



P135 Differentiating between Neutropenic and C. Diff Colitis in a patient with Mycosis Fungoides on Immunotherapy (Brentuximab)

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Case presentation: A 61 year old man with Mycosis Fungoides was admitted with decreased nutritional intake and mobility. He received two cycles of Brentuximab, with the last cycle one-week prior to admission. He was treated for skin sepsis and supported with intravenous hydration and enteral nutrition. Whilst he was an inpatient, he developed febrile neutropaenia, transaminitis, and watery diarrhoea. Initial stool culture was negative for C. diff toxin and serologies were negative for hepatitis viruses, CMV, EBV, and HIV. He continued to deteriorate with rising inflammatory markers. Several days later he had a positive C. diff toxin and was started on fidaxomicin. Initial CT-AP showed dilated large bowel but no evidence of colitis. Due to ongoing deterioration, he had a repeat CT-AP two-days later which showed pancolitis with toxic megacolon. He continued to deteriorate and died in intensive care.

Discussion: The learning points have been divided into two: 1. Clinical correlation: This gentleman was on antibiotics and a proton-pump inhibitor known to cause pseudomembranous colitis. Neutropenia and typical symptoms would further increase clinical suspicion. Early empirical antibiotics should be considered in high-risk patients despite initial atypical radiological features and negative stool culture. 2. Differentiating between neutropenic and pseudomembranous colitis on CT: C. Diff infections typically have the accordion sign, bowel wall thickening, free fluid (ascites) in up to 40% of cases, and rectal involvement in 90-95% of cases. Neutropenic enterocolitis on the other hand may demonstrate thickening of the caecum, intramural bowel gas, bowel wall thickening, and ileus.

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Radiology. 1994;191 (1): 103-6 Ramachandran I, Sinha R, Rodgers P. Pseudomembranous colitis revisited: spectrum of imaging findings. Clin Radiol. 2006;61 (7): 535-44 Frick MP, Maile CW, Crass JR et-al. Computed tomography of neutropenic colitis. AJR Am J Roentgenol. 1984;143 (4): 763-5



SERVICE DELIVERY AND INNOVATION POSTER PRESENTATIONS

P136 Percutaneous biopsy procedures audit project

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Background: Percutaneous image-guided biopsy is a common procedure in radiology departments today (1). In the past 2 decades, imaging techniques and biopsy equipment have progressed to enable safe and accurate diagnosis in a less-invasive way (2,3). The documentation of image-guided procedures is a very important practice. Adequate documentation of biopsy procedures, including the number of passes and samples obtained and the size of the needle used, can guide the team in case of inadequate sample for pathology diagnosis. Based on these data, the team can decide if they should repeat the same procedure or go for something else.

Audit-Cycle: Target: 80-90% of specimens which are adequate for histological/cytological diagnosis (4,5). Reports of biopsy procedures should include(target:100%) (6): The site/organ biopsied The biopsy technique The size of the needle The number of samples obtained

Method: Retrospective analysis of the cases underwent imaging guided biopsy last month.

Results: Initial results showed that only72%of the biopsy samples were adequate for pathology assessment (Target-not-met) The site of organ biopsied and the technique used were mentioned in100%of the procedures(Target-met) The size of needle and number of samples were mentioned in75%of the cases.(Target-not-met)

Conclusion: The results were discussed in the radiology department audit meeting. Obtaining multiple samples from different sites was encouraged. A template for biopsy procedures covering all the essential items that needs to be documented was introduced*. Re-audit results: The percentage of adequate samples for pathology assessment has increased from 72%to88%. Thanks to the introduced template, 100%of the reports included the essential data (biopsy-technique, site-biopsied, needle-size and samples-number). *

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Percutaneous Needle Biopsy 2004. http://www.sirweb.org/medical-professionals/GR_PDFs/nb.pdf (Accessed 19.9.16) (6)

<https://sir.personifycloud.com/PersonifyEBusiness/Default.aspx?tabid=251&productId=178580910>



P137 Initial experiences of remote scanning

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Background: Siemens Syngo Virtual Cockpit is a remote scanning interface available on its MRI systems allowing a connection to be made between scanners and a remote user. Thereby enabling remote access to scanners for comprehensive scanning support regardless of physical location. In the age of COVID-19, remote working has increased across all walks of life, and potentially the use of a remote scanning system could provide some benefit to support short term staffing cover, reduce extra people within departments when training, and utilise clinical expertise of those vulnerable staff shielding away from the clinical setting.

