



P129 Arterial Stiffness in Bicuspid or Tricuspid Aortic Valve Aortopathy Using Magnetic Resonance Imaging: Crossing the Physical and Hemodynamic limits?

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ABSTRACT

Purpose: To provide a comprehensive assessment of aortic stiffness, through both local and regional distensibility and pulse wave velocity (PWV), in patients with either a tricuspid (TAV) or bicuspid (BAV) aortic valve and/or aortic dilation using MRI.

Methods: We included 18 patients with TAV and dilated ascending aorta (DTAV, 65 ± 14 years, 11 males), 19 patients with a non-stenotic BAV without severe regurgitation (55 ± 15 years, 17 males), both paired for age, gender and pressures to control groups. All subjects underwent thoracic aortic axial 2D+t and sagittal 3D+t velocity-encoded MRI and carotid applanation tonometry. Local ascending (AA) and descending (DA) aortic distensibility as well as aortic arch PWV were automatically measured from 2D+t data [1], while regional AA and DA PWV were calculated from 3D+t data [2].

Results: As expected, both DTAV and BAV groups showed significantly increased maximal aortic diameters when compared to their respective control group: 47 ± 5 vs 31 ± 3 mm and 44 ± 4 vs 31 ± 4 mm, respectively ($p < 0.001$). However, no significant changes were found in local and regional aortic stiffness indices between both patient groups and their matched controls ($p \geq 0.05$).

Conclusion: 2D or 3D data-derived distensibility or PWV concomitantly and unexpectedly indicate that aortic stiffness was unchanged in patients with aortopathy when compared to matched healthy controls. Since fundamental laminar flow conditions and elastic properties driving Moens-Korteweg models are not reached in highly dilated aortas, the associated turbulent flow, local flow disorganization, changes in derived pressure gradients and flow-wall forces might be more suitable for an early discrimination of patients with valve/aneurismal disease.

REFERENCES

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