

**ABSTRACTS OF THE 2021
YORKSHIRE
INTERNATIONAL
IMAGING AND
INTERVENTIONAL
RADIOLOGY SYMPOSIUM
AT THE UNIVERSITY OF
LEEDS**

IJMS

**INTERNATIONAL JOURNAL *of*
MEDICAL STUDENTS**

Abstracts of the 2021 Yorkshire International Imaging and Interventional Radiology Symposium at the University of Leeds

01. ABLATIVE THERAPIES VERSUS PARTIAL NEPHRECTOMY FOR SMALL RENAL MASSES: A SYSTEMATIC REVIEW AND META-ANALYSIS.

Vinson Wai-Shun Chan¹, Ahmad Abul¹, Helen Hoi-Lam Ng¹, Filzah Hanis Osman¹, Kaiwen Wang¹, Jon Cartledge² and Tze Min Wah².

¹ School of Medicine, University of Leeds, Leeds, United Kingdom

² St.James' University Hospital, Leeds, United Kingdom

INTRODUCTION: The optimal treatment of small renal masses is unclear. As a potential alternative, ablative therapies(AT) have been favoured for their lower complication rates and non-inferior oncological outcomes. We conducted a systematic review to compare AT and partial nephrectomy (PN) in patients with T1aN0M0 renal masses. **METHODS:** This review is registered on PROSPERO (CRD42020199099). Medline, EMBASE, and Cochrane CENTRAL databases were searched to identify studies comparing AT and PN. Subgroups of different modalities and approaches were further analysed. Outcomes include cancer-specific survival (CSS), overall survival (OS), recurrence-free survival (RFS), metastatic-free survival (MFS), postoperative complications, and change in renal function. **RESULTS:** From 1,351 identified records, 30 studies involving 85,837 patients were included for meta-analysis. Patients receiving AT were found to have significantly worse CSS, OS, RFS in comparison to patients receiving PN ($p < 0.05$). Patients undergoing AT have a non-inferior MFS and significantly lower overall complication rates (HR: 0.79, 95% CI 0.41-1.51, $p=0.48$; RR: 0.71, 95% CI 0.53-0.96, $p=0.03$). Patients undergoing AT have a lesser decline in post-operative renal function (SMD: 0.30, 95% CI 0.11-0.50). When limited to studies with propensity score matching, CSS and RFS are no longer significantly different between the two groups (HR: 1.54, 95% CI 0.67-3.52, $p=0.31$, HR: 1.72, 95% CI 0.90-3.28, $p=0.10$). Subgroup analyses between different modalities and approaches of AT did not show significant differences in all outcomes. **CONCLUSION:** AT is potentially non-inferior to PN when managing small renal masses, and more high-quality propensity score-matched studies with long follow-up time are needed to confirm the non-inferiority.

02. ASSESSMENT OF TUBO-OVARIAN ABSCESS USING DIFFUSION-WEIGHTED MAGNETIC RESONANCE AMAGING: A LITERATURE REVIEW.

Thomas Ferenc¹.

¹ Merkur University Hospital, Zagreb, Croatia

OBJECTIVES: Objective of this review was to summarize and define the efficacy of combining conventional magnetic resonance imaging (MRI) with diffusion-weighted imaging (DWI) in the assessment of tubo-ovarian abscess (TOA) and distinguishing TOA from ovarian neoplasms. The use of DWI has been fairly documented, however limited reports are available on efficacy of combining DWI and MRI (DW-MRI) in the evaluation of patients with TOA. Literature searches of English-language articles were performed in PubMed and Google Scholar. The used keywords included: "Tubo-ovarian abscess" "Diffusion-weighted magnetic resonance imaging". Additional studies were noted by reviewing reference lists of found studies. Identified studies revealed that TOA presents on MRI as multilocular, mixed cystic to solid pelvic mass with heterogeneously high signal on T2-weighted and low signal on T1-weighted images. TOAs usually demonstrate high signal intensity on DWI with low apparent diffusion coefficient (ADC) values. Display of the invasion into adjacent organs and tubal dilatation is more frequent in TOA than in ovarian malignancy. The size of TOA is noticeably smaller compared to ovarian malignancy and in addition, neoplasms are not usually associated with dilated fallopian tube. In comparison to other methods (positron emission tomography/computed tomography (PET/CT), CT, MRI), DW-MRI possesses highest sensitivity, specificity, positive predicting value, negative predicting value and accuracy in the assessment of TOA. The addition of DWI, with corresponding ADC values, to conventional MRI improved the overall evaluation of TOA and its distinction from ovarian tumors. Therefore, combination of DWI with MRI in the assessment of TOA should become obligatory.

Key words: Diffusion-weighted imaging, Magnetic resonance imaging, Tubo-ovarian abscess, Pelvic inflammatory disease, Ovarian neoplasms.

03. **ATTEMPTED PLUG EMBOLISATION OF A CONGENITAL PORTOSYSTEMIC SHUNT WITH SUBSEQUENT PLUG EMBOLISATION INTO THE PULMONARY ARTERY AND SUCCESSFUL ENDOVASCULAR SNARE RETRIEVAL.**

Ellen Collingwood¹, Nasim Tahir¹.

