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**Performance of cardiac MRI for congenital heart disease in a High Field Open (HFO) 1.0Tesla MRI scanner**

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**Background and aims:** Combined cardiac catheterization and magnetic resonance imaging (XMR) is a well-established approach in some centers, particularly for accurate assessment of pulmonary hypertension (PHT) and its reversibility. Its wider application however, is hampered by limited availability of hybrid XMR suites. We advocate that the procedure can still be performed with minimal changes to the MRI suite's infrastructure with important benefits for the management of borderline inoperable patients due to PHT. The aim of the current study was twofold: First, to test the feasibility of performing such studies in the catheterization laboratory and moving the patient to the MRI suite and secondly, to assess patients' outcomes based on XMR findings, as well as the importance of XMR on the decision planning.

**Methods:** We reviewed the data of 12 patients who underwent an XMR catheterization because of echocardiographic suspicion of PHT. 1/12 patient had a solely MRI-guided cardiac catheterization procedure.

**Results:** Twelve patients with median age of 16yrs (range 2-56yrs) underwent an XMR procedure to assess pulmonary vascular resistance (PVR) and guide further management. Median baseline PVR was 5.1 WU.m<sup>2</sup> (range 3.1-12WU.m<sup>2</sup>), which improved to 4.2 WU.m<sup>2</sup> (range 2.3-8.5WU.m<sup>2</sup>) after administration of pulmonary vasodilators. Of the 12 patients, eight were operated and one had percutaneous closure of an ASD at a median time of 5 months (range 0.5-18 months) after the procedure. After administration of pulmonary vasodilators, elevated PVR was found in 3/9 patients (3.5-8.5WU.m<sup>2</sup>), who therefore had fenestrated closure of their septal defect. The remaining 6/9 patients had complete closure of their defects without fenestration. Two patients had changes in their medical management and one patient has been referred for a heart-lung transplant.

**Conclusions:** The performance of MRI-assisted or guided catheterization procedures can take place outside the setting of a hybrid XMR suite. XMR procedures are extremely important for the management of patients with CHD and pulmonary hypertension. Acquisition of accurate flow data from MRI combined with simultaneous pressure measurement provides a robust assessment of the patient's operability status and type of operation, such as fenestrated defect closure, whilst also guiding the postoperative management in the intensive care unit.