Abstracts

P9 CORONARY ARTERY CALCIFICATION ON THORACIC CT IS ASSOCIATED WITH PULMONARY HYPERTENSION AND IS AN INDEPENDENT PREDICTOR OF MORTALITY IN SYSTEMIC SCLEROSIS

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Objective Coronary artery calcification (CAC) on thoracic computed tomography (CT) is a known biomarker of coronary artery disease and mortality. Systemic Sclerosis (SSc) is a pro-inflammatory condition; microvascular inflammation is increasingly hypothesised to drive pulmonary hypertension (PH) in SSc. Inflammation is also a driver of CAD. We hypothesised that CAC would be prevalent and associated with mortality in SSc.

Methods Retrospective analysis of 262 CTs in SSc patients from a prospectively maintained clinical database at a tertiary Rheumatology/PH service March 2007-March 2021 (mean age 65±12, 14% male). 86/262 (33%) had interstitial lung disease (ILD), 128/262 (49%) had PH. CTs were re-reviewed for CAC; severity was graded by experienced readers using a four-point scale per vessel and summed for total CAC score (CACS).

Results CAC was present in 152/262 (57%). All-cause mortality occurred in 65/262 (25%) patients over mean 5±3 years follow-up. Presence of CAC was associated with >2 times risk of death (Hazard ratio [HR] 2.41; 95% CI 1.3–4.5; p=0.006), correcting for age and gender. PH was predictive of mortality (HR 3.6, 95%CI 1.4–9.3, p=0.007), corrected for age and gender; ILD was not (HR 1.3, 95% CI 0.8–2.2, p=0.34). PH was significantly associated with CAC (Χ²=7.7, p=0.009). In contrast, ILD had no significant association with CAC (Χ²=0.57, p=0.81).

Conclusion CAC is common in SSc and is associated with PH. PH and CAC are predictors of mortality in SSc and both have a hypothesised pro-inflammatory driver. Further validation is required to assess the potential role for anti-inflammatory therapies.

P10 ACTIVITY OF THE SPLEEN AND BONE MARROW IN RELATION TO CARDIO-PULMONARY PAIN IN PATIENTS WITH ACUTE COVID-19 EVALUATED BY 18F-FLUORODEOXYGLUCOSE POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY IMAGING

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Objective COVID-19 primarily causes pneumonitis but can also cause myocarditis. Injury may be due to a generalised inflammatory immune process or by direct viral infection. Using 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG-PET/CT) and cardiac magnetic resonance (CMR) imaging we correlated the metabolic activity/injury between the reticuloendothelial system (bone marrow [BM] and spleen) and myocardial/pulmonary tissue.

Methods 18F-FDG-PET/CT (n=29, fasted n=27) and CMR (n=23) were performed on hospitalised patients with acute COVID-19. 18F-FDG PET/CT standardised uptake values (SUV) were measured in the spleen, spinal BM, myocardial and pulmonary tissue. Cardiac target-to-background ratio (TBR) was calculated by indexing to blood-pool SUV. Myocarditis was assessed using the sensitive 2018 Lake Louise criteria (LLC), and viral load (by cycle threshold).

Results 13 patients had myocarditis on CMR (57%), 8 (30%) visually on 18F-FDG-PET/CT. There was no statistical difference comparing LLC positive and negative patients for BM (4.21±0.30, 4.98±0.56, P=0.23), spleen (4.40±0.40, 5.15±0.08, P=0.38) and lung (4.08±0.72, 4.16±0.91, P=0.94) SUV. Lung SUV was significantly associated with BM (r=0.61, P<0.001) and spleen (r=0.48, P<0.05) SUV. Cardiac TBR, T1 and T2 mapping showed no significant association with BM and spleen SUV (P>0.05 for all). Cycle threshold did not correlate with either cardiac TBR and T1 or T2 (P>0.05 for all).

Conclusion Reticuloendothelial system activation strongly correlated with lung activity, suggesting pulmonary injury is part of a systemic inflammatory process. Cardiac inflammation was not associated with either spleen, BM or viral load, suggesting injury is multifactorial.

