



increase awareness of its imaging findings, presentation, and appropriate management and follow up.

Summary of content: We present an overview of the clinical presentation, imaging findings including mammography, ultrasound and breast MRI and the role of MDT in planning further management of these patients.

1. Kulkarni N, Pezzi CM, Greif JM, V Suzanne Klimberg, Lisa Bailey, Soheila Korourian, et al. Rare breast Cancer: 933 adenoid cystic carcinomas from the National Cancer Data Base. *Ann Surg Oncol* 2013 Jul;20(7):2236-41. 2. Wang S, Li W, Wang F, et al. 36 cases adenoid cystic carcinoma of the breast in China: comparison with matched grade one invasive ductal carcinoma-not otherwise specified. *Pathol Res Pract* 2017Apr; 213(4):310-5.



CARDIAC / CHEST & LUNG POSTER PRESENTATIONS

P054 Incidence of indeterminate computed tomography pulmonary angiogram (CTPA) examinations during first wave of COVID-19 pandemic in a tertiary center

Hiba Abbas; Chryshane Fernandopulle; Marko Berovic; Hasti Robbie

King's College Hospital NHS Foundation Trust

Aim: To compare the incidence of indeterminate CTPAs between COVID-19 and pre-pandemic periods.

Methods: All consecutive CTPAs performed at King's College Hospital from A+E/inpatient settings were evaluated in two periods: from 01/3/2019 to 15/04/2019 and from 01/03/2020 to 15/04/2020. Positive SARS-CoV-2 RT-PCR results were recorded. One observer scored CTPAs for presence/absence of pulmonary embolism (PE), motion artefact and attenuation of the main pulmonary artery (MPA). Motion artefact was recorded when it was deemed detrimental to diagnostic accuracy. Pearson Chi-squared test was performed to compare motion artefact in COVID-19 vs non-COVID-19 groups.

Results: In the pre-pandemic period, there were 158 CTPAs (N=158, 60 males, median age=59). 17% had PE (n=27/158). Motion artefact and inadequate contrast enhancement were documented in 11.4% (n=18/158) and 12% (n=19/158) respectively. In the pandemic period, there were 238 CTPAs (N=238, 122 males, median age=57). 47.1% (n=112/238) had positive RT-PCR tests. 25.6% had PE (n=61/238). Motion artefact and inadequate contrast opacification were recorded in 39.9% (n=95/238) and 5.9% (n=14/238) respectively. CTPA examinations increased by 50.6% during the pandemic with 8.6% increase in positive PEs. In patients with COVID-19, there was significantly higher motion artefact (25.2% (n=60) vs. 14.7% (n=35), P<0.001).

Conclusion: There is high demand for CTPAs with higher incidence of PE during the COVID-19 pandemic. Acquiring diagnostic CTPAs in severe COVID-19 can be challenging and the high incidence of indeterminate CTPAs can have adverse clinical outcomes. Careful consideration of factors such as better imaging equipment and enhanced operator training is needed to improve the diagnostic image.

1. Jones SE, Wittram C. (2005) The indeterminate CT pulmonary angiogram: imaging characteristics and patient clinical outcome. *Radiology* 2005; 237:329-337.

P055 Evaluating the difference in prevalence of acute pulmonary embolism on CT pulmonary angiograms for COVID-19 positive patients between the first and second waves of COVID-19

Henry de Boer; Steven Kennish

Sheffield Teaching Hospitals NHS Foundation Trust

Background: The first wave of the COVID-19 pandemic (April 2020) resulted in many escalations to critical care (CC). Computed Tomography Pulmonary Angiography (CTPA) excludes pulmonary embolism (PE). The cross-infection risks of CTPA scans were justified following a consultant clinician to consultant radiologist discussion at our institution. Evidence subsequently emerged of an increased risk of PE in COVID+ patients and the requirement for a consultant-to-consultant discussion was dropped prior to the second wave (October 2020).

Purpose: To evaluate the number of CTPA scans and positive rates for PEs during the first and second waves and establish whether the risks of cross contamination are justified.

