

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.

P-123 Vascular access site complications in an interventional radiology daycase unit

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Background: Our interventional radiology daycase unit (IRDU) has been in service since 2012 and has reduced hospital stay and angioplasty waiting times. Our initial protocol kept patients for 4-6h post arterial puncture regardless of haemostasis method used to prevent emergency readmissions in the early stages. Vascular closure devices (VCD's) are an established alternative to manual compression, reducing the time to haemostasis and enabling early ambulation.

Aim: To assess access site complications with aim to reduce time to ambulation following arterial puncture.

Method: Patients who underwent femoral artery puncture over 12 months were identified and all cases were reviewed for procedure, haemostasis method and complications encountered. All patients were contacted by telephone 48-72hrs post-procedure to identify any further complications. Patients were re-reviewed if any concerns were identified during the telephone consult

Results: 143 punctures were performed in 122 patients with 199 procedures performed. Patients were divided into two groups. Group A had haemostasis achieved by manual compression (51%) whilst Group B had haemostasis achieved by VCD's (49%). Group B was sub-divided into Group I (53% Exoseal™) and II (47% Angioseal™). Immediate complications were observed in 1 patient only and closure method was Angioseal™. Delayed complication rate overall was 4% and 0% in Group A and B respectively.

Conclusion: VCD's are safe for achieving haemostasis with a tendency to fewer delayed complications. This data will be used to shorten the IRDU patient stay in patients in whom VCDs have been used and to perform a re-audit to assess the cost savings.

P-124 An audit into peripheral MRA image

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InHealth Group

Aim: High quality magnetic resonance angiography studies provide vascular surgeons with a surgical map to aid diagnosis, patient management and planning of surgical procedures. Following feedback from vascular surgeons regarding variability in image quality of peripheral magnetic resonance angiography studies, an audit was conducted to establish a baseline of current quality and look at strategies that could be employed to improve it.

Content: Images were assessed for image quality and artefacts using a 5 point score. This showed image quality had reduced between periods 1 & 2, that there was a variance in the sequences sent to PACS, lack of composed images available on PACS, MRI artefacts on one of the scanners, some practical and technical teaching points, and that radiographer comments on RIS are vital.

Outcomes: Following assessment of the audit results and issues raised, a revised protocol for patient positioning was implemented, along with use of breath-hold whilst acquiring the upper station to improve subtraction, the importance of required anatomical review of vessel coverage stressed to staff, revision of manual subtraction technique and the need to use a revised and standardized scanning protocol. A follow up audit is planned to complete the cycle of continuous quality improvement

P-125 Transarterial chemoembolisation using drug-eluting beads: The West of Scotland experience

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Transarterial chemoembolisation (TACE) for hepatocellular carcinoma (HCC) is carried out in a single tertiary referral centre in our region. We identified all patients undergoing TACE from 2009 to 2014.

Survival figures were calculated from the date of diagnosis, and in addition demographics, aetiology, Childs-Pugh score and multiplicity of lesions were also recorded. 148 patients underwent 333 TACE procedures for HCC (mean 2.25, median 2).

The most common underlying aetiologies were alcoholic liver disease (33.8%), Hepatitis C (13.5%) and non-alcoholic fatty liver disease (12.1%). The 1 year survival was 63% (n=101), 2 year survival was 35% (n=50) and 3 year survival 29% (n=23). The median follow up was 25 months.

Survival was inversely correlated with Childs-Pugh score and multiplicity of lesions, while men and older patients (>70) had a better prognosis. Local survival was comparable to that quoted in published trials. This information will be used in the consent process for TACE locally and our aim is to use this as the basis of a national registry; this would serve as an audit tool as well as hypothesis generating for new trials.

P-126 Intravenous contrast use (Prevention of contrast induced nephropathy)

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Background: The incidence of contrast induced nephropathy is low worldwide; however it's still the third commonest cause of hospital acquired acute kidney injury. Despite the absence of national guidelines, local guidelines exist for most trust or hospitals in UK. This audit aimed to find out whether clinicians follow the trust guidelines to prevent contrast induced nephropathy.

Methods: Patients who had CT angiograms between 01/01/2014 – 30/06/2015 with EGFR \leq 60 were selected from GM-CRIS-Live and followed up to see if clinicians followed trust guidelines to prevent contrast induced nephropathy.

Results: Total number of 96 patients was selected with a mean and median age of 71 which was not statistically different from the total number of patients within the time frame (mean and median age 86 years). 77.10% of the patients were seventy years and above. CALLB was the highest procedure done (79.2%). 87.50% of patients had moderate risk and 12.50% had high risk factors. 60.20% were day cases and 39.80% were in-patients. 10.60% of the patients had their EGFR rechecked within 72 hours and 89.40% had theirs not rechecked. 77.10% had no feedback from the clinicians with respect to hydration. Less than 20% of the inpatients had no EGFR recheck or feedback from clinicians.

Conclusion: Contrast induced nephropathy is a highly preventable case; simple following of TRUST policies or protocols will prevent contrast induced nephropathy. Majority of clinicians within the Trust didn't follow Trust policy to prevent contrast induced nephropathy, thus exposing patients to contrast induced nephropathy.

