

Oral presentation

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Pre-operative ischaemia on CMR stress perfusion is a marker for prolonged post-operative stay after coronary artery bypass grafting

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Background

Stress perfusion CMR accurately identifies inducible perfusion defects, but its role prior to coronary artery bypass surgery (CABG) is unclear. Similarly, late gadolinium enhancement (LGE) in CMR is well established in the identification of viability, but prognostic value post-CABG is uncertain. Out of the 2600 stress perfusion studies performed at our centre from 2008-2009, early post-operative outcomes were assessed in 56 consecutive patients who had CABG following a CMR scan. 28 patients underwent adenosine stress perfusion imaging, while all 56 underwent LGE imaging.

Methods

56 patients (10 females, age 64 +/- 12 years) were imaged on a 1.5 Tesla MR Scanner (Philips Achieva, Best, Netherlands) within 2 months of cardiac catheterisation demonstrating significant multivessel disease, prior to urgent or elective CABG. Adenosine (140 mcg/kg/min) was administered for 3 minutes to achieve myocardial hyperaemia following a standard CMR stress perfusion protocol, with single-bolus injection of gadoterate meglumine contrast (0.1 mmol/kg, Dotarem, Guerbet, SA). Early post-operative outcomes were assessed over a mean follow up period of 6 months. Continuous variables were reported as mean ± standard error; groups (based on the number of viable or ischaemic segments) were compared using either Mann-Whitney, t-test or Fisher's exact test.

Results

Across the cohort, mean left ventricular (LV) end diastolic volumes (EDV) were increased at 204 ± 10 mls, with a low mean ejection fraction (EF) of 28 ± 2.5%. 24 patients out of 56 had LGE with 3 or more non-viable segments, and had a significantly longer post-operative stay (11.1 ± 1.2 vs 7.4 ± 0.6 days, $p < 0.01$), and more severe LV impairment and dilatation (EF 27 ± 2.0 vs 50 ± 3.5%, $p < 0.01$, EDV 242 ± 13 vs 161 ± 12 mls, $p < 0.0001$). This group were also more likely to have had an unstable presentation with an acute coronary syndrome (ACS) (16/24 vs 12/40, $p < 0.008$). Patients with 6 or more ischaemic segments on stress CMR perfusion imaging also had a longer post-operative stay (11.6 ± 2.0 $n = 12$ vs 6.8 ± 0.6 days $p < 0.05$, $n = 17$) but this group had no differences in EDV or EF.

At 6 months, the incidence of angina and heart failure symptoms were similar across all groups. All cause mortality and cardiac readmissions were also similar across all groups.

Conclusion

6 or more ischaemic segments on stress perfusion imaging are associated with a longer post-operative stay after CABG. Similarly, 3 or more non-viable segments detected by LGE are also associated with a longer post-operative stay. Although promising, further prospective studies are

required to establish the prognostic role of stress perfusion in revascularisation.

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