

4 NON-CONTRAST ASSESSMENT OF MYOCARDIAL VIABILITY IN CHRONIC MYOCARDIAL INFARCTION BY NATIVE T1 AND T2 MAPPING AT 1.5T CMR: COMPARISON WITH LATE GADOLINIUM ENHANCEMENT TECHNIQUE

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Background Viability assessment is a key aspect in the management of ischaemic heart disease (IHD). Hypothesis: native T1 and T2 mapping can assess myocardial viability without the use of gadolinium.

Methods 30 patients with known MI (>5yrs from MI) and 20 normal healthy controls underwent conventional 1.5T CMR to assess LV function and the presence and extent of myocardial infarction (scar transmural) using a scale of 0–4 for the 16 AHA segment (0=no scar, 1=1–24%, 2=25–49%, 3=50–74% and 4 ≥75% scar thickness). Segments with <50% LGE was considered viable. LGE viability was compared with the corresponding native segmental T1 and T2 obtained from T1 maps (MOLLI sequence, motion corrected) and T2 maps.

Results 800 myocardial segments were analysed (320-healthy controls, 480-MI patients). The mean segmental T1 and T2 values for scar transmural grade 0–4 were 1031±31 ms, 1070±33 ms, 1103±32 ms, 1164±58 ms, 1206±118 ms ($p<0.001$) and 52±4 ms, 55±4 ms, 58±5 ms, 59±8 ms, 66±9 ms ($p<0.001$) respectively in chronic MI. ROC analysis of 480 segments in chronic MI showed that for myocardial viability assessment, native T1-mapping demonstrated excellent diagnostic performance compared to LGE as the gold standard (AUC-0.94, 95%CI 0.89–0.99, $p<0.0001$). Native T1 mapping also had the highest diagnostic accuracy for viability assessment when compared to T2 mapping, LV wall thickness, regional wall motion abnormality. A T1 threshold of 1090ms best differentiated viable from non-viable segments with a sensitivity of 90% and specificity of 91%.

Conclusions Native T1 mapping can differentiate between normal, viable, and non-viable myocardium with distinctive T1 profiles in chronic MI without the need for gadolinium.

5 CURRENT NHS SERVICE PROVISION FOR CT CORONARY ANGIOGRAPHY AND FORECASTS OF REQUIREMENTS FOLLOWING NICE CG95 2016

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Introduction The updated NICE guidelines ‘chest pain of recent onset: assessment and diagnosis’ (CG95) recommend CT Coronary Angiography (CTCA) as the first line investigation for stable chest pain if clinical assessment indicates typical or atypical angina, or non-anginal chest pain with ECG changes suggesting underlying coronary artery disease. The aim of our investigation was to assess the current provision of CTCA within the NHS, estimate the requirement if the guidelines are fully implemented, and identify geographic variation in delivery. Ancillary aims were to survey the number of

CTCA-capable scanners and formally accredited CTCA practitioners.

Methods The annual number of CTCA scans performed was surveyed across the NHS. Potential requirement for CTCA was estimated by applying the number of percutaneous coronary interventions (PCI) performed for stable chest pain in 2014 (31,727 according to the National Audit of PCI Annual Report) to the ratio of CTCA: revascularisation (1778:233) observed in SCOT-HEART (7.6:1). Registries of CTCA-capable scanners were obtained from manufacturers and formally accredited practitioners from the BSCI/BSCCT and SCCT.

Results 42,340 CTCA are currently performed annual and we estimate 350,000 would be required to fully implement the guidelines. 302 CTCA-capable scanners and 198 formally accredited practitioners were identified. Marked geographic variation between health regions was observed.

Conclusion This study provides insight into the scale of increases in the provision of CTCA required to fully implement updated NICE guidelines. The currently small specialist workforce and limited number of CTCA-capable scanners may present significant challenges to the expansion of services.

6 CT REPORTS IN SUSPECTED ACUTE AORTIC SYNDROME – AUDIT FAILURE TO IMPROVE REPORTING ACCURACY

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Introduction Acute aortic syndrome (AAS) is a life-threatening condition, which requires timely and accurate diagnosis, typically by CT angiography. Experience of significant radiological discrepancies relating to CT reports in patients with AAS has driven an audit of the accuracy of CT reports.

Methods Retrospective automated electronic search of all CT reports containing the term ‘dissection’ over three audit cycles, covering a 4-year period (January 2013 to December 2017), across a Health Board covering over a million people with 116 consultant radiologists. Interventions consisted of presentation of audit results, discrepancies and education. The first, second and third audit cycles covered periods of 27, 12 and 9 months, respectively. CT images and reports were systematically assessed with consensus to identify cases of AAS and radiological discrepancies in reports.

Results A total of 32% ($n=35/110$) of reports contained at least one major discrepancy over the 4-year period, with rates of 31% ($n=20/65$), 26% ($n=5/19$) and 38% (10/26) in each of the three audit cycles. Errors consistently related to non-cardiac-gated scans, accurate diagnosis, correct classification, plus detection of haemorrhagic and malperfusion complications.

Conclusion The review consistently demonstrated major deficiencies in the radiological interpretation of suspected AAS on CT scans over three audit cycles, significant in both number and grade. Further research is required to fully assess the clinical significance the radiological errors identified. Efforts to improve local practice will continue and include wide dissemination of results, further education and encouragement to involve a specialist in cardiovascular imaging in suspected cases.