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Measuring invasive blood pressure by catheters guided solely by Cardiovascular Magnetic Resonance by using a new MRI-compatible guidewire without the need of a hybrid MRI-fluoroscopy suite

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BACKGROUND: Blood pressure or blood pressure gradients cannot be evaluated accurately by routine cardiovascular magnetic resonance. However, blood pressure can be measured using invasive fluid-filled catheters guided by fluoroscopy in conventional catheter-laboratories. First clinical approaches have also been made using so-called hybrid cardiovascular magnetic resonance (CMR)-fluoroscopy suites. Therefore, the aim of this study was to test the feasibility of measuring blood pressure using fluid-filled catheters solely by CMR guidance without the need of a hybrid CMR-fluoroscopy suite.

METHODS: Patients scheduled for routine clinical CMR and combined diagnostic and interventional catheterization by fluoroscopy were included into the study [10 patients with untreated or recurring coarctation of the aorta and 4 further patients with Fontan Circulation, RVOT-Conduit and pulmonary artery hypertension (2 female, median age: 23 years, range: 13 to 55 years)].

RESULTS: Blood pressure was measured successfully by fluid-filled catheters guided solely by CMR using a guidewire (MRWire®, Nano4imaging, Aachen, Germany) CE certified for use in the MR environment. No guidewire-related adverse event occurred.

CONCLUSIONS: This study shows that invasive blood pressure can be measured relatively easily using fluid-filled catheters solely by CMR guidance without the need of a hybrid MR-fluoroscopy suite.