

EuroValve

October 24-25 2014, Rome, Italy

www.eurovalvecongress.com



Ascending aortic elastic properties and LV longitudinal function in isolated bicuspid aortic valve by speckle tracking echocardiography

A.F. D'Aiello¹, D. Avitabile², C. Bancone², G. Di Salvo³, G. Limongelli¹, M. Buonocore², M. Montibello², M.G. Russo¹, A. Della Corte²

(1) Pediatric Cardiology, University of Naples II, Monaldi Hospital, Naples, Italy

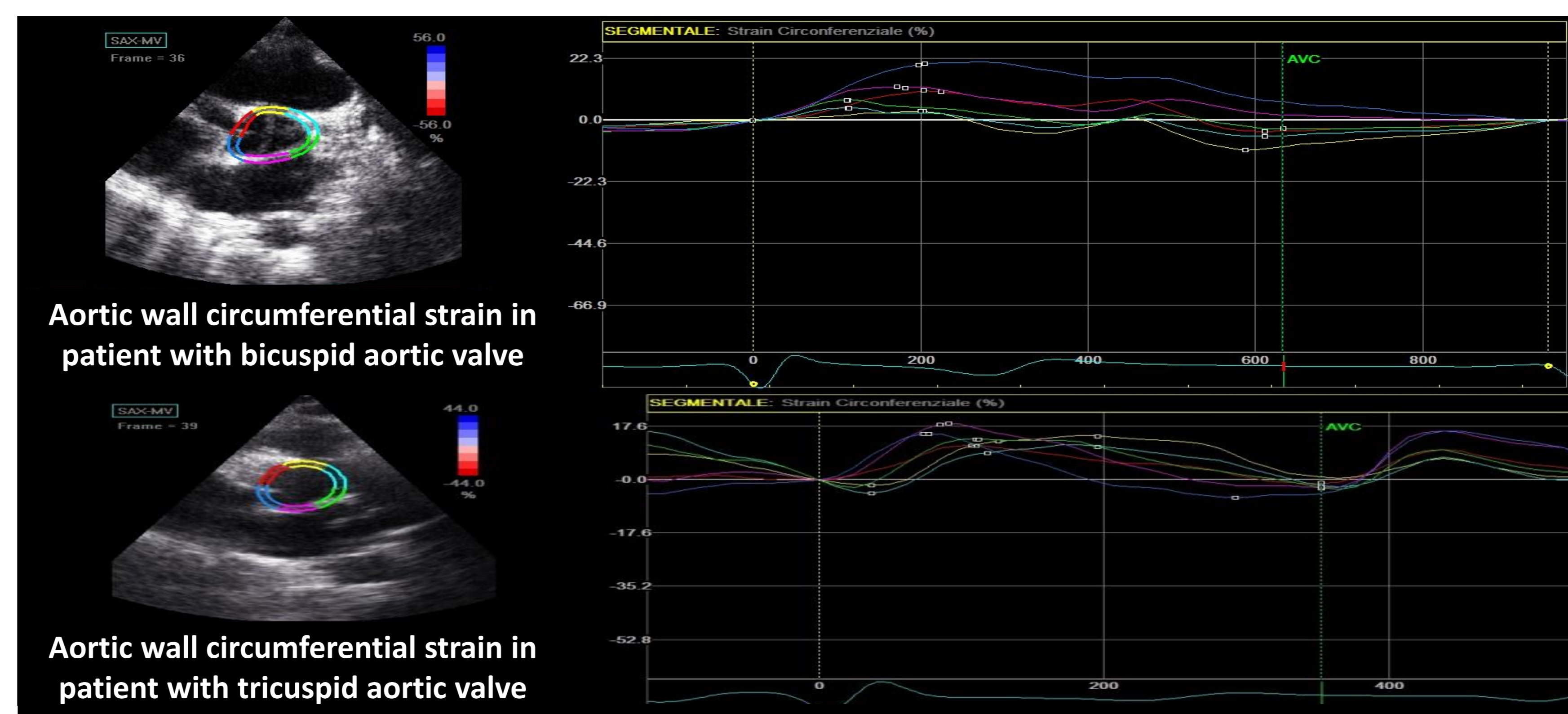
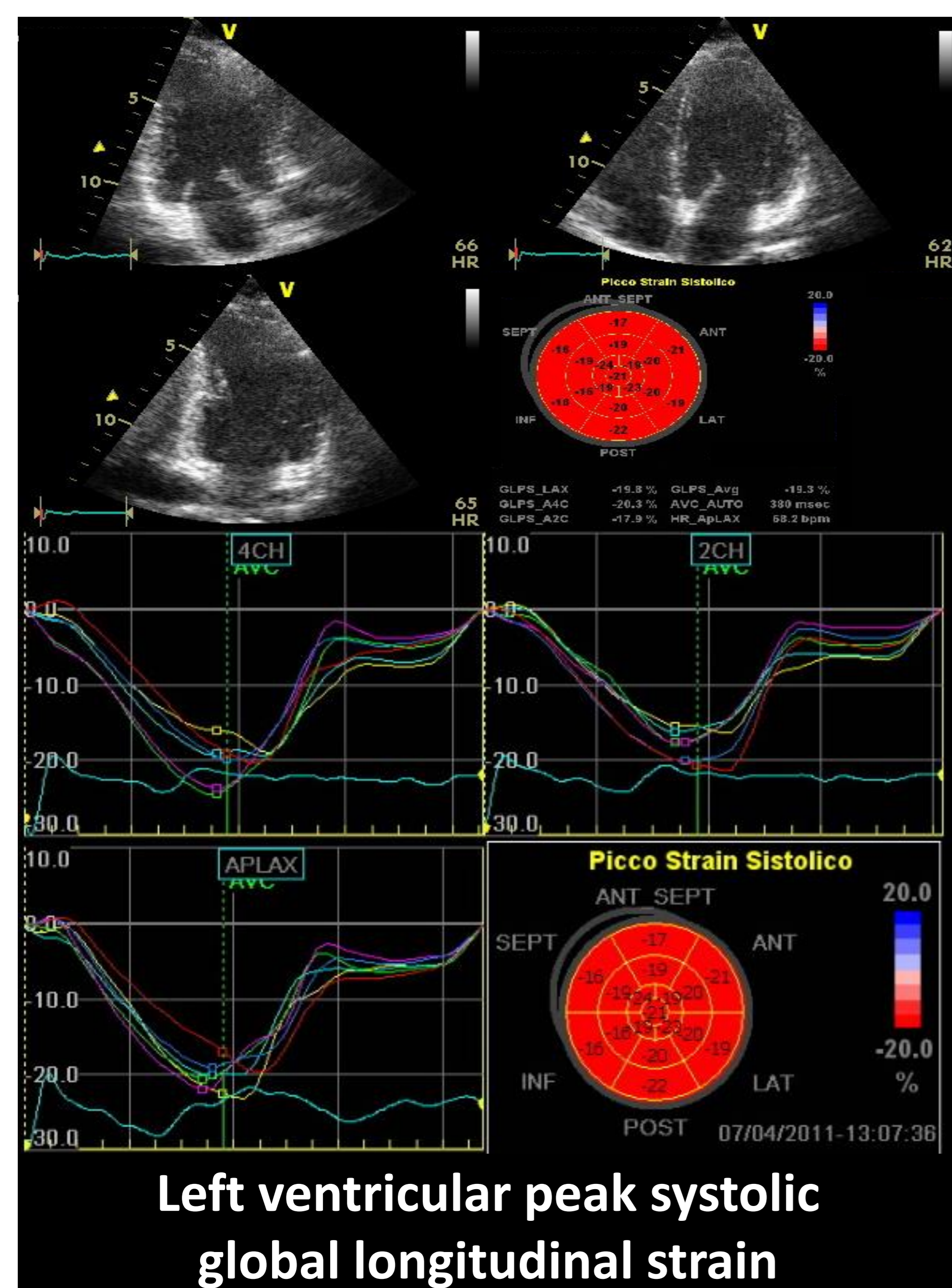
(2) Cardiac Surgery, University of Naples II, Monaldi Hospital, Naples, Italy

