



Method: A baseline data collection was carried out retrospectively looking at abdominal 4DCT scans. This evaluated the distance between the superior extent of the stomach and the inferior extent of the heart in the inhalation and exhalation phases to give an indication as to whether DIBH or EEBH would be beneficial in minimising heart dose.

Results: Of the 20 patients evaluated, 85% showed a greater distance from stomach to heart in inhalation and 5% an equal distance. While a consideration in interpreting this data is that the patients analysed had not consistently followed any fasting protocol, this correlation is still strong enough to favour use of DIBH to reduce cardiac dose in these patients, especially factoring in that this distance is likely to increase further in deep inspiration hold from a natural inhalation.

Conclusion: This has provided the evidence to go forwards piloting treating this cohort in DIBH. A second retrospective data collection was carried out to show mean heart doses in lymphoma patients treated in free breath. This will be prospectively compared to patients planned in DIBH to definitively show if cardiac dose is reduced.

GI UPPER AND LOWER / HEP

P078 Pictorial review: Imaging features of extra-abdominal desmoid tumours at presentation and following treatment

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Background: Extra-abdominal desmoid tumours (DT) are monoclonal proliferations of fibroblasts that are locally aggressive with unpredictable clinical behaviour. These tumours are difficult to treat medically and surgically. Although definitive diagnosis remains histopathological, DTs have characteristic imaging features that aid diagnosis and response assessment.

Purpose: To present multi-modality imaging features of extra abdominal DTs and post-treatment changes. The learning outcomes will include 1) Familiarity with the radiological appearances of extra abdominal DTs 2) Appreciation of imaging features following treatment.

Summary: This educational pictorial review will present a variety of extra abdominal DT images from various modalities in a tertiary centre. We will outline the main imaging features that aid diagnosis and assessment of treatment response.

1. Alman BA, Pajerski ME, Diaz-Cano S, Corboy K, Wolfe HJ. Aggressive fibromatosis (desmoid tumor) is a monoclonal disorder. *Diagn Mol Pathol* 1997; 6: 98–101
2. Castellazzi G, Vanel D, Le Cesne A et al. Can the MRI signal of aggressive fibromatosis be used to predict its behaviour? *Eur J Radiol* 2009; 69: 222-229
3. Firouzeh, Wei-Lien et al., MRI may be used as a prognostic indicator in patients with extra-abdominal desmoid tumours. *Br J Radiol*. February 2016; 89 (1058)
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7. Salas S, Dufresne A, Bui B, Blay JY, Terrier P, Ranchere-Vince D, et al. Prognostic factors influencing progression-free survival determined from a series of sporadic desmoid tumors: a wait-and-see policy according to tumor presentation. *J Clin Oncol* 2011; 29: 3553–8
8. Salem Ul, Amini B. Imaging patterns of local failure in desmoid fibromatosis: how to scan and what to look for. In. *Society of Skeletal Radiology, 2014 Annual Meeting; 10/11/2014; San Diego, CA2014*

P079 Clinical audit of rectal cancer patient referrals for Papillon contact brachytherapy

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Background: Papillon contact X-ray brachytherapy (CXB) is an alternative to surgery for rectal cancer (NICE, 2015). Although it has seen a resurgence in the UK in recent years (Myint, 2017) there are currently no national guidelines guiding referrals for treatment. This study audited patients who were referred for and treated with CXB over a 6 year period against guidelines derived from a critical review of the evidence.

Methods: Patient demographics, tumour characteristics, and outcome data were gathered for 31 patients referred for CXB. A critical review of the evidence identified consensus referral criteria and outcome data against which to audit patients.

Results: Referral criteria were derived from six published studies of patients unfit for surgery or stoma-averse. All referred patients had a visible tumour or scar with a tumour size under 3cm sited less than 12cm from the anal verge. Nodal status varied (NO-2) but there was no metastatic disease present. The audited cohort demonstrated equivalence of median age, performance status, and tumour stage. Initial clinical complete response, local recurrence, and occurrence of distant metastases were also comparable. The overall survival rate of 83.9% exceeded the published results.