Methods: A retrospective, single centre study evaluated 102 COVID+ patients. CTPAs for COVID+ patients for 21 consecutive days of each wave (from 1st April 2020 and from 15th October 2020) were reviewed for the presence of PEs. Gender, age and referral source were recorded.

Results: 48% of COVID+ patients had PEs on CTPA during the first wave with 16 of 33 patients referred from CC. Only 10% of COVID+ patients had PEs in the second wave with only 5 of 79 patients from CC.

Conclusion: The high positive pick-up rates for PEs in the first wave suggest that CTPA was underutilised. The greatly reduced pick-up rates of PE in the second wave suggests overutilisation of CTPA or earlier anticoagulation of COVID+ patients. Scanning more COVID+ patients puts staff and other patients at an indeterminately increased risk of cross-infection. Can we better risk stratify COVID+ patients?



Fauvel, C. et al. (2020). Pulmonary embolism in COVID-19 patients: a French multicentre cohort study. *European heart journal*, 41(32), 3058-3068.
Whyte, M. et al. (2020). Pulmonary embolism in hospitalised patients with COVID-19. *Thrombosis research*, 195, 95-99.

P056 Pictorial review of causes of acute cardiovascular collapse in the COVID-19 era

Lucinda Frank; Dominic Kite; Garrett McGann

Gloucestershire NHS Foundation Trust

Background: Observational publications have suggested an increase in delayed presentation of patients with acute cardiovascular pathology during the COVID-19 pandemic (Joshi et al, 2020). This is thought to be secondary to patient reluctance to attend Emergency departments during the pandemic and public health initiatives changing from early recognition and treatment of chest pain symptoms to staying at home and protecting the NHS. This delay in presentation has seen a rise in the diagnosis of mechanical complications of acute myocardial infarction diagnosed on CT.

Purpose of poster: We present a pictorial review of several significant cardiovascular pathologies presenting to a mid-sized acute institution during the pandemic. We aim to suggest techniques for cardiac interrogation on acute CT to identify these acute and life threatening pathologies which need to be considered alongside acute aortic syndrome as a cause for central chest pain and haemodynamic instability.

Summary of content: We will include CT angiogram images of acute ischaemic ventricular septal defect, acute false aneurysm of the left ventricle, acute papillary muscle rupture and Takotsubo cardiomyopathy. We discuss their key features to aid recognition of these important cardiac findings on acute non gated CT angiogram.

1. Joshi S, Kazmi FN, Sadiq I, Azemi T (2020) Post-MI Ventricular Septal Defect During the COVID-19 Pandemic. *J Am Coll Cardiol Case Rep*;2:1628-32.

P057 Imaging guided percutaneous lung biopsy: Lessons from 6 years of completed audit cycles

Pia Charters; Lynne Armstrong

University Hospitals Bristol and Weston NHS Foundation Trust

Background: Imaging guided percutaneous lung biopsy (PLB) is a widely performed test for obtaining tissue diagnosis in suspected thoracic malignancy. The procedure is associated with specific complications, including death, thus annual audit is essential to assess outcomes and maintain/improve safe and effective practice. The British Thoracic Society (BTS) has produced guidelines outlining best practice and target complication rates (2003).

Purpose: To assess local performance of imaging guided PLB against nationally agreed standards and previous local performance. To identify trends in practice over 6 years of re-audit.

Summary:

- The number of image-guided PLBs performed locally has tripled since 2013-14 (28-120).
- Complication rates including haemoptysis, pneumothorax and death were within BTS target.
- Increasing the pass-rate to ≥ 2 has improved diagnostic yield sufficiently ($\geq 90\%$ BTS).
- Documenting the specific time to perform the post-procedure CXR in writing improves accuracy over verbal communication.
- The percentage of CT-guided biopsies performed relative to ultrasound-guided is increasing. This is likely due to a combination of performer preference/skill-set, availability of CT and/or the trend towards biopsying ever-smaller lesions only accessible on CT in increasingly high-risk patients (e.g. emphysema). Furthermore, although the pneumothorax rate remains low, the percentage of patients requiring chest drains is increasing which is likely related to aforementioned factors.
- Although our figures are still within BTS guidelines (2003), PLB has evolved in both the biopsy of small central lesions rather than 'straight-to-surgery' and the histological requirement for core biopsy rather than fine needle aspirate. We propose updating the guidelines to reflect these changes in outcome and safety.