¹ Leeds Teaching Hospitals NHS Trust

INTRODUCTION: We present a case of a 14-year-old with an intrahepatic Congenital Portosystemic Shunt (CPSS). The patient was referred following investigations for premature adrenarche which included abdominal ultrasound that incidentally showed abnormal portal venous anatomy. MRI confirmed drainage of the main portal vein into the right atrium via a large shunt with absence of the right and the left main portal vein branches. **TREATMENT AND RESULTS:** It was decided to attempt endovascular embolization of the shunt via a right internal jugular approach. A balloon occlusion test was performed, demonstrating no significant rise in portal pressure. An 18mm Cera vascular plug was deployed and remained in a stable position over a ten minute period. As expected, shunt occlusion did not occur immediately. The following day an ultrasound was performed to check for shunt patency and position of the plug. This showed that the shunt remained patent and the occlusion device could not be visualised. A chest x-ray demonstrated that the plug had embolized into the right pulmonary artery. The patient was asymptomatic. She subsequently returned to theatre and the plug was retrieved using an endovascular snare without further complication. **DISCUSSION:** CPSS are abnormal connections between the portal and systemic circulations. The risk of hyperammonaemia, portopulmonary syndrome, pulmonary hypertension and focal nodular hyperplasia means that if spontaneous closure does not occur shunt closure is recommended. Since the shunt remains patent, further MDT discussion will be undertaken to decide whether a repeat endovascular procedure or an open surgical procedure should be performed.

04. **DIAGNOSING PROSTATE CANCER WITH MRI.**

Aqua Asif¹, Alexander Ng² and Vinson Wai-Shun Chan³.

¹ Leicester Medical School, University of Leicester, Leicester, United Kingdom

² UCL Medical School, University College London, London, United Kingdom

³ School of Medicine, Faculty of Medicine and Health, University of Leeds, United Kingdom

BACKGROUND: Until 2019, serum PSA level and digital rectal examination followed by systematic transrectal ultrasonography (TRUS) guided prostate biopsy was the pathway in diagnosing PCa. However, this resulted in both over diagnosis of clinically insignificant PCa (cisPCa) and under diagnosis of clinically significant PCa (csPCa). Multiparametric MRI (mpMRI) has been shown to increase the sensitivity and specificity in diagnosing PCa. **OBJECTIVES:** To understand the limitations of the previous prostate cancer (PCa) diagnosis pathway, To understand the use and benefits of performing MRI in diagnosing PCa. To understand the future of MRI PCa diagnosis. **CLINICAL FINDINGS AND PROCEDURE DETAILS:** mpMRI generally consists of T1-weighted, T2-weighted, diffusion-weighted, and dynamic contrast-enhanced imaging. mpMRI is usually indicated for two main roles. Firstly, it allows MRI-targeted biopsies in addition to systematic core biopsies to reduce sampling error and underdiagnosis. Secondly, it allows triaging prior to biopsy, where only those with an mpMRI suspicious of PCa are offered a targeted biopsy, reducing potential overtreatment. The diagnostic accuracy of mpMRI for prostate cancer was established by the PROMIS study (2017). The landmark study, PRECISION (2018), found that amongst biopsy-naïve patients, mpMRI was superior to TRUS alone in diagnosing both csPCa and cisPCa. mpMRI involves a contrast sequence, which incurs longer scanner time and costs compared to biparametric MRI (bpMRI). The efficacy of bpMRI compared to mpMRI in diagnosing PCa is unknown. **CONCLUSION:** mpMRI is now the first-line investigation in the diagnosis of PCa. Future work aims to compare the diagnostic efficacy of mpMRI and bpMRI.

05. **THE STATE OF ULTRASOUND TEACHING IN UK MEDICAL SCHOOLS: A SYSTEMATIC REVIEW.**

Brendan Flanagan¹, Eva Sweeney¹.
¹ Queen's University Belfast

BACKGROUND AND PURPOSE: A centralised UK ultrasound curriculum for undergraduate medical schools currently does not exist. The aim of this review is to explore how ultrasound is integrated into medical education across undergraduate UK medical schools. **METHODS:** A systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Medline and Embase electronic databases were searched using the keywords ultrasound, ultrasonography, insonation, medical education and undergraduate medicine. A title and abstract screen was carried out and followed by a full-text review to assess eligibility for inclusion. Articles were removed based on pre-selected exclusion criteria. Included data was extracted using Excel and coded under multiple subheadings, including teaching methods, ultrasound skills being taught and student perceptions. **RESULTS:** 12 journal articles and seven conference abstracts were included in the review. A total of 10 UK medical schools have published articles relating to undergraduate ultrasound teaching. The number of students per ultrasound programme ranged from 7 students undertaking a student-selected component, up to 215 students for a year-wide teaching intervention. All studies involved 'hands-on' experience of using ultrasound and small-group didactic learning was the most popular method of teaching. Medical students could perform echocardiography and focused assessments with sonography in trauma to a clinically acceptable standard after a short period of training. Student and tutor perceptions of ultrasound teaching were largely positive. **CONCLUSION:** Performing non-invasive ultrasound-guided procedures is a realistic teaching goal for undergraduate medical schools and is popular among both students and tutors.

06. **IRREVERSIBLE ELECTROPORATION OF HEPATOCELLULAR CARCINOMA WITH NAVIGATION ASSISTED CT GUIDANCE.**

Mahira Zahid¹, Daniel Stokes¹, James Lenton², Jonathan Smith¹, Tze Min Wah².

¹ Leeds Medical School, University of Leeds, Leeds, GB

² Diagnostic and Interventional Radiology, Institute of Oncology, St. James' University Hospital, Leeds Teaching Hospitals Trust, Leeds, GB

CLINICAL HISTORY: A 64 years old male patient presented with an 18 mm hepatocellular carcinoma (HCC) on the posterior aspect of segment III of the liver. The patient had a history of type II diabetes and liver cirrhosis secondary to hemochromatosis.