Conclusion: Similarity of cohort demographics enabled comparison of outcome data which confirmed the validity of referral and treatment protocols. Although the limited evidence base and retrospective nature of the audit limits the strength of the findings, this work should guide future referrals until evidence from ongoing studies becomes available and contribute to development of robust national (2015)

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P080 Simultaneous integrated boost for positive pelvic sidewall lymph nodes in rectal cancer patients

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Purpose: Long course pre-operative chemo-radiotherapy is the standard treatment for people diagnosed with locally advanced rectal cancer. Between 10 and 20% of these patients may present with positive pelvic sidewall lymph nodes which often fall beyond the standard surgical plane. By boosting the dose to the positive nodes, a greater reduction in the size of the lymph node may be achieved. This is a single patient case study presenting the use of a simultaneous integrated boost (SIB) to a patient staged as T2 N0 M1, with positive pelvic sidewall lymph nodes.

Method: Patients diagnosed with rectal tumours are offered computed tomography (CT) staging scans of the chest, abdomen and pelvis in addition to magnetic resonance imaging (MRI) to determine resection margins and lymph node staging. Volumetric modulated arc therapy (VMAT) treatment is planned using Varian Eclipse Treatment Planning System, V13.6 (Varian Medical Systems, Palo Alto, California) using 2 full arcs at 6MV. Optimisation structures are created for all organs at risk to control the dose distribution without compromising coverage to the PTVs.

Results: By utilising VMAT, external beam radiotherapy is delivered using two arcs at 6MV whilst simultaneously delivering a boosted dose to the enlarged positive pelvic sidewall lymph nodes. Doses to surrounding organs at risk are controlled during optimisation to minimise toxicity.

Conclusions: The patient presented tolerated the treatment with negligible toxicity and proceeded to successful surgery with an R0 resection margin to the primary tumour, at resection, the tumour was re-staged as T1 N0.

P081 Increasing Radiologist's reporting time by extending skills mix to Interventional Radiology

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Introduction: Ultrasound (US) guided paracentesis for ascites is a safe and commonly performed procedure by Radiologists. Patients' waiting times for paracentesis varies depending on availability of Radiologists and beds within the hospital. Inpatients and Outpatients were experiencing delays, leading to increased symptoms and discomfort. Subsequently many of these outpatients were admitted to the hospital, however with the implementation of a radiology day case unit (RDCU), the burden on the service was partly alleviated. This led to the training of advanced practitioner radiographers (APR) to perform ultrasound-guided paracentesis, with a view to improving the service^[1,2].

Methods: An audit of 170 APR performed paracentesis was performed between January 2017 and December 2018.

Effectiveness of the service was measured using the key indicators of: the wait from referral to drain insertion time, documented procedural complications, whether radiologist assistance was required and the average time taken to perform paracentesis.

Results: Effectiveness of the service was measured by the average referral to drain insertion time which was on average 7.9 days for RDCU outpatient and 2.2 days for an inpatient. No complications and no requirement of Radiologist assistance were recorded for any APR performed paracentesis. On average the time of APR performed paracentesis was 32 minutes; this equates to 90 hours Consultant Radiologist time saved.

Conclusion: APR led paracentesis service is a safe and effective in providing patients with improved care. This service has also led to considerable time being saved for Consultant Radiologists to deliver other imaging service where advanced practitioner roles are limited^[3].

1. Hill, S., Smalley, J. R., & Laasch, H. U. (2013). Developing a Nurse-Led, Day-Care, Abdominal Paracentesis Service. *Cancer Nursing Practice*, 12(5)

2. Aplin, N. (2017). Advanced nurse practitioner-led abdominal therapeutic paracentesis. *Emergency Nurse* (2014+), 24(10), 34. 3. NHS. (2017). *Cancer Workforce Plan: Phase 1: Delivering the cancer strategy to 2021*. London. NHS

P082 The role of multi-modality fusion imaging with CT/Fluoroscopy for TIPSS Procedures using Philips Vessel Navigator Software

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Background: The current standard practice is to perform TIPSS (transjugular intrahepatic portosystemic shunt insertion) procedures using live Fluoroscopy only with Hepatic Venography. By using this technique there is no visualisation of the portal vein, so navigation during procedure can prove extremely difficult and time consuming for the Interventional Radiologist; the blind portal vein puncture remains the most challenging step during transjugular intrahepatic portosystemic shunt (TIPSS) creation^[1]. The procedure can also lead to excessive radiation dose to both patient and Interventional staff involved. Dedicated fusion software was employed to improve practice for performing TIPSS procedures.

Purpose: The poster aims to demonstrate the clinical use of Philips Vessel Navigator Software, which combines pre-op CT data with Fluoroscopy to perform fusion-imaging. This provides a continuous 3D Roadmap of the hepatic and portal veins and significantly improves the accuracy of navigation of needle/guide-wire path and stent deployment for TIPSS procedure.

