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.

This poster is intended to show a selection of normal appearances and then to give a summary of the major complications which can develop as a result of these surgeries, with example cases and images. It is of value to general radiologists and radiographers doing on call work, as well as to those with a specific interest or those in training.

P066 **Pictorial review of coronary artery anomalies**

Dina Hikmat; Rosalind Joseph; Farokh Setna; Daniel Earnshaw; Yvonne Jones
Arrowe Park Wirral University Teaching Hospital

Anomalous coronary arteries are a varied collection of congenital heart disorders with a prevalence of around 1% in the population. With current imaging techniques, anatomical anomalies can be elegantly presented. The poster will present a pictorial review of the coronary artery anomalies.

Although rare, coronary artery anomalies can have a range of clinical manifestations and pathophysiology. This starts from simple dyspnoea to the most severe; sudden death syndrome in young healthy individuals.

In addition to the possibility of a serious clinical outcome, knowledge and understanding of the anatomical variants aids the diagnosis and management of these individuals, which may include invasive angiography to revascularisation.

In our review, we will outline anomalies of origin of the coronary arteries, myocardial bridging and benign and malignant courses of arteries where they originate from the opposite sinus; for example anomalous left main coronary artery (ALMCA) arising from the right sinus and anomalous right main coronary artery (ARCA) arising from the left sinus. The computed tomography coronary angiography imaging will demonstrate how clinical presentation may be influenced and explained by the vessel anomaly. We hope the review will provide educational benefit to those in general radiology, as well as those interested in cardiac imaging, in this rare but potentially devastating range of conditions.

P067 **A review of the sensitivity, specificity, patient tolerance and safety of ultrasound and computed tomography in the imaging of abdominal aortic aneurysm in males over 65**

Samantha Moles; Stuart Mackay
University of Liverpool

Purpose: This literature review will compare the accuracy of Computed Tomography (CT) and Ultrasound (US) in the diagnosis and evaluation of abdominal aortic aneurysm (AAA) as US and CT are the most commonly utilised imaging methods for AAA. Comparators used were sensitivity and specificity, patient tolerance and safety.

Method: Google Scholar, Scopus and Web of Science were used to search for English language publications between the years 2004-2014. Articles were screened for quality and relevance before use in this review.

Results and Discussion: Both modalities show high sensitivity and specificity values in the evaluation of AAA. A study by Gabriel et al (2012) demonstrated that ultrasound was 98-100% sensitive and 98-99% specific and a study by Constantino et al (2005) calculated that ultrasound was 94% sensitive and 100% specific. Research carried out by Biancari et al (2013) found that CT was 98.3% sensitive and 94.9% specific and Constantino et al (2005) found that CT was almost 100% sensitive and specific. However, both modalities show size discrepancies in the measurement of AAA, as US can underestimate aneurysm size and CT can overestimate aneurysm size. There was no agreement regarding which measurement method to use for ultrasound assessment of AAA.

Conclusion: Ultrasound and CT are both accurate in the evaluation abdominal aortic aneurysm, but have distinct roles. It is apparent that more research needs to be carried out regarding the sensitivity and specificity of both modalities, in addition to establishing which ultrasound measurement method is the most accurate.

P068 **Should we be accepting routine CTPA referrals for elderly patients?**

Victoria Jackson; Niall Lynch; Omair Rauf; Abdul Choudhri
Stepping Hill Hospital

Objectives: Computed tomographic pulmonary angiography (CTPA) has been suggested as the first line investigation in patients over 50 with suspected pulmonary embolism (PE), due to the benefit of finding other causes of chest pain and dyspnoea, and artefacts from chronic airways disease (COPD) making planar ventilation perfusion (V/Q) scans difficult to interpret.

Methods and materials: We retrospectively studied the departmental records of all consecutive CTPA requests over a 12 month period. These were mostly from junior doctors, using a protocol (based on BTS guidelines) suggesting those aged over 65 had CTPA.

