

**Content:** Retrospective analysis was performed of 280 breast cancers over a period of 23 months (Jan 2014-Nov 2015). Correlation was performed of all 189 operated cancers taking pathology as gold standard.

**Outcome:** Of the 189 patients, 21 were found to be SNB positive (sensitivity 11%, specificity 100%). Of these 21 patients, 33% were found to have ILC in comparison to 5.4% of SNB negative patients ( $p=0.03$ ). In addition the SNB positive patients had an average of 3.25 nodes sampled compared to 2.35 nodes in negative patients ( $p=0.04$ ). Statistical significance was also found for tumour size with SNB positive patients having larger tumour (26mm Vs 20mm,  $p=0.03$ ), however no statistical significance was found in relation to the multi-focality or grade of tumour ( $p>0.05$ ).

**Discussion:** Of all the variables affecting false negative pre-operative assessment of axilla, multiple number of harvested SN has not been reported before. It needs further study for evaluation.

At SRFT, we plan to FNA upto two radiologically suspicious nodes ( instead of one uptill now); pre operatively as a change of practice and reaudit our results in one year time.

### P-111 Palpable breast mass in lactating women

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Lactating breast lesions are a common occurrence and can cause anxiety to patients and doctors; we aim to present the sonographic features of different pathologies presented during lactation, including benign and malignant aetiologies.

A wide range of benign and malignant breast problems may be encountered during lactation. In our pictorial review we present and describe sonographic findings of the most common differential diagnosis: milk cyst, fibroadenoma, lactating adenoma, galactocele, abscess and pregnancy associated breast cancer, and their appearances on ultrasound

Breast masses are encountered frequently during lactation and may be a cause of concern and great anxiety. Most findings in lactating patients are benign. The physiological changes during pregnancy and lactation make the clinical and radiological evaluation of these masses challenging. The hypertrophic changes during lactation increase the radiographic density of the breasts reducing the sensitivity of mammography. Taking into account the availability and risks associated with different modalities, ultrasound is the diagnostic tool of choice to characterize the nature of the mass. It has high sensitivity, is readily available and is reproducible. In majority of cases tissue sampling is usually warranted for a definite diagnosis. There is a limited role for breast MRI.

Radiologists commonly come across palpable breast masses in lactating women. Changes occurring in the breast during pregnancy and lactation makes evaluation challenging. A good understanding of the potential differential diagnosis and the use of appropriate imaging modalities and available investigations can help the radiologist make the diagnosis.

## Chest, lung and heart

### P-112 Experience of using active breathing co-ordinator (ABC) to manage tumour motion

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The Nottingham Cancer Centre was accepted as one of the 17 sites to take part in the Stereotactic Ablative Body Radiotherapy Commissioning through Evaluation scheme (SABR CTE). In October 2015 the first patient to be entered in to the scheme presented with a metastasis in his left lung from a colorectal primary.

A 4D planning CT scan was acquired and exported to MIMvista version 6.5.5 where the maximum intensity projection (MIP) demonstrated a large degree of tumour motion. This motion made the patient unsuitable for SABR in free breathing as the internal target volume (ITV) would be too large.

Using the Elekta Active Breathing Co-ordinator the motion of the tumour was successfully managed reducing the ITV to half that of the free breathing volume. This involved coaching the patient to be able to hold their breath comfortably for 20 seconds at a measured volume of air. By having a set volume of air the tumour was kept in a

reproducible position at every breath hold. Each CBCT scan took approximately 6-8 breath holds, depending on the scan pre-set, and the treatment required 5-6 breath holds, the patient tolerated the procedure very well.

The outcome of the process enabled sufficient tumour immobilisation allowing the patient to undergo SABR treatment and the resultant imaging demonstrates this effectively. The success of this is very relevant as more mobile tumours may present to the department via the CTE programme. These may include liver tumours for which the guidelines suggest using breathing control techniques.

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### **P-113 Imaging findings in pulmonary Sjögren syndrome**

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**Aims:** The poster aims to give some background on the clinical features and pathogenesis of Sjögren syndrome and then looks at the known pulmonary manifestations associated with this condition.

Examples from a collection of cases will demonstrate the radiological features associated with pulmonary Sjögren syndrome.

