

**Abstracts presented at the 36th Annual Conference (Virtual Meeting)
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Radiological Society of Pakistan
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ORAL PRESENTATIONS (O)

O-1

To determine sensitivity of diffusion weighted imaging for diagnosis of hepatocellular carcinoma, keeping the dynamic post contrast MRI as gold standard

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BACKGROUND: Post contrast dynamic MRI with typical enhancement and wash out is gold standard for diagnosis of HCC. However, many patients have contraindications to contrast injections. Diffusion weighted imaging is emerging modality and to the best of our knowledge no consistent data is yet available to accurately establish the role of DWI in diagnosis of HCC.

PURPOSE: To evaluate and compare the role of DWI in diagnosis of HCC with post contrast dynamic MRI.

METHOD AND MATERIALS: After IRB approval a retrospective study was conducted, 52 diagnosed hepatocellular carcinoma cases from hospital database from July 2018 to October 2019 were evaluated by two experienced radiologists. MR-imaging was performed at 1.5 T Titan Toshiba. MR sequences were T1, T2, and DWI/ADC. Contrast enhanced T1 after 25, 60 and 180 seconds. DWI was performed by SEPI sequence. Data analysis was done using SPSS version 21 and results were compiled.

RESULTS: 50 patients (89.3 %) typical pattern on contrast enhanced dynamic imaging. 6 patients (10.7 %) showed equivocal pattern on arterial and venous phase washout. Restricted diffusion was seen in patients 51 (91.1%). Sensitivity of diffusion weighted imaging alone for diagnosis of HCC is 94%.

CONCLUSION: DWI can act as standalone sequence in diagnosis of HCC in patients with any contraindication to contrast administration. Exploring new non-invasive diagnostic modality to help improve diagnosis of HCC is challenging, this study will open doors for new researches in future.

O-2

Evaluation of the progress of COVID-19 pneumonia using the BSTI reporting model - A validation study.

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INTRODUCTION: SARS-COV-2 (known as severe acute respiratory syndrome corona virus-2), has emerged as pandemic and become a global concern, with its unprecedented nature, resulting in significant morbidity and mortality worldwide. Reverse transcription polymerase chain reaction (RT-PCR) is considered as gold standard in detecting clinically symptomatic patients presenting with fever, shortness of breath and cough. Chest X-Ray (CXR) is used as baseline investigation as well as for follow up of patients for both COVID suspected and COVID positive patients in many hospitals.

METHODS: 409 CXRs (including initial and serial X-rays) of COVID positive patients (having RT-PCR positive for COVID-19 on throat swabs) were reviewed by two experience radiologists (having experience of 3 and 5 years in radiology reporting) in a tertiary care Hospital in Karachi, Pakistan. British Society of Thoracic Imaging (BSTI) coding system was used to classify and

interpret the CXR imaging findings and to assess the prognosis of the disease severity in these patients reviewing serial Chest X-rays. These findings were then correlated with clinical data i.e patient's Oxygen saturation and C-Reactive Protein (CRP) levels during hospital course. The data was analysed using spss version 22.

RESULTS: Sample size was 409 CXRs of 255 patients; 76 % male patients (n = 193), 24 % female patients (n=62). According to BSTI coding system, initial CXRs in COVID positive patients were normal in 48% (n=123), out of which only 13% (n=16 out of 123) CXRs showed definite COVID findings on serial CXRs. Classic (definitive) COVID-19 findings were present in 35% CXRs (n=89). These patients showed moderate to severe form of disease, with less than 93 % Oxygen saturation on exertion and raised CRP levels (more than 10 mg/dl). Indeterminate findings were present in 15% (n=39) CXRs which subsequently showed definitive findings in 48% (n=19 out of 39). Non-COVID-19 findings were noted in 1.6% (n=4) CXRs only.

CONCLUSION: BSTI classification system can be used to both classify the disease and assess the prognosis of disease severity in the serial radiographs. Implications for practice utilization of BSTI reporting model for reporting CXRs , even before RT-PCR , in current or in future COVID pandemic can be considered as an ideal tool.

O-3

Role of ultrasound guided surgical clip placement in breast lesions - An advancement towards better radiological approach

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PURPOSE: The main objective of ultrasound guided surgical clip placement for breast lesions is to have a marker for better localization of tumor, precise surgical resection and neo adjuvant chemotherapeutic response using ultrasound and mammography. Further it helps the surgeon in better planning of patient management.

MATERIALS AND METHOD: This study will be conducted in mammo-graphy section of Diagnostic radiology department, Mayo hospital Lahore which is a tertiary care hospital and primary referral hospital in Punjab. A number of 10 patients with breast lesions will undergo ultrasound guided stapling from 1-8-2020 to 31-10-2020.

Stepwise systematic approach to be done with the patients selected for Neo-adjuvant chemotherapy will include:

Pre-procedural steps: Characterization of the lesion according to Breast Imaging Reporting and Data System (BIRADS) using

1. Ultrasound
2. Mammography

Post-procedural steps: Both ultrasound and Mammography of single targeted breast to assess-

1. Proper clip placement.
2. Any post intervention complication.
3. Response to Neo-adjuvant chemotherapy.
4. Follow up.

Collaboration with surgery department will be done for better accessibility of patients.

RESULTS:

- Only two patients showed complete Radiological response. Tumor bed was identified by the surgical clips placed under ultrasound guidance and surface marking done to facilitate precise surgical excision.
- Lymph node clip placement under ultrasound guidance was done in two out of 6 patients.
- No significant post intervention complication was reported.

CONCLUSION: Breast lesion stapling is definitely a better targeted approach for radiologist to better localize and delineate the tumor, follow chemotherapeutic

response, provide more accurate comparison with previous imaging and further guiding the oncologist regarding future management.

O-4

Meckel's cave sign: Identification of perineural spread of tumor to the trigeminal nerve ganglion on T2-weighted MR imaging

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OBJECTIVE: Increased signal intensity on FSE T2-WI is normally observed in the Meckel's cave due to CSF. We hypothesize that the normal increased signal in the Meckel's cave on the T2-WI will be lost or decreased, if there is perineural spread of tumor along the trigeminal nerve.

DESIGN: Original research, observational study, cross-sectional study

PLACE AND DURATION OF STUDY: Shaukat Khanum Memorial Cancer Hospital, Lahore

METHODOLOGY: 10 patients with known perineural spread (along the trigeminal nerve) of the head and neck tumors and 40 MRI studies of normal patients were selected. These patients were randomly evaluated by two faculty radiologists who were blinded for the final radiology report and histopathology. The signal intensity of the Meckel's cave on the axial and coronal T2 weighted images was evaluated. Their impression, regarding the presence or absence of disease, were tabulated and calculated for the specificity and sensitivity of Meckel's cave signal intensity for the perineural spread of tumour.

RESULTS: 8 out of 10 patients (sensitivity 80%) were correctly identified with perineural spread of tumor. Similarly, 36 patients (specificity 90%) were correctly identified as normal (Total 40 control patients). The positive and negative predictive values were 66.6% and 94% respectively.

CONCLUSION: The study determined that the loss of normal high signal intensity on T2 weighted images in the region of Meckel's cave can correctly identify patients with perineural spread of tumour along the trigeminal nerve branches.

O-5

Diagnostic accuracy of TVS in diagnosing placenta previa

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INTRODUCTION: Placenta previa is associated with significant morbidity and mortality. There is always stress on early detection to make a management plan. Routinely, transabdominal sonography (TAS) is done to evaluate the problem. However, transvaginal sonography (TVS) is promoted by some authors as having more accuracy. This study was done to determine the diagnostic accuracy of TVS in diagnosing placenta previa.

OBJECTIVE: To determine the diagnostic accuracy of transvaginal ultrasonography in diagnosis of placenta previa (operative findings kept as a gold standard).

METHODS: This was a cross sectional study which included 192 patients with placenta previa on transabdominal USG. All the patients had TVS followed by surgery (operative findings as gold standard). Diagnostic accuracy of TVS was detected by determining sensitivity, specificity and accuracy.

RESULTS: The sensitivity, specificity, and accuracy of TVS were 93.7%, 80.6%, and 91.6%, respectively.

CONCLUSIONS: TVS is a reliable test and should be done in every case of suspected placenta previa on TAS.

O-6

Ultrasound vs computed tomography in the diagnosis of acute appendicitis

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INTRODUCTION: Appendix is a small blind ended finger like projection of narrow lumen connected to the cecum. Acute inflammation of the appendix (appendicitis) is a very common cause of acute abdomen presenting to surgical units. In order to avoid unnecessary appendectomies, preoperative imaging via ultrasound and computed tomography (CT) has gained wide acceptance due to the improved diagnostic accuracy.

OBJECTIVE: To determine the diagnostic accuracy of ultrasound vs computed tomography in the diagnosis of acute appendicitis keeping histopathology as a gold standard.

MATERIALS AND METHODS: This study was conducted in the in the Department of Radiology Khyber Teaching Hospital, Peshawar from 16-06-2016 to 16-12-2016. Through a Descriptive Cross Sectional Study Design, a total of 163 patients suspected of having acute appendicitis were included in the study in a consecutive manner and subjected to US followed by CT pre operatively and histopathology post operatively for the acute appendicitis.

