Results: 5639 features were extracted from the images. 344 features showed a moderate to good correlation in univariate analysis (FDR q-value<0.05, 0.6≤AUC≤1) with the presence of LGE. The models trained with radiomic features (GLM: 0.91, RF: 0.94, SVM: 0.90), showed a significantly higher performance than the model trained with clinical features (AUC: 0.78) in temporal validation. External validation showed a good performance AUC of 0.70, 0.68 and 0.73 for respectively the GLM, RF and linear SVM with CMR on a different scanner.
Conclusion: This study demonstrates the potential of computer-aided diagnosis of medical images using a radiomics approach. Our algorithms were able to automatically discriminate between subjects with and without enhancement in a group of patients with relatively subtle fibrosis. Multivariate analysis of LGE could lead to a better classification of LGE than univariate analysis of features. Future studies are needed to demonstrate whether radiomics guided fibrosis analysis might be generalizable to other cardiac pathologies involving more patients but also more distinct scars.
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P4687
Midwall late gadolinium enhancement in both nonischemic cardiomyopathy and ischemic heart disease

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Background: Late gadolinium enhanced (LGE) cardiac magnetic resonance imaging (CMR) is frequently used for diagnostic and prognostic purposes in heart failure patients. Midwall LGE is often described in patients with nonischemic dilated cardiomyopathy (DCM) and is associated with adverse events and lack of left ventricular (LV) reverse remodelling.
Purpose: Our aim was to describe the presence and characteristics of midwall LGE on CMR in ischemic cardiomyopathy (ICM).
Methods: This retrospective study used LGE-CMR-data of patients with impaired LV ejection fraction (EF) (<50%), either due to DCM or ICM. LV volumes were quantified and the presence and pattern of LGE was assessed visually. Midwall LGE was defined as striae-like or patchy midmyocardial contrast enhancement. Results were compared between aetiology and presence or absence of midwall LGE.
Results: We included data of 515 patients, mean age 64±11years and mean LVEF 33±10%, of whom 265 patients had ICM and 250 patients had DCM. Midwall LGE was present in 110 patients (21%), most frequently in DCM (89 patients, 35.6% of DCM-patients). However, in the patients with ICM, 21 (7.9%) demonstrated midwall LGE as well. These patients were significantly older and had increased LV end-diastolic and end-systolic volumes and decreased LVEF (Table 1). Patients with midwall LGE showed no significant differences in LV volumes or ejection fraction between either ICM or DCM.
Conclusion: Midwall LGE, a typical LGE-pattern in DCM-patients, was also present in 8% of patients with ICM and was associated with increased ventricular volumes and worse systolic LV function. As previous studies associated midwall LGE in DCM with adverse events and lack of reverse remodelling, this finding in ICM could be relevant in future decision-making, in particular regarding revascularization.

P4688
MRI characteristics and clinical value of hypertrophic cardiomyopathy with scar-like late enhancement