1. Manhire, A. et al, 2003. Guidelines for radiologically guided lung biopsy. *Thorax*, 58(11), pp.920-936.

2. Callister, M., Baldwin, D., Akram, A., Barnard, S., Cane, P., Draffan, J., Franks, K., Gleeson, F., Graham, R., Malhotra, P., Prokop, M., Rodger, K., Subesinghe, M., Waller, D. and Woolhouse, I., 2015. British Thoracic Society guidelines for the investigation and management of pulmonary nodules: accredited by NICE. *Thorax*, 70(Suppl 2), pp.ii1-ii54.

P058 Cardiac PET/CT - Evaluation of quality of myocardial suppression using a dedicated cardiac diet

Santosh Mathew; Amit Parekh

University Hospitals Dorset

Background: Cardiac PET is useful in identification and monitoring of diseases causing pathological inflammation of the heart. However, sufficient suppression of myocardial activity is required to distinguish inflammatory from physiological myocardial tracer uptake.¹

We use a dedicated high fat, low carbohydrate cardiac protocol with a prolonged fast for PET/CT scans performed for the diagnosis of cardiac sarcoidosis.



The aim of this study was to identify if our cardiac protocol was adequately suppressing myocardial activity in order that inflammatory cardiac disorders could be confidently diagnosed. Our standard for this study was adequate suppression of physiological myocardial uptake in 80% of patients.¹

Methods: All patients who underwent PET/CT for a cardiac indication from August 2018 to July 2020 were included. We used qualitative (visual Likert scale) assessment to score uptake as in previous studies.² We performed quantitative analyses by drawing ROI around two areas of the myocardium (SUVmax) and compared to background liver uptake.³

Results: 21 patients were identified according to the criteria. 14 patients followed the cardiac diet. 100% of patients that followed the cardiac diet demonstrated excellent suppression of myocardial uptake with visual score of 0 and was quantitatively below background liver. Mean myocardial SUVmax was 2.08 in those that followed the diet compared to 3.42 in those that did not.

Conclusion: This study demonstrates that our cardiac protocol provides reliable myocardial suppression in cases of suspected myocardial inflammatory disease. However, this study had a small sample size and prospective audit is necessary to ensure continued efficacy of the technique.

¹Osborne MT, Hulten EA, Murthy VL, et al. Patient preparation for cardiac fluorine-18 fluorodeoxyglucose positron emission tomography imaging of inflammation. *Journal of Nuclear Cardiology: Official Publication of the American Society of Nuclear Cardiology*. 2017 Feb;24(1):86–99. DOI: 10.1007/s12350-016-0502-7.

²Williams G, Kolodny GM. Suppression of myocardial 18F—FDG uptake by preparing patients with a high—fat, low—carbohydrate diet. *AJR Am J Roentgenol*. 2008 Feb;190(2):W151—6. doi: 10.2214/AJR.07.2409. PMID: 18212199.

³Balink H, Hut E, Pol T, Flokstra FJ, Roef M. Suppression of 18F—FDG Myocardial Uptake Using a Fat—Allowed, Carbohydrate—Restricted Diet. *J Nucl Med Technol*. 2011 Sep;39(3):185-9. doi: 10.2967/jnmt.110.076489. Epub 2011 Jul 27. PMID: 21795368.

P059 Chest x-rays requests in elderly care, are they appropriate?