RESULTS: The mean age of the patients was 29.9 + 6.7 years. We had 52.8% males & 47.2% females. On US, acute appendicitis was recorded in 50.3% of patients compared to CT on which it was recorded in 58.9% of patients. Postoperatively, appendicitis was confirmed on histopathology in 43.6% of patients. US was found to have 70.4% sensitivity and 65.2% specificity. For CT, the sensitivity was found to be 90.1% and specificity 65.2%

CONCLUSION: CT is more sensitive and specific as compared to US for the detection of acute appendicitis. As such, CT is a useful radiological tool for diagnosis of acute appendicitis in adults and further studies are recommended to confirm its usefulness.

O-7

Relationship of dolichoectasia with hypertension - Is it strong enough?

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PURPOSE: To establish an association of hypertension with dolichoectasia of vertebro-basilar system on MRI brain.

METHOD AND MATERIALS: Ours was a retrospective cross-sectional study between June 2017 and June 2019 in which we studied MRI brain of 200 patients of age 40 years and above. Of these 100 patients were clinically normotensive (described as having normal blood pressures according to age on atleast 2 separate settings and a normal blood pressure recorded on the day of examination). Rest of the 100 patients were clinically hypertensive and receiving antihypertensive medication. We studied the vertebro-basilar system of these patients and described dolichoectasia as a greater than 4.5 mm dilatation of basilar or vertebral artery, deviation of any portion of greater than 10 mm from shortest expected course, basilar artery length of > 29.5 mm or intracranial vertebral artery length > 23.5 mm.

RESULTS: Among 100 normotensive patients, 37 had dolichoectasia of vertebro-basilar system. A close detail of history of these normotensive patients with dolichoectasia revealed 23 were diabetic, 3 patients had chronic kidney disease, 2 were treated for SLE, 1 had Wegener's granulomatosis, 2 had been treated for cancer, while 6 had no known comorbid. Among the 100 hypertensive patients, 88 had dolichoectasia of vertebro-basilar system. The incidence of this pathology was more frequent in male population.

CONCLUSION: Our study demonstrates a strong association of dolichoectasia with hypertension (frequency of 88% in hypertensive versus 33% in normotensive patients). Where dolichoectasia is encountered in normotensive patients there is usually another underlying comorbid condition.

CLINICAL RELEVANCE/APPLICATION: The prevalence of dolichoectasia is more frequent in patients with underlying comorbidities and while it appears more prevalent in hypertensive population, where patient is normotensive its presence is more frequently associated with another underlying comorbidity of which most common appears to be diabetes.

O-8

Assessment of malignancy risk in thyroid nodules using ACR TIRADS scoring - Are we over-reporting suspicion of malignancy

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PURPOSE: To determine the accuracy of ACR TIRADS classification assigned on ultrasound to score a potential malignancy.

METHOD AND MATERIALS: This is a descriptive, retrospective cross-sectional study conducted in a tertiary care hospital. A total of 237 patients with thyroid nodule were studied in duration between 1st January 2019 to 5th March 2020. Of these, 164 patients were included who underwent an ultrasound for TIRADS scoring of suspicious nodule and subsequently an FNA cytology. Excluded were those patients in whom ultrasound was not followed by FNAC. Patients with TIRADS 1 and TIRADS 2 scored nodules were also excluded. We followed the ACR-TIRADS criterion to assign points for final score of malignant probability of suspicious thyroid nodule in each patient. Our results were compared with cytological analysis. Data was analyzed on Spss v21. Accuracy was assessed by frequency and percentage of malignancy for each of the TIRADS score in correlation with cytological results.

RESULTS: 84 patients were assigned TIRADS III on ultrasound (mildly suspicious nodule for malignancy) of which only 3 had malignancy confirmed on FNAC (3.6% of patients with TIRADS III score). 62 patients were assigned TIRADS 4 score (moderately suspicious nodule for malignancy) of which 6 showed cytological malignant nodule (9.7% of patients with TIRADS IV score) and 18 patients were assigned TIRADS 5 (highly suspicious nodule for malignancy) of which 14 had malignancy confirmed on FNAC (77.8% of patients with TIRADS V score).

CONCLUSION: ACR-TIRADS classification based on scoring of suspicious nodule on ultrasound was most accurate for TIRADS 5 nodules. Majority of nodules assigned TIRADS III and IV were benign. ACR TIRADS score therefore over staged thyroid nodules for TIRADS III and IV as most of the nodules in these two categories were not malignant.

CLINICAL RELEVANCE/APPLICATION: ACR-TIRADS score though widely used is not truly representative of the level of suspicion with which a thyroid nodule needs to be scrutinized via cytology as majority of thyroid nodules are benign, and TIRADS III and IV score carry an unnecessary high need for FNAC analysis based on scoring recommendations. Follow-up of thyroid nodules in TIRADS III and IV may be a better alternative to FNAC (which is an invasive procedure and may be accompanied by complications) as per our experience.

O-9

High frequency ultrasound in detection of knee meniscal tears

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INTRODUCTION: Timely diagnosis of meniscal pathology is vital for determining type and timing of treatment, as well as prognosis for return to function. Ultrasonographic examination of the knee shows promise for being an effective diagnostic tool for assessing meniscal pathology with the potential to overcome many of the shortcomings of MRI.

OBJECTIVE: To determine the diagnostic accuracy of high frequency ultrasound in the diagnosis of Meniscal Injuries keeping arthroscopy as a gold standard.

STUDY SETTINGS: Radiology Department, Khyber Teaching Hospital Peshawar.

STUDY DURATION: From 03-05-2018 to 03-11-2018

MATERIALS AND METHODS: This study was conducted in the Department of Radiology, Khyber Teaching Hospital, Peshawar. Through a Descriptive Cross Sectional Study Design, a total of 125 cases suspected of having meniscal injury were included in the study in a consecutive manner and subjected to high frequency ultrasound followed by arthroscopy for the confirmation of meniscal injuries.

RESULTS: The mean age of the patients was 36.7 + 9.2 years. We had 71.2% males & 28.8% females. The mean BMI of the study sample was 23 + 2.1 kg/m². On HFUS we observed meniscal injury in 73.6% of patients compared to 60% on follow up arthroscopy. On applying the formulae for calculation, sensitivity of meniscal injury was found to be 81.3% and specificity 38%. The positive predictive value of the HFUS was 66.3% and negative predictive value was 57.6%.

CONCLUSION: High frequency ultrasound has an acceptable sensitivity and specificity for the detection of meniscal injuries. As such, it is a useful radiological marker for diagnosis of meniscal injuries in adults and further studies are recommended to confirm its usefulness.

O-10

Which side is which? Audit to assess Radiographic image labelling.

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OBJECTIVE: To assess the local practice of anatomic side markers placement at radiology department of RMI. To ascertain the placement of legible markers. To assess the accuracy of marker placement and to verify whether markers were placed during pre-exposure or in post processing.

METHOD: A hospital based descriptive prospective study was conducted at Rehman Medical Institute from July 2020 to October 2020 over a span of 3 months. The sample size was set for 500 consecutive x-ray images of each chest, musculoskeletal, kidney ureter and bladder (KUB), paranasal sinuses and pelvis. The Australian Institute of Radiography guidelines and 'Best practices in digital radiography' were taken as standards to compare our setup compliance with. Each image was assessed for placement of a legible anatomic side marker. Missing markers were documented. Errors in marker placements were recorded for both pre and post exposure practices and the reasons for these mistakes were analyzed. An immaculate record was kept of marker placement in pre-exposure or post processing. For images where pre-exposure

marker was used documentation of placement of marker in primary or secondary beams were made. For both practices relative percentages were assessed. A close ended questionnaire was distributed among the radiographers to assess their knowledge related to standard guidelines, their methods of preference for use of markers (pre or post exposure) and to analyze the possible reasons for their inclination to the use of post processing ASMs.

RESULTS: Of the 500 consecutive images the missing markers were found in 1.2% (n=6). 1.8% (n= 9) were marked wrong. We found that 79.8% (n=399), of images in our setup were marked during post processing. 6.4% (n=32) were marked during pre-exposure alone. All of these were placed in secondary beam field. 13% (n= 65) had both pre and post exposure markers placed. Of the 11 radiographers we questioned, 4 were aware of the optimal guidelines with knowledge about pre and post exposure markers. 4 of the new recruits had limited knowledge about markers used in pre- exposure specifically pertaining to placement in primary and secondary beams.

CONCLUSION: In our study we found errors of missing markers in 6 images (1.2%). Erroneous placement of markers was documented in 9 radiographs (1.8%). We observed a heavy practice (79.8%, n= 399) of post processing marker placement. Pre-exposure markers were placed mostly by senior radiographers who were aware of the optimal guidelines. Most of radiographers justified their use of post processing markers only due to time constraints, distressed patients or pediatric patients who would be uncooperative and for time saving while training the students or techs who would otherwise take more time in marker placement due to their inexperience. 4 were aware of standards while others were not. We intend to have a re audit after discussion regarding to methods that can be applied for the improvements in this practice.