TREATMENT: The decision to use image-guided non thermal ablative technology-Irreversible Electroporation (IRE) was because the HCC was sited in close proximity to vascular pedicles and stomach. Needle placement was performed using the CAS-One IR navigation system (Cascination AG). The patient was under general anesthesia and suspended respiratory technique were employed during imaging and needle navigation. A four-needle configuration was planned and subsequently place under CT-navigation. All IRE needles were successfully placed with one needle required repositioning. IRE ablation was performed using the Nanoknife system (AngioDynamics), two overlapping ablations with 1cm pull-back. The three-month post ablation control scan showed a complete destruction of the HCC with no ablative injury to surrounding vital structure (Figure 1). **DISCUSSION:** IRE is a novel non thermal technology, and is increasingly used when treating tumours sited in close proximity to vital structures e.g. vessels, bile duct, gastro-intestinal tract. Precise needle positioning is crucial for effective delivering of IRE treatment (needles are required to be in parallel, inter-electrode distance of > 1.5cm and <2cm). Navigation assisted CT guidance appeared to be achievable with the CAS-One IR workflow after initial learning curve. **TAKE HOME POINTS:** Navigation assisted CT-guidance can potentially facilitate the ease of IRE treatment for more precise needle placement to ensure parallelism and stringent inter-electrode distance.

07. **FEASIBILITY AND ACCURACY OF DEEP LEARNING IN GLIOMA SEGMENTATION.**

Andrew Gregory¹, Stuart Currie², Ali Gooya¹, Andrew Scarsbrook¹.

¹ University of Leeds

² Leeds Teaching Hospitals NHS Trust

BACKGROUND AND PURPOSE: The objective of this study is to assess the feasibility and accuracy of deep learning segmentation of low grade gliomas on magnetic resonance images against that of an experienced neuroradiologist within Leeds Teaching Hospitals NHS Trust (LTHT). **METHODS:** Data from 30 patients referred to Leeds Teaching Hospitals NHS Trust for suspected glioma between September 2008 and December 2018 were collected. Patients with missing personal data were excluded. For the remaining 20 patients, FLAIR images were manually segmented by a consultant neuroradiologist working within the trust. Training of three models and testing of one pre-trained model was attempted. Dice similarity coefficients (DSCs) were to be calculated. **RESULTS:** All four models produced errors that could not be solved and so failed to produce segmentation masks. DSCs could not be calculated. **CONCLUSION:** Deep learning segmentation was shown to be unfeasible in the conditions of this study therefore accuracy of segmentation methods could not be compared. Errors were encountered that required greater experience with deep learning and more resources to solve. Virtual environments and large GPUs are recommended when training deep learning models, and macOS Mojave 10.14.4 is not the most suitable operating system on which to do this.

Key words: Glioma, segmentation, deep learning, CNN, error.

08. **PERCUTANEOUS TRANSHEPATIC OBLITERATION OF GASTRIC VARICES USING GLUE – A VIABLE ALTERNATIVE IN THE EMERGENT SETTING.**

ViMAL Chacko Mondy¹

¹ Department of Imaging Sciences and Interventional Radiology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum 695011, Kerala, India

INTRODUCTION: 60-year-old male with chronic liver disease and history of hepatic encephalopathy presented with hematemesis and shock. He had one episode of hematemesis 2 years back due to bleeding gastric varices for which endoscopic ultrasound guided glue injection and coiling was done. His haemoglobin was 5.8g/dl. He was given RBC transfusions. Emergency esophago-gastro duodenoscopy revealed distended stomach with fresh blood, but site of bleeding could not be identified. CT of abdomen showed gastric fundal varices with afferents from short gastric vein and draining through gastrosplenic shunt, cirrhotic liver, pneumobilia and chronic thrombus in the main portal vein. **RESULTS:** Due presence of active hematemesis, unfavorable morphology of cirrhotic liver, pneumobilia hindering visualization of portal vein branch on ultrasound and past history of hepatic encephalopathy TIPS was not considered. BRTO was deferred due to large highly tortuous gastrosplenic shunt and near total chronic thrombosis of portal vein. It was decided to attempt percutaneous transhepatic obliteration of the gastric varices. Procedure was done under general anesthesia. Percutaneous transhepatic puncture of right branch of portal vein was done under ultrasound guidance with the NEFF set needle which was exchanged for 5F sheath. Splenic venograms showed gastric varices fed by afferents from short gastric vein and draining via splenorenal shunt. The afferent was selectively cannulated using Progreat microcatheter and was embolized with 50% glue. Concentrated glue to prevent systemic embolization. Post procedure venogram showed obliteration of gastric fundal varices. Transhepatic puncture tract was embolized with 50% glue. Post procedure, vitals stabilized with resolution of hematemesis and no further fall in hemoglobin. **DISCUSSION:** Percutaneous transhepatic obliteration of gastric varices using glue is a viable alternative in the emergent setting, especially when TIPS or trans TIPS balloon assisted antegrade obliteration or BRTO are not feasible.

09. **PLAIN BALLON ANGIOPLASTY FIRST FOR CEPHALIC ARCH FISTULA STENOSIS: NEED FOR A PARADIGM SHIFT!**Dhikshitha Nagaraj¹, Ahmad Abul¹, Gary Cuthbert², Simon McPherson², Sapna.Puppala².¹ School of Medicine, University of Leeds² Department of Vascular radiology, Leeds Teaching Hospital NHS Trust

BACKGROUND: Cephalic arch stenosis is a common complication with brachial artery-cephalic vein fistulas and frequently leads to loss of function of the fistula. This is treated by various percutaneous techniques. **AIM:** A service evaluation assessing the technical success and outcomes of intervention on the cephalic arch, using plain balloon angioplasty first followed by other techniques. **METHODS:** Retrospective study of cephalic arch procedures from 2009 to 2019. **RESULTS:** Out of 5000 fistuloplasties performed, a total of 267 cephalic arch angioplasties were performed. The plain balloon first approach was used in 132 patients as a primary procedure with 74% success. The rest of which required a further intervention on table used cutting balloon in 9.8%, high pressure dorado balloon in 6.82% and stent in 3.03%. Drug coated balloon used in 10 patients as an operator choice. Secondary intervention was performed in 56.8% (cutting balloon 14.6%, high pressure dorado 12%, both cutting and high pressure 1.33% and stent 9.3%). Tertiary intervention was done in 28.8% and 10.5% of patients had a stent placed. Quaternary intervention was carried out in 13.6% of patients and 16.67% had a stent placed. 3 fistulas were abandoned. No anticoagulation was used to assist patency, though 55 patients were on anticoagulation for other cardiac reasons. **CONCLUSION:** Our evaluation suggests that a primary plain balloon angioplasty was the standard approach with a 74% primary success rate however more than 50% had re-intervention. Drug coated balloon and stents were increasingly used suggesting a need to reassess the plain balloon first approach.