P11 RADIOGRAPHER LED CTC – THE BEGINNING OF THE END FOR ROUTINE FACILITATING BETA BLOCKER THERAPY

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Objective Since inception computerised tomographic coronary angiography (CTCA) has required facilitating beta blockers (BB). However, CT technology has improved rapidly as has radiographer and reporter expertise. Utilising this, we instituted a radiographer led cardiac CT service (RLCCTS), with-out routine BB, which we then studied for quality control (QC).

Methods RLCCTS started October 2021 using the Revolution Apex CT System (GE Healthcare UK), with 20-minute slots. QC study was registered with the clinical audit team, University Hospitals Plymouth, CA 2020–21-118. Uniform reporting was agreed including indication, BB administration, demographics, dose length product (DLP) and the coronary artery disease – reporting and data system (CAD-RADS) score. Uncertain CAD-RADS meant a non-diagnostic scan (NDS). Six months data was collected; stable chest pain patients (SCPP), who have national CTCA QC indicators, were analysed using descriptive statistics.

Results Of 1475 patients, 447 were not SCPP - known CAD (157); valves (286); removed (4, data incomplete) leaving 1028 SCPP CTCA for analysis. Demographics - mean age 63 years, BMI 29, 50.4% female. BB therapy - 4 patients (2
CARDIAC FINDINGS ON BODY CT: A REVIEW OF IMPACTS OF THE COVID-19 PANDEMIC ON THE USE OF CT IMAGING

Cardiac findings have increasingly been detected on body computed tomography (CT) scans. This trend is driven by advancements in CT techniques improving non-gated image quality combined with the vast increase in CT imaging over recent years. We aimed to assess reported cardiac findings on general body CT.

### Methods
The reports of all CT scans between January 2008 and December 2021 were obtained from the radiology information system at Sheffield Teaching Hospitals. The radiology reports of any studies that included the thorax and abdomen were collated for all patients per year that included cardiac findings, highlighting the heart as an important review area on body CT.

### Results
A total of 274,246 body CT reports were analysed, including 90,882 CTs of the abdomen and 183,364 CTs including the thorax. Between 2008 and 2021, the rate of abdominal CT scans with reported cardiac findings increased from 5% to 10%, while the rate of positive thorax CT increased from 23% to 38%. Overall, the most commonly reported findings on abdominal CTs were chamber abnormalities such as cardiomegaly (44%) and coronary artery calcifications (39%). Almost 61% of positive thorax CTs mentioned coronary calcification and 56% noted chamber abnormalities.

### Conclusion
Over the past 14 years, general radiologists have increasingly detected cardiac findings on body CT. More than a third of thorax CTs and one in ten of abdominal CTs showed cardiac findings, highlighting the heart as an important review area on body CT.

IMPACTS OF THE COVID-19 PANDEMIC ON THE USE OF NON-INVASIVE ANGIOGRAPHY

We sought to evaluate the impact of the pandemic on the relative uses of CTA and MRA across different body systems and between different patient groups.

### Methods
Governance permission was obtained for data collection from the local Radiology Information Systems (RIS) of two Health Boards representative of city/university teaching hospital versus district general hospital-based practice. Data were collated for all non-invasive angiographic studies performed by CT and MRI from 2019 to May 2022 regarding examination modality, examination type (body area), date and site of performance plus age, gender, patient type (in-patient versus out-patient versus ED), time and day of performance.

### Results
CT pulmonary angiographic studies have shown up to a 71% increase on pre-pandemic levels with a rate of 1,095 scans per 100,000 population. CT coronary angiographic studies have shown a 64% increase on pre-pandemic levels, with a rate of 86 to 142 scans per 100,000 population. Lower limb angiographic studies have returned to pre-pandemic levels but the share for MRA has reduced from 57% to 29%. Cardio-tid studies increased by up to 55% with CTA increasing to cover this need while MRA use has remained at ~11% of overall scans. A 50% increase in venographic examinations has been driven by an increase in cerebral venographic studies. Emergency department recourse to non-invasive angiographic imaging.