O-11

Fluoroscopic defecography

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BACKGROUND: For nearly five decades the morphologic and dynamic changes during defecation are being studied through fluoroscopic defecography. Defecation disorders are often unlikely to be identified by static imaging. Fluoroscopic defecography evaluated in real time the dynamic changes that occur within the anal canal and rectum in correlation with the adjacent pelvic bony structures. Although MR defecography is now replacing fluoroscopic defecography in more advanced places due to high resolution as well as avoiding radiation exposure, fluoroscopic defecography is still considered gold standard test for evaluation anorectal function during evacuation.

OBJECTIVE: This study is primarily designed to understand the technique and imaging findings as well as to analyze the frequency of different findings at fluoroscopic defecography in patient with defecation disorder.

MATERIALS AND METHODS: We retrospectively reviewed all fluoroscopic defecography studies performed in (2017-2020) patients presenting with defecation problems and normal colonic transient time function.

RESULTS: We included 64 patients (20/44 females/males). Most of the patient is being refer to tertiary care hospital with chief complain of chronic constipation. Of 64 patient, 60 (93.7%) showed positive findings on FD, including rectocele 30/64, 46.9 %, intussusception 42/64, 65.6 %, enterocele 19/64, 29.7 %, incomplete evacuation 25/64, 39.1%, pelvic floor dyssynergia (PFD) (6/58, 9.4.0%) and mega rectum 3/64. Only 4 (6.25) patient does not show any significant abnormality of FD.

CONCLUSION: Fluoroscopic defecography is valuable tool in investigating and understanding the pathophysiology of chronic constipation in patient with defecation disorders.

O-12

DEB-TACE (drug eluting beads transarterial chemoembolisation): Our initial experience at Mayo hospital

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INTRODUCTION: Transarterial Chemoembolisation (TACE) is the current standard of therapy for patients with intermediate stage hepatocellular carcinoma (HCC) according to Barcelona clinic liver cancer classification. Conventional TACE is performed with injection of an emulsion of a chemotherapeutic drug with lipiodol into the artery feeding tumor followed by embolization of same feeding vessel to obtain synergistic effect of drug cytotoxic activity and ischemia. DEB-TACE is a type of TACE that uses microbeads as carriers to chemotherapeutic drugs. Compared with traditional TACE, DEB-TACE has unique properties of improving delivery efficiency, results in prolonged slow release of chemotherapeutic drug with less systemic toxicity and less chances of post embolization syndrome. The aim of the study was to analyze the effectiveness and complications of DEB-TACE performed at our unit and compare with international data.

MATERIALS AND METHODS: Approval from institutional review board and ethics committee was sought. Data of 25 patients who had DEB-TACE was retrospectively analyzed from April 2019 to February 2020. The procedures were done in angiography suite of Radiology Department of Mayo Hospital. 30-60 micrometers Hepasphere particles were used as microbeads which were used in combination with Doxorubicin followed by gelfoam. Stasis of feeding artery was used as endpoint of DEB-TACE. Clinical data and follow-up CT scans were reviewed. Tumor response assessment, progression free survival and safety assessments were done.

RESULTS: Out of 25 patients, 21 patients had excellent response after first session of TACE. 4 patients had partial response after first session and had second session of TACE. Considering complications, only 1 patient had cholecystitis which resolved after conservative management.

CONCLUSION: Results of DEB-TACE performed at our unit are comparable with international data highlighting the fact DEB-TACE is a safe and effective treatment in management of HCC.

O-13

Audit of appropriateness of CT and MRI

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OBJECTIVE: To audit the appropriateness of CT and MRI performed at RMI according to guidelines of ACR.

STANDARD: Appropriateness criteria of the American College of Radiology (ACR) for MRI and CT scans.

TARGET: 100% (80% acceptable in first audit).

METHODS AND MATERIALS: This is audit of appropriateness of MRI and CT imaging done in the Radiology department of Rehman Medical institute Peshawar between 01-04-2020 and 30-07-2020. CT was done on 128 multidetector Toshiba Aquilion CT scanner and MRI on 1.5T GE MR. Total 400 scans were selected from PACS, equal number of MRI and CT. The clinical history of the patients was acquired from central database (HMIS). The images were viewed through PACS workstation using Synapse® (FUJI DICOME VIEWER). The protocol of the scan performed was then compared with the guidelines of ACR. For each scan performed, collected data included age, gender, referrer, clinical information, requested examination, scan

performed, recommended exam by ACR and appropriateness was assessed. The data was analyzed using SPSS 21.

RESULTS: Our results showed that only 3 MRI scans (1.5%) and 16 CT scans (7.7%) were inappropriate. Two of the inappropriate MRI procedures were referred by general practitioners (GP) and one by surgeon for MRI. In case of CT scan 10 were referred by GP and 6 by concerned specialist. The most inappropriate scan was CT abdomen with contrast.

CONCLUSION: We concluded from our audit that 90.8% of scans were appropriate. Among the 9.1% inappropriate scans, CT scans were more as compared to MRI (1.5%), likely due to the reason of being performed at out-of-hour emergency referral and non-availability of radiology resident at these hours for justification.

The reason for more appropriate scans at RMI were as follows:

1. Most of the scans are referred by specialist.
2. Separate justification counter in the radiology department.
3. All scans are done under the supervision of consultant radiologists.
4. Trained technician who knows appropriate protocol for each clinical condition.

RE-AUDIT: ACR suggests that 100% of scans should be appropriate. We will implement changes and will re-audit after 6 months.

O-14

Adequacy of indication of CT brain plain in patients with head injury - An audit of request / referral forms in a tertiary care hospital

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BACKGROUND: Road traffic accidents (RTAs) are a leading cause of death worldwide. Out of these the most detrimental injuries are the ones sustained to the head. Patients with head injury upon presentation to the ER are vitally stabilized and evaluated by neurology team upon which they decide the need of further investigation according to NICE Guidelines. CT Brain plain is the gold standard investigation in patients with head trauma.

OBJECTIVE: The purpose of the study is to audit the accuracy of indications provided on CT brain plain request forms at Radiology Department of Mayo Hospital Lahore, Pakistan.

MATERIALS AND METHODS: After approval from institutional review board and ethics committee, a retrospective study will be done over a period of one month i.e. from 1st August 2020 to 31st August 2020. CT Brain plain request forms of 100 patients with head injury referred from the ER will be analysed for appropriateness of indications according to NICE guidelines.

O-15

A comprehensive review of animals in neuroradiology

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ABSTRACT: Neuroradiology remains the most fascinating dimension of radiology; encompassing a variety of interesting radiological signs manifested in the brain with particular neurological disease. Interestingly most of these signs resemble different animals, birds or insects in the brain. Understanding

and recognizing these signs aids in successful interpretation of the scans and aids in establishing appropriate diagnosis.

The purpose of this is to illustrate these typical neuro-radiological appearances resembling various animals and to develop an understanding for the underlying causes and mechanism behind these imaging appearances.

METHOD: We compiled all these cases with interesting neuro-radiological signs manifested on CT and MRI performed at Shifa international hospital, Islamabad from January 2016 - December 2019. These include:

1. Hallervorden Spatz disease; eye of tiger sign
2. Wilson disease; Face of the giant Panda sign
3. Central pontine myelinolysis; Owl eye appearance
4. Glioma; Butterfly sign
5. Joubert syndrome; Bat wing fourth ventricle
6. Metachromic leukodystrophy; Tigroid pattern
7. Meningioma: Tail sign
8. Corpus callosum agenesis; Steer horn ventricles
9. Penguin sign; Progressive supranuclear palsy
10. Bulls eye sign; Cerebral metastasis
11. Caput medusa; DVA.
12. Tumefactive demyelination: Horseshoe enhancement
13. Arnold-chiari malformation: Tectal beaking
14. Cerebellar hemorrhage: Zebra sign

CONCLUSION: Knowledge of these easily decipherable animal based signs in brain is important as it helps in narrowing down the elaborate list of differentials and also facilitates in making imaging based diagnosis.

O-16

Risk factors analysis of vascular invasion in hepatocellular carcinoma

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OBJECTIVE: To analyze association between vascular invasion and various tumor parameters in patients with hepatocellular carcinoma (HCC).

SUBJECTS AND METHODS: After approval from Institutional Review Board, this retrospective cross-sectional study was conducted in Department of Radiology at Shifa International Hospital, Islamabad. Data of all patients scanned for hepatocellular carcinoma (HCC) between 2017 to September 2020 was obtained from hospital database system. Patients with tumors showing more than 90% necrosis or those treated by chemoembolization were not included in this study. A total of 78 patients were included in the study. All patients with HCC were scanned using multi-slice CT and 3 Tesla MRI as imaging tools. Scans were perused for parameters including tumor size, location, morphology, encapsulation, tumor enhancement and vascular invasion. Size of the tumors was measured along their longest axis and recorded in centimeters (cms).

Data was analyzed on SPSS 23. Descriptive statistics were reported in percentages or means. Vascular invasion was cross-tabulated against size, location, morphology and encapsulation of tumor. Chi square test was used to determine significance of the differences between parameters.