Alaa Issa¹; Ahwab Alam¹; Sondos Eladawi¹; Sarena Rashid²; Folasade Ijaola³

¹The Dudley Group NHS Foundation Trust; ²University Of Birmingham; ³Russel's Hall Hospitals

Background: According to National Institute for Health and Care Excellence guidelines, diagnosis of pneumonia in hospital is made on the basis of new lung shadowing on Chest X-ray (CXR) which should ideally be performed within 4 hours of presentation. Working in the care of elderly, it was noted that some patients had a documented diagnosis of Community Acquired Pneumonia (CAP) with no radiological evidence on CXR. Additionally, most of CXR requests were found to be inaccurately reflecting the patient's clinical examination. This was noticed whenever the CXR request could not be justified which exposes the patients to essentially avoidable radiation. The aim of our study is to evaluate adherence to the 4 hour rule in suspected CAP, the accuracy of CXR requests and the abandonment of CAP misdiagnosis in normal CXRs.

Method: A prospective review of clerking sheets of patients admitted to elderly care unit. Patients who had a diagnosis of CAP were included. Their diagnosis was then compared to the CXR findings.

Results: 50 patients were identified with a mean age of 81.4. 86% of CXR were done within 4 hours of presentation. 12% had no radiological finding of CAP but were given the diagnosis. Only 46% of CXR requests accurately matched the documented clinical findings.

Conclusion: CXR is a valuable tool to confirm CAP but can also exclude it, therefore it is crucial to review the preliminary diagnosis of CAP after the CXR is done. Finally the request for a CXR must accurately reflect the patient's clinical findings.

P060 Patient compliance with preparation instructions for stress cardiac MR: an audit

Panaqiotis Papaqeorqiou; Andrew Flett; Abbas Ausami; Stephen Harden; James Shambrook; Katharine Vedwan; Charles Peebles

Cardiothoracic Radiology Department, Southampton General Hospital

Background: Cardiac magnetic resonance imaging (CMR) and its perfusion modality provides invaluable diagnostic information for the presence of myocardial ischemia (sens 80-90%, spec 70-80%) and its diagnostic performance is at least equivalent to that of nuclear perfusion imaging. The preparation of patients 24h ahead of the CMR is key and entails refraining from drugs such as nitrates, nicorandil, isosorbide mononitrate, dinitrate and caffeine beverages. Preparation malcompliance may result in incomplete physiological response and subsequent inaccurate reporting.

Method: 60 consecutive individuals were scanned in March 2020 in Southampton General (UHS) and their electronic notes were reviewed for their compliance. This practice was compared against the standard Local policy and UHS guidelines in concordance with the Euro-CMR registry [1] and the SCMR-standardised protocol [2]. The standard for each section would be 100%. The results were compared with the prior compliance audit.

Results: The sample percentage that did not adhere to the preparation were 10% for caffeine and 1.6% for nitrates and rest anti-anginal drugs (N=60). The previous audit found adherence issue in 2% for caffeine and 2% for drugs



(N=50).

Conclusion: This audit highlights the need for appropriate preparation to stress CMR reflecting the importance of accurate reports. Additionally, appointment cancellation results in loss of resources (CMR and staffing). Here both audits showed a satisfactory degree of compliance ($\geq 90\%$) for both parameters. As a result, we are planning to: 1) change SMS service to specific advice for stress patients, 2) review the information leaflets with the patients representatives and audit for 3rd time.

1. Klinkle, V. et al. (2013) 'Quality assessment of cardiovascular magnetic resonance in the setting of the European CMR registry: Description and validation of standardized criteria', *Journal of Cardiovascular Magnetic Resonance*, 15(1), pp. 1-13. doi: 10.1186/1532-429X-15-55. 2. Kramer, C. M. et al. (2020) 'Standardized cardiovascular magnetic resonance imaging (CMR) protocols: 2020 update', *Journal of Cardiovascular Magnetic Resonance*. *Journal of Cardiovascular Magnetic Resonance*, 22(1), pp. 1-18. doi: 10.1186/s12968-020-00607-1.

P061 Vascular arterial anomaly in Marfan syndrome: imaging findings

Stavroula Theodorou¹; Daphne Theodorou²; Fotios Mantzoukis²; Ioannis Iliodromitis²; Niki Tsifetaki²

¹University Hospital of Ioannina, Greece; ²General Hospital of Ioannina, Greece

Background: Marfan syndrome (MFS) is a genetic disorder characterized by defective formation of connective tissue. MFS affects 0.01-0.02% of individuals with an equal male to female distribution. Although distinctive signs of MFS are manifest in the skeletal system, the most serious findings involve the cardiovascular system including aortic dilatation, aneurysm formation, aortic dissection, and mitral valve prolapse. Pulmonary artery dilatation, ventricular arrhythmia, and dilated cardiomyopathy may also occur.