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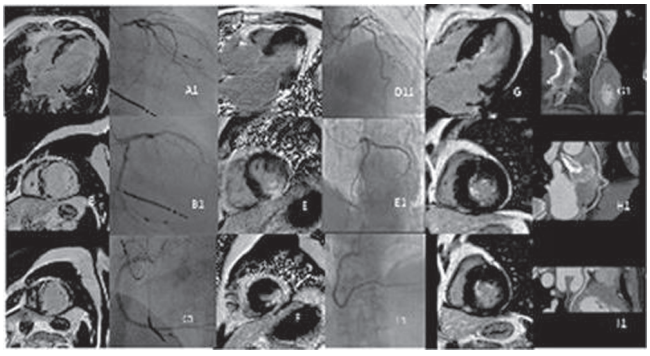
Background: LGE is confirmed as an independent risk factor of sudden cardiac death and heart failure in HCM. In previous research and our clinical practice, a subgroup of HCM patients show 'infarct-like' LGE (mainly in the subendocardium), but without significant stenosis in the coronary arteries, and this subgroup is till unkown.
Purpose: To evaluate the prevalence, cardiac magnetic resonance (CMR) features of infarct-like late gadolinium enhancement (LGE) in hypertrophic cardiomyopathy (HCM) and to explore the prognostic value of infarct-like LGE.
Methods: From 1411 HCM patients confirmed by CMR, 465 patients showed visible LGE, of which 24 patients demonstrated LGE mainly in the subendocardium resembling subendocardial LGE of infarcted myocardium, 28 patients with mixed infarct-like LGE and LGE in typical locations were excluded in this study. 437 patients were divided into A: infarct-like LGE and B: non-infarct-like LGE group and were followed up for a median of 3.83, 4.13 years, respectively. The clinical and CMR characteristics were compared between the 2 groups. Cardiovascular events were defined as a composite of sudden death, appropriate implantable cardioverter-defibrillator (ICD) discharges, potentially lethal ventricular arrhythmic incidents including ventricular tachycardia or fibrillation, heart failure related death, heart transplantation, progressive heart failure, nonfatal thromboembolic stroke.
Results: 437 patients were included in this study, 24 patients showed infarct-like LGE, 413 patients showed LGE in hypertrophied myocardium or right ventricular insertion point. The prevalence of infarct-like LGE were 0.05% (24/437). Median age was 47.5 and 47 years for group A and B, respectively. 66.7% (16/24) of group A and 67.8% (280/413) of group B patients were males. LGE extent of group A was higher than group B [12.20 (6.27–29.72) vs 8.50 (5.02–14.90)], but it did not reach statistical significance (P=0.071). LVEF was lower in group A than group B [59.95 (46.60–70.85) vs 67.5 (61.75–72.70)](p=0.004). Left ventricular end-systolic volume index (LVESVi) was higher in group A than group B[27.25 (16.35–39.39) vs 20.64 (15.80–25.82)]. 37.50% (9/24) patients of group A and 5.33% (22/413) patients of group B experienced cardiovascular events. In univariate analysis, LVEF, LVESVi, LGE extent and presence of infarct-like LGE were associated with cardiovascular events. In multivariate analysis, both LGE extent (HR,1.07; 95% CI: 1.04–1.11, P<0.0001) and presence of infarct-like LGE (HR,3.49; 95% CI: 1.37–8.91, P=0.009) were independent factors of adverse prognosis of HCM. The cardiovascular events rate was significantly higher in infarct-like group than non-infarct-like group (P<0.0001), difference of which was more evident than patients grouped by LGE extent ≥15%.



CMR images

Conclusion: Infarct-like LGE was a rare manifestation in HCM. In addition to LGE extent, presence of infarct-like LGE was a novel independent factor of adverse prognosis in HCM.

P4689
New occurrences of macroscopic myocardial fibrosis in thalassemia at long term by multiple follow-up

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Introduction: To date in thalassemia patients it is recommended to repeat cardiac magnetic resonance (CMR) scans for iron quantification every 1 or 2 years based on the myocardial iron overload (MIO). Also in these patients, late gadolinium enhancement (LGE) has been demonstrated to be a strong predictor for cardiac events. However, many studies have shown an association between intravenous gadolinium based contrast agents (GBCA) exposure and neuronal tissue deposition. So, it appears prudent at this time to revisit institutional protocols for GBCA administration, in particular in the follow up (FU) studies.
Aim: We investigated the evolution of myocardial fibrosis in terms of new occurrences over a period of 6 years in thalassemia patients who underwent to multiple FU.
Methods: We considered 52 patients with thalassemia major (28.78±8.59 years;

Abstract P4687 – Table 1. CMR characteristics of ICM and DCM

	Ischemic cardiomyopathy				Non-ischemic dilated cardiomyopathy				p-value
	midwall LGE present	midwall LGE absent	p-value	total	midwall LGE present	midwall LGE absent	p-value	total	
N	21	244		265	89	161		250	
Age	70.9±6.1	65.3±10.3	0.013*	65.7±10.1	61.5±11.7	62.5±11.6	0.504	62.2±11.6	0.001*
LVEDV	282.2±69.9	235.6±81.0	0.003*	239.3±81.1	276.7±101.9	225.1±77.5	<0.001*	244.1±90.1	0.783
LVESV	210.5±67.1	157.9±70.4	<0.001*	162.1±71.4	201.4±99.3	154.1±70.4	<0.001*	170.9±84.7	0.475
LVSV	70.5±23.2	77.9±24.6	0.12	77.3±24.6	74.2±24.4	72.0±22.5	0.526	72.8±23.1	0.028*
LVEF	26.1±9.5	34.6±9.3	<0.001*	34.0±9.6	29.2±11.3	33.4±9.5	0.004*	31.9±10.3	0.027*

LVEDV = left ventricular end-diastolic volume; LVESV = left ventricular end-systolic volume; LVSV = left ventricular stroke volume; LVEF = left ventricular ejection fraction. *Statistical significance.