



physics, technique and normal anatomy, trainees need to be able to interpret normal, abnormal and artefactual findings on the mammogram. An appreciation of how mammography is used in the screening and symptomatic settings is also important.

Summary: Here we provide a short revision aid for all radiology trainees, covering the essentials of mammography for the FRCR examination.

Clinical: Chest

P054 CT features do not predict histological diagnosis in lung cancer

[Rory Hesketh](#)¹; [John Howells](#)²

*The University of Manchester*¹; *Lancashire Teaching Hospitals Trust*²

With the emergence of new treatments specific to histologic sub-types of lung cancer, the rapid assessment of likely histological sub-type without invasive testing would be attractive. We have carried out a retrospective analysis of CT features to establish whether particular CT features are predictive of histology.

Two hundred consecutive patients with biopsy proven lung cancer were identified. Demographic characteristics and CT features were analysed by fifteen variables, including age, sex, size, shape and location of tumour. The analysis was carried out blind to the eventual histologic diagnosis. A logistic regression was then carried out.

Small cell lung cancer was significantly more likely to present with smoothly marginated masses situated solely within or close to the mediastinum and significantly less likely to contain central cavitation or air bronchograms. However, no other correlation between tumour type and CT features was identified. It appears that CT scanning alone has little role in determining histological sub-type.

P055 Patient reported experiences of CT guided lung biopsy: A prospective cohort study

[Naomi Winn](#); [Jonathan Spratt](#); [Enid Wright](#); [Julie Cox](#)

County Durham and Darlington Foundation Trust

Background: CT guided lung biopsy is a commonly performed procedure to obtain tissue for a histological diagnosis in cases of suspected lung cancer.

Methods: This is a prospective cohort study to obtain information directly from patients about their experiences of the biopsy procedure, thus obtaining a more accurate picture of complications compared with previously performed retrospective reviews. Patients participated in a post-procedure telephone interview and information was gathered about any procedural complications and personal experiences. We also compared the patient reported complications with those obtained from a retrospective review of hospital databases, analogous to previously performed retrospective studies.

Results: In our patient group, reported procedural complication rates were 10% pneumothorax rate (4% requiring a chest drain) and 10% haemoptysis. Post-procedural pain and shortness of breath showed positive correlation, with one patient experiencing prolonged pain. No statistical difference was found between the patient reported complication rates and those obtained from retrospective review of the hospital database.

Conclusions: Our study demonstrates CT guided lung biopsy is a safe procedure and is generally well tolerated. Some patients may experience significant and lasting pain and should be counselled about this pre-procedure.

P056 Imaging for cancer in patients with unprovoked pulmonary emboli: The one-year Oxford Experience

[Nassim Parvizi](#); [Sarfraz Nazir](#); [Horace D'Costa](#)

Oxford University Hospitals NHS Trust

Purpose: In 2013, the British National Institute for Health and Care Excellence recommended that in patients with unprovoked PE "consider further investigations for cancer with an abdomino-pelvic CT scan in all patients aged over 40 years...who do not have signs/symptoms of cancer based on initial investigation or a known diagnosis of cancer."



Our aim is to assess how many patients with unprovoked PE proceed to further imaging and how many have a new diagnosis of cancer.

Methods: A retrospective study of all computerised tomography pulmonary angiograms (CTPAs) performed in the Oxford University Hospitals between 1/1/2013-31/12/2013 was conducted.

Results: 443 of 1213 CTPAs were reported as positive for PE. 190 of these were unprovoked PEs. 39% (74/190) had some form of subsequent imaging of the abdomen/pelvis but only 27% (51/190) were requested as per NICE guidelines to assess for malignancy. The remaining 23 patients had imaging for other indications. The median length of time between a positive CTPA and further imaging was seven days. In our cohort, we identified 11 of the 51 (22%) as making a new diagnosis of cancer.

Conclusion: One in five cases of unprovoked PE may have an underlying malignancy. It is important to consider further imaging to exclude malignancy in patients over the age of 40 with no known history of cancer with unprovoked PE.

P057 Lung cancer associated with cystic lesions: raising awareness

[Iara Sequeiros^{1,2}](#); [Ladli Chandratreya²](#)

University Hospitals Bristol NHS Trust¹; North Bristol NHS Trust²

Aims/objectives: To raise awareness of primary malignant lung lesions that can arise from cystic air spaces within the lung.