P-127 Is haemodynamic status a good predictor of angiographic outcome in patients with major gastrointestinal bleeding?

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Purpose: To determine whether haemodynamic status is a good predictor of angiographic outcome in patients with major Gastrointestinal bleeding

Method: Data was retrospectively collected for consecutive patients who had catheter angiography for major GI haemorrhage presenting to A&E from October 2009 to December 2012 (n =69).

The total number of cases were then divided into two main groups according to haemodynamic status: Those that were shocked (group 1, n = 24), and those that were not shocked (group 2, n = 45). These groups were then further divided into those who demonstrated a site of haemorrhage on catheter angiography and hence were embolised and those where a site of haemorrhage was not identified.

Results: In group 1, out of 24 patients that were shocked 13 patients (54%) did not demonstrate a site of haemorrhage on angiography. In 8 of these patients (62%) the bleeding settled with conservative management. The remaining 5 patients (38%) had surgery or endoscopic intervention. Similarly in group 2, 34 out of 45 patients (75%) had negative angiography. In 25 patients (74%) the bleeding settled with conservative management. 7 patients (21%) needed surgery and 2 patients (6%) needed Endoscopic intervention.

Conclusion: Haemodynamic status in itself is not a reliable predictor of angiographic outcome in patients with major GI haemorrhage. Conservative management appears to be an effective option in patients where a bleeding point cannot be identified on catheter angiography.

P-128 A review of linograms in central venous catheters

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Background: Patients who need long term venous access or are on long term IV therapy e.g. oncology or haematology patients often have Central venous Catheters (CVC) inserted. These lines are often associated with complications such as blockage, thrombosis and misplacement. Inability to Flush or aspirate blood raises the possibility of line complication hence a CXR and linogram is often requested to check patency and position of the line.

Purpose:

1. To evaluate compliance with the Yorkshire and Humber Cancer Network (YHCN) i.e. How many patients had CXR prior to linogram?
2. To assess if there is a predictor for a blocked line?

Method: We retrospectively identified patients who had a linogram done over a two year period between 2010 and 2012 via the hospital electronic system.

Results: 78 patients were identified in total. The majority of them were oncology patients with a hickman line in situ. 7 patients (9%) had a blocked line, 3 patients (4%) had a leak, 3 patients (4%) had an incorrectly positioned line. 2 patients (3%) demonstrated a line thrombus and 2 patients (3%) had a broken line. 50% of the patients complied with the YHCN guidelines by having and CXR. The best predictor of a blocked was inability to flush (6/7 patients) the line.

Conclusion: Blockage was the most common complication of CVC with 50% compliance with the YHCN guidelines. Inability to flush rather than aspirate was the best predictor of line blockage. The secondary predictor of line complication was pain.

P-129 Managing the risks of high radiation skin doses in intervention

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Aim: Complex fluoroscopic procedures are resulting in greater patient skin doses and increased risk of tissue damage. The purpose of this study was to quantify typical skin doses indicated for a range of interventional procedures and identify the proportion of patients requiring follow-up when dose thresholds are exceeded.

Method: Dose-area-product, screening time, cumulative skin dose, BMI and procedure type were prospectively recorded for all patients in cardiology and interventional radiology departments in a large acute hospital over 9 days. Retrospective data (without BMI) was also collected from interventional radiology for all patients for a two-year period.

Outcomes: In the prospective data 17/70 cardiology patients received a skin dose >1Gy (24%); 7 of those 17 received a skin dose >2Gy (10%) and 4 >3Gy (6%). 6/70 patients had a screening time >20 minutes. In IRU 4/50 patients received a skin dose >1Gy (8%) and one >3Gy (2%). 7/50 patients' procedures had a screening time >20 minutes (14%). Correlation between skin dose and BMI was weak.

In the retrospective data 150/4,198 (6%) cases received a cumulative skin dose greater than 1Gy. Of these, 101/150 patients had screening times greater than 20 minutes. Typical skin doses for a range of procedures have been determined.

Conclusion: Fewer than 1/10 procedures are expected to lead to skin doses >2Gy. These patients are informed and receive an information leaflet on skin effects and skin care. The patient's family doctor is also sent an information sheet.

P-130 Management of persistent type 2 endoleaks with sac expansion post-EVAR

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Aims/objectives: A retrospective audit to evaluate the success of intervention in patients with persistent Type 2 Endoleak (ELT2) and sac expansion following Endovascular repair of Abdominal Aortic Aneurysm (EVAR).

Content: The radiology information system and interventional radiology database of 463 EVAR procedures performed over 10 years at our tertiary vascular institute was reviewed. Post-EVAR sac size progression and ELT2 existence was determined on serial CT imaging. Significant sac expansion was defined as greater than 5mm diameter increase and were treated by secondary interventions.

Relevance/impact: ELT2s have been reported in 9-30% cases following EVAR. ELT2 occurs when retrograde flow through branch vessels continues to fill the aneurysm sac. ELT2s often self-resolve, however embolisation of the branch vessel is indicated when associated with significant sac expansion on follow up imaging. Recent literature states that technical and clinical success for ELT2 embolisation is 70%.