Purpose: Remote scanning was set-up across one static location with 3 MRI scanners and at the home of the company's MRI Clinical Lead. Over this time the system was used to test its functionality and performance under real world conditions. Its main use within the department was to support training and skill mix amongst staff, as well as protocol management. Testing remote access from a home location with standard broadband capability was conducted to check accessibility and performance. Remote scanning presents potential benefits but comes with important considerations around working relationships, human factors and cognitive limitations, as well as how it impacts on the profession and patient.

Summary of contents: This poster provides an overview of how remote scanning works in the clinical arena. It will provide a summary of benefits and limitations, make recommendations for wider implementation, and pose some interesting challenges to discuss as a profession.

P138 A review of cone beam extremity CT in an acute NHS trust

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Background: Cone-Beam CT (CBCT) is a technology that allows cross sectional imaging with equivalent demonstration of fracture in extremities as Multi-Detector CT (MDCT) with lower radiation dose, as well as weight bearing exams of lower extremities.^{1,2,3}

Method: A CBCT scanner was utilised at an acute NHS Trust for 1 year. All extremity CT exams performed during this period were reviewed and categorised by scanner and body region examined. All dose information was recorded in mGy*cm and analysed via T-test in R.⁴

Results: Of 728 extremity CTs performed August 2019 to September 2020, 296 were CBCT examinations. Most common areas scanned were wrists (44%), followed by ankles (27.7%), knees (20.5%) and elbows (7.8%). CBCT wrist doses (M= 44.99, SD= 6.57) were significantly lower than CT (M= 103.87, SD= 107.19) ($t(318) = 8.881, p < .0001$). CBCT ankle doses (M=76.45, SD = 20.45) were also significantly lower than CT (M= 119.44, SD= 59.84) ($t(200) = 3.888, p < .0001$). All elbow and 98% of knee exams were performed on MDCT scanners. Slight movement artefact was reported on the CBCT weight bearing ankle scans.

Of patients that had extremity CBCT, 7 also had MDCT on the same region without any changes in casting or orthopaedic hardware (5 wrists, 1 knee, 1 ankle). The CBCT doses for these exams (M= 53.3, SD = 9.83) were significantly lower than equivalent MDCT doses (M= 106, SD= 30.9) ($t(6) = 5.1189, p < .005$).

Conclusion: CBCT is widely applicable for cross sectional scanning of extremities with lower dose than equivalent extremity MDCT

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2- Gang, G. J. et al. (2018). Image quality and dose for a multisource cone-beam CT extremity scanner. *Medical Physics*, 45(1), pp. 144-155.

3- R Core Team (2019). R: A language and environment for statistical computing. R Foundation for statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.

P139 Ultrasound in spinal distractions - Improving patient services

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Background:

- MAGec rods are a type of spinal growing rods used for treatment in patients with early onset scoliosis. They are used as an interim treatment, where lung development may be compromised, before full fusion scoliosis surgery when the patient is skeletally mature.
- Patients undergo an initial operation and the rods are then distracted in follow up clinics every 3-6 months. It is a non-invasive technique using magnets to lengthen the rods.
- The follow up clinics took place in the children's x-ray department with fluoroscopy screening.

Change of practice:

- A few Radiographers who were trained to use Ultrasound started to offer ultrasound instead of fluoroscopy during



follow up distractions.

- A MAGec specialist trained the Radiographers in image interpretation and the parts of the inserted rods.
- One Radiographer was trained initially and cascaded on to two others.

Advantages:

- Eliminates the use of ionising radiation and adheres to the ALARA principle. Especially as children are more radiosensitive and the patients often have lots of x-rays.
- Allows more flexibility when booking the clinics as the 10 day LMP rule does not have to be considered for females of child bearing age.
- Allows accurate measurements in real-time so the surgeon can assess the length of distraction and its efficiency.
- Ultrasound machine is portable and also allows us to work around the patient.
- Increased job satisfaction.

Conclusion: The use of ultrasound has many advantages over fluoroscopy and the change has allowed us to deliver the best practice for our patients.

P140 The devil is in the detail; the ground up implementation of a national blueprint strategy for cross sectional imaging

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Background: A national blueprint strategy was devised in response to one regions approach in the restoration and recovery of imaging services post covid. During the implementation phase, this region invested in a dedicated imaging leadership team and employed a ground up methodology to ensure a targeted response in driving the agenda forward.