Content: The poster will describe this unusual form of presentation of primary lung cancers, and illustrate it with case examples from our institution.

Discussion: Primary lung cancer arising from the wall of a pre-existing lung cyst is an unusual presentation, but has been reported since the 1940s. These include several cells types, such as adenocarcinoma, squamous cell, small cell and carcinoid. The tumours can present as growths abutting or in the wall of a pre-existing cyst, which are seen as thickening of the wall and subsequent emergence of a mural nodule on follow-up CT scans. The extent of wall thickening can vary, encompassing from 60 to 360 degrees of the circumference of the cyst. The nodule component can be either solid or subsolid. The pre-existing cystic lesion can be for example a bulla, a bronchiectatic airway or a pleural bleb. The literature suggests that these cancers can be slow growing, therefore follow-up should be prolonged, (median 35 months on a study by Farooqi et. al, 2012, after initial baseline CT obtained as part of a lung cancer screening programme). Possible mechanisms for the formation of these cystic lesions prior to the detection of the tumour include a check-valve obstruction at the terminal bronchiolar level by an inflammatory or neoplastic process. Careful inspection should be made of cystic lesions in patients with high risk for lung cancer, as progressive wall thickening may represent lung cancer.

P058 Documentation of chest X-rays in intensive care

[Stephanie Toner](#)

Altnagelvin Hospital

Aim: To improve documentation of chest X-ray reviews; thereby improving patient safety and clinical care.

Relevance: The National Patient Safety Agency found that between 2005 and 2011, 21 deaths and 79 cases of harm occurred due to misplaced NG tubes¹. Given the large number of chest X-rays requested in ICU; accurate documentation of chest X-ray findings are of significant importance.

Method: A retrospective analysis of 13 consecutive ICU in-patient stays. Clinical notes evaluated to assess documentation of chest X-ray reviews, focusing on placement of NG tubes, lines, chest drains and tracheal tubes. Time taken for images to be carried out also assessed.

Results: 51% (n=80) of images were reviewed and documented by medical staff. 42% (n=17) of images documented that confirm NG tube position. 50% (n=4) of tracheal tubes, 100% (n=7) vascular lines and 33% (n=3) of chest drain insertions had documented chest X-ray positioning. Images (n=3) requested >12 hours in advance had no



documented review. 52% of images were carried out within 30 minutes of request. Initial data was presented to the ICU medical team and an additional section reminding staff to review imaging was added to daily review proforma. Provisional reaudit data showed that 73% (n=70) of images were documented; 65% (n=26) of NG tubes, 54% (n=13) of tracheal tubes and 67% (n=18) of vascular lines were documented accurately.

Conclusion: The accurate documentation of chest X-ray findings in ICU improved following education and intervention. Nonetheless continued clinical efforts must be persistent to further improve upon documentation.

P059 The role of chest digital tomosynthesis in the diagnosis of pulmonary nodules

[Adam Stamboulid](#); [Zainab Hussain](#)

University of Liverpool

Aims: To evaluate the role of chest digital tomosynthesis (CDT) in imaging pulmonary nodules.

Content: A literature review was performed using databases, PUBMED, SCIENCE DIRECT and DISCOVER. The medical keywords used were, “digital tomosynthesis”, “tomosynthesis” and “chest tomosynthesis”. Search criteria restricted literature to the last 10 years.

Relevance/impact: CDT is able to image the lungs whilst removing obstacles such as the ribs and mediastinum. Literature suggests CDT has higher sensitivity at detecting pulmonary nodules than plain chest imaging and can be performed with similar radiation levels as plain chest imaging.

Outcomes: The study has shown CDT to have an average sensitivity of 88% compared to 38% for plain chest imaging in the detection of pulmonary nodules. Mean effective doses ranged from 0.1-1.95mSv, although dose differences between CDT manufacturers were apparent. CDT can reduce costs and doses.

Discussion: CDT is significantly more sensitive at identifying pulmonary nodules than plain chest imaging. It has been shown to reduce costs due to reducing the need for computerised tomography and gives only slightly higher radiation dose levels than plain chest imaging. It should not, however, replace CT and only be implemented for inconclusive plain chest imaging and low risk lung cancer patient screening. Further research is needed with regard to further optimisation, reduced costs and improved diagnostic accuracy.