Outcomes: 49/463 (11%) patients had persistent ELT2, of which 17/49 (34%) demonstrated significant sac expansion. 9 patients were appropriate for secondary intervention, with 5 by transarterial embolisation; 3 by direct sac puncture embolisation and 1 laparoscopic clipping. Mean duration of follow up post-secondary intervention was 29 months. Immediate technical success was seen in 86% patients, but clinical success in 36% patients, although 1 awaits follow-up imaging.

Discussion: The findings suggest that technical success of secondary interventions for significant ELT2s is consistent with the literature, however fails to meet with clinical success standards.

P-131 Endurant EVAR program comparison with the Engage register

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A comparison between the first 100 enduring EVAR elective grafts in our institution compared with the European Engage registry.

UHMN is a high volume Interventional Radiology EVAR vascular hub with >100 Grafts implanted per year. The Engage registry is a multicentre real world european registry of Medtronic enduring stent grafts for endovascular repair of the aorta.

The prospective UHMN database for first 100 elective enduring cases was interrogated and compared with the registry looking at graft migration rates, all cause mortality, aneurysm related mortality 30 day mortality and re intervention.

The sub group of secondary reintervention for endoleaks was interrogated further.

EVAR surveillance strategy at UHMN is described along with images and descriptions of endoleaks and treatment strategies including contrast USS and use of onyx.

P-132 A completed audit cycle investigating patient satisfaction and QoL outcomes following venous sclerotherapy procedures in the management of venous malformations at Barnet General Hospital

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NHS

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/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 sixteen patients were contacted during the first audit cycle, and of these ten patients (62.5%) felt satisfied after the procedure. Eleven patients (68.8%) noted an improved QoL post-procedure, with four patients (25%) experiencing worse QoL. On re-audit, seventeen patients were contacted, with fourteen patients (82.4%)

feeling that their expectations had been met. In addition, fourteen patients (82.4%) had improved QoL post-procedure, with two (11.8%) experiencing worse QoL.

Conclusions: This audit cycle has demonstrated improvements in patient satisfaction and 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.

GI and hepatobiliary

P-133 Pictorial review of ciliated foregut cyst of the liver

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Objective: Pictorial review of ciliated foregut cysts of the liver

Content: Ciliated hepatic foregut cysts are rare congenital cysts of the liver. These are commonly asymptomatic and are found incidentally (45%). Sometimes these can cause vague upper abdominal discomfort. These are usually located in median segments of the liver in segments, IV, V and VIII. These have variable imaging appearances depending on their content. Usually high on T2 and mild to variable on T1. These do not show enhancement. Possibility of malignant transformation and diagnostic difficulty makes them important and challenging.

Relevance/impact: Since these are incidental, they can pose challenge when the imaging is performed for staging of various malignancies. Typical location of these cysts in the superficial part of segment IV of the liver, lack of enhancement and variable signal on T1 can make them identifiable and differentiate from sinister cystic lesions.

Outcome: We would like to present the four cases we came across in our practice during the last five years. These were challenging initially but with the knowledge of their typical imaging appearances we could differentiate them from metastases or other sinister liver lesions.

Conclusion: Since the ciliated foregut cysts of the liver could potentially harbor squamous cell carcinoma (4.4%) these should be recognised from other cystic lesions. Their typical location and imaging features could help in suspecting and identifying them.

P-134 Diagnostic accuracy and complementary role of barium swallows in the workup for oesophageal cancer

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Aims/objectives: The incidence of oesophageal cancer is on the rise and endoscopy is the preferred first line investigation. However, for patients presenting with non-specific upper oesophageal symptoms barium swallows are frequently performed to exclude malignancy. There are no current updates on the diagnostic accuracy of oesophageal cancer detection at barium swallow. This study evaluates the diagnostic accuracy of barium swallows in detecting oesophageal cancer, and its complementary role in the workup for suspected malignancy.

Content: A presentation of findings of 200 consecutive barium swallows with clinical suspicion of oesophageal cancer. Further discussion of diagnostic accuracy of cancer detection & aid to CT.

Relevance/impact: To provide an update of the diagnostic accuracy and contribution of barium swallow in the detection of oesophageal malignancy in modern radiology.

Outcomes: 22 (11%) cases of cancer were identified at barium swallow. 1 case was false positive. This resulted in a diagnostic accuracy and diagnostic yield of 95.4% (21/22) and 10.5% (21/200) respectively. 25.5% (51/200) were normal and 63.5% (127/200) benign pathology. Majority of the benign cases (97 cases, 48.5%) were oesophageal dysmotility. Oesophageal web, hiatus hernia, pouch, achalasia and Schatzki ring were also noted.

Discussion: Barium swallows showed high diagnostic accuracy but low diagnostic yield, which could reflect that moderate to high risk patients have been referred for endoscopy as their first-line investigation. From the 21 positive cases, barium swallows played important part in the diagnosis and specific cases will be further discussed.