Rapid Fire Abstracts

1231

Left atrial septal and lateral wall strains contain different pressure information: Utility in pulmonary hypertension

Khan FH.[1]; Inoue K.[2]; Andersen OS.[1]; Gude E.[3]; Skulstad H.[3]; Smiseth OA.[1]; Remme EW.[1]

[1]Oslo University Hospital, Institute for Surgical research, Oslo, Norway
[2]Ehime University Graduate School of Medicine, Department of Cardiology, Pulmonology, Hypertension & Nephrology, Ehime, Japan
[3]Oslo University Hospital, Department of cardiology, Oslo, Norway

Funding Acknowledgements: South-Eastern Norway Regional Health Authority

Background: Reduced left atrial (LA) reservoir strain is a marker of elevated LA pressure. Thus it could be a potential non-invasive marker to differentiate pre- and post-capillary pulmonary hypertension (PH) as the latter is defined by elevated pulmonary capillary wedge pressure (PCWP) > 15 mmHg. However, in pre-capillary PH patients with elevated right atrial pressure (RAP), the atrial septal geometry may be abnormal. This could lead to lower regional LA septal strain, making LA lateral wall strain more accurately reflect PCWP.

Purpose: We investigated if LA lateral wall strain can differentiate between pre- and post-capillary PH, and how LA lateral wall strain and LA septal strain are both affected by elevated RAP in pre-capillary PH. Furthermore we investigated if LA septal strain can be used in pre-capillary PH patients to identify those with elevated RAP.

Methods: We analysed 63 patients with PH, 28 pre-capillary and 35 post-capillary, who underwent right heart catheterisation. Echocardiography was performed simultaneously with or within 24 hours of the invasive pressure measurements. Regional LA septal strain and lateral wall strain were measured from the apical four chamber view.

Results: Pulmonary artery pressure was 39.5 ± 11.1 mmHg (mean ± SD) in the pre-capillary PH patients and 37.0 ± 10.1 mmHg in the post-capillary PH patients (p = ns). Mean PCWP was 9.9 ± 2.5 mmHg and 24.5 ± 6.0 mmHg (p < 0.001), respectively.

LA lateral wall strain was significantly lower in patients with post-capillary PH compared to pre-capillary PH (11.9 ± 7.7% vs 26.6 ± 9.9%, p < 0.001) (Fig. a,b). At a cut-off value of 18.0%, LA lateral wall strain could predict elevated PCWP > 15 mmHg with AUC = 0.88, sensitivity = 85.7% and specificity = 76.3%.

In the 28 patients with pre-capillary PH, we classified mean RAP ≥ 10 mmHg as elevated and < 10 mmHg as normal. Seven of these patients had elevated RAP and showed significantly reduced LA septal strain compared to the 21 patients with normal RAP (13.0 ± 6.2% vs 22.1 ± 7.6%, p < 0.01). LA lateral wall strain showed no difference in these groups of pre-capillary PH patients (25.8 ± 10.1% vs 28.9 ± 9.4%) (Fig. c).

Conclusions: LA lateral wall strain can be used for differentiating between pre- and post-capillary PH. In addition, LA septal strain may be used in pre-capillary PH patients to identify those with elevated RAP.

Abstract 1231 Figure