Results: 440 of 1214 referrals were for patients aged over 80. Initially 106 examinations were not done, most commonly due to renal failure, although subsequently 31 had CTPA, and 8 had V/Q of which only two were equivocal. 53 CTPAs were positive for PE; 194 were negative; 38 reported equivocal, but no large embolus; 18 were non-diagnostic. 60 had CT evidence of heart failure. In total 131 without a definitive answer had no further relevant imaging.

Conclusion: Elderly patients are more likely to have renal impairment or heart failure which can be exacerbated by contrast: if they have a normal CXR, V/Q scan should be considered instead of CTPA. Further imaging is not requested in most failed/equivocal exams, suggesting it is not necessary for management after senior clinical review. We suggest CTPA in patients over 80 should be regarded as high risk and only be justified on an individual case basis, after discussion with the consultant in charge.

P069 **Computed tomography in transcatheter aortic valve implantation**

Steve Chai; Colin Lim; Narayan Lath
Singapore General Hospital

Transcatheter Aortic Valve Implantation (TAVI) is a procedure performed for the treatment of selected high-risk patients with severe aortic valve stenosis (AS) by implanting a prosthetic valve, using less invasive means than conventional major surgery. AS is a condition in which opening of the aortic valve is stenotic, obstructing the outflow of blood from left ventricle of the heart. This is a presentation on multi-detector computed tomography (MDCT) technique used at our institute in pre-TAVI patient workup to assess suitability for TAVI and the pertinent imaging findings on MDCT. Scanning parameters are presented with discussion on how MDCT helps in assessing patient suitability for TAVI procedure by measuring aortic root, aortic valve annulus, and relevant aortic and iliofemoral anatomy.

All scans are performed with retrospective ECG-triggered gated CT thorax alongwith non-gated CT abdomen and pelvis using Toshiba 'Aquilion One' scanner. Subsequently, images are analysed with multiplanar reformat on dedicated workstation using Fx Vitrea and Vitrea Core systems.

MDCT has emerged as an important imaging tool in aortic annulus sizing, which formerly relied on echocardiographic measurement, including transthoracic echocardiogram (TTE) and trans-esophageal echocardiogram (TEE). MDCT has also been used in determining TAVI implantation route, either via transfemoral, trans-subclavian or transpical approach. This is done by assessing for calcifications in the illiofemoral arteries, tortuosity and diameter of these vessels. MDCT's ability in multiplanar reformation also allows for better appreciation of prosthetic valve deployment angle. Finally, MDCT also has an important role for post TAVI imaging for suspected prosthetic valve migration.

P070 **Retrospective re-audit of inferior vena cava filter retrieval**

Joanne Edwards; Frances Colgan; Simon Milburn; Richard Hartley
James Cook University Hospital

Aims/objectives: To assess temporary IVC filter retrieval rates since 2012 and the impact of the introduction of a departmental database on retrieval rate.

Content: All IVC filter insertions between February 2012 and July 2014 were identified using a search in PACS. Data

were entered into Excel, capturing inserted date, removal date, indication, re-attempt and duration. Analysis was carried out to determine retrieval rates.

Relevance/impact: Inferior vena cava (IVC) filters are often inserted by interventional radiologists at our institution for patients who are at increased risk of venous thromboembolism (VTE).

UK guidance from The British Society of Interventional Radiologists states that these filters should be removed within nine weeks.

A previous audit demonstrated that many temporary filters were not being retrieved. A database was established to aid the recall of patients who had a temporary IVC filter inserted.

Outcomes: 88 IVC filters were inserted during this period. 21 patients were deceased and were excluded from the data analysis. Overall, 79% of filters were successfully retrieved. Nine filters failed 1st retrieval attempt, 7 were successful at 2nd attempt.

Of the successful retrievals, 57% were carried out within the nine-week guideline. Median duration was 48 days, range 4-273 days.

Discussion: This re-audit has found a considerable improvement in retrieval rates compared with 2009/2012. Retrieval within the recommended nine-week timescale was only achieved in half of cases and further action is required to recall patients once anti-coagulation has been re-established.