P060 CTPA - should we add CTV of the lower limbs?

[John Mullany](#); [Chung Shen Chean](#); [Neena Kalsy](#); [Rebecca Wiles](#)

Royal Liverpool and Broadgreen University Hospitals NHS Trust

Aims: In the PIOPED II study, CTPA with CTV of the lower limbs increased detection of thromboembolism compared to CTPA alone, leading to the recommendation that a scanning protocol for detecting pulmonary embolism should include CTV. We aimed to estimate the impact that implementing this protocol could have on our department.

Content: We studied several factors including:

- How many CTPA studies were performed in a six week period and the scan results
- How many patients who underwent CTPA also underwent ultrasound scan of the lower limbs
- How many CTPA studies are performed per year.

Outcomes: 153 CTPA studies were performed over a six week period. 21(14%) were positive for PE, 38(25%) were considered of suboptimal quality by the reporting radiologist. 18 (12%) patients had ultrasound scan lower limbs within six months of CTPA. Of those two were positive for DVT. We performed 1,495 CTPA studies in total in 2013.

Impact: Using the data obtained by the audit, adding CTV to CTPA could prevent 164 ultrasound scans per year, however would mean increased radiation dose (approximately 1.5mSv per patient), reporting time and cost (approximately £79 per patient).

Discussion: Implementing the recommendations from the PIOPED II study of the addition of CTV to all CTPA studies could have important implications to a radiology department, both in terms of cost, radiation dose and reporting time. The reduction in ultrasound scans as a consequence of the addition of CTV is unlikely to compensate for the additional reporting time or cost.



P061 Audit of CT pulmonary angiogram (CTPA) requests and diagnostic yield

[Henna Singh](#); [Sophie Sneddon](#); [Derek Baxter](#)

NHS Ayrshire and Arran

Introduction: CTPAs are commonly requested investigations for the exclusion of pulmonary thromboembolism (PTE). Current guidelines recommend probability scoring using either Well's or modified Geneva systems. Additionally, d-dimer testing improves diagnostic yield when low clinical risk with high clinical suspicion exists. Therefore, most appropriate use of imaging should occur.

Aim: The aim was to investigate the diagnostic yield of CTPAs performed, if clinical management was otherwise improved and to determine appropriate documentation of probability scoring in CTPA requesting.

Methods: Data from all CTPAs conducted over a four-month period was retrospectively collected at University Hospital Ayr. Information on patient demographics, probability scoring, d-dimer tests, and imaging requests and reports were collected.

Results: 159 CTPAs were available. 23.3% (n=37) showed evidence of PTE. 10.7% (n=17) of the patients had a probability score documented on the request using the Well's score and of these n=3 had PE. 75.5% (n=120) of patients had d-dimer testing. The majority of those without PTE had infection (16.4%; n=20); others were heart failure, effusion and malignancy. Median time from request to CTPA was 1 day.

Conclusion: The majority of CTPAs requested were negative and probability scoring and d-dimer testing were inappropriately recorded. This suggests improving patient selection is necessary. CTPA is often a test of exclusion and probability scoring is necessary to satisfy IRMER guidance. Compulsory probability documentation prior to re-audit will minimise risk in those undergoing imaging. Moreover, prompt reporting minimises unnecessary anticoagulation.

P062 Would the use of an age adjusted D-Dimer adjusted according to age cut down the number of CTPA requests without compromising the ability to pick up pulmonary thromboembolism: A prospective study

[Mohamed Anwar](#); [Madeleine McCarthy](#); [Claire Wood](#)

NHS Forth Valley

Our study sought to compare the specificity and sensitivity of this age adjusted D-Dimer cut off value against the conventional D-Dimer (CDD) cut of when used as a rule out test in patients with low probability of PTE in patients over 50. Age adjusted D-Dimer (AADD) was defined as age x0.01 as published in a recent large BMJ meta-analysis.

Method: We collected data for all patients over 50 with a low pre-test probability score and a positive CDD who underwent a CTPA to exclude a PTE over a twenty week period. Each patient with a positive CDD was then assigned an AADD. We used PACs database to assess which of these patients then underwent a CTPA imaging and what the result of this was.