Purpose: As part of its strategy, two separate short-term interventions were introduced. The first addressed the shortfall in the radiographer workforce through a significant international recruitment drive. The second was in direct response to the increased demand for cross-sectional modality scanning and involved providing post graduate education throughout the region. There are four key areas that were deemed essential in this approach: establishing a functional regional diagnostic imaging workforce action group and working collaboratively with arm's length bodies such as HEE and SCoR. The responsiveness of the HEI's involved in the demands for post graduate education in a post pandemic world. The leadership team having key skills and experience in strategic leadership, operational management and academic policies and procedures.

Summary: The success of this project has been driven through a strong leadership team who have enabled and facilitated the right conversations with the right people at the right time. Working from a ground up approach has allowed radiology managers to directly steer each intervention in alignment with their specific service recovery plans. This project has enabled strong foundations to be laid and solid collaborative working partnerships to be formed from which future projects will emerge

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P141 An audit of CT extravasation rates and management

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Background: Most CT examinations require the use of Contrast Media (CM) for optimum visualisation of vessels and organs. Automated power injectors allow the CM to be injected at higher flow rates than can be achieved by hand. Although this is good for image quality, regular use of injectors, alongside high flow rates in CT can increase extravasation risks by up to 0.25%. Extravasation is the leakage of intravenously (IV) administered CM into the surrounding soft tissues of the limb. Risk factors include puncture site, age and the use of an existing cannula. Patients with poor venous access or pre-existing conditions such as diabetes or lymphoedema have an increased risk of serious injury.

Purpose: To determine if extravasations in CT are recorded correctly and to establish if we are adhering to the local management protocol. To use this data to compare our management plan and extravasation rate to national guidance and literature.

Summary of content: Results show that rates are low, indicating efficient risk assessment. There were no major complications or referrals to plastic surgeons, suggesting satisfactory management of extravasations. Literature shows that most complications occur with contrast volumes of 100mls or more. As there are no current CT protocols at this



Trust that use more than 80mls of contrast, major complications are unlikely. A locally agreed protocol is in place for the management of CM extravasation in CT in line with RCR and ESUR guidelines. Images demonstrating complications of extravasation are included.

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P142 An audit to compare the diagnostic image quality of dual-energy Computed Tomography (CT) scans using water instead of Barium Sulphate oral contrast

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The use of Barium Sulphate is recommended in oncology follow-up CT scans however, the pandemic stopped this in our department. Water was used as a neutral oral contrast instead to reduce patients time spent in the department. Many patients express Barium Sulphate as unpleasant and intolerable. Both contrasts provide different diagnostic information, and it is unclear if Barium Sulphate is required for all cancers. A group of 35 patients with the seven common cancers; breast, colon, lung, melanoma, ovarian, renal and testicular were selected. Each patient had CT scans pre-pandemic with Barium Sulphate and post-pandemic with water totalling 70 scans. These scans were evaluated by Radiologists for diagnostic quality using a self-audit tool to determine which had greater benefit.



Results show Barium Sulphate has greater optimal noise, optimal spatial resolution and acceptable diagnostic quality for CT scans compared to those with water. All Barium Sulphate scans had optimal noise and spatial resolution with water scans demonstrating too much noise and reduced spatial resolution in 3% of cases. Results demonstrate evidence suggesting that water used as oral contrast provides similar diagnostic quality CT scans questioning its use in all cancers. The use of Barium Sulphate for follow-up CT scans may not be necessary for all cancers. Water provides similar results adequate enough to determine the nature of oncology disease thereby limiting the amount of time patients spend in department and improving their experience. Due to a small study, it is difficult to ascertain if Barium Sulphate is required for all cancers.

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P143 A prototype interpretive layer (PIL) to enable safe and effective independent patient image access

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Introduction: The pandemic has precipitated a move towards remote interaction and communication with patients. Mechanisms already exist for patient to access to their radiological images¹ and reports.² A previous study by the authors identified risks and benefits associated with this process.³ This follow up study identified requirements for enabling those benefits and mitigating the risks.⁴

Methods: Patients and clinical experts were surveyed in order to identify perceived benefits and risks of sharing images with patients. Thereafter, semi-structured interviews were undertaken with participants from both groups in order to identify barriers and facilitators for this process.

