

Meeting abstract

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## 1112 Strain encoded imaging (SENC) in MR – a new method to quantify RV dysfunction in pulmonary hypertension

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### Background

Pulmonary hypertension (PH) is still difficult to diagnose and remains often undetected because of unspecific symptoms like dyspnea, lethargy and fatigue. However PH is a life-threatening condition with a poor prognosis if untreated.

### Purpose

We hypothesize that SENC imaging provides additional information about RV function and might therefore be useful to detect PH as well as to guide pharmacological treatment in addition to conventional clinical parameters.

### Methods

SENC was used to detect regional strain in the RV and LV free wall as well as the interventricular septum in a conventional 4-chamber view. All measurements were conducted on a 1.5 T Philips Achieva MRI scanner. 8 patients (age  $59 \pm 15$ ) with pulmonary hypertension (PAP syst.  $73 \pm 24$  mmHg, range 55 to 110 mmHg, NYHA class III) were examined with a standard MRI protocol, including SENC acquisitions.

### Results

Using SENC, a significant difference in time-to-peak strain was found between RV free wall and septum ( $p < 0.001$ ). Furthermore, RV free wall tended to reach their maximal strain later than LV free wall ( $p = 0.08$ ). This time delay (125–225 ms) was detectable in all RV wall segments in patients with PAP > 70 mmHg, while patients with mod-

erately increased PAP (40–60 mmHg) showed only regional or shorter delays (75–125 ms). However, no significant difference in peak strain could be detected between RV and LV although significant RV dilation and visual dysfunction was found in all patients. Additionally no correlation between RV peak strain and PAP could be detected.

### Conclusion

SENC is a valuable, noninvasive tool to assess RV dysfunction in patients with PH. Peak strain seems to be within normal range during development of PH, even when PAP is severely increased, RV morphology has changed, and RV function is decreased. However, a delay in time-to-peak strain of the RV free wall seems to be an early sign of RV dysfunction and can be a useful not only for diagnostic but also for therapeutic requirements. This delay relative to the septum and the LV free wall indicates RV intraventricular dyssynchrony, which compromises the RV function. Nevertheless, due to the small study group further studies have to be done to fortify our findings.