10. **SKELETAL FIBROUS DYSPLASIA IN MCCUNE-ALBRIGHT SYNDROME.**Anthony Jen -Yu Chung¹, Mahadura Eranda Mahesh Mendis¹.¹ Department of Radiology, Queen Elizabeth Hospital, Woolwich, London

INTRODUCTION: We present the clinical and imaging findings in a 46-year-old gentleman with known McCune-Albright syndrome who presented with worsening dyspnoea since being discharged from a different hospital 4 weeks ago where he was treated for a hospital acquired pneumonia (HAP). On admission he had a type 2 respiratory failure (pH 7.31, PaCO₂ 8.98, PaO₂ 11.5), normal inflammatory markers and was Covid-19 negative. He had an admission chest XR which was suggestive of inflammatory changes in the left lung base. He was started on IV Tazocin for treatment of HAP as his previous hospital admission was 8 months long. Throughout his current admission, he underwent a variety of imaging: 1) CT pulmonary angiogram – negative for pulmonary embolism, 2) Repeat chest XR before commencing non-invasive ventilation – negative for pneumothorax, 3) MRI lumbosacral spine due to new faecal incontinence and reduced sensation in L5 distribution – spinal stenosis at S2-S3 level without cord compression. Following a sleep study and respiratory input, it was felt that there was a chronic element to the patient's respiratory failure. He was established and optimised on home ventilation as an inpatient. **OBJECTIVES:** To recognise skeletal fibrous dysplasia on various imaging modalities including X-ray (XR), computed tomography (CT) and magnetic resonance imaging (MRI) using a case study of a patient with McCune-Albright syndrome. **CONCLUSION:** Fibrous dysplasia is associated with McCune-Albright syndrome. Fibrous dysplasia has a varied radiographic appearance across plain radiographs, CT imaging and MRI.

11. **TUBERCULOSIS WITH PARAVERTEBRAL ABSCESS.**Israah Amin¹, Wee Ping Ngu¹, Lee Wun Chong¹.
¹ Hull University Teaching Hospital NHS Trust

INTRODUCTION: 27 year old male, Sudanese national, came to the UK 11 months ago. No previous imaging or known past medical history. He presented to hospital febrile and tachycardic, on a background of a 4 month history of feeling generally unwell, including night sweats, haemoptysis and weight loss. **TREATMENT AND RESULTS:** A chest radiograph in A&E showed bilateral pleural effusions, but given how systemically unwell he was he soon proceeded to have a CT Thorax Abdomen Pelvis to further investigate for the source of his septic picture. This revealed multifocal patchy consolidation within bilateral upper lobes with hilar lymphadenopathy, suspicious for TB. Large bilateral pleural effusions were again demonstrated, along with partial collapse-consolidation of bilateral lower lobes and there were features of pulmonary oedema. However, in addition to the lung findings, there was a large paravertebral collection/abscess anterior to the upper thoracic spine. The report advised MRI of the Spine to look for features of spondylodiscitis – MR appearances suggested tuberculous spondylitis. **DISCUSSION:** In retrospect, there was some widening of the upper paratracheal region on the initial chest radiograph, which corresponded to the lateral borders of the later confirmed paravertebral collection. Following the CT and MRI imaging, the patient was put on empirical medical treatment for TB but eventually had several attendances to the Radiology department for Ultrasound and CT guided drainages of the collection. In the meantime, Interventional Neuroradiologists performed a spinal biopsy to help obtain a histological diagnosis, which confirmed TB.

12. **THE ON-CALL CT ABDOMEN: THE BASICS.**Wee Ping Ngu¹, Israah Amin¹.
¹ Hull University Teaching Hospital

BACKGROUND: There has been exponential increase in demand for Radiology services since the pandemic due to ease of accessibility and short scanning duration. This has inadvertently increased the workload particularly in the out-of-hours setting and resulted in delayed reporting. It is therefore helpful for junior doctors to be familiar and to recognize the abnormal radiological features of common pathologies. **OBJECTIVES:** To review the CT appearances of common causes for the acute abdomen. To be aware of the strengths and limitations of CT. To be aware of the indications for specific protocols on a CT abdomen. **CLINICAL FINDINGS:** Pictorial review of acute abdominal pathologies on CT e.g. appendicitis, bowel obstruction, bowel ischaemia, cholecystitis, perforation, pancreatitis, renal stone, AAA rupture, ovarian torsion. **CONCLUSION:** To recognize the appearances of common acute pathologies on the CT abdomen.