RESULTS: Out of a total of 78 patients, 54 (69.2%) were male and 24 (30.8%) female. Minimum age of patients was 22 and maximum 77 years with a mean age of 56.76 ± 10.857 . Size of tumors as measured along their longest axis, ranged from 1 to 22 cms with a mean size of 7.29 ± 4.761 cms. Forty one patients (53%) showed vascular invasion in one or more branches of portal vein. There was significant difference in vascular invasion of small and large tumors ($p=0.02$). Difference between vascular invasion of unifocal and

multifocal tumors was statistically significant ($p=0.40$) although there was no significant difference between peripheral and centrally located ones. Unencapsulated tumors and those with raised serum AFP levels were more likely to invade multiple vessels as compared to those with tumors that were encapsulated or had normal AFP levels ($p=0.001$ and $.016$ respectively). Similarly infiltrative tumors were more likely to invade multiple vessels ($p=0.000$). Tumors with typical enhancement pattern showed more vascular invasion than atypical ones although the difference was not statistically significant ($p=0.557$).

CONCLUSION: Larger size and multifocality of HCC are associated with more vascular invasion.

O-17

Radiographic patterns of corona virus disease 2019 (COVID-19) in patients presenting to lady reading hospital, Peshawar, Pakistan and literature review

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BACKGROUND: COVID-19 is a novel viral infection primarily infecting respiratory tract. Chest radiography is the first-line imaging for patients with suspected or confirmed COVID-19 infection. For ease of decontamination use of dedicated portable radiography unit is preferred.

METHODS: This prospective observational study was conducted on 178 consecutive swab positive COVID-19 patients presenting to Lady Reading Hospital, Peshawar, Pakistan from 15th March to 15th June 2020. Patients of all ages and both genders were included. Chest radiographs performed by portable X-ray unit were viewed for different patterns by two consultant radiologists independently and results were analyzed using IBM SPSS 20.

RESULTS: Out of 178 patients 134 were male. Mean age was 55.67 years. Radiographic patterns observed included; ground glass haze without or with reticulation and/or consolidation (45.5 % and 33.2% respectively) and consolidation either alone or in combination with ground glass haze or other findings (27.1% collectively). Peripheral distribution pattern was seen in 69.1% of patients with bilateral findings in 84.3%. Further categorization was based on pulmonary zonal demarcation with changes most commonly involving four zones (33.1%) i.e., the lower and mid zones bilaterally.

CONCLUSION: Dedicated portable chest radiography is a vital tool for assessing different patterns of COVID-19 especially those patients who cannot be mobilized. The most common pattern of the disease in our study is bilateral alveolar opacification in peripheral distribution with initial lower zone involvement.

O-18

Computer aided reading of chest radiographs in screening of pulmonary tuberculosis in a high-volume tertiary care public sector hospital, Peshawar, Khyber-Pakhtunkhwa province, Pakistan

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BACKGROUND: WHO tuberculosis profile 2018 for Pakistan shows annual incidence of 562,000 with 80% new and relapse cases of TB having 42% female and 45% male distribution. MDR/RR TB cases are 2-4% annually.

Patients undergoing treatment are 64% while annual fatality ratio is 8%. Patients tested with rapid diagnostics are 22%.

METHODS: This cross-sectional observational study was conducted by Radiology Department Lady Reading Hospital Peshawar in affiliation with Indus Hospital network. Data collected from mass screening by using CAD4TB software to analyze chest radiographs using scoring of 1-100. Individuals presumptive of tuberculosis referred for GeneXpert.

RESULTS: Out of 26,997 individuals screened, 2617 individuals were found presumptive for pulmonary TB by CAD4TB on radiograph findings and clinical information. Sputum samples for GeneXpert were obtained in 2100 individuals, out of which 1825 were presumptive on CAD4TB. GeneXpert was positive in 159 patients and negative in 1666 individuals.

275 of the 2100 were assessed for GeneXpert on the basis of clinical indication although their CAD4TB was negative out of which 32 patients were positive and 243 negative on GeneXpert. Hence sensitivity of 82% and specificity of 12%.

CONCLUSION: CAD4TB used for reading chest radiographs is a helpful tool for mass screening of TB in a high burden countries, like Pakistan. The software can be strengthened by radiologist input, hence making it an effective means for mass screening and early diagnosis of TB in individuals, who would otherwise go undiagnosed.

O-19

MRI brachial plexus with anatomical and pathological details our experience at SIH; a pictorial review

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INTRODUCTION: Brachial plexopathies, present with vague symptoms and often is a diagnostic challenge for clinicians. Clinical examination and electrophysiological studies are useful but may not localize the lesion accurately. Magnetic resonance imaging (MRI) with its high soft tissue contrast resolution and multiplanar imaging capability has an important role in evaluation of the pathologies involving brachial plexus. The objective of this study is to provide the radiologist with a basic approach to understand the anatomy, pathology, and imaging of the brachial plexus.

METHOD: We retrospectively reviewed anatomical details and pathologies encountered in 36 MRI brachial plexus performed at SIH using 1.5T and 3T scanner from January 2017 to September 2020.

RESULTS: We found normal study in 16.7%. The most common pathology being post traumatic pseudomeningoceles in 22.2%, followed by pseudomeningoceles with nerve root avulsion in 16.7%, perineural edema and enhancement in 13.9%, perineural cysts in 8.3%, nerve root edema in 5.6%. other pathologies including brachial plexus cord injury, post-traumatic neuritis, chest wall infection involving brachial plexus cords, C7 nerve injury, neuroma and right scalene muscle edema were seen in 2.8%.

CONCLUSION: Diagnosing brachial plexus pathology can be clinically challenging, often necessitating further evaluation with MRI. MRI is capable of depicting beautifully anatomical details as well as above mentioned pathologies in brachial plexus.

O-20**Imaging features surrogates for molecular subgroups of medulloblastoma-An initial experience benefitting from twinning with Sick Kids, Toronto**

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INTRODUCTION: Recent advances in genomics have led to the division of medulloblastomas into 4 groups which are wingless (WNT), sonic hedgehog (SHH), group 3, and group 4. This has shown potential for improved risk stratification as different subgroups show different clinical behaviours and may be subjected to subgroup-specific treatment as well. Recent literature has shown that different subgroups of medulloblastoma show different subgroup-specific imaging features.

METHODOLOGY: We retrospectively reviewed the imaging of all patients with biopsy proven medulloblastoma from the period of April 2015 till Dec 2019 which were sent for genomic testing to Toronto, Canada, in collaboration with Sick Kids Foundation. A total of 17 cases were included. However, cases with inconclusive genomic testing and unavailable pre surgical baseline imaging were excluded. Cases were reviewed for important radiological features such as location of the lesion, contrast enhancement, margins of the lesion.

RESULTS: In our initial review, we found 6 cases of group 4 tumors, 3 cases of SHH and 1 case of WNT. No case from group 3 was found in our review. Group 4 tumors were mainly found in the midline and show heterogeneous post contrast enhancement. SHH tumors lie lateral to the midline, in the cerebellar hemisphere and show heterogeneous post contrast enhancement. A single case of Wingless tumors was reviewed which was midline in location however it shows homogenous post contrast enhancement.

CONCLUSION: Medulloblastoma depict characteristic imaging features according to their genomic subgroups. Location being the most distinctive feature followed by enhancement pattern.

O-21**Improvement of FAT suppression and artifact reduction using IDEAL Technique at 1.5 T MRI in head and neck malignancies**

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BACKGROUND: Fat suppression techniques are routinely used during body MRI (T2 FATSAT and Post contrast T1 FATSAT) and are essential for lesion detection and characterization in the head and neck malignancies, due to the large amounts of fat present in these regions. The commonly used fat suppression methods are classified into 3 types: Chemically selective methods: FSFSE and water excitation (WE), Inversion recovery methods: short Tau inversion recovery (STIR), SPIAR, SPAIR, Chemical shift-based water-fat separation methods: Dixon methods including IDEAL. FS-FSE is conventional FATSAT that is Routinely used FATSAT for T2 and post contrast T1 weighted images. It is sensitive to magnetic field inhomogeneity and vulnerable to susceptibility and metallic artifacts. IDEAL is a technique using three asymmetric echo times and the three-point Dixon method.

OBJECTIVE: To compare fat-suppressed MRI quality using IDEAL with that using frequency selective fat-suppression (FSFSE) fast spin-echo images of the head and neck at 1.5T.

METHODOLOGY: Retrospective MR image analysis was performed in 60 individuals with head and neck malignancy at Radiology Department of RMI. All scans were performed on 1.5 tesla GE MRI machine. Fat suppressed FS-FSE images were compared with IDEAL. Analysis of sets of images was

performed using an independent PACS viewer. Visual assessment of image quality of two sets of sequences was retrospectively conducted: IDEAL FS and axial FSFS T2/CET1-weighted. Each category was evaluated using two different sets of MR sequences in the corresponding plane. Visual assessment was performed by two independent readers for Metallic artifacts around oral cavity, Susceptibility artifacts around upper airway, paranasal sinuses and head-neck junction, Homogeneity of fat suppression, image sharpness, tissue contrast of pathologies and lymph nodes.

RESULTS: There was 100% homogenous fat suppression in all cases seen in IDEAL as compared to FSFSE fat-suppression. Clarity of margin of lesion seen in IDEAL (91%) vs only 69% in conventional fat sat. Image sharpness was better in IDEAL (91%) vs only 69% in conventional fat sat. Artifacts around airways were significantly reduced on IDEAL (only in 2%) vs 87% in fatsat. Metallic artifacts were 2% in IDEAL vs 22.4% in fat sat. Hence IDEAL images significantly reduced artifacts around airway, paranasal sinuses and head-neck junction, improved homogeneous fat suppression in compared to those using FSFS ($P < 0.05$), provided better tissue contrast and reduced susceptibility artifacts.

