

Meeting abstract

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## 225 Cardiac MRI for differential diagnosis of the apical ballooning syndrome – a series of 46 patients

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### Introduction

The apical ballooning syndrome (ABS) is a new diagnostic entity with typical characteristics which is increasingly recognized. The underlying mechanisms of this clinical entity mimicking acute coronary syndromes (ACS) are still controversially discussed. Coronary spasm, coronary emboli with spontaneous fibrinolysis, regional myocarditis, and stunning as a result of excessive catecholamines are some of the potential mechanisms. Precise magnetic resonance imaging (MRI) data are not yet available. We therefore evaluated MRI-parameters for the identification and differential diagnosis of apical ballooning syndrome. Cardiac MRI might be an imaging tool to further elucidate the underlying mechanisms.

### Methods

Between January 2005 and August 2007 46 consecutive patients, showing a left ventricular dysfunction with apical ballooning not explainable by the coronary artery status and initially admitted with ACS underwent cardiac MRI using a 1.5 T MRI scanner. Left ventricular function, T2-weighted spin echo sequence for oedema and delayed enhancement images after administration of Gadoteridol were assessed.

### Results

Between January 2005 and August 2007, 4990 consecutive patients with diagnosis of acute coronary syndrome with ST-elevation or non-ST-elevation myocardial infarction underwent left heart catheterization. Of these 46

(0.9%) patients (40 female, age  $69 \pm 11$  years) were identified with ABS without significant coronary artery disease. Cardiac MRI revealed extensive delayed enhancement in the territory of the LAD in 10 patients (22%) and a delayed enhancement pattern suggestive of acute myocarditis in 5 (11%). In all other 30 (67%) patients (28 female, age  $71 \pm 10$  years) no delayed enhancement was detected, consistent with viable myocardium and the diagnosis of ABS.

In these latter patients cardiac MRI showed impaired left ventricular ejection fraction which normalized at 3 months follow-up (EF baseline:  $49,7 \pm 9,9\%$ ; EF 3 months:  $67,7 \pm 3,9\%$ ;  $p < 0.001$  versus baseline). Similarly, the enddiastolic volume (EDV) and endsystolic volume (ESV) improved at follow-up (EDV baseline:  $126,3 \pm 25,4$  ml; EDV 3 months:  $111,8 \pm 23,1$  ml;  $p < 0.001$  versus baseline; ESV baseline  $63,7 \pm 19,4$  ml; ESV 3 months:  $36,5 \pm 9,9$  ml;  $p < 0.001$  versus baseline). There were no differences in patient characteristics between patients with presumed coronary emboli with spontaneous lysis and myocarditis in comparison to those with ABS with the exception that in patients with ABS emotional stress as a trigger could be identified in 17 (56,7%) versus 0 ( $p < 0.001$ ).

### Conclusion

The ABS is a phenomenon mimicking ACS which has a prevalence of approximately 1% in our patient series. MRI is a useful technique to identify patients with suspected

ABS and allows differentiating ABS from other rare causes with unobstructed coronary vessels such as myocarditis and coronary emboli with spontaneous lysis. In contrast to patients with myocardial infarction and myocarditis, there was no detection of delayed enhancement in patients with ABS. Therefore cardiac MRI should be performed in all patients with suspected apical ballooning syndrome for further differential diagnosis and may be useful for therapeutic decision making.

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