13. **PROGNOSTIC VALUE OF NEUTROPHIL TO LYMPHOCYTE RATIO AND PLATELET TO LYMPHOCYTE RATIO FOR SMALL RENAL CELL CARCINOMAS AFTER IMAGE-GUIDED CRYOABLATION (CRYO) OR RADIO-FREQUENCY ABLATION (RFA).**Aqua Asif¹, Filzah Hanis Osman¹, Jasmine Sze-Ern Koe¹, Alexander Ng¹, Jon Cartledge¹, Michael Kimuli¹, Naveen S. Vasudev¹, Christy Ralph¹, Satinder Jagdev¹, Selina Bhattarai¹, Jonathan Smith¹, James Lenton¹, Vinson Wai-Shun Chan¹, Tze Min Wah¹.¹ University of Leeds, Leeds Teaching Hospitals NHS Trust

BACKGROUND AND PURPOSE: This is the first study investigating the relationship between NLR or PLR and outcomes of percutaneous cryoablation or RFA for small RCCs with long-term outcomes.

METHODS: All patients undergoing cryoablation or RFA for small RCCs (<7cm) from 2003-2016 at a regional centre for RCC were included. Optimal cut-offs for NLR/PLR were determined using the ROC curve and AUC using the Youden method. Outcomes were compared using Cox or logistic regression. **RESULTS:** 203 patients (Cryoablation:103, RFA:100) were included. Median follow-up was 75 months and 98 months, respectively. Using the Youden method, high post-operative NLR values were associated with worsened local recurrence-free survival (LRFS) (NLR >5.38; HR: 5.13, p=0.037) and worsened Overall Survival (OS) (NLR >6.42; HR: 3.40, p<0.001) in all patients. High post-operative PLR values were associated with worsened OS in all patients (PLR >192; HR:2.31, p=0.006) and RFA patients alone (n=100; PLR >260; HR: 8.27, p<0.001). Using continuous Cox regression model, greater changes in peri-operative NLR were associated with worsened LRFS in cryoablation alone and all patients (Continuous; HR: 1.09, p=0.028). Higher post-operative NLR was also associated with worsened LRFS in cryoablation patients alone (HR: 1.10, p=0.046). Post-operative NLR (HR:1.17, p=0.002), change in peri-operative NLR (HR:1.19, p=0.001), and change in peri-operative PLR (HR:1.20, p=0.009) were all associated with worsened CSS in all patients. Pre-operative PLR and NLR were not associated with complications and change in renal function.

CONCLUSION: NLR and PLR are valuable prognostic factors for this group of patients and should be used to guide subsequent follow-up and monitoring of recurrence.

14. **THE CHANGING TRENDS OF IMAGE GUIDED BIOPSY OF SMALL RENAL MASSES BEFORE INTERVENTION- AN ANALYSIS OF EUROPEAN MULTINATIONAL PROSPECTIVE EURECA REGISTRY.**

Vinson Wai-Shun Chan¹, Francis Xavier Keeley, Jr², Brunolf Lagerveld³, David J. Breen⁴, Alexander King⁴, Tommy Kjærgaard Nielsen⁵, Marco van Strijen⁶, Julien Garnon⁷, Des Alcorn⁸, Ole Graumann⁹, Eric de Kerviler¹⁰, Patricia Zondervan¹¹, Miles Walkden¹², Giovanni Lughezzani¹³, Tze Min Wah¹⁴

¹ School of Medicine, Faculty of Medicine and Health, University of Leeds, Leeds, United Kingdom

² Bristol Urological Institute, North Bristol NHS Trust, Bristol, United Kingdom

³ Department of Urology, OLVG, Amsterdam, the Netherlands

⁴ Department of Radiology, Southampton University Hospitals, Southampton, United Kingdom

⁵ Aarhus University Hospital, Department of Urology, Aarhus, Denmark

⁶ Department of Radiology, St Antonius Hospital, Nieuwegein, The Netherlands

⁷ Department of Interventional Radiology, Nouvel Hôpital Civil, 1 place de l'Hôpital 67000 Strasbourg, France

⁸ Department of Interventional Radiology, Gartnavel General Hospital, Glasgow, United Kingdom

⁹ Department of Radiology, Odense University Hospital, Denmark

¹⁰ Radiology Department, Saint-Louis Hospital, AP-HP, 1, avenue Claude-Vellefaux, 75475 Paris cedex 10, France

¹¹ Department of Urology, 26066Amsterdam UMC, University of Amsterdam, the Netherlands.

¹² Department of Imaging, University College London Hospitals NHS Foundation Trust, London, United Kingdom

¹³ Vita-Salute San Raffaele University, Department of Urology, Milan, Italy

¹⁴ Department of Diagnostic and Interventional Radiology, Institute of Oncology, Leeds Teaching Hospitals Trust, St. James's University Hospital, Leeds, United Kingdom

OBJECTIVES: To evaluate the use of pre-cryoablation biopsy for small renal masses (SRMs) and the effects of increasing up take on histological results of treated SMRs. **METHODS:** From 2015 to 2019, patients with sporadic T1N0M0 SRMs undergoing percutaneous, laparoscopic or open cryoablation from 14 European institutions within the European Registry For Renal Cryoablation (EuRECA) were included for the retrospective analysis. Univariate and multivariate logistic models was used to evaluate the trends, histological results and the factors influencing use of pre-cryoablation biopsy. **RESULTS:** 871 patients (Median [IQR] age, 69[14], 298 women) undergoing cryoablation were evaluated. The use of pre-cryoablation biopsy has significantly increased from 42% (65/156) in 2015 to 72% (88/122) in 2019 ($p < 0.001$). Patients treated for a benign histology are significantly more likely to have presented later in the trend, where pre-cryoablation biopsy is more prevalent (OR: 0.64, 95% CI 0.51-0.81, $p < 0.001$). Patients treated for undiagnosed histology are also significantly less likely to have presented in 2018 compared to 2016 (OR 0.31, 95% CI 0.10-0.97, $p = 0.044$). Patients aged 70+ are less likely to be biopsies pre-cryoablation ($p < 0.05$). R.E.N.A.L. nephrometry score of 10+ and a Charlson Comorbidity Index > 1 are factors associated with lower likelihood to not have received a pre-cryoablation biopsy ($p < 0.05$). **CONCLUSION:** An increased use of pre-cryoablation biopsy was observed and cryoablation patients treated with a benign histology is more likely to have presented in periods where pre-cryoablation biopsy is not as prevalent. Comparative studies are needed to draw definitive conclusions on the effect of pre-cryoablation biopsy on SRM treatments.

