

Poster presentation

Evaluation of microvascular obstruction after acute myocardial infarction with cardiac magnetic resonance imaging, 201-thallium and 99 m-technetium pyrophosphate scintigraphy

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Introduction

There are few reports about comparison of microvascular obstruction (MO) segments detected by cardiac magnetic resonance (CMR) with scintigraphic findings using 201-thallium (Tl) and 99 m-technetium pyrophosphate (PYP).

Purpose

We examined the relationship between scintigraphic and CMR characteristics of MO after acute myocardial infarction (AMI).

Methods

14 patients (age 69 ± 8 years, 11 males) underwent Tl/PYP SPECT, initial and follow-up cardiac MRI 7 \pm 3 days, 16 \pm 12 days and 193 \pm 20 days after a first reperfused AMI, respectively. Each image was analyzed using 17-segment model. The transmural extent of delayed enhancement (DE) was scored as follows: 0: 0%, 1: 1-25%, 2: 26-50%, 3: 51-75%, 4: 76-100%, and so were wall motion (0: akinesis, 1: severe, 2: moderate, 3: mild hypokinesis, 4: normal) and Tl uptake (0: normal, 1: mildly, 2: moderately, 3: severely reduced, 4: absent).

Results

Of all 91 MI segments detected with DE-CMR, MO was recognized in 22(25%) segments. Comparing MO-posi-

tive segments with MO-negative segments, the latter had significantly better wall motion score (1.5 ± 1.1 vs. 2.2 ± 1.2 ; $p = 0.027$) and less transmural extent of DE (3.1 ± 0.9 vs. 2.2 ± 0.9 ; $p = 0.0001$) in initial CMR. The same results were also seen in the follow-up CMR (1.9 ± 1.1 vs. 2.6 ± 1.3 ; $p = 0.0135$, 2.5 ± 1.1 vs. 1.9 ± 1.2 ; $p = 0.026$, respectively). Tl uptake was significantly better in MO-negative segments than in MO-positive segments (1.5 ± 1.1 vs. 2.0 ± 0.9 ; $p = 0.045$). Focusing on 22 MO segments, 8(36%) segments showed wall motion score improvement at the follow-up CMR. Comparing these segments with the other 14 segments which showed no wall motion improvements at the follow-up CMR, although the CMR parameters and Tl uptake were not significantly different, all of the former segments had PYP uptake while only 3 segments(21%) had PYP uptake in the latter group ($p = 0.0039$).

Conclusion

After revascularized AMI, MO segments showed worse wall motion score, more transmural extent of DE at the initial CMR and less Tl uptake than MO-negative segments. PYP uptake was significantly more recognized in MO segments with wall motion improvement at the follow-up CMR than those without wall motion improvement.