

POSTER PRESENTATION

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# Embolic myocardial infarctions look different: a comparison of experimental and fateful embolic lesions

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## Introduction

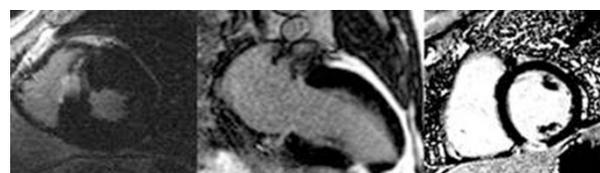
According to the wavefront-phenomenon myocardial infarction scar should have a larger extent on the sub-endocardial than the subepicardial surface. This is important for differentiating ischemic from non-ischemic lesions in late gadolinium enhancement (LGE) images.

In hypertrophic obstructive cardiomyopathy septal ablation (TASH) with injection of microparticles instead of ethanol represents a controlled model of iatrogenic embolic infarction.

We compared cardiac magnetic resonance (CMR) scar patterns after microparticle-induced TASH with those after clinical embolic infarctions from other sources.

## Methods

18 patients with hypertrophic obstructive cardiomyopathy (13 male,  $60 \pm 17$  years) underwent injection of foam particles into a septal coronary branch. We compared the shape of the resulting myocardial scar with those in 23 consecutive patients (14 male,  $55 \pm 15$  years) with evidence of embolic myocardial infarctions. Embolic infarctions were defined as small single or multiple myocardial scars in conjunction with a normal coronary angiography or a single thrombotic lesion without evidence of general atherosclerosis. A history of embolic events in other vascular territories or the presence of atrial shunts confirmed the diagnosis. Patients with evidence of acute inflammation were excluded. In all patients 3 long axes and a contiguous stack of short axis LGE images were obtained after  $0.2 \text{ mmol/kg Gd-DTPA}$



**Figure 1** Wedge-shaped scar after embolic TASH in HOCM (left) and 2 different patients (center and right) with embolic infarctions.

in 1.5 T scanner. In-plane resolution was  $1.8 \text{ mm/pixel}$ .

Using Osirix 3.3.2., we measured maximal subepicardial and subendocardial extent on LGE images in that short axis slice with the largest extent of the scar. Thereby we differentiated wedge-shaped scars (subepicardial extent  $>$  subendocardial extent) from transmural (subepicardial = subendocardial) or subendocardial scars (subepicardial  $<$  subendocardial).

## Results

After embolic TASH, infarction scars showed a wedge-shaped pattern in 13/18 cases (72%) with a subendo-subepicardial ratio of  $0.8 \pm 0.3$ . In patients with embolic infarctions, 7 cases showed multiple lesions. Wedge-shaped lesions with larger epicardial extent were found in 11, transmural lesions in 10, subendocardial lesions in 2 cases. The mean subendo - subepicardial ratio of embolic infarctions was  $0.6 \pm 0.1$ .

## Conclusions

Embolic infarctions after septal ablation in HOCM show a wedge-shaped pattern with a larger extent on the epicardial surface, resembling the pattern of other embolic infarctions. This wedge-shaped pattern contradicts the

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wavefront phenomenon. When differentiating non-ischemic from ischemic lesions in late enhancement images this phenomenon should be taken into account to avoid misclassification of embolic infarction scars as nonischemic lesions.

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