15. **MULTIMODAL IMAGE-GUIDED ABLATION ON MANAGEMENT OF RENAL CANCER IN VON-HIPPEL-LINDAU SYNDROME PATIENTS FROM 2004-2021 AT A SPECIALIST CENTRE: A LONGITUDINAL OBSERVATIONAL STUDY.**

Vinson Wai-Shun Chan¹, James Lenton², Jonathan Smith², Satinder Jagdey³, Christy Ralph³, Selina Bhattarai⁴, Andrew Lewington⁵, Michal Kimuli⁶, Jon Cartledge⁶, Tze Min Wah².

¹ School of Medicine, Faculty of Medicine and Health, University of Leeds, Leeds, LS2 9JT, United Kingdom

² Division of Diagnostic and Interventional Radiology, Institute of Oncology, St. James's University Hospital, Beckett Street, Leeds LS9 7TF, United Kingdom

³ Division of Medical Oncology, Institute of Oncology, St. James's University Hospital, Beckett Street, Leeds LS9 7TF, United Kingdom

⁴ Division of Pathology, Institute of Oncology, St. James's University Hospital, Beckett Street, Leeds LS9 7TF, United Kingdom

⁵ Division of Nephrology, St. James's University Hospital, Beckett Street, Leeds LS9 7TF, United Kingdom

⁶ Division of Urology, Institute of Oncology, St. James's University Hospital, Beckett Street, Leeds LS9 7TF, United Kingdom

OBJECTIVES: To analyse the safety, technical feasibility, long-term renal function-, and oncological outcome of multi-modal technologies in image-guided ablation (IGA) for renal cancer in Von-Hippel-Lindau (VHL) patients and evaluate factors that may influence the outcome. **METHODS:** Retrospective analysis of a prospective database of VHL patients who underwent IGA at a specialist centre. Patient's demographics, treatment energy, peri-operative outcome and oncological outcomes were recorded. Statistical analysis was performed to determine factors associated with complication and renal function reduction. The overall, 5 and 10-year cancer-specific (CS), local recurrence-free (LRF) and metastasis-free (MF) survival rates were presented with Kaplan-Meier Curves. **RESULTS:** From 2004-2021, 17 VHL patients (age 21-68.2) with a mean (\pm SD) RCC size of 2.06 ± 0.92 cm received IGA. Median (IQR) RCCs per patient was 3 (2-4) over the course of follow up. Fifty-four RCCs were treated using radiofrequency ablation ($n=11$), cryoablation ($n=38$) and irreversible electroporation ($n=8$) in 50 sessions. The primary and overall technical success rates were 94.4% (51/54) and 98% (53/54). One CD-III complication with proximal ureteric injury. Five patients in seven treatment sessions experienced a $> 25\%$ reduction of eGFR immediately post-IGA. All patients have preservation of renal function at a median follow-up of 79 (51-134) months. The 5 and 10-year CS, LRF and MF survival rates are 100%, 97.8% and 100%. Whilst, the 5 and 10-year overall survival rates are 100% and 90%. **CONCLUSION:** Multi-modal IGA of de novo RCC for VHL patients is safe and has provided long term preservation of renal function and robust oncological durability.

16. **TEACHING ULTRASOUND-GUIDED CANNULATION TO FOUNDATION YEAR 1 DOCTORS.**Rebecca Morris¹, J Gleeson¹, H Boal¹, T Sharp¹, A Wragg¹, E Dodd¹, J Thompson¹¹ Mid Yorkshire Hospitals NHS Trust

BACKGROUND: A new programme called STRIDE (Simulation, Teaching, and Reflection for FY1 Development & Education) has been introduced in 2021-22 for Foundation Year 1 Doctors at Mid Yorkshire NHS Trust. The first day of teaching with the theme of "Surviving F1" included a session teaching ultrasound guided cannulation. **OBJECTIVES:** Identify patients where Ultrasound (US) guided cannulation may be applicable. Demonstrate how to perform US guided cannulation. Apply the technique using mannequins. Build confidence to utilise US on the wards. **PROCEDURE DETAILS:** The one-hour teaching session began with an introduction and discussion of the context of the skill. There was an explanation of how the US machine works and a demonstration into how it is used to guide cannulation. The doctors then had 30 minutes to practice using mannequins with the last ten minutes of the session concluding the teaching, answering any questions and encouraging the students to use what they have learnt in their jobs on the wards. **CONCLUSION:** The teaching session was successful across all groups with feedback demonstrating that the doctors appreciated learning the skill, they enjoyed the session and they felt more confident to use US in practice with patients. There certainly seems to be a place for introducing junior doctors into radiology and the applications of it in terms of procedures and there is hope that this session can lead the way for more education to be delivered with a radiology and interventional radiology focus.

17. **A REVIEW OF IMAGE GUIDED LOCALISATION OF LUNG LESIONS FOR VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS).**Omar Mostafa¹, Derek Grokeutz².¹ Walsall Healthcare NHS Trust, U.K² Quinnipiac University, Hamden, Connecticut, U.S.