P071 **A completed audit cycle investigating patient satisfaction and QoL outcomes following venous sclerotherapy procedures in the management of venous malformations at Barnet General Hospital**

Jordan Green; Christopher Tang; Sara Zafar; Yaron Berkowitz; Kevin Lotzof
Barnet Hospital

Purpose: Sclerotherapy is a management option for patients with symptomatic venous malformations, who have failed conservative management. We completed an audit cycle investigating the local venous malformation sclerotherapy service provided by the Interventional Radiology department at Barnet General Hospital, from 2010 to 2014. We investigated both patient satisfaction and quality of life (QoL)improvement, and examined whether there was improvement in these outcomes, following changes in patient education and clinical practice.

Materials and methods: Patients undergoing venous sclerotherapy from 2010 to 2014 were identified using departmental records. Patients were contacted via telephone, and QoL and patient satisfaction were assessed using a modified QoL questionnaire. The first audit cycle included patients from 2010-2012, with the re-audit cycle covering patients from 2012-2014. Changes implemented between the cycles included improved patient education regarding procedure expectations, as well as more aggressive treatment and closer follow-up post-procedure.

Results: A total of 16 patients were contacted during the first audit cycle, and of these 10 patients (62.5%) felt satisfied after the procedure. 11 patients (68.8%) noted an improved QoL post-procedure, with 4 patients (25%) experiencing worse QoL. On re-audit, 17 patients were contacted, with 14 patients (82.4%) feeling that their expectations had been met. In addition, 14 patients (82.4%)had improved QoL post-procedure, with 2 (11.8%)experiencing worse QoL.

Conclusions: This audit cycle has demonstrated improvements in both patient satisfaction and patient QoL post-sclerotherapy, following concerted changes in clinical practice, both in terms of improved patient education, as well as more aggressive treatment and careful follow-up of patients.

P072 **Overview of the role of 4D magnetic resonance angiography (MRA) in the management pathway of a case study patient with an extremity arteriovenous malformation (AVM)**

Bianca Lottmann; Darren Walls
City University London

Aim: The aim of this poster is to provide an overview of the role of 4D magnetic resonance angiography (MRA) in the management pathway of a case study patient with an extremity arteriovenous malformation (AVM).

Objectives:

- Define an imaging protocol for 4D Contrast Enhanced (CE)-MRA for an AVM of the hand/ foot
- Discuss the advantages and pitfalls of the technique
- Include pre 4D CE-MRA and post Digital Subtraction Angiography (DSA) images for a case study patient who has been treated with embolization
- Discuss the implications for best clinical practice.

Content:

- A review of the relevant published literature
- An example of a clinical imaging protocol
- Case study medical images from both 4D CE-MRA and DSA
- Discussion of the different k space acquisition techniques that support 4D MRA
- Conclude with the implications for choosing MRA imaging in the assessment for pre planning embolization treatment.

Outcomes: 4D MRA using intravenous gadolinium can provide diagnostic information relating to vascular anatomy with high spatial resolution. This is in combination with an assessment of the flow characteristics of blood in a peripherally located AVM. The innovative methods to acquire k space filling facilitate high refresh rate dynamic scans.

Discussion: The diagnostic utility of conventional DSA as the gold standard in identifying the vascular anatomy and flow characteristics of AVM's could now be superseded. Advances in 4D CE–MRA are now establishing itself as an alternative to DSA.

P073 **Serial ultrasound in the exclusion of deep venous thrombosis**

Srikanth Puttagunta; Nemi Gandy; Giles Roditi
NHS Greater Glasgow and Clyde

Objectives: 80% of suspected DVTs have a negative result on initial ultrasound. Patients with a positive D-dimer and medium/high clinical pre-test probability should have a repeat doppler ultrasound scan to rule out DVT. RCR standards state 3-5% with medium pre-test probability and 20-30% with high pre-test probability should demonstrate an above knee DVT on serial ultrasound. The aim of our study is to assess if serial ultrasound is yielding the results expected as per guidelines.

Method: Retrospective review of results for doppler ultrasound scans carried out for DVT over six months in a central hospital. The original Wells score was used to determine clinical pre-test probability for DVT.