Results: Over 20 weeks there were a total of 120 patients eligible. There were 77 CTPAs done. 59 excluded PTE and 18 positive for a PTE. All 18 patients who had a positive PTE on CTPA would have also have had a positive AADD. Using an AADD 10 CTPA could have been excluded without any impact on PTE pick up rate. The CDD had a sensitivity rate of 100% as did the age adjusted D-Dimer. Age adjusted D-Dimer cut off rate had a better specificity rate of 91% compared to 89% for the CDD.

Conclusion: Introduction of an AADD (age x0.01) would have avoided unnecessary CTPA in our cohort of low probability patents. This change would not compromise sensitivity but improves specificity and positive predictive value.

P063 Thoracic actinomycosis: a case report illustrating its non-specific presentation, with systematic literature review

[Mohammed Nabi](#); [Amir Awwad](#); [Maruti Kumaran](#)

Nottingham University Hospitals NHS Trust



Background: Thoracic actinomycosis is an uncommon chronic suppurative pulmonary &/or endobronchial infection caused by *Actinomyces* species, particularly a gram-positive anaerobic organism called *Actinomyces israelii*. Definitive diagnosis on clinical grounds is difficult due to non-specific manifestations. The condition can mimic a range of other thoracic pathologies on clinical and radiological findings, therefore histological sampling and microbiology analysis are considered to be the definitive diagnostic tests for this condition.

Objectives: Our case illustrates the non-specific clinical and radiological findings of thoracic actinomycosis in a 44 years-old male patient. With a background of heavy smoking, this has initially presented with a productive cough, weight loss and a lung mass. Various clinical and radiological investigations had been performed and were not conclusively diagnostic. However, a final call to test for rare aetiologies has led the clinical team to identify thoracic actinomycosis not until the elapse of about two years from the first presentation. A systematic literature review has been conducted to collate the latest updates on imaging perspective, management and complications in current practice.

Conclusion: While clinical and radiological presentations are non-specific, it is imperative to consider thoracic actinomycosis as a differential diagnosis for a variety of radiographic presentations in thoracic imaging, and to perform relevant microbiological studies.

Clinical: Cardiac and Vascular

P064 T1 mapping in cardiac MRI: A pictorial review

[Samuel Leach](#); [Andrew Flett](#); [James Shambrook](#); [Charles Peebles](#); [Peter Weale](#); [Stephen Harden](#)

University Hospital Southampton

We present an educational poster explaining the role and benefits of T1 mapping in Cardiac MRI, with a pictorial review of example cases in which this technique can add value.

T1 mapping is an emerging approach to tissue characterisation in cardiac MRI, utilising native tissue T1 relaxation characteristics to identify areas of abnormal tissue such as fibrosis, oedema or fat which are often not identifiable on conventional cardiac MRI. The sequence we used is based on modified look locker inversion recovery (MOLLI). MOLLI provides accurate characterisation of even small volumes of abnormal tissue and localisation of scarring. MOLLI is quick to perform, taking less than 10 seconds and has inline motion correction, producing a colour map, with the scale indicating the T1 on a pixel by pixel basis. T1 mapping can be used without contrast in patients with renal failure, where there may be a reluctance to administer intravenous gadolinium agents.

We provide imaging examples of T1 mapping. These include patients who are post-myocardial infarction to confirm areas of fibrosis and oedema seen on late gadolinium enhancement MR, as well as cases where T1 mapping has characterised more equivocal abnormalities on conventional MRI sequences. We also present cases in which T1 mapping refined differential diagnoses in cardiomyopathies, such as the reduction in T1 seen with the intracellular fat accumulation typical of Anderson-Fabry disease and the increase in T1 seen in cardiac amyloidosis.

P065 Postoperative appearances of the aortic root, what every radiologist should know

[Marc Bramham](#); [Franchesca Wotton](#); [Vikram Raju](#); [Tinu Purayil](#)

Plymouth Hospitals NHS Trust

This poster aims to provide an overview of both normal and abnormal postoperative CT appearances of the aortic root. In general radiology, the heart has been largely invisible before now. With advancements both in surgical technique and in medical imaging, the importance of reviewing this organ is growing. There are now large numbers of patients passing through radiology departments who have had surgery to the proximal aorta. In many cases, they present with chest pain or cardiorespiratory compromise. When on call or managing an inpatient list, it is important that the postsurgical appearances can be readily recognised and evaluated as either normal or abnormal. The decision in this regard can be immediately relevant to the patient's management.