BACKGROUND: The use of different imaging modalities in management of tumours has led to early detection of primary and secondary lesions at early stages of tumour progression. Coupled with the emergence of wire guided localisation in 1993, this has facilitated precise targeting of deep and challenging lung tumours not fit for surgical excision. Subsequently, the role of interventional radiology has become influential in improving surgical outcomes. Localisation can be performed using two techniques: 1) Percutaneous hook-wire placement. 2) Dyes, oil or radioisotopes (Injections of). **OBJECTIVES:** Describe and explore the use of imaging in localising lesions peri-operatively prior to surgical resections. **RESULTS:** Reviews in this field are limited. Multiple studies have reported a high success rate (>95% of cases) with percutaneous hook-wire placement and up to 100% with injections. Minor complications with hook-wire were reported in up to 50% of cases; those included small pneumothoraces, pain and wire-dislodgment. Major complications included large or tension pneumothoraces (<2%). On the contrary, complications from injections were <10% overall, including minor allergic reactions (<1%). **CONCLUSION:** Commonest reason for VATS conversion to thoracotomy is failure of lesion localisation. Image guided localisation, whether by wire or dyes, significantly increases the technical success of VATS. Minor complications are more common in wire-guided procedures than in dyes or radioisotopes.

18. **LONG-TERM OUTCOMES OF IMAGE-GUIDED ABLATION AND LAPAROSCOPIC PARTIAL NEPHRECTOMY FOR T1 RENAL CELL CARCINOMA.**Vinson Wai-Shun Chan¹, Filzah Hanis Osman¹, Jon Cartledge², Walter Gregory³, Michael Kimuli², Naveen S. Vasudev⁴, Christy Ralph⁴, Satinder Jagdev⁴, Selina Bhattarai⁵, Jonathan Smith⁶, James Lenton⁶, Tze Min Wah⁶¹ School of Medicine, Faculty of Medicine and Health, University of Leeds, Leeds, England, United Kingdom² Department of Urology, St. James's University Hospital, Leeds, United Kingdom³ Leeds Institute of Clinical Trials Research, University of Leeds, Leeds, United Kingdom⁴ Department of Medical Oncology, St. James's University Hospital, Leeds, United Kingdom⁵ Department of Pathology, St. James's University Hospital, Leeds, United Kingdom⁶ Department of Diagnostic and Interventional Radiology, Institute of Oncology, Leeds Teaching Hospitals Trust, St. James' University Hospital, Leeds, England, United Kingdom

OBJECTIVE: To compare long-term outcomes and peri-operative outcomes of image-guided ablation (IGA) and laparoscopic partial nephrectomy(LPN). **METHODS:** This is a retrospective cohort study of localised RCC (T1a/bN0M0) patients undergoing cryoablation (CRYO), radio-frequency ablation (RFA) or LPN at our institution from 2003 to 2016. Oncological outcomes were compared using Cox regression and log-rank analysis. eGFR changes were compared using Kruskal-Wallis and Wilcoxon-rank tests. **RESULTS:** 296 (238 T1a, 58 T1b) consecutive patients were identified, 103, 100 and 93 patients underwent CRYO, RFA and LPN, respectively. Median follow-up time was 75, 98 and 71 months, respectively. On univariate analysis, all oncological outcomes were comparable amongst CRYO, RFA and LPN ($p > 0.05$). On multivariate analysis, T1a patients undergoing RFA had improved local-recurrence-free survival (LRFS) (HR 0.002, 95%CI 0.00-0.11, $p=0.003$) and metastasis-free survival (HR 0.002, 95%CI 0.00-0.52, $p=0.029$) compared to LPN. In T1a and T1b patients combined, both CRYO (HR 0.07, 95%CI 0.01-0.73, $p=0.026$) and RFA (HR 0.04, 95%CI 0.03-0.48, $p=0.011$) had improved LRFS rates. Patients undergoing CRYO and RFA had a significantly smaller median decrease in eGFR post-operatively compared to LPN (T1a: $p < 0.001$; T1b: $p=0.047$). Limitations include retrospective design and limited statistical power. **CONCLUSION:** IGA is potentially as good as LPN in oncological durability. IGA preserves kidney function significantly better than LPN. More studies with larger sample size should be performed to establish IGA as a first-line treatment alongside LPN.

19. **IMAGING RECOMMENDATIONS DURING THE COVID PANDEMIC FOR THE INVESTIGATION OF RIGHT ILLIC FOSSA PAIN: AN UNACHIEVABLE AND UNNECESSARY BURDEN ON RADIOLOGY SERVICES?**

Alice Doughty¹, S Cheetham¹, M Kenber¹, E Smellie, A Saha¹
¹ Calderdale Huddersfield Foundation Trust

AIMS: Initial Covid-19 surgical guidance, produced without radiological input, recommended that patients with right iliac fossa (RIF) pain should have imaging before intervention. This study quantified the burden on imaging services from these guidelines. **METHODS:** Patients who presented to a DGH general surgical unit with RIF pain from March to October 2020 were identified. Clinical parameters, radiology and final diagnosis were recorded. Minimum follow-up was 12 months (October 2021) to identify re-admissions and morbidity. **RESULTS:** There were 417 patients. There was a drop in admissions in the first months of each new wave of Covid (March/April, September/October) compared with intervening months (36% vs. 64%, $P=0.036$). 266 patients (64%) had a CT scan increasing from 42% of patients in March to 75% in September ($P=0.019$). The proportion of patients with normal imaging increased correspondingly with over a third (34%) of CT scans being normal. 93 CT scans (35%) showed appendicitis, which was the suspected diagnosis in all but 7 of these patients. Patients with normal imaging had lower white cell counts (Mean 10.1×10^9 vs. $14.8 \times 10^9/L$, $P<0.001$) and CRPs (Mean 21 vs. 99, $P<0.001$). Patients seen first by a consultant were less likely to require imaging. **CONCLUSION:** During the first year of Covid-19, two-thirds of patients with RIF pain had a CT scan with a third being normal. Most scans showing appendicitis had clinical parameters consistent with this diagnosis. Current guidelines may lead to unsustainable pressures on radiology services; ensuring consultant assessment prior to imaging requests may reduce the burden on these teams.

