Multiple prestenting provides for the Melody valved stent an adequate landing tube with minimal recompression or fracture

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Introduction Long term function of the Melody valved stent depends on conduit integrity; stent fracture and recompression which has been reported to exceed > 20% in first year. Prestenting adds stiffness to the scaffold, reduces the stress amplitude and therefore may delay or avoid metal fatigue and fracture.

Patients and methods
A/ in vitro: stents in various combinations of CP stent (Numed, NY, USA) which is also the Melody stent, and Andrastent XXL (Andramed, Reutlingen, DE) at 22 mm were submitted to pressure tests to quantify stiffness.
B/ patient implantation: all patients treated by Melody PPVI; systematic follow-up with dedicated database. Doppler velocity across the RVOT stent tube to assess tube and valve function. Chest X-ray at 6 months and annually to look for stent recompression or fractures.

Results
A/ deploying stents into each other significantly increased stiffness; for similar lengths the CP stent was slightly stiffer.

B/ 131 patients had the RVOT presented in 2006-2014; mean age 19.9 years (3.8 – 81.6); follow-up 2.8 years (31 days – 8 years). Pre-stenting evolved significantly: stents were implanted until the outflow tract became a rigid non-restrictive tube without relative motion nor wringing. In 33 patients without a previous surgical conduit, 1 stent was used for pre-stenting in 98 patients, 2 stents in 21 patients, 3 stents in 6 patients and in 2 patients up to 4 stents were implanted prior to the implantation of the valved stent. The residual gradient after PPVI was 20 mmHg (8-53) Vmax 2.1 cm/s (1.4-3.6); the final diameter was 22 (18-24). During follow-up no relevant increase in peak RVOT velocity (+ 0.2 m/sec at 3y, 0.5 m/s at 5y). During follo-up of mean 2.8 years, we observed stent fractures in 6 patients, anterior recompression in 3 pts; an increase in gradient was seen in only 1 patient (+ 25 mmHg).

Discussion Adequate prestenting of the RVOT before revalvulation offers good stent support which nearly abolishes Melody recompression or fracture.