CONCLUSION: We conclude from our results that IDEAL technique improves image quality in the head and neck by reducing artifacts with homogeneous fat suppression, while maintaining a high soft tissue resolution.

O-22**Radiation dose during transarterial embolization (TAE) in patients of hepatocellular carcinoma (HCC)**

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BACKGROUND: With the increasing use of TAE as a treatment for HCC, it is important to employ exposure-reducing methods to complete the procedure safely and at the lowest achievable dose. Even considering the given relative safety of this procedure as currently performed, operators need to be aware of the techniques that can be employed to minimize those risks.

AIM: To assess the radiation dose during the procedure of transarterial embolization (TAE) in patients of hepatocellular carcinoma (HCC).

METHODS: A cross-sectional retrospective study was performed at Rehman Medical Institute, Radiology department, Peshawar from June 2020 to September 2020. Total number of 136 procedures of TAE were done during this time period on Artis zee imaging system from Siemens. The fluoroscopy time, number of exposures and total dose for each procedure was recorded and maintained in a register along with patient's details including age, gender, weight and BMI. The doses are maintained to obtain a data of doses of all patients. Those patients in which doses are relatively high were assessed retrospectively to take steps in future to maintain low radiation doses of patients for TAE.

RESULTS: The average fluoroscopy time is 18.2 minutes with average total exposures of 9 and total dose of 12393 mGym³. This data will help in taking steps for reduction of doses in patients undergoing TAE procedure.

CONCLUSION: This study shows that total radiation dose during TAE was 12393mGym³. This study has outlined those steps that can be taken to enhance the margin of safety for avoiding radiation injury without compromising the success of the procedure.

O-23**Actionable reporting: Audit of radiology reports at RMI**

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BACKGROUND: Radiology reporting serves as the only bridge between a clinician and radiologist. To generate a productive radiology report there must be a system of constant assessment and monitoring that is in accordance with modern standards. A look over study will help to find out the inadequacies and point out the areas that can be improved further.

OBJECTIVE: To assess the reporting standards in radiology department keeping in mind the standards focusing on three major parameters: 1. Answer to the clinical question/s asked by the referrer. 2. Tentative diagnosis and/or differential diagnosis. 3. Suggestion for the next appropriate step.

TARGET: The report should answer the clinical question (100%). A diagnosis or differential diagnoses must be there in the report (100%). There must be some advice for the next best step (100%).

MATERIALS AND METHODS: This study was conducted at radiology department of Rehman Medical Institute Peshawar after approval from the consultants. Retrospective data of 100 patients was collected from Health Management Information Systems (HMIS), spanning from May to September 2020. Out of 100, 24 were of U/S, 44 CT scans and 32 MRI reports were obtained. Only those reports were taken into consideration in which the referrer had asked question/s. Reports were checked whether they had answered the clinical question, listed any diagnosis or differential diagnosis, and suggested some future advice or not. Confidentiality of the patients was made sure. The experience years and level of the reporting consultants were also taken into consideration. Data was put in tables using MS Excel to calculate the statistical values.

RESULTS: Data of 100 radiology reports was obtained during the above-mentioned period. 100% of the reports contained an answer to the question/s asked by the referring clinician. 56% contained a tentative/differential diagnosis and 48% reports had some advice about the next appropriate step. All the CT reports had answered the question, 47.7% of the reports had a tentative or differential diagnosis with no regular trend during experience years of radiologists and 50% of the reports had suggested next best step with a graph curve that peaked during mid experience years, remained the lowest during initial and lower during last experience years. 100% of the MRI reports had answered the question, 81.25% contained a tentative or differential diagnosis with a bimodal trend that peaked during initial and last experience years, 59.3% reports contained some advice for the next best step with a bimodal trend that peaked during early and late experience years. All of the ultrasound reports by FCPS consultants contained an answer to the question asked, 20% of the reports had a diagnosis or differential diagnosis and 40% reports had suggested some next appropriate step. 100% of the reports by non-FCPS sonologists had an answer to the question asked, 42% reports contained a diagnosis or differential diagnosis with a peak during initial years of experience, a sudden drop and then steady upward trend during later years of experience. 26.3% of the reports by non-FCPS sonologists contained some advice for the next best step. The graph curve here was touching the bottom during initial experience years, remained steady during middle years and had a downward trend during later experience years.

CONCLUSION: We concluded from our results that the radiology reports were focused mainly on answering the question asked by the clinicians, but the remaining parts of a standard actionable report was ignored in a huge number of cases. Answer to the question is of paramount importance but providing tentative or differential diagnosis and suggesting the next step will standardize the report even further. **Re-audit:** Identification and elimination of the causes of deficiencies in radiology reports will be made sure and a reaudit will be done after 6 months.

O-24**Audit to assess patient satisfaction with the radiology department**

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BACKGROUND: Patient satisfaction with any department of hospital is a very important indicator for good services and quality of healthcare. It contributes to more patient's flow, positive patient recovery experience and can improve the physical and mental quality of life for people with serious illnesses.

STUDY DESIGN: Cross-sectional survey.

METHODOLOGY: This study was conducted at the Radiology department of Rehman Medical Institute, Peshawar from 15th August 2020 till 1st October 2020. A questionnaire was given to every patient at the end of the scan which contained questions regarding the patient satisfaction from the length of appointment time, information about the scan, finding department, waiting area time, duration of time before taking for scan, behavior of the staff, introduction of the staff, expecting today's scan and overall satisfaction and rating today's visit at the radiology department. We collected 60 questionnaires in the different waiting areas of each modality of radiology.

RESULT: The overall satisfaction level about services in all modalities of radiology department was 88.2% (in CT (80%), MRI (53%), US (46.6%) and XRAY (66.6%)), 66.6% patients were satisfied with the length of appointment time, 94% patients located the department very easily and 44.3% patients were satisfied with the waiting area time. 50% of the patients were introduced by the staff introduced themselves before the scan and 85% rated their visit as good. Suggestions were asked regarding any improvement in services, for which 47% suggested reducing waiting area time while 23% suggested proper patient guidance, rest of 30% didn't find any need of improvement.

CONCLUSION: We conclude from our results that the majority of patients were satisfied with the radiological services. Young age, high education level and outpatient's referral were the factors associated with patient satisfaction.

O-25**The association of chest radiographic findings and severity scoring with clinical outcomes in patients with COVID-19 presenting to the emergency department of a tertiary care hospital in Pakistan**

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INTRODUCTION: While chest x-rays (CXRs) represent a cost-effective imaging modality for developing countries like Pakistan, their utility for the prognostication of COVID-19 has been minimally explored. Thus, we describe the frequency and distribution of CXR findings, and their association with clinical outcomes of patients with COVID-19.

METHODS: All adult (≥ 18 years) patients presenting between 28th February-31st May to the emergency department of a tertiary care hospital in Pakistan, who were COVID-19 positive on RT-PCR with CXR done on presentation, were included. A CXR Severity Score (CXR-SS) of 0-8 was used to quantify extent of pulmonary infection on CXR, with a score of 0 being negative and 1-8 being positive. The patient's initial CXR-SS and their highest CXR-SS over the hospital course were used for analysis, with cut-offs of 0-4 and 5-8 being used to assess association with clinical outcomes.

RESULTS: A total of 150 patients, with 76.7% males and mean age 56.1 years, were included in this study. Initial CXR was positive in 80% of patients, and 30.7% of patients had an initial CXR-SS between 5-8. The mortality rate was 16.7% and 30.6% patients underwent ICU admission with intubation (ICU-Int). On multivariable analysis, initial CXR-SS (1.355 [1.136-1.616]) and highest CXR-SS (1.390 [1.143-1.690]) were predictors of ICU-Int, and ICU-Int was independently associated with both initial CXR-SS 5-8 (2.532 [1.109-5.782]) and highest CXR-SS 5-8 (3.386 [1.405-8.159]). Lastly, age (1.060 [1.009-1.113]), initial CXR-SS (1.278 [1.010-1.617]) and ICU-Int (5.047 [1.731-14.710]) were found to be independent predictors of mortality in our patients.

CONCLUSION: In a resource-constrained country like Pakistan, CXRs may have valuable prognostic utility in predicting ICU admission and mortality. Additional research with larger patient samples is needed to identify to further explore the association of CXR findings with clinical outcomes.

O-26

Audit of MRI protocol, referral pattern and appropriateness of clinical indications for lumbar spine MRI for adult low back pain

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OBJECTIVE: To evaluate the local lumbar spine MRI protocol, clinical indications, referral sources, imaging findings and the appropriateness of the request using the appropriateness criteria (AC) of the American College of Radiology (ACR) for MRI of lower back pain patients.

STANDARD: Appropriateness criteria (AC) of American college of Radiology (ACR) of MRI of lower back pain (LBP) patients.