Results: 548 initial and 131 repeat doppler ultrasound scans were carried out over 6 months. Only 10% of initial scans for suspected DVT were positive. Of the repeat scans, 9% of medium pre-test probability scans were positive but only 8% of high pre-test probability scans were positive. 36% of repeat ultrasounds were carried out on patients with a Wells Score of 0 or less, none of which were positive.

Discussion: The audited department showed a low initial positive rate. The high clinical probability target for serial ultrasound (20-30% positive) was not met; this suggests that the target may be too high. Over one third of repeat scans were carried out on patients with Wells score 0 or less. Review of the local DVT protocol with a view to use multivariate analysis incorporating initial ultrasound result and Wells score may obviate repeat ultrasound in low clinical probability cases.

P074 **Patient pathway for peripheral vascular disease**

Eilean Todd
Robert Gordon University

This poster will describe the typical pathway a 75-year-old male patient would follow if he presented with the following symptoms: pain in his left foot on walking and a visible colour change to his foot. There are a wide variety of tests and images, which would be used during the differential diagnosis. There would be a brief account of

pathologies, which could explain the patient's presentation. The poster would focus on the idea that the patient has Peripheral Vascular Disease.

There are many imaging routes that could be used to confirm PVD including DSA, MRA, CTA and duplex ultrasound. The poster would make an analysis of these imaging techniques and subsequently discuss the potential treatment options. Overall the poster is designed to share the complete pathway of a patient and develop an understanding of the features of different imaging modalities. Also the presentation would allow others to appreciate the role of the radiographer in relation to the patient's care.

P075 **Pick up rate of repeat Doppler ultrasound scans**

Adeel Syed
Princess Alexandra Hospital NHS Trust

Relevance: NICE states that we should repeat proximal leg vein ultrasound scans 6–8 days later for all patients with a positive D-dimer test and a negative proximal leg vein ultrasound scan. For a busy department, this can significantly increase workload, therefore I audited this practice.

Aims: To assess:

- How many of these repeat ultrasound scans had a change in outcome?
- How many patients are getting repeat ultrasound scan within 6-8 days?

Content: 75 Repeat limb ultrasound scans carried out between Sept 2013 and Jan 2014 (excluding repeat ultrasounds done for 2 limbs on same day and scans repeated for technical factors).

Outcomes: Data showed that 75 patients with repeat scans carried out, 11 of which positive for DVT, 6 scans showed a change in result from negative to positive and 5 scans were positive on both scans. Therefore, 8.0 % of scans had a change in scan result from negative to positive for DVT 75 patients with repeat scans carried out, out of which 55 were within 8 days, and 20 were after 8 days therefore, 73.33% of repeat scans were carried out within the 8 days recommended by NICE.

Discussion: Since 8% of scans had a changed result for DVT, audits could be repeated elsewhere, and NICE informed regarding cost effectiveness of this procedure. 73% of repeat scans were done within 8 days as per NICE, suggested more out of hours work is needed to meet deadlines.

Clinical: Uroradiology; gynaecology; obstetrics

P076 **Inadvertent scanning of the pregnant uterus - what it looks like and what to do**

Peter Logan; Azadeh Taheri; Rebecca Wiles
Royal Liverpool and Broadgreen University Hospitals NHS Trust

Aims/objectives: Occasionally, despite best efforts of radiographers and radiologists, women who do not know they are pregnant inadvertently undergo radiological investigations. It is important that the practitioner is able to recognise the pregnant uterus on imaging and to know the implications that the radiological investigation may have on the woman and the foetus.

Content: The authors present the imaging findings in pregnancy using plain film, CT and MRI images. The authors also discuss the issues of radiation protection and MRI safety in pregnancy using the available guidelines, to enable the reader to be able to counsel patients if they have had an inadvertent radiation exposure or MRI study.

Relevance/outcomes: Although rare, inadvertent radiation exposures in pregnant women do occur. The authors aim that after reading this poster the reader will be better prepared to deal with this if required.