocardiography examination and LUS according to 28 scanning-site assessment. Patients were followed-up after enrollment to establish the prognostic value of LUS. A composite endpoint was considered, including: aortic valve replacement due to deterioration of patient condition or progression of AS from moderate to severe, death (any cause), hospitalization due to acute heart failure or progression of chronic heart failure which required hospitalization.

Results: We found a severe number of B-lines (total B-lines ≥30) in 31% of AS patients. The number of B-lines was correlated with estimated pulmonary artery systolic pressure (p < 0,005, r = 0,52) and increased along with NYHA class (p < 0,001) Figure 1. Patients with ≥30 B-lines had more events during the 13,4 ± 6 months follow-up (p < 0,001, Log-rank: 10,7; Figure 2).

Conclusion: Assessing B-lines in AS is a simple, feasible method to detect pulmonary congestion. The number of B-lines correlates with hemodynamic changes caused by AS and with the functional status of the patients. A severe degree of sonographic pulmonary congestion is associated with an increased risk of adverse events.

Abstract Figure. FC class vs. Blines and prognostic value

![Figure 1](image1.png)

![Figure 2](image2.png)