Summary: The poster will show how the use of fusion imaging in TIPSS procedures has led to improvement in overall image



quality, radiation dose reduction to both patient and staff, reduction in the amount of contrast and shortened procedural times which has led to an overall improvement in standards for practice and safety for performing TIPPS procedures

1. Xuefeng Luo, Xiaoze Wang, (2018). Transjugular intrahepatic portosystemic shunt creation: three-dimensional roadmap versus CO2 wedged hepatic venography. *European Radiology*. Volume 28, Issue 8, (1), pp 3215–3220

P083 SPLENOSIS - A pictorial review

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Background: Splenosis is a benign condition caused by heterotopic autotransplantation of ectopic splenic tissue following splenic trauma or elective splenectomy. It has a slight male preponderance and although it is normally asymptomatic or an incidental finding, the splenic tissue can be surgically removed in symptomatic patients. Accurately diagnosing splenosis is vital in the context of possible lymphoma, polysplenia, accessory spleens, metastatic disease, endometriosis, exophytic renal or liver tumours. The gold standard for diagnosis is a Tc99m-tagged heat-damaged RBC scan with autologous erythrocytes being capable of specifically proving splenic tissue.

Purpose: The purpose of this pictorial review is to aid diagnosis by achieving the following learning outcomes:

1. To review the aetiology, epidemiology and presentation of splenosis.
2. To appreciate the characteristic appearances of splenosis on ultrasound, CT and Scintigraphy.
3. To discriminate between splenosis and its common differential diagnosis.

Summary: For this pictorial review, we have selected cases of splenosis diagnosed in our tertiary centre using a range of modalities. We have reviewed the patient histories and the methods used for achieving an accurate diagnosis, highlighting the different radiological features for each case.

1. Fremont R. D. and Rice T. W. (2007): Splenosis: A Review. *South Med J*. Jun;100(6):589-93

2. Fortin F et al. Splenosis.

3. Yammine J. N. et al. (2003) Radionuclide imaging in thoracic splenosis and a review of the literature. *Clin Nucl Med*. Feb;28(2):121-3

P084 The potential role of high-resolution MRI in guiding treatment of early rectal cancer: What a radiologist needs to know

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Screening for early rectal tumours (ERC) has significantly increased the detection rate of non-invasive T1 colorectal cancers. The current gold standard of endoscopic ultrasound (EUS) is failing to adequately stage these cancers and, in turn, has led to a considerable number of patients being subjected to unnecessary radical treatment^[1]. Encouraging results from recent preliminary studies suggest high-resolution MRI is able to successfully delineate the degree of invasion in mucosal and muscular layers within the rectum and significantly improve the accuracy of ERC staging; specifically reducing the under/over-staging produced by other diagnostic techniques^[1,2]. This potentially would improve identification of tumours amenable to organ preserving treatment such as endoscopic or transanal microsurgery (TEMS).

The principal aim of the poster is to educate the reader on the potential of high-resolution MRI in ERC staging with a view to shielding patients from unnecessary radical treatments. Initially, the current practice and associated concerns of ERC staging will be outlined. This will be followed by MRI's prospective role in addressing these concerns and its additional benefits, such as evaluation of nodal status. Specific detail will be included on how to improve the MRI technique to increase visualisation, for example, by the use of buscopan, 3T scanners and rectal distension and further discussion will address how radiologists can improve their ability to identify early tumours. The poster layout will be a pictorial review based on evidence-based research^[1,2] encompassing the above points.

1. Svetlana Balyasnikova, James Read, Andrew Wotherspoon et al (2017) *Diagnostic accuracy of high-resolution MRI as a method to predict potentially safe endoscopic and surgical planes in patients with early rectal cancer*. *BMJ Open Gastro* 2017;4:e000151. doi:10.1136/bmjgast-2017-000151

2. Regina G. H. Beets-Tan, Doenja M. J. Lambregts, Monique Maas et al (2017) *Magnetic resonance imaging for clinical management of rectal cancer: Updated recommendations from the 2016 European Society of Gastrointestinal and Abdominal Radiology (ESGAR) consensus meeting*. *Eur Radiol* (2018) 28:1465-1475

P085 Correlation between diagnostic query on request form and findings on CT scan in the acute abdomen at a DGH

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Background: The workload of clinical radiology continues to increase each year with 5,146,475 computed tomography scans performed in England in 2017/2018 - a 6.9% increase from the previous year^[3]. Studies have found a large proportion of CT scans carried out for acute abdominal pain are not clinically indicated or performed prior to sufficient clinical work up^[1], as well as an overuse of CT for minor head injuries^[2].