TARGET: 100%

METHODS AND MATERIAL: This audit was done to assess the local practice and appropriateness of MRI lower back pain in Radiology department of Rehman Medical Institute, Peshawar, the study population was of randomly selected 100 patients, aged 18 years and above, who were referred between 10-3-2020 to 10-9-2020. MRI was done on 1.5t GE MR and 0.3 tesla open MRI. The clinical histories were acquired from central database HIMS. The images were viewed through PACS workstation using Synapse® (FUJI

DICOME VIEWER). The protocol of the scan performed was then compared with the guidelines of ACR. For each scan performed, collected data included age, gender, referral, clinical information, requested examination, scan performed, recommended exam by ACR and appropriateness was assessed Microsoft excel. Age, gender, clinical indications, imaging finding and the appropriateness of lumbar spine was analyzed descriptively.

RESULTS: A total of 100 patients (52 females and 48 males) 18 years and above underwent MRI for Lower back pain in defined period of time. 10% were referred from orthopedic and rest of 90% from non-orthopedic (neurosurgery and neurology). Among the patients referred by orthopedic surgeon 50% were in category of "usually appropriate" and rest of 50% were in category of "usually non appropriate" and the patient referred by non-orthopedic were 90 among which 60% were "usually appropriate" and 40% were "usually non appropriate". OPD accounted for majority of referrals for MRI lumbar spine.

CONCLUSION: We concluded from our study that 59% of MRI scans performed were appropriate according to ACR criteria for LBP, out of which 8% were referred by orthopedics and rest of 92% were referred from non-orthopedic (neurosurgeon and neurologist). Imaging for those patients who presented with red flags was more appropriate than those who were not with red flags. OPD accounted for major referrals. Females were in majority among the patient referred for LBP imaging.

O-27

Diagnostic accuracy of uterine artery resistance index in the prediction of intrauterine growth retardation in preeclampsia

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BACKGROUND: Intrauterine growth restriction (IUGR) results from placental insufficiency. Preeclampsia is one of the major risk factors responsible for placental insufficiency. Early identification of the IUGR helps in reducing perinatal morbidity and mortality. Doppler flow velocity waveform analysis in the uterine arteries has proved to be a useful method for evaluation of uteroplacental insufficiency and hence prediction of IUGR.

OBJECTIVES: To determine the diagnostic accuracy of uterine artery Resistance Index (RI) in the prediction of IUGR in preeclampsia taking neonatal weight at birth as gold standard.

METHODS: A Cross sectional study was conducted at Radiology Department, Khyber Teaching Hospital, Peshawar over a period of 6 months (17th January 2019 to 16th June 2019). 281 patients diagnosed with preeclampsia underwent Doppler ultrasound to calculate uterine artery RI. Sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of the uterine artery RI in the prediction of IUGR was calculated.

RESULTS: 281 Preeclamptic patients underwent Doppler ultrasound for determination of uterine artery RI in order to predict IUGR. Sensitivity, specificity, positive predictive value, negative predictive value of the Uterine artery RI in the prediction of IUGR was found to be 78.99%, 89.51%, 87.90%, 81.53% respectively. The diagnostic accuracy of uterine artery RI taking birth weight as gold standard was found to be 84.34%.

CONCLUSION: Uterine artery RI determination can help in detection of IUGR in preeclamptic patients and hence timely intervention can be made possible.

O-28**Magnetic resonance imaging for determination of rectal anatomic dimensions and the anterior peritoneal resection**

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PURPOSE: Colorectal cancer accounts for the third most common cause of death by cancer. Previous studies have used invasive methods such as rigid endoscopy or intraoperative proctoscopy to measure the distance from the anal verge to the anterior peritoneal reflection (APR). Comparatively MRI is not only non-invasive but its measurements are easily reproducible and verifiable. Moreover, no data exists regarding the rectal anatomic features and landmarks in our population to guide the surgeons. The aim of this study is to estimate the rectal canal length and the level of APR using MRI.

METHOD AND MATERIALS: Data of 100 individuals who underwent pre-treatment MRI pelvis for the evaluation of rectal carcinoma from Jan 2016 to Dec 2018 was retrospectively analyzed. After excluding patients with prior history of surgery or chemo/radiotherapy related to rectosigmoid region, biopsy proven cancer patients were 30. Rest of the 70 patients who were negative for rectal malignancy were included as healthy group. The relevant demographic, radiological and histopathological findings were recorded on a pre-structured proforma. Rectal canal length, distance of the peritoneal reflection from the anal verge and length of the anal canal was measured on sagittal T2 MR Sequence.

RESULTS: The mean rectal canal length, distance of peritoneal reflection from ARJ and distance of ano-rectal junction from anal verge values were 14.3 cm, 11.2 cm and 3.4 cm respectively in disease population whereas 10 cm, 8.2 cm and 4.7 cm in healthy population. These results show that anatomical dimensions appear relatively less in local population in comparison to western population. This is likely explained due to the differences in body habitus and build. A statistical significant change in anatomical dimension in presence of rectal malignancy is also noted ($p = 0.0003, 0.001$ and 0.004) for rectal length, APR and anal canal respectively.

CONCLUSION: This study, which is first in our population, shows that rectal canal length and the level of peritoneal reflection are different in our population as compared to the western population. Therefore, treatment decisions made on the basis of the western data might not be applicable to our population and indigenous local guidelines should be developed.

CLINICAL RELEVANCE/APPLICATION: The rectal anatomical dimension and level of peritoneal reflection vary among different population of the world due to difference in body habitus and build.

O-29**CT Density measurement correlation with hematocrit values on unenhanced brain CT examination**

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PURPOSE: Brain CT is a first line investigation in suspected stroke patients and is widely used for initial evaluation of cerebral venous sinus thrombosis. Hem concentration is thought to increase the CT density of blood in unenhanced examinations. The purpose of this study is to assess the value of attenuation of dural venous sinus measured on unenhanced brain CT scans and its correlation with hematocrit and hemoglobin level.

METHOD AND MATERIALS: The first 500 CT head examinations performed in 2018 from the emergency room (ER) of Aga Khan University Hospital at the Radiology Department were included in the study. Data was

collected from hospital PACS (picture archiving and communication system). All patients of age ≥ 18 years were included in the study who also had the same day complete blood count done. The CT densities from the superior sagittal sinus and its correlation with hematocrit and hemoglobin were calculated. Those patients who had any intracranial artifact, pathology, operative lesions that might obscure or affect the venous sinus system or with history of trauma or patients who had received iodine based intravenous contrast material within 3 days of CT scan were excluded from the study population. After exclusion, 490 CT head examinations remained

RESULTS: The mean age of our study population was 54.14 ± 19.2 years. The mean CT density value, hematocrit value and hemoglobin values were 43.17 ± 5.54 , 38.31 ± 6.30 and 12.63 ± 2.32 respectively. A positive correlation was found between the CT density (Hounsfield unit) value and hematocrit with R^2 value of 0.302.

CONCLUSION: CT density measurement of dural venous sinuses has a positive correlation with hematocrit value.

CLINICAL RELEVANCE/APPLICATION: CT density measurement of Dural venous sinuses correlates with hematocrit value this may indicate that high density value could be suggestive of cerebral venous thrombosis, which should warrant further investigation.

O-30**Role of formal training of residents for evaluation of the Alberta stroke program early CT Score (ASPECTS) in patients with acute middle cerebral artery (MCA) infarction**

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PURPOSE: The Alberta Stroke Program Early Computed Tomography Score (ASPECTS) is a semi quantitative grading system developed to quantify the extent of early ischemic changes (EIC) in the middle cerebral artery territory. Current AHA/ASA guidelines recommend calculating ASPECTS to interpret non-contrast CT scans in emergency situations of large vessel strokes presenting with an NIHSS >6 and within 6 hours of symptom onset to determine the treatment strategy. However adequate score calculation by residents and its inter observer agreement remains a diagnostic challenge. Therefore, we proposed that formal resident training for ASPECT score calculation is necessary which in turn can have a significant impact on possible treatment options and patient outcome. The purpose of this study is to assess the effectiveness of online ASPECTS course certification among residents for calculation of ASPECTS in patients with acute MCA territory infarction.

METHOD AND MATERIALS: After taking informed consent, 24 radiology residents from year I to IV who were currently under training at Aga Khan Hospital were asked to fill ten image-based cases with multiple choice questions without any formal training. The participants were kept blinded from results. The cases were already diagnosed cases of acute MCA infarctions available on the official website <http://www.aspectsinstroke.com>. Subsequently, residents were asked to go for a free online course of ASPECTS calculation. Post-training test was conducted one week after completion of their certification. The pre- and post-test scores were compared using paired student's t-test.

RESULTS: There was no significant improvement in pre and post test scores (p value 0.50). Out of 24 residents, 7 (29%) had pretest scores between 5 and 8 and 18 (71%) secured scores less than 5. After certification, 9 (37%) secured scores between 5 and 8, while 15 (63%) scored below 5. No statistically significant difference was noted among residents on the basis of gender and training year.

CONCLUSION: The online available ASPECTS certification does not appear to be an effective learning tool for acquiring training in calculation of ASPECTS for middle cerebral artery (MCA) infarct.

CLINICAL RELEVANCE/APPLICATION: Formal resident training can be achieved by Continuing Medical Education (CME) activities and by dedicated lectures from experienced and trained faculties.

O-31

MRI Knee association of peripheral vertical meniscal tears with anterior cruciate ligament tears

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OBJECTIVE: To describe prevalence of peripheral vertical medial meniscal tear and its association with anterior cruciate ligament (ACL) tears as compared to other types of meniscal tears.

