

## Right Ventricular Involvement in Patients with Myocardial Infarction (MI): a Cardiac Magnetic Resonance (CMR) study of Prevalence and Prognostic Implications

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**PURPOSE:** Right ventricular (RV) involvement occurs in about one-half of patients (pts) with inferior MI and is associated with considerable immediate morbidity and mortality. Accurate identification and precise delineation of RV involvement is essential for appropriate patient management. Diagnosis of this condition is challenging and is typically based on clinical suspicion, early ECG recordings through right precordial leads, and elevated right-sided filling pressures. Nevertheless, ECG assessment of RV involvement remains technically difficult. The present study sought to assess the role of late enhancement (LE) on CMR for detection of RV infarction and to evaluate its prevalence in a population of pts with acute and chronic MI.

**METHOD AND MATERIALS:** Retrospective assessment was performed of 97 pts with acute (n=58) or chronic MI (n=31) who had previously undergone CMR at 1.5T (Siemens Avanto, Germany) as well as routine ECG and trans-thoracic echocardiography. The CMR imaging protocol in all cases comprised SSFP cine-MR sequences, T2w STIR sequences, as well as first-pass perfusion imaging and delayed CE-IR acquisitions after intravenous administration of gadobenate dimeglumine (MultiHance<sup>®</sup>, Bracco) at 0.1 mmol/kg bodyweight @ 2 mL/sec. The right ventricle was divided into 9 segments for image evaluation. The presence/absence of LE in each segment was determined and thereafter matched with findings from both ECG and trans-thoracic echocardiography.

**RESULTS:** Our study population comprised 31/97 pts with inferior MI, 62/97 pts with anterior wall MI and 4/97 pts with extensive chronic scarring involving both the anterior and infero-lateral walls. Overall, LE of the RV was observed on CMR in 13/31 (41%) pts with inferior MI and 9/62 (14%) pts with anterior wall MI. In the subgroup of pts with inferior MI detected on CMR, ECG with right precordial leads + echocardiography showed signs of RV involvement in 12/31 cases (38.7%). Conversely, none (0%) of the 62 pts with anterior wall MI showed any signs of RV involvement on ECG with right precordial leads + echocardiography. Additionally, RV infarctions showed larger RV end diastolic volumes as compared to those non involving the RV (163±27 mL vs 132±11 mL p= 0.37).

**CONCLUSION:** Detection of RV is feasible on CMR and very often misdiagnosed with conventional clinical-instrumental data.

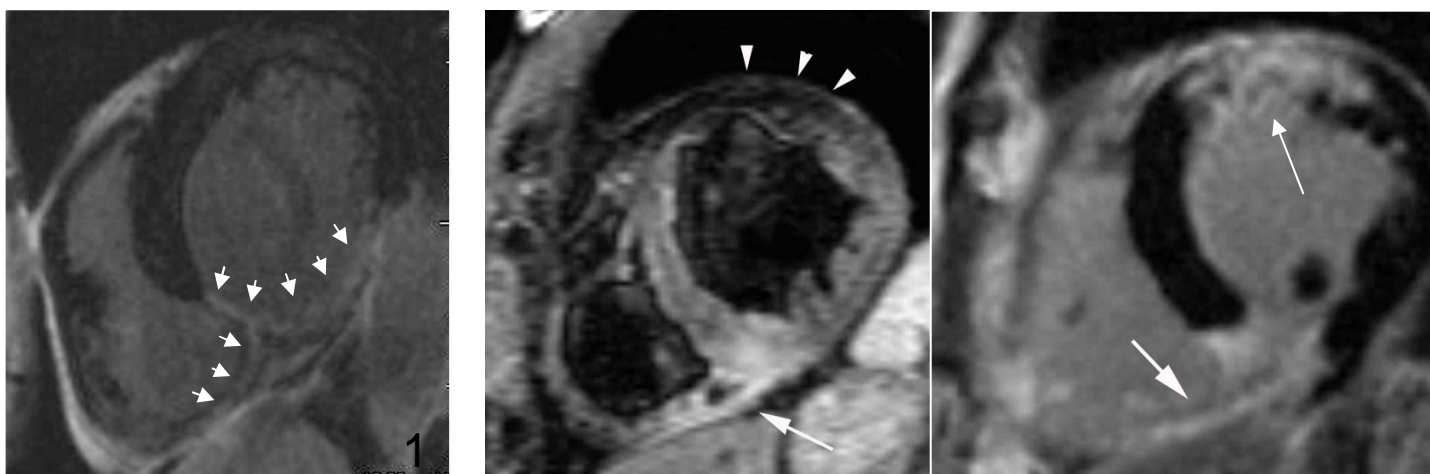


Figure 1: Patient with a transmural inferior and infero-septal MI involving the inferior wall of RV. Short axis delayed enhancement acquisition shows a hyperintense and thinned left and right inferior wall and infero-septal wall.

Figure 2: Patient with an acute transmural inferior and infero-septal MI involving the inferior wall of RV; this patient had already a transmural anterior MI 4 years before. On the left T2w STIR image shows a hyperintense signal (edema) in the inferior walls of RV and left ventricle related to the acute MI. CE-IR technique demonstrates the presence of LE both in the anterior, inferior and infero-septal wall of left ventricle and in the inferior wall of RV.