Method: A retrospective review was undertaken of one hundred acute abdominal/pelvic CT scans from December 2017 to January 2018, using RCR iRefer guidelines as our standard. Primary outcome was positive yield rates between indication on request and radiology report. Scans were deemed positive if there was a radiologically significant lesion related to the indication



for the scan. Other outcomes included analysis of content of the request, variation in clinical indications, report outcome/diagnosis and clinical outcome.

Results: The positive yield rate of CT scans was 40%, meaning that 60% of radiological reports did not correlate with the indication on the request. Request for query obstruction or collection carried the highest negative rates at 10% and 9% respectively. Overall there were 27 different clinical diagnoses queried in the requests, with 3% categorised as 'vague' due to no identifiable clinical question.

Conclusion: The low positive yield rates between indication and report outcome is concerning, as is the content and diagnostic variation of requests. Education regarding appropriate requesting of CT scans could be warranted to attempt to reduce the number of unnecessary scans requested.

1. de Burel, K. J. et al. (2018) 'Appropriateness of CT scans for patients with non-traumatic acute abdominal pain', The British Journal of Radiology. The British Institute of Radiology, 91(1088), p. 20180158. doi: 10.1259/bjr.20180158
2. Cellina, M. et al. (2018) 'Overuse of computed tomography for minor head injury in young patients: an analysis of promoting factors', La radiologia medica, 123(7), pp. 507-514. doi: 10.1007/s11547-018-0871-x.
3. NHS England (2018) Diagnostic Imaging Dataset Annual Statistical Release 2017/18

P086 Drug pushers- A case report and review of the literature

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Background: Radiology has a key role in the identification of ingested/inserted packages of illicit substances (e.g. cocaine) in drug packers/pushers, as well as a role in the detection of potential complications. It is therefore vitally important for radiologists to be aware of the spectrum of appearances of illicit drug packages on various imaging modalities including abdominal radiographs and CT, which are the most common methods used for the identification of concealed drug packets and their potential complications.

Purpose: We aim to review the key differences between drug packers and pushers, the different packaging methods used and the implications for radiologists reviewing their imaging. We will review the imaging techniques used and the key radiological features to look out for in the identification of cocaine packets in drug packers/pushers. The varying radiological appearances of cocaine packets when different packaging methods are used will also be highlighted. Finally we will provide some key learning points to bear in mind when reviewing your next case of drug packing/pushing to prevent misdiagnosis!

Summary: Through the use of images from an interesting "drug pusher" case we will provide an overview of drug packing/pushing, the role of radiology in the diagnosis and management of these patients and provide a pictorial review of the differing radiological appearances of cocaine packets dependant on packing method used.

1. Aks, S. and Bryant, S. (2017). Acute ingestion of illicit drugs (body stuffing)
2. Pinto, A., Reginelli, A., Pinto, F., Sica, G., Scaglione, M., Berger, F., Romano, L. and Brunese, L. (2014). Radiological and practical aspects of body packing. The British Journal of Radiology, 87(1036), p.20130500

P087 Management and surveillance of pancreatic IPMNs: An update

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Background: Intraductal papillary mucinous neoplasms (IPMNs) are mucin-producing pancreatic papillary tumours which arise from the epithelium of the main pancreatic duct or the duct side branches. They are therefore classified into three types: side branch IPMN, main duct IPMN or combined IPMN which shares imaging features of both. They account for approximately 20-50% of all pancreatic cystic lesions, and are associated with a number of hereditary conditions. They do have a malignant potential, however the management and surveillance strategy for IPMNs, in particular branch-duct type, has remained controversial. Therefore, many patients with IPMNs will have extensive imaging follow-up over a number of years and repeated MDT discussion.

Purpose: 1. Understand the malignant potential of pancreatic IPMNs. 2. Adopt an evidence-based surveillance and management strategy for IPMNs based on the 2018 European guidelines. 3. List the relative and absolute indications for surgery in radiologically suspected IPMN. 4. Review appearances of the range of IPMN features on CT, MRI and EUS (endoscopic ultrasound).

