allows the calculation of the effective AVA, but the accuracy of this measure- 
ment has been criticized and is not part of core guidelines. Multidetector com- 
puted tomography (MDCT) supports AS diagnosis using valvular calcium scor-
ing and MDCT can delineate aortic cusps, but anatomical AVA measure remains
untested.

**Purpose:** To compare the measurement of 4D-MDCT derived anatomical AVA, 
with new, custom-made software, with effective AVA by transthoracic echo-
cardiography (TTE) continuity equation.

**Methods:** Twenty patients with severe AS and clinically indicated 4D-MDCT 
of the aortic valve were included. AVA was obtained using continuity equation 
for Doppler-Echocardiography. Using 4D-MDCT with contrast after imaging re-
registration, custom semi-automated software allowed aortic cusp delineation 
and anatomical AVA measurement. With this software, a systolic 3D model of the 
valvular complex and LVOT was obtained and LVOT planimetry was performed,

**Results:** In 18 out of 20 patients (80%) MDCT image quality allowed complete 
delineation of aortic cusps. AVA by Doppler-Echo was 82±15 mm². Anatomical AVA 
measured 80±16 mm² for method-A, 88±20 mm² for method-B, 93±21 mm² for 
method-C, and 87±19 mm² when averaging over the three methods. Absolute dif-
ferences between Echo and 4D-MDCT measurements were 7.7±4.6 mm² (p for 
difference=0.3; r=0.85, p=0.0001) for method-A; 9.2±6.8 mm² (p for difference=
0.074; r=0.86, p=0.0001) for methods-B; 11.9±9.1 mm² (p for difference=0.0002;
 r=0.90, p=0.0001) for method-C, and 7.7±5.9 mm² (p for difference=0.03; r=0.88,
 p=0.0001) for the average. Analysis of regression slopes >1 (echo lower than 
MDCT) was observed for methods-B, -C, and -average (1.26, 1.13, and 1.11 re-
spectively) but was 0.93 for method-A.

**Conclusion:** The present pilot study introduces a promising method to quantify 
anatomical AVA by contrast 4D-MDCT. This approach is highly feasible and pro-
vides detailed visualization of the complex stenotic orifice. Good correlation with 
Echocardiography (TTE) continuity equation. The use of 4D-MDCT supports AS 
diagnosis using valvular calcium scoring and MDCT delineates aortic cusps, but 
anatomical AVA measure remains untested.

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**Left atrial dysfunction as a pathway to heart failure symptoms in patients with severe aortic stenosis and preserved left ventricular ejection fraction**

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**Background:** Although prognosis in asymptomatic patients (pts) with severe aortic 
stenosis (AS) is relatively benign, the risk increases abruptly with symptom’ occurrence. The relationship between left atrium (LA) dysfunction and heart failure (HF) symptoms has been demonstrated in several settings of left ventricular (LV) myocardial dysfunction such as HF with preserved LV ejection fraction (LVEF) or hypertrophic cardiomyopathy. However, data regarding the contribution of LA dysfunction to the patients’ symptoms in severe AS is scarce.

**Aim:** We aimed to evaluate the usefulness of LA function over other parameters related to the symptomatic status (eg BNP serum values, LV global longitudinal strain - GLS, LA size, E/e’ ratio) in stratifying the risk of pts with severe AS.

**Methods:** We prospectively enrolled 291 consecutive pts (66±11 yrs, 57% men) with severe AS (indexed aortic valve area, AVAI <0.6 cm²/m²) and preserved LVEF (>50%), in sinus rhythm, with no more than mild aortic or mitral regurgita-
tion. Patients were divided in two groups based on the presence of HF symptoms: symptomatic (238) or asymptomatic (53 pts). A negative exercise echocardio-
gram/ECG test was required to confirm the asymptomatic status. A comprehen-
sive echocardiogram was performed in all patients. Left ventricular and LA defor-
mation parameters were assessed using speckle tracking echocardiography.

**Results:** No significant differences were found between symptomatic and asym-
ptomatic pts regarding age (66±10 vs 64±12 yrs), cardiovascular risk factors and 
comorbidities (ie smoking, hypertension, dyslipidemia, chronic kidney disease) 
(p>0.10 for all). Left ventricular EF and geometry - diameters, volumes, LV mass 
index (146±38 vs 146±38 g/m²), relative wall thickness and E/e’ average ratio 
(15.6±5 vs 13.5±4.8) were similar between groups (p>0.10 for all) despite a higher 
AVA in asymptotic pts (0.44 vs 0.39 cm²/m², p<0.001). Moreover, in symp-
tomatic pts BNP values (In BNP: 5.4±1.0 vs 4.3±1.0; p=0.019), LAVI (48±15 vs 
42±15, p=0.033) and PAPs (349±9 vs 30±8 mmHg, p=0.029) were significantly higher, whereas GLS (−14.6±3.6 vs −15.9±3.4%, p=0.026), peak LA longitudinal strain (17±7 vs 23±7%, p=0.001) and strain rate parameters (SSr, Esr, ASr, 
 p<0.001) were significantly lower compared to asymptomatic pts. In the multi-
variable analysis, peak LA longitudinal strain was the only independent correlate 
of HF symptoms (p=0.011).

**Conclusions:** Peak LA longitudinal strain is an independent correlate of the pres-
ence of HF symptoms in patients with severe AS and preserved LVEF. A non-
invasive echocardiographic evaluation of LA function would be useful to improve 
risk stratification in this clinical setting.