**Title of Abstract:** Age-related and regional changes of aortic compliance in the Marfan syndrome: assessment with velocity-encoded MRI

**Category:** MR Aorta/ Peripheral Vascular Disease

**Purpose:** To describe age-related changes in global and regional aortic compliance using velocity-encoded (VE) MRI in Marfan syndrome (MFS) as compared to healthy volunteers.

**Methods:** Twenty-five MFS patients (age range: 18-63 years, mean age 36±14 years, 13 men) and 25 age/gender-matched healthy volunteers were examined with VE-MRI. Compliance was expressed as pulse wave velocity (PWV) and distensibility. PWV was assessed in the aortic arch (AA), descending (DA) and total aorta. Distensibility was assessed in the ascending aorta. PWV and distensibility were compared between patients and healthy volunteers using paired t-tests. The relation between age and PWV and distensibility was determined by stepwise multiple linear regressions with forward entry analysis and Pearson’s correlation.

**Results:** PWV in MFS patients was significantly higher in the AA, DA and total aorta compared to healthy volunteers (5.7±1.5m/s, 6.4±2.4m/s and 5.9±1.7m/s vs. 4.8±0.9m/s, 5.0±1.2m/s and 4.9±1.1m/s, all p<0.004). Secondly, distensibility was significantly lower in patients (4.5±2.6?10^-3mmHg^-1 vs. 6.7±4.3?10^-3mmHg^-1, p=0.002). All PWV-values correlated significantly with age (Pearson R between 0.45 and 0.94), for both patients as well as for healthy volunteers. In the AA, the yearly PWV-increase was significantly higher in patients (mean increase 7±2 cm/s/year) than in healthy volunteers (mean increase 3±1 cm/s/year, p=0.03), but not for DA and total aorta.

**Conclusion:** Velocity-encoded MRI detects age-related changes of aortic wall compliance in patients with Marfan syndrome. Aortic arch compliance decreases more pronounced with age in Marfan patients, suggesting more severe wall disease in the ascending aorta.