METHODOLOGY: The cross-sectional study was conducted at Radiology department of RMI from June 2018 to December 2019. Following ethical approval, a retrospective review of 100 knee MR examinations with imaging diagnoses of ACL tear was performed to assess the location and morphology of the meniscal tear and to assess the status of the ACL. ACL tear was assessed on Coronal PD and meniscal injuries were assessed on PD FATSAT in both coronal and sagittal planes.

RESULTS: 40% scans had peripheral vertical meniscal tears, all of whom had ACL tears and one with chronic ACL deficiency causing anterior tibial translation. The difference in the prevalence of vertical type meniscal ACL tear with ACL tear (40%) compared with the prevalence of other meniscal tears association with ACL tear was statistically not significant ($P < > 0.001$).

CONCLUSION: We concluded from our results that peripheral vertical meniscal tears, particularly when involving the posterior horn, are associated with ACL tear. The finding of this type of tear on knee MR imaging should prompt close inspection of the ACL for evidence of acute or chronic injury, and its presence may help make the diagnosis of ACL tear in equivocal cases.

O-32

Clinical audit to assess accuracy of radiology procedure codes vital for standardization and structure in the radiology department

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BACKGROUND: Procedure codes are a critical part of radiology workflows. Structured codes facilitate the automated identification of relevant prior imaging studies and the collection of data for radiation dose tracking.

OBJECTIVE: The aim of this audit was to review the percentage of completed radiology examinations that have been accurately coded according to locally established guidelines.

METHODOLOGY: This audit was done at radiology department of Rehman Medical Institute Peshawar. Imaging procedures performed in department were assessed for their codes. CT, MRI, fluoroscopy and radiography were reviewed independently on PACS and 100 examinations for each modality were selected randomly to ensure that the data collection gives a good reflection of the coding process in the department over different days. The request forms for the examinations saved in system were reviewed and the allocated code was then compared with the radiology images on PACS to determine whether the coding was appropriate for the examinations carried out.

RESULTS: Our study showed 90%, 99%, 95%, and 85% of total completed CT, MRI, Fluoroscopy and X-ray examinations respectively that had been accurately coded according to locally established guidelines.

CONCLUSION: We concluded from our results that coding for procedures was not 100% accurate. Highest accuracy was for MRI codes, the credit for which goes to MRI technician. The results were discussed in a departmental meeting and a re-audit is planned after six weeks.

O-33

Audit to assess local practice of wearing film badges during fluoroscopic procedures

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BACKGROUND: Although the wearing of a personal dosimeter is not obligatory for diagnostic radiology personnel, the ionizing radiation regulations require every department of Radiology to prepare local rules which define when staff should wear their dosimeters.

OBJECTIVE: To assess the local practice of wearing film badges during fluoroscopic procedures at RMI, Peshawar.

METHODOLOGY: In this audit, a survey was done from personnel working in fluoroscopy procedures in the departments of diagnostic radiology, interventional radiology and cardiology at RMI, Peshawar. The respondents were observed whether they used the film badge during procedure. In order to eliminate any bias, the collected data was then compared to the film badge reading data provided by the radiation protection officer. Aayas and gastroenterologists were not included in the study as no film badges were provided to them. The collected data was then analyzed.

RESULTS: The data collected showed that out of 24 personnel, 10 (41.6%) wore the film badge during fluoroscopic procedures. It was 50% in diagnostic radiology, 75% in interventional radiology and 33% in cardiology.

CONCLUSION: The results of the study concluded that the 100% target of film badge use was not met in our department.

O-34

Estimation of skeletal age by Greulich-Pyle method in healthy adolescents in Karachi, Pakistan

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To assess the Greulich-Pyle method for the determination of skeletal age in healthy adolescents in Karachi, Pakistan using legal document as gold standard proof of the chronologic age.

MATERIALS AND METHODS: After obtaining approval from the institutional ethics review committee, a convenience sample of healthy boys and girls was recruited from public schools in Karachi, Pakistan. Plain radiographs of wrist and hand were acquired for determination of bone age using Greulich-Pyle atlas. All plain films were interpreted by two experienced radiologist at Aga Khan University (Karachi, Pakistan), who were blinded to the actual age of the subjects. Legal documents (that is birth certificate) was used as gold standard for the proof of the chronologic age.

RESULTS: Ninety-nine subjects (52 boys and 47 girls) were included in the study with a median age of 14.1 years. The median bone age estimated by

Greulich-Pyle method for the whole sample was 15 years, which was not significantly different ($p > 0.05$) from the median chronologic age. However, median bone age estimated for girls under the age of 13 years was significantly different from the median chronologic age ($p < 0.01$).

CONCLUSION: Our study revealed significant discrepancies between chronologic age and bone age as estimated by the Greulich-Pyle atlas in Pakistani children, specifically in girls below the age of 13 years. These results warrant the development of an indigenous tool of bone age estimation in the Pakistani population.

O-35

The accuracy of HRCT chest for diagnosis of anaemia

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BACKGROUND: In Pakistan, the prevalence of anemia is high up to 26% in urban areas and 47% in rural areas. Anemia causes overlapping cardio-respiratory symptoms including dyspnea and fatigue. The display of different gray shades at CT is due to variable densities of tissues in the human body. The aim of our study is to determine the sensitivity and specificity of computed tomography for Anemia at HRCT chest, by keeping complete blood count as the gold standard.

MATERIALS AND METHODS: A cohort of 124 patients attending our hospital underwent complete blood count (CBC) and chest HRCT within 7 days interval comprised the study population. The blood attenuation measurements and visual perception of inter ventricular septum (IVS) was done by radiologist, blinded to hemoglobin (Hb) and hematocrit lab values. Region of interest (ROI) attenuation cursor was placed within right ventricular chamber, left ventricular chamber at soft tissue window on axial sections. Quantitative diagnosis of anaemia at CT was made when the HU was < 35 HU in a chamber. Qualitative diagnosis of anaemia at CT is equivalent to visualization of IVS. Analysis was done at SPSS (version 17).

RESULTS: There were 62 males and 62 females. 50 subjects comprised the control group and 74 were anaemic acc. to hematology. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of HRCT chest for quantitative diagnosis of anaemia in our study was 48.6%, 76.5%, 76.5%, 50.6% and 60.5% respectively. Chi square demonstrated significant association of anemia with visualization of IVS (p -value 0.000). ROC curve was skewed towards the left side and AUC is found to be 0.312. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and diagnostic accuracy of HRCT chest for qualitative diagnosis of anaemia was 55.4%, 88.0%, 87.2%, 57.1% and 68.5% respectively.

CONCLUSION: Overall, there is a high positive predictive value for the quantitative diagnosis of anaemia at HRCT chest with diagnostic accuracy up to 68% when IVS is visualized. This has led to the conclusion that a radiologist can arouse the suspicion of anaemia 'Virtually' at HRCT chest.

O-36

Average calcium score in patient undergoing CT coronary angiography in radiological department of Rawalpindi Institute of Cardiology

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OBJECTIVE: To determine the average calcium score in patients undergoing computer tomography coronary angiography. To identify the low risk and high

group of calcium score for prophylactic management and intervention treatment respectively.

METHODOLOGY: We carried out a cross-section study at Department of Radiology, Rawalpindi Institute of Cardiology (RIC) for the six months from July 2018 to December 2018. Data was collected for risk factors for a calcium score. Calcium score screening was done in all patients undergoing Computer tomography coronary angiography.

RESULT: Total 422 patients were enrolled in which 159 female and 263 are male patients and the age range was 25-85 years. Calcium score was found 8%, 10%, 13% and 9% of female patient with CCA 1-10, 11-100, 101-400 and > 400 , respectively. Calcium score was found 6%, 14%, 13% and 13% of male patient with CCA 1-10, 11-100, 101-400 and > 400 , respectively. Significant calcium score was found 9% in female and 13% in male. Calcium score was found 5.6%, 12.3%, 13.3% and 11% of both male and female patient with CCA 1-10, 11-100, 101-400 and > 400 , respectively. The incidence of significant calcium score was according to age of both male and female patients are 4%, 10% and 19% with age < 40 years, 41-60 years and > 60 years respectively. According to co-morbid the patient with calcium score 74% patients with HTN, 41% patients with family history, 29% patients with smoking and 24% patients with diabetes.

CONCLUSION: CT calcium scoring is very effective tool in assessment of low and high risk groups leading to coronary artery disease, which is a major disease burden in developing and developed countries. There is significant number of patients who are falling in low risk group which can be targeted with timely life style modification and prophylactic medication reducing the morbidity and mortality and eventually economic burden of the country.

O-37

Correlation of deep vein thrombosis and pulmonary embolism in patients coming to Rawalpindi Institute of Cardiology

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INTRODUCTION: Deep vein thrombosis (DVT) occurs when a blood clot (thrombus) forms in one or more of the deep veins in your body, usually in the legs. Blood clot that develops in vein is also known as venous thrombosis. Deep vein thrombosis can cause leg pain or swelling, warmth, and redness, but also can occur with no symptoms. Deep vein thrombosis can develop if you have certain medical conditions that affect how much your blood clot. It can also happen if you don't move for a long time, such as after surgery or an accident, or when you are confined to bed.

