

1 SETTING UP A CARDIAC CT SERVICE – PEARLS AND PITFALLS

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10.1136/heartjnl-2017-311677.1

Introduction CT coronary angiography is being increasingly recognised as an important non-invasive modality for the assessment of coronary artery disease, especially in light of the new NICE guidance. Providing this service in a busy District General Hospital has its challenges and developing the service can be an interesting journey for Radiologists and Cardiologists. Luton and Dunstable University Hospital (L&D) is a large district general hospital in Bedfordshire serving a population of 320,000. The Cardiac CT service was set up in March 2015.

Methods We retrospectively analysed the first 578 studies performed at the L&D. We reviewed various audits and consequent improvements that were made to the service at various points to increase productivity including Radiographer training and technical support for complex case assessment. We also measured our waiting lists to assess the service demand over time since setting up the service.

Results The service was initially set up as a single session once a week with 2–3 patients per session. This grew steadily over the past two years to two sessions per week with 5–6 patients per session reported by 3 Radiologists and 3 Cardiologists. The waiting list has risen from one week to six since the introduction of new NICE guidelines. We are now hoping to move to a 5 day service.

Conclusion Introducing a relatively high demand service to a busy DGH Radiology department can be difficult. Careful time management, training and planning are required with regular audit of scan quality, time for scanning and reporting.

2 PHYSIOLOGICAL RESPONSE TO ADENOSINE AND SPLENIC SWITCH OFF

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10.1136/heartjnl-2017-311677.2

Introduction Cardiac magnetic resonance perfusion studies require a patient to be ‘adequately’ physiologically stressed to ensure reliable data. The principle aim of this study was to investigate the assumption that the standard adenosine dose (140mcg/kg/min) achieves this stress. A secondary aim was to investigate splenic switch off (SSO), this has recently been reported as a marker of adequate response to adenosine.

Methods An adequate stress response was defined as >20% increase in heart rate (HR) plus >3/5 symptom discomfort (5-point scale). Three separate adenosine infusion protocols were trialled, depending on patient physiological responses. Protocol A: 140 mcg/kg/min for 4mins. Protocol B: 140 mcg/kg/min for 2mins then 210mcg/kg/min for 2mins. Protocol C: 140 mcg/kg/min for 2mins then 210 mcg/kg/min for 4mins. After exclusion of studies that were “off-protocol”, 67 studies were eligible. Splenic enhancement was assessed using CMR42

(Circle CVI, Calgary, Canada) software, creating regions of interest. Significance ($P<0.05$) was determined using Two-sample T-tests and ANOVAs.

Results No significant differences were observed between protocols considering HR response, symptom severity or splenic enhancement. 3 distinct splenic responses were revealed. The ten best enhancing spleens were similar to blood pool whilst the ten lowest resembled SSO. These three subgroups of splenic enhancement showed no correlation to HR or symptom response.

Conclusions We would recommend the described adenosine protocol as a consistent way of overcoming poor responses. In terms of SSO, sub group analysis of splenic enhancement shows it is unrelated to HR or symptomatic response, suggesting SSO may not reflect vasodilator stress.

3 PROGNOSTIC RISK STRATIFICATION TOOL (CMR AND CONVENTIONAL RISK FACTORS) IN MYOCARDIAL INFARCTION WITH NON-OBSTRUCTED CORONARY ARTERIES (MINOCA)

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10.1136/heartjnl-2017-311677.3

Introduction Evidence on the prognostic role of Cardiac Magnetic Resonance (CMR) and conventional risk factors in myocardial infarction with non-obstructed coronaries (MINOCA) is lacking. Aim: To assess the prognostic impact of CMR and conventional risk factors in MINOCA.

Methods 402 consecutive MINOCA patients undergoing CMR scan were prospectively followed up for primary clinical endpoint of all-cause mortality. 1.5T CMR was performed using a comprehensive protocol. Patients were grouped into 4 categories based on CMR findings: MI (embolic/spontaneous recanalisation), myocarditis, cardiomyopathy and normal CMR.

Results Overall, CMR was able to identify the cause for the troponin rise in 74% (26% MI, 24% myocarditis and 23% cardiomyopathy). In a mean follow up of 2.5years, 4.5% patients died. Cardiomyopathy group had the worst prognosis (mortality – 12%, log rank 15.97 $p=0.001$). MI and normal both had 3% mortality and myocarditis 1%. In a multivariate model that included clinical and CMR parameters, CMR diagnosis of cardiomyopathy and ST-segment elevation on presentation ECG remained the only 2 significant predictors of mortality. Using a risk score with 1 point each for presentation as STEMI and CMR diagnosis of cardiomyopathy, the mortality risk rates for a score of 0, 1 and 2 were 2%, 7% and 21% respectively ($p<0.0001$).

Conclusion A CMR diagnosis was identified in 74% of MINOCA. Cardiomyopathy has the highest mortality, followed by MI and myocarditis. The strongest predictors of mortality were a CMR diagnosis of cardiomyopathy and ST-elevation on presentation ECG, thereby allowing a robust stratification of patients.