Summary: This poster reviews the 2018 European evidence-based guidelines on pancreatic cystic neoplasms, with specific reference to IPMNs. It contains an algorithm for a management and surveillance strategy that can be adopted to appropriately and safely utilise imaging and MDT time. It also provides specific case examples of the range of IPMN features seen on EUS, CT and MRI.

1. European Study Group on Cystic Tumours of the Pancreas, 2018. European evidence-based guidelines on pancreatic cystic neoplasms. Gut, pp.gutjnl-2018

P088 Are they really bleeding? Common CT artefacts post endoscopy

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CT is common place post endoscopy to identify ongoing haemorrhage which may require embolisation or repeat endoscopy in both upper and lower GI bleeds. Advancements in endoscopic technology have brought novel ways of stemming GI bleeds.



Many of these new technologies lead to artefacts on subsequent CT imaging which, unless the reporting Radiologist is aware of the endoscopic procedure, can be misinterpreted as active haemorrhage. Here we present a pictorial review of cases where artefact from endoscopic procedures has led overcalls of active contrast extravasation and the lessons learned from these cases.

P089 Non-specific upper GI mural thickening on CT - is it just from peristalsis?

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Background: Non-specific upper GI mural thickening on CT is a common abnormal finding, raising the suspicion of upper GI malignancy. The correlation between this finding and an endoscopic diagnosis of malignancy is not clearly known.

Method: A retrospective single centre study of patients referred for gastroscopy with the indication of 'abnormal imaging' (n=147) over a 3-year period (2016 to 2018) was performed. Patients with a CT reported finding of 'mural thickening' were included for analysis (n=59).

Results: Site of CT reported mural thickening: oesophageal 20, GOJ 9, gastric 23, pyloric 4, duodenal 5 and jejunal 1. Median time from CT to endoscopy: 21 days (IQR 12 - 54). Median age: 77 (IQR 62 - 83). Initial indication for CT included: weight loss 16, abdominal pain 14, possible malignancy 6 and dysphagia 3.

11 patients had a normal gastroscopy, 24 showed oesophagitis or gastritis, 20 had a hiatus hernia and 5 had benign polyps. 5 had a histological diagnosis of gastric adenocarcinoma, 4 of Barrett's oesophagus and 1 of squamous dysplasia.

Those with adenocarcinoma could not be accurately differentiated by indication for imaging (abdominal pain 2, weight loss 1 and non-GI or systemic related symptoms 2).

Conclusion: Upper GI mural thickening on CT correlated with malignancy, dysplasia or metaplasia in 10/59 (17%) patients in this study. Patients with malignancy could not be accurately differentiated by indication for imaging. Owing to this high concordance, we recommend gastroscopy is performed in every case when mural thickening is detected incidentally.

P090 Do I really need to go to the toilet eight times tonight? Quality of CT colonographies in patients with or without laxative bowel preparation

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Introduction:

- The CT colonography (CTC) is used to detect colonic tumours
- Prior to the CTC, patients are instructed to consume oral contrast (e.g. Gastrografin), and in some centres, also laxative bowel preparation (LBP) (e.g. Citrafleet)
- However, LBPs commonly cause patient discomfort, dehydration and electrolyte abnormalities
- We investigated whether LBPs affected the quality of CTCs.

Methods:

- We retrospectively identified all patients aged >75 who had a CTC in the Pennine Acute Trust between September and December 2017, and recorded whether they had Citrafleet
- The quality of faecal tagging was determined by calculating the average CT attenuation of tagged faecal matter across the ascending, descending and distal colons
- The extent of bulky faecal residues was classified into none, slight, moderate or severe.

Results:

- 25 patients received both Citrafleet/Gastrografin, whereas 57 patients only received Gastrografin during the study period
- The quality of faecal tagging was significantly better ($P = 1.06 \times 10^{-4}$) in patients who received Gastrografin only (694.0 HU; 95% CI 612.8-775.3 HU vs 409.8 HU; 95% CI 308.9-510.6 HU)
- The number of patients with moderate or severe bulky faecal residues was 3 in the Citrafleet/Gastrografin group and 12 in the Gastrografin-only group ($P = 0.5356$).

Conclusion:

- Taking LBPs prior to CTCs does not significantly improve the quality of the CTC, but is associated with a significant side effect profile
- We recommend that all UK centres should protocol their CTCs such that patients only receive Gastrografin prior to their CTCs.

GU & URO

P091 The effect of rectal size and shape on bladder deformation in urinary bladder radiotherapy

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