Impact of pulmonary wave reflection in heart failure: right ventricular-arterial coupling

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Background: Pulmonary wave reflection, an important loading component on RV, would help better describe right ventricular (RV) – arterial uncouplingin type II pulmonary hypertension (PH).
Methods: This study included 105patients with type II PH (age = 72±13 years old, ejection fraction = 47±21%). Pulmonary wave reflection was characterised by estimating pressure and velocity profiles from Doppler measurement and separating pressure waveform into forward (Pf) and backward pressure (Pb) waves based on the concept of wave intensity. The relationship of RV strain against Pb or pulmonary artery systolic pressure (PASP) was compared between patients with and without subsequent event of worsening heart failure, using discriminant analysis.
Results: Sample profiles of pressure waveforms illustrated Pb accounted for a significant proportion of total pressure (figure A). When RV strain was plotted against Pb, the distribution of both group were clearly separated, indicating significant uncoupling in patients with events, whereas when plotted against PASP, the both groups were overlapped (figure B and C).
Conclusions: Pulmonary wave reflection can better describe RV-arterial uncoupling in type II PH.