**Content:** Significant lung disease in Sjögren syndrome is rare but many patients complain of a chronic cough related to drying of the mucous membranes.

One study found plain radiograph abnormalities in 14% and abnormalities on HRCT in 34% but there is poor correlation between symptoms, clinical signs and radiological findings. Pathology may precede the appearance of symptoms by a number of years.

HRCT helps categorize the pulmonary involvement into that affecting the airways (bronchiectasis, bronchial wall thickening and follicular bronchiolitis) and that of an interstitial pneumonia (NSIP, UIP or organizing pneumonia) Occasionally patients present acutely with lymphocytic interstitial pneumonitis (LIP). Clinical manifestations include fever, cough, and dyspnoea, with bibasilar pulmonary infiltrates consisting of dense interstitial accumulations of lymphocytes and plasma cells

Patients with Sjögren syndrome have an increased risk of Lymphoma and the radiologist should raise suspicion if there is evidence of mediastinal lymphadenopathy or a pulmonary mass.

**Relevance:** This poster will be relevant for general radiologists and radiologists in training.

**Outcomes:** The reader will be able to recognise the pulmonary features of Sjögren syndrome on CT and know what rare but malignant conditions should not be missed.

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### **P-114 Quality of CT pulmonary angiography in suspected pulmonary embolism in pregnancy**

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**Background:** Pulmonary embolism (PE) is the leading preventable cause of maternal death during pregnancy. A diagnosis of pulmonary embolism in pregnancy has important clinical implications. It is of utmost importance to minimise radiation exposure to both the mother and foetus whilst acquiring high quality, diagnostic imaging.

**Audit standards:** RCR audit standards; (1) 90% CT pulmonary angiography (CT PA) should be optimal (210 HU of the central pulmonary artery). (2) 100% patients should have a chest radiograph prior to a CT PA.

**Method:** Retrospective analysis of all pregnant patients that had a CT PA between 2013 to 2015 performed in our Trust. The imaging was then reviewed by the departmental CT lead consultant radiologist and categorised as; (1) Good, diagnostic. (2) Suboptimal (due to contrast), diagnostic. (3) Suboptimal (due to patient factors), diagnostic. (4) Suboptimal, not diagnostic.

**Results:** The sample consisted of 19 patients. 100% had a chest radiograph prior to CT PA. 90% scans had optimal central contrast. 11% scans were not diagnostic. Cardiac and respiratory motion reduced the diagnostic accuracy in the majority of cases. The 2 scans that were bolus tracked were not diagnostic.

**Conclusion:** Our institution met the RCR audit standards for quality of pulmonary angiography in suspected pulmonary embolism in pregnancy. Bolus tracking increased patient dose and did not improve diagnostic accuracy.

The limitations of this audit are the results are based on a small number of patients but the outcomes of this audit reinforced not using bolus tracking in our routine CT protocol.

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### **P-115 Central venous catheter (CVC) tip position on chest radiographs for administration of chemotherapy treatment**

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*The Christie NHS Foundation Trust*

**Aims & content:** This poster demonstrates the preferred position of central venous catheter tips as used at an oncology centre primarily for administering chemotherapy treatments. Correct and common incorrectly sited catheter tips requiring repositioning are illustrated. Radiographs with internal jugular vein catheters, portacatheters and peripherally inserted central catheters (PICC) are presented along with examples of complications.

**Discussion:** In general hospitals the CVC tip placement is often higher in the SVC as the drugs being administered via the central catheter are less toxic, e.g. antibiotics. Additionally, the lines for non-chemotherapy use are in situ for a shorter period of time. For chemotherapy agents, the preferred line tip position is at the atrio-caval junction/upper third right atrium enabling chemotherapy agents to enter with optimal blood flow rates reducing tip thrombus, fibrin sheath development and venous stenosis. The tip should not abut the vessel/atrial wall as persistent bombardment by chemotherapy agents and friction from the line tip may cause erosion.

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### **P-116 Mobile chest xrays are they good enough?**

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The audit aimed to assess the image quality of digital radiography (DR) as compared with computed radiography (CR) chest radiographs.

An audit was undertaken to determine the quality of mobile CXRs and to highlight areas of improvement. It is vital these images are of high diagnostic quality and adhere to IR(ME)R regulations.