20. **CASE REPORT – HYBRID REPAIR OF RUPTURED SUPRARENAL ANEURYSM.**

Lois Scoffield¹.
¹ Leeds Teaching Hospitals

BACKGROUND: A 54 year old male gardener presented to a District General Hospital with sudden onset lower abdominal and back pain. He had a tender abdomen and was haemodynamically unstable. An urgent CT scan demonstrated a ruptured suprarenal abdominal aortic aneurysm. **RESULTS:** The patient was transferred to the regional tertiary vascular centre. With no “off the shelf” branched stent graft immediately available locally, nor surgical expertise for complex thoracoabdominal repair, the on-call surgical and interventional radiological team devised a hybrid repair. His coeliac axis was embolised prior to an SMA chimney EVAR covering his renal arteries. This was immediately followed by a laparotomy and bilateral surgical CIA-renal artery PTFE bypass grafts. After two weeks the left renal bypass underwent stenting of a stenosis at the distal anastomosis, the right renal bypass had occluded. After a long recovery on intensive care he was ultimately discharged without requiring renal replacement therapy. Three months later he underwent embolization of a bleeding hepatic artery pseudoaneurysm which had possibly developed as a result of liver infection, ischaemia or an initial wire injury. After six months the patient is recuperating at home. **DISCUSSION:** Whilst pure surgical or endovascular solutions to this complex aneurysm are possible, the hybrid repair performed was a unique solution utilising the local skills and available equipment of both interventional radiology and vascular surgery. Having required two further endovascular procedures and a long stay on intensive care he will be closely followed up clinically and radiologically.

21. **AUDIT OF THE CONSENT PROCESS IN INTERVENTIONAL RADIOLOGY AND PATIENT PERSPECTIVES.**

Iman Sulevani*¹, Bipima Gurung*¹, Jim Zhong², Chris Hammond², Oliver Hulson²

**Joint first author*

¹ School of Medicine, University of Leeds

² Department of Diagnostic and Interventional Radiology, Leeds Teaching Hospitals NHS Trust, Leeds, UK

OBJECTIVE: The current guidance on the pre-procedural consent from the General Medical Council recommends a two-stage process. In many interventional radiology (IR) departments, patients are consented on the same day of their procedure, often immediately prior to their procedure, in breach of GMC guidance. The aim of this two-cycle audit was to evaluate patients' perspectives on consenting processes in an IR department. **METHODS:** A prospective audit was carried out between December – March 2016 (cycle 1), and March – August 2021 (cycle 2). Patients were invited to complete a questionnaire after they were consented for IR procedures (angiographic and US guided interventions). Patients self-rated their understanding of the procedure and its risks and benefits before- and after consent on a Likert scale from 0 (no understanding) to 5 (full understanding). Patients also rated their overall satisfaction level with the consent process and were asked their preferences for additional face-to-face or virtual consenting appointment pre-procedure. **RESULTS:** A total of 345 questionnaires were completed: 194 patients in cycle 1 and 151 in cycle 2. The median age of patients was 63 years (range: 21-83). 222 patients (64%) were undergoing the procedure for the first time. Overall, patients felt that they had enough time to weigh up risks (90%, n=312/345), did not receive information during consent that they were unaware of beforehand (65%, n=223/345) and were satisfied with the consent process (92%, n=316/345). Most of the patients did not desire a separate consent appointment pre-procedure (89%, n=134/154). **CONCLUSION:** Despite clinicians' concerns and GMC guidance, the majority of patients feel the current consent processes are satisfactory and do not want an additional consultation for consenting.

22. **QUALITY OF ULTRASONOGRAPHY FINDINGS IN BILIARY OBSTRUCTION WITH POSITIVE MRCP SCAN.**

Yi Wah Wong¹

¹ Department of Respiratory Medicine, Pinderfields General Hospital, Mid Yorkshire Hospitals NHS Trust, United Kingdom

BACKGROUND: Abdominal ultrasound is often the first line investigation for biliary obstruction. However, sensitivity of abdominal ultrasound in detecting extrahepatic biliary dilatation secondary to biliary obstruction can be affected by operator and patient factors. The Royal College of Radiologists (RCR) recommended that where magnetic resonance cholangiopancreatography (MRCP) demonstrates common bile duct (CBD) dilatation, at least 90% of abdominal ultrasound performed beforehand should identify this. This audit is performed to investigate this in a district general hospital. **METHODS:** All MRCP performed between 15th July 2021 to 31st December 2021 were screened. Only MRCP with evidence of biliary dilatation were included. Among this cohort of patients, reports of abdominal ultrasound performed prior to MRCP were obtained and reviewed. The report should contain specific comments on presence or absence of extrahepatic biliary dilatation, cause of dilatation if known and recommendation for further imaging or referral if required. **RESULTS:** A total of 74 patients who fitted the predetermined criteria were included in this audit. Among these patients, sensitivity of abdominal ultrasound in detecting biliary dilatation is 82.4% (n=61). 4.1% (n=3) had identifiable cause of biliary dilatation, with all three due to presence of CBD stones. All ultrasound reports, (n=74) commented on the presence or absence of extrahepatic dilatation and 45.9% (n=34) documented recommendations for further actions in ultrasound report. **CONCLUSION:** Abdominal ultrasound is sensitive in identifying biliary dilatation, but has limited use in identifying its cause. The overall quality of ultrasound abdominal performed in this DGH is satisfactory.

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

ISSN 2076-6327

This journal is published by [Pitt Open Library Publishing](https://pittopenlibrarypublishing.com/)