Purpose of poster: A 17-year-old male with MFS presented with acute onset of chest pain. ECG yielded atrioventricular conduction delay. Chest radiography revealed an increased cardiothoracic ratio, and CT performed for suspected aortic aneurysm or dissection, readily excluded diagnosis of aortic dissection. Pectus carinatum with marked dilatation of the aortic root was seen. Measurements were obtained at the levels of annulus, sinus, and sinotubular junction. Three cusp-commissure and three cusp-cusp lines of measurement in the axial plane were drawn, and aortic root area was calculated. Cross-sectional aortic root area measured approximately 15 cm², nearly twice above normal values. In MFS, degeneration of the medial aortic wall involves disorganization and fragmentation of elastic fibers. Progressive dilatation of aortic root predisposes the aorta to dissection and rupture, which can be fatal. Our patient was treated with medical prophylaxis with b-blockers to prevent further dilatation, and underwent reconstructive surgery and grafting.

Summary Background: Patients with MFS may exhibit ongoing dilatation of the aortic root due to defective, intrinsic anatomy of the aorta. A high index of suspicion is required to diagnose life-threatening aortopathy in MFS.

1. Ha HI, Seo JB, Lee SH et al (2007) Imaging of Marfan syndrome: multisystemic manifestations. *Radiographics* 27: 989-1004 2. Magid D, Pyeritz RE, Fishman EK (1990) Musculoskeletal manifestations of the Marfan syndrome: radiologic features. *AJR Am J Roentgenol* 155: 99-104 3. Stuart AG, Williams A (2007). Marfan's syndrome and the heart. *Arch Dis Child* 92: 351-356

P062 Large vessel vasculitis for the general radiologist -- if you don't look, you won't see

Clement Leung; Natasha Hougham; Tom Sulkin; Giles Maskell

Royal Cornwall Hospital

Background: Large vessel vasculitis (LVV) is part of a spectrum of primary vasculitides characterised by granulomatous inflammation predominantly involving the aorta and its major branches. Identifying patients with LVV may be challenging, as they often present with a combination of nonspecific clinical symptoms and laboratory results. Imaging features may be difficult to recognise but failure to make the diagnosis can lead to potentially serious complications, such as stenosis, occlusion and aneurysm formation.

Purpose: The aim of this presentation is to describe the imaging findings of LVV including its main variants, giant cell arteritis (GCA) and Takayasu arteritis (TA). Imaging features of LVV overlap with those found in atheroma and secondary vasculitis. Features which may allow distinction include uniform circumferential thickening, hypoattenuation, layered appearance, and involvement of brachial or subclavian arteries. The potential complications of LVV are also presented.

Summary: The identification of LVV may present a diagnostic challenge. Imaging features may allow the diagnosis to be suggested in advance of clinical suspicion. Early diagnosis may help to prevent potentially serious complications.

P066 Utilisation of fractional flow reserve computed cardiac tomography to drive service development of cardiac CT in a large DGH

Peter Chapman; Miquel Cervantes

HHFT

HeartFlow provides an alternative to catheter angiography, which is invasive, expensive and a limited resource, for



primary diagnosis of coronary artery disease (CAD) in patients with stable, recent onset chest pain. HeartFlow provides remote computer analysis of Computer Tomography Coronary Angiography (CTCA) data to create a three-dimensional model of the coronary arteries and model fractional flow reserve (FFR). Our Trust successfully developed a CTCA service and adopted HeartFlow technology - 58 patients underwent CTCA during the period between January and March 2020, the first complete quarter with HeartFlow implementation before the start of the COVID-19 pandemic. Five patients underwent HeartFlow analysis, only one went on to require invasive catheter angiography. The use of HeartFlow FFRCT identifies cases where no invasive interventional cardiology procedure is subsequently required, thus reducing the use of resource intensive invasive procedures and improving patient experience. This best practice abstract highlights the fact that CTCA and HeartFlow analysis should be considered as a non-invasive alternative to catheter angiography in the assessment of patients presenting with stable, recent onset chest pain. The analysis provided by HeartFlow extracts maximum value and information from CTCA data through the use of its models, aiding clinical decision making and therefore reducing the need for and burden on the invasive catheter angiography service.