100 DR images and 100 CR images were scored subjectively using an image quality template. Assessment of image quality included rotation, inspiration, aspect marker visible, patient positioning and artefacts.

CR mobile CXRs had an average image quality score of 13.2. Marks were mainly lost due to the lack of an aspect marker, patient positioning and artefacts. 16% of the images did not include the full area of interest. In comparison, DR images had an image quality score of 15.6 which is a substantial improvement. Importantly, 100% of the images included the full area of interest.

Areas that needed improvement included inspiration, artefacts and visualisation of the costophrenic angles. It is imperative to utilise clinical skills, clear communication, correct radiographic technique and teamwork when considering mobile chest radiography on the critically ill patient.

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### **P-117 What not to miss on CTPA**

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**Aims/objectives:** Computed tomography pulmonary angiograms (CTPA) has become part and parcel in investigation of the patients presenting with acute shortness of breath and one of the most frequently requested CT investigations.

As radiologist, we are very well trained at excluding pulmonary embolisms. But there are other treatable conditions that can account for patient symptoms.

I would like to highlight partial anomalous pulmonary venous drainage (PAPVD). PAPVD is one of the commonest treatable causes of pulmonary hypertension, if remained unidentified can progress to irreversible pulmonary hypertension. Even in the hands of an experienced echocardiographer, this diagnosis can be missed. Cross sectional imaging remains gold standard.

**Contents:** A few cases would be presented with PAPVD, showing signs of right heart strain.

**Relevance:** With ever increasing demand of CTPAs as a first line investigation for acute shortness of breath and dyspnea, radiologists need to be aware of alternative pulmonary differentials and actively exclude them on CTPAs.

**Outcome:** To raise awareness amongst reporting Radiologists to actively sought alternative diagnosis on CTPAs other than thromboembolic disease especially when there are signs of right heart strain.

**Discussion:** PAPVD is a congenital cardiovascular condition estimated to involve 0.7 % of population, in which some of the pulmonary veins drain into the systemic circulation rather than the left atrium causing left to right shunting.

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### **P-118 Mediastinal lymph node stations: A pictorial review**

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We present an educational poster explaining the anatomical descriptions of hilar and mediastinal lymph node stations as recommended by the International Association for the Study of Lung Cancer (IASLC)<sup>1</sup>. Radiologists are familiar with describing hilar and mediastinal lymph nodes according to the TNM classification, where the staging ranges from N0 to N3. This newer classification subdivides these nodes into 14 nodal stations. Clinicians of different subspecialties in the multidisciplinary team (MDT) use this newer terminology for correlating accessible lymph nodes, for example chest physicians undertaking endobronchial ultrasound and trans-bronchial needle aspiration (EBUS-TBNA), and thoracic surgeons planning nodal resection or mediastinoscopy. Computed tomography (CT) and positron emission tomography (PET) play important roles in staging lung cancers according to the TNM system<sup>2</sup> but increasingly we should be identifying and reporting nodal groups according to the IASLC classification and presenting these to the MDT. This poster will provide imaging examples from everyday routine radiology practice and translate the illustrations into a more practical format for radiologists through the use of colour-coded CT image maps.

#### **References:**

1. Rusch VW, Asamura H, Watanabe H, et al. The IASLC lung cancer staging project: a proposal for a new international lymph node map in the forthcoming seventh edition of the TNM classification for lung cancer. *Journal of Thoracic Oncology* 2009;4(5):568–577.
  2. Mirsadraee S, Oswal D, Alizadeh Y, Caulo A, van Beek EJ. The 7th lung cancer TNM classification and staging system: Review of the changes and implications. *World Journal of Radiology*. 2012;4(4):128-134.
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### **P-119 Bronchoscopic lung volume reduction techniques – what a radiologist needs to know**

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Lung volume reduction techniques are offered to suitable patients who continue to experience dyspnoea from chronic obstructive pulmonary disease (COPD) despite best medical management.

There is increasing prevalence of bronchoscopic lung volume reduction (BLVR) techniques, usually by means of coils or valves to prevent ventilation of the most emphysematous areas of lung. These methods are less invasive than traditional operative approaches and may also be offered to patients otherwise not fit for surgery.