Results: The interviews identified several requirements for safe and effective patient access to their images. These informed the design of a PIL which should include: a disclaimer/warning as not all patients will want to see their images or they may be upset by them; supporting information to help patients to understand their images -such information may include: flagging of key images/abnormalities; previous imaging/normal images for comparison; labels -- to indicate anatomy and for orientation; a copy of the report and the report in layman's terms; links to trusted information and the patient's care plan; interactive elements such as query and feedback mechanisms. Finally, security measures are required.

Conclusion: Respondents identified several requirements for consideration in sharing images safely and effectively. Further work is required both to assess the effectiveness of this strategy in practice and to identify appropriate mechanisms via which to deliver it.

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P144 Quality of CT scan requests in trauma patients: a single-centre clinical audit

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Inclusion of clinical information with radiology requests improves interpretation accuracy, clinical relevance and confidence of the reporting radiologist.⁽¹⁾ The Royal College of Radiologists (RCR) guidance on trauma radiology in severely injured patients sets the standards and outlines the importance of an annual audit to assess the adequacy of image requesting in the trauma setting.⁽²⁾ The purpose of the clinical audit was to assess the quality of clinical information provided in computerised tomography (CT) scan requests for major trauma patients. We conducted a retrospective clinical audit to assess the quality of trauma CT scan requests at a major trauma centre in the United Kingdom. The first 100 patients admitted as major trauma calls in 2019 were included in this study, irrespective of age, gender or severity of injury. Trauma CT scan requests should include the following clinical information: 1. Haemodynamic stability, 2. Suspected injuries, 3. Visible injuries/Findings on examination, and 4. Mechanism of injury. The audit findings were held against a 100% standard outlined by the RCR guidelines. (2) Of the 100 CT requests analysed, 6% included information on whether the patient was haemodynamically stable, 43% made reference to the suspected injuries, 72% included information on visible injuries or findings on examination and 92% of requests included information on mechanism of injury. The findings of this audit demonstrate that key clinical information is



often omitted from trauma CT scan requests and outline room for improvement. This may adversely impact patient care by reducing interpretation accuracy and causing unnecessary exposure to ionising radiation.

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P145 Playing it safe: communication of important findings

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Background: The 2007 National Patient Safety Association identified that for critical and significant unexpected results, safety nets should be established with 'fail safe alerts' (1). Since, the Royal College of Radiologists (RCR) have published multiple documents relating to alerting systems. The most recent sets out standards to promote the provision of a high quality and most importantly safe service to patients (2). The document states that a radiologist should flag a report which has 'urgent, critical, significant, unexpected and actionable findings, which he/she feels may not be acted upon in a timely manner'.

Purpose of poster: Following a recent audit at our institution it was highlighted that over a 2-month period a very high number of reports had been coded to alert the clinical team. We also had anecdotal feedback from clinicians stating that 'too many reports had alerts on them' and suggestions that this was diminishing impact. This led to a second audit to determine if our department was using the failsafe alerting system appropriately. We hope to present our results in order to open up discussion about these systems and present adaptations to maintain their power.

Summary of content: Poster divided into two: 1. Our audit and results as a way to introduce the topic and 2. Adaptations (main part of poster, in pictorial display) that we feel may help other centres establish local guidelines for safe communication of important findings.

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P146 Patient preparedness for MRI - An evaluation of the perceptions of different resource types

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Background: There is increasing interest in how best to prepare patients for MRI where there may be an association with feelings such as claustrophobia. The range of resources is expanding, ranging from leaflets, written websites, videos, and apps. This study aimed to explore how well three types of resources are perceived to prepare individuals for MRI.

Method: Freely available resources (with appropriate permissions) were evaluated to ensure comprehensive and broadly equivalent content. The resources selected were a website, a video and an app. A mixed methods questionnaire was designed, piloted and refined, and then opened to consenting volunteers (students and staff) from within the institution following appropriate ethical approvals.

Results: 30 complete responses were received (age range 18 to 60). The average participant ratings (out of 5) in terms of how informative they found the resources were: website: 3.9 (range 2--5, standard deviation (SD): 1.9), video: 4.3 (range 2--5, SD: 0.8), app: 3.6 (range 1--5, SD: 1.0). The app was ranked as least preparative (57%, n = 17) and the video as the most (53%, n = 16). 23% (n = 7) felt the website was the most useful and 30% (n = 9) the least. Thematic analysis suggested that all resources provided some benefits for some participants, perhaps reflecting different learning styles.

Conclusion: Results suggest the best approach is having a selection of resources in different formats thereby meeting the needs of a diverse population.