(3) King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia

OBJECTIVE: Only few data are available on aortic stiffness and left ventricular longitudinal function in patients with bicuspid aortic valve. We aimed to assess aortic stiffness and myocardial deformation in bicuspid aortic valve patients without significant valvular dysfunction and non dilated ascending aorta by using speckle tracking echocardiography.



METHODS: We selected 20 bicuspid aortic valve patients (mean age 11.2±6.2 years) and 20 matched healthy controls. Standard echo study and speckle tracking were performed. From short-axis images of the ascending aorta, the peak circumferential strain and strain rate of the vessel wall were determined and left ventricular global peak systolic longitudinal strain was assessed from the standard apical 4 chamber, 2 chamber and 3 chamber view.



RESULTS: Patients and controls were comparable for age, sex, anthropometrics, blood pressure and heart rate. Aortic peak circumferential strain and strain rate were lower in bicuspid patients than in controls (4.3±2.5% versus 10.2±3.5%, p<0.001). Left ventricular ejection fraction was similar between pts and controls, however left ventricular longitudinal peak systolic deformation was significantly impaired in bicuspid aortic valve patients (-18.3±3.8 versus -20.5±1.7%, p<0.05).

	TAV (n=20) (Tricuspid Aortic Valve)	BAV (n=20) (Bicuspid Aortic Valve)
Age (yrs)	11.8 ± 5.3	11.2 ± 6.2
Male (%)	65	65
IVSTd (mm)	6.8 ± 1.3	7.9 ± 1.4
LVDd (mm)	39.7 ± 6.1	40.1 ± 4.7
LVEF (%)	66.2 ± 6.2	65.8 ± 5.2
LVMI (g/m ²)	57.9 ± 14	64 ± 14 *
DT (ms)	163 ± 40	182 ± 36 *
E (cm/s)	17 ± 2	12 ± 3 *
E/A	1.72 ± 2	12 ± 3 *
E/E'	4 ± 2.9	6 ± 2.8 *
Average long 2D strain (%)	-20 ± 1.7	-18 ± 3.8 *
Average circ Ao 2D strain (%)	10.2 ± 3.5	4.3 ± 2.5 **
Annulus (cm/m ²)	1.11 ± 0.1	1.12 ± 0.1
Valsalva sinuses (cm/m ²)	1.44 ± 0.1	1.45 ± 0.1
Sinotubular junction (cm/m ²)	1.26 ± 0.1	1.26 ± 0.2
Ascending Aorta (cm/m ²)	1.42 ± 0.1	1.44 ± 0.1

CONCLUSIONS: Aortic elasticity, as assessed by trans-thoracic echocardiography is impaired in bicuspid aortic valve patients, despite the absence of significant valve dysfunction and of aortic dilatation. Also left ventricular global longitudinal strain was lower in bicuspid patients than in controls, despite a normal ejection fraction. Thus, speckle tracking echocardiography appears to be a promising tool in risk stratification and potentially, if validated, as a support in surgical decision making for bicuspid aortic valve patients.