Bronchoscopically inserted coils and endobronchial valves can be readily identified on plain radiographs or cross-sectional imaging and as such it is desirable for all radiologists to be familiar with their appearances. In addition, the radiologist plays an essential role in determining which procedure may offer most benefit and can identifying patients with specific contraindications.

Particular criteria such as a pattern and distribution of emphysema, presence of airway abnormality, pulmonary perfusion characteristics and fissure integrity are all factors that must first be evaluated with imaging studies before lung volume reduction is attempted.

Including images from CT, nuclear medicine, plain film and bronchoscopic studies from our hospital, this poster reviews the imaging findings associated with these devices and the key role of imaging in the pre-procedure work-up. Normal post-lung volume reduction appearances are also discussed.

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### **P-120 An audit of percutaneous lung biopsy – safety and diagnostic adequacy**

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**Aim:** CT-guided lung biopsy is a commonly performed interventional procedure for the investigation of suspicious lung findings. This is the 4th cycle of a retrospective audit of CT-guided lung biopsies performed at James Cook University Hospital against standards provided by British Thoracic Society guidelines for radiologically-guided lung biopsy (2003), National Institute for Health and Care Excellence (NICE) Lung Cancer guidance (2011) and QS17 Quality Standards (2012).

**Methods:** All patients undergoing CT-guided lung biopsy performed between January 2011 to December 2011 (12 months) were included. Data were obtained from PACS, WebIcse and RIS. The complication rate and sampling accuracy rate/sensitivity were recorded. Correlation was made with concurrent PET-CT, when available, and the histology results. Follow up imaging scans of the "benign" biopsies over 24 months post biopsy were also reviewed.

**Results:** 169 patients (79 males, 90 females) were identified. Adequate samples for diagnosis were obtained in 163 patients (96.4%). 26 patients (15.3%) had pneumothorax, none requiring chest drainage. Haemoptysis was observed in 20 patients (11.8%), none needing medical management or intervention. There were no fatalities. The false positive rate was 0. The false negative rate was related to the size/location of the lesion and number of cores taken.

**Conclusions:** CT-guided biopsies at our institution are largely within standards set by BTS and NICE guidelines. The use of PET-CT, if available, to target biopsy sites increases the sampling accuracy.

### Cardiac and vascular intervention

#### P-121 Cardiac CT: Calcium score, scan range and image quality on dual source CT

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**Aims/objectives:** To optimise scan range in cardiac CT on a dual source scanner using the calcium score

**Method:** A retrospective RIS search identified consecutive patients undergoing cardiac CT between April and October 2015. Scan indications other than ischaemic heart disease were excluded. Patients with a coronary calcium score prior to angiogram were included. All scans were analysed for the most superior slice position demonstrating the coronaries and compared with the starting slice position of the CTCA.

**Results:** 60 patients were scanned. The average difference in distance between the calcium score and the angiogram was 4.2mm (range 0-14.5). The average difference in distance between the start of the CTCA and top slice of the angiogram was 29mm (range 6.5 - 52.8mm).

**Relevance:** Scanning in a single heartbeat minimises radiation dose. However, on a dual source system, the time to acquire the scan is proportional to scan distance. Therefore, starting the scan as close to the coronaries as possible reduces the chance of artefacts, although allowance needs to be made for varying degrees of inspiration.

**Outcomes:** This audit demonstrated a potential for reduction in scan range.

**Discussion:** On a dual source scanner, limitation of the scan range can help give the best quality scan for the lowest radiation dose (FLASH mode). This can be achieved by using the calcium score as a guide. We plan to implement education of radiographers and re-audit.

#### P-122 Role of platelet level in interventional radiology

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Throughout NHS trusts, various levels of platelet count are used as a cut-off point to which platelet transfusion are required prior to interventional procedures. This, at present, is not based on conclusive research.

In this poster we discuss the role of platelets in haemostasis, common associated disorders, accurate testing and understanding replacement therapy available. More importantly we will summarise the present literature on platelets levels and current guidelines being used.

We hope to conclude, that with lack of significant evidence the use of platelet level alone should not stop an interventionist performing a procedure. Aspects such as, they type of procedure risk, the cause of the low platelets and the safety of giving platelet transfusion should also be considered.