1. Patel et al., (2020) 1-Year Impact on Medical Practice and Clinical Outcomes of FFRCT. JACC: Cardiovascular Imaging, 13(1), pp.97-105.

P067 Audit on Access to CTPA, Appropriateness of CTPA Requests and Whether Right Heart Strain was Reported

May Ting Tan; Mohammed Abdi; Hussein Hassan; Joseph Alex; Deepak Pai

Northern Lincolnshire and Goole NHS Foundation Trust

Background: Pulmonary embolism (PE) is one of the important causes of morbidity and mortality. Computed tomography pulmonary angiography (CTPA) remains the investigation of choice for detecting PE.

Method: Retrospective data was searched on PACS from January 2019 to February 2020 (n=1680). Data exported to excel; RAND formula assigned to each patient to ensure randomisation. Data sorted by RAND formula column from largest to smallest. First 10% (n=168) reports were selected and reviewed. Teaching was delivered locally to clinicians. In the second cycle, retrospective data from September to October 2020 was selected and reviewed (n= 300).

Results: The percentage of CTPA requested and reported within 24 hours was 76.19%. Most of the delays were from between receipt of request and completion of scan. There were only 10.71% confirmed positive PE on CTPA. Alternative diagnoses on CTPA included respiratory infection and lung tumour. Only 48.30% of the CTPA report commented on the presence/absence of RHS. In the second cycle, there is decline seen in time between request and report, to 69.33%. 13.67% confirmed PE on CTPA is seen, showing slight improvement. There is marked improvement in reporting the presence/absence of RHS at 60.33%. Alternative diagnoses included Covid-19, heart failure and lung nodules.

Conclusion: Compared to standards set, there is suboptimal compliance. The likely reason for the fall in performance is due to the Covid-19 pandemic and time constraint from increased disinfection requirements. There is also over-requesting of scans.

1. National Institute for Health and Care Excellence, 2019. Pulmonary Embolism. Available at: <https://cks.nice.org.uk/pulmonary-embolism> [Accessed 31 March 2020].

2. Howard, L., Barden, S., Condliffe, R., Connolly, V., Davies, C., Donaldson, J., Everett, B., Free, C., Horner, D., Hunter, L., Kaler, J., Nelson-Piercy, C., O'Dowd, E., Patel, R., Preston, W., Sheares, K. and Tait, C., 2020. British Thoracic Society Guideline For The Initial Outpatient Management Of Pulmonary Embolism (PE).

3. The National Confidential Enquiry into Patient Outcome and Death, 2019. Know the Score. London.



DENTAL / HEAD & NECK / NEURO POSTER PRESENTATIONS

P068 A retrospective audit into the satisfactory completion of general dental practitioner's radiology request forms

Cleavon Shand; David Smith

Sheffield Teaching Hospitals

Introduction: The majority of General Dental Practitioners (GDP) radiology request forms are hand written. An audit was carried out to obtain reassurance on the effectiveness of communication between GDP and Radiographers. A retrospective audit was conducted of 300 requests over a 12 month period within one dedicated dental hospital.

Aim: The aim of this audit was to investigate whether or not GDPs meet the minimum requirements in requesting radiology request forms and evaluate current referral systems. Determine which fields of interest are frequently incomplete on request forms.

Results: The audit revealed the inadequate completion of request forms by GDPs, 19% (n=558) of 3000 fields were left blank. The results of this study support the need for a redesign of dental radiology request forms within the hospital in which the audit was carried out. The results suggested that it would be beneficial for dental referrers to receive ICE