A Pulmonary Embolism (PE) usually happens when a blood clot called deep vein thrombosis (DVT), often in your leg, travels to your lungs and blocks blood vessels. That leads to low oxygen levels in your blood. It can damage the lung and other organs and cause heart failure. Deep vein thrombosis and pulmonary embolism are collectively known as venous thromboembolism (VTE).

OBJECTIVES:

- 1) To determine the prevalence and outcome of DVT in patients with PE;
- 2) To identify additional risk factors for PE-related unfavorable outcome and 30-day all-cause mortality; and
- 3) To establish the clinical importance of screening for concomitant DVT

MATERIALS AND METHODS: After obtaining approval from hospital ethical committee, formal consent was taken. This was a descriptive, cross sectional and prospective study done at the Rawalpindi Institute of Cardiology. All PEs were diagnosed by computed tomography pulmonary angiography (CTPA). All CTPAs were interpreted by two board-certified radiologists. Among the 15 patients with PE, 11 patients were assessed for the presence

of DVT in the lower extremities using duplex ultrasonography or lower extremity CT venography and were evaluated retrospectively in this study.

Based on the findings of duplex ultrasonography, DVT was divided acute or chronic DVT and complete or partial DVT. Complete DVT was defined as thrombus involving the common and external iliac veins, common femoral vein, femoral vein, and popliteal vein with or without calf vein thrombosis. Partial DVT was diagnosed if the thrombosis involved calf veins solely. PE was confirmed if a filling defect outlined by contrast media or complete occlusion was seen on CTPA. Each confirmed PE on CTPA was further evaluated for the localization of the following vessels: main pulmonary arteries, right and left pulmonary arteries, and segmental or sub segmental branches.

RESULTS: According to this study, we can provide the following statistical analysis, DVT diagnosed in patient is 27% and pulmonary embolism diagnosed is 43% and concomitant DVT diagnosed in patients is 30%. Total enrolled patients were 36 out of which 20 were male and 16 female patient. CTPA and ultrasound Doppler lower limb of patients diagnosed with DVT in popliteal vein (60%) DVT in common femoral vein CFV (27%), in short saphenous vein (13%) CTPA showed 15 patients with pulmonary embolism, out of these 7 patient represented with RPA, LPA (66%), 3 patients with sub segmental and segmental artery (34%). DVT caused by patients with variables or risk factors like hypertension HTN(41%), patients who travel long distance were (30%) and obese patients were (29%). So, according to our result, RPA, LPA (66%) are most common arteries with significant PE and most common lower limb popliteal vein (60%) with DVT.

CONCLUSION:

In the majority of the researches, retrospection is a disadvantage. Our study showed that patients having deep vein thrombosis must have the risk of developing the pulmonary embolism. More attention must be paid to patient education to ensure safe and high-quality patient care. Pulmonary embolism is a potentially preventable condition. It is also potentially life-ending. The best clinical outcome comes when the embolism never makes it to the lungs. And the best way to prevent the embolism from migrating to the lungs is to prevent it from forming in the lower extremities to begin with patient should do exercise, lose weight and take treatment like anticoagulants and other preventive measures.

O-38

Correlation of renal echogenicity and serum creatinine level on gray scal ultrasound in patients presenting in radiology department of Rawalpindi Institute of Cardiology

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INTRODUCTION: Chronic kidney disease is a major health problem and one of the most common causes of kidney failure. CKD generally remains asymptomatic so most patient are identified because of routine blood/urine tests or ultrasound. Ultrasound is an ideal modality to determine renal parenchymal disease because of its non-invasiveness. On ultrasound small shrunken kidneys with the echogenic parenchyma indicates chronic kidney disease. Serum creatinine level is an endogenous serum marker made by breakdown of body muscle protein Creatinine can also be measured in urine and saliva. A rise in serum creatinine concentration of atleast 0.3mg/dl indicates acute kidney failure.

HYPOTHESIS: The study design to access the hypothesis that the ultrasound is an important non-invasive modality for the detection of renal echogenicity and consequently chronic kidney disease.

MATERIAL AND METHOD:

Study design: Prospective study.

Study setting: The study was carried out at radiology department of Rawalpindi Institute of Cardiology, Rawalpindi.

Study time and place: The study was conducted at Rawalpindi Institute of Cardiology from July 2019 to December 2019

RESULT: Total 72 patient were selected, out of which 33 were male(46%) and 39 were female (54%). 39 patients had increased serum creatinine level and 33 had normal serum creatinine level. 33 patients (46%) had grade 0,7 patients (10%) had grade 1 renal echogenicity, 20 patients (28%) had grade 2 renal echogenicity, 6 patients (8%) had grade 3 renal echogenicity and 6 patients (8%) had grade 4 renal echogenicity. 33(46%) patients which had normal serum creatinine level. 5 patients (7%) had increase renal echogenicity and 27 patients (37%) had normal renal echogenicity. 27 patient had (37%) risk factor HNT, 19 patient (26%) had DM. Out of 72 patients, 22 patient (30%) had the family history of renal disease. 47 patients (65%) were those who had not taken exercise, even not work or walk for at least 15 minutes a day.

CONCLUSION: Renal echogenicity and its grading correlates better with serum creatinine level in the patients of CKD then other parameter like cortical thickness ,parenchymal thickness and longitudinal size of the kidney. CKD is closely associated with risk factor such as HTN, diabetes and unhealthy lifestyle.

O-39

Efficacy of date syrup in suppression of upper gastrointestinal fluid signals in MRCP

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INTRODUCTION: Orally administered substances which suppress signals from gastrointestinal fluid can be used to enhance image quality in MRCP. In daily practice, the available substances range from commercial products to regular viands such as fruit juices.

MATERIALS AND METHODS: This study was conducted at department of Radiology, Khyber Teaching Hospital, Peshawar from January 2019 to June 2019. MRCP was done twice in the same patient once before and second after the administration of date syrup orally, and effect of syrup on suppression of fluid signal in GI was evaluated. Forty patients underwent MRCP before and 30 minutes after ingestion of 100 mL of date syrup. Images with and without date syrup were scored for gastrointestinal tract signal suppression and visualization of various pancreaticobiliary structures.

RESULTS: Images obtained after administration of date syrup had significant improvement in gastrointestinal tract fluid signal suppression and an increase in visibility of the common bile duct, cystic duct, and pancreatic duct.

CONCLUSION: There is significant effect of date syrup in suppression of unwanted fluid signals from upper gastrointestinal tract in MRCP which further improves the visualization of various pancreaticobiliary structures. The administration of date syrup for gastrointestinal signal suppression in MRCP is recommendable.

O-40

Role of cross-sectional imaging in diagnosing thyroid associated orbitopathy and dysthyroid optic neuropathy

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INTRODUCTION: Thyroid-associated orbitopathy (TAO) is the most prevalent and serious extra thyroidal manifestation of Graves' disease. Although TAO is diagnosed clinically, imaging also plays important role in the diagnosis,

detecting complications like dysthyroid optic neuropathy (DON) and follow-up of disease.

MATERIAL AND METHODS: It was descriptive cross sectional study. It was carried out at Radiology Department, Khyber Teaching Hospital, Peshawar, for a period of 24 months from March 2018 to March 2020. 25 patients with diagnosis of TAO (duration was shorter than 2 years) were selected. Patients with other orbit diseases such as trauma, optic neuropathy, and previous orbital surgery were excluded. T1 W, T2 W, Gadolinium enhanced T1 W and STIR MRI, pre and post contrast enhanced CT orbits were done. MRI and CT orbits were evaluated and different findings suggesting TAO were studied.

RESULTS: In this study, 16 female and 9 male patients with mean age of 41 years were included. Radiological findings of proptosis were present in 23 (92%) patients. Enlargement of extraocular muscles (EOM) was found in 20 (80%) patients. Imaging findings suggesting DON were seen in 8 (32%) cases. Predominantly orbital fat involvement only with normal EOM was found in 2 (8%) patients.

CONCLUSION: We concluded that orbital cross sectional imaging is crucial step in the management of TAO and is always indicated in cases where the diagnosis is in doubt or in the clinical suspicion of DON and to plan orbital decompression.

O-41

Comparison of 128-slice spiral computed tomography pulmonary angiography findings with plasma D-dimer levels in patients with clinical suspicion of pulmonary embolism

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OBJECTIVE: To compare effectiveness of plasma D-dimer levels with findings of 128-slice spiral computed tomography pulmonary angiography (CTPA) in patients with clinical suspicion of pulmonary embolism.

STUDY DESIGN: Retrospective observational study

PLACE AND DURATION OF STUDY: Department of computed tomography, Armed Forces Institute of Radiology & Imaging, Pak Emirates Military Hospital Rawalpindi. Duration of 12 months from January 2018 to December 2018.

PATIENTS AND METHODS: A total of 59 patients were inducted who presented in emergency department, Pak Emirates Military Hospital Rawalpindi with clinical suspicion of pulmonary embolism. The main symptoms were shortness of breath and chest pain. Plasma D-dimer levels of all patients were sent to laboratory and computed tomography pulmonary angiography was performed at computed tomography department, Armed Forces Institute of Radiology & Imaging using 128-slice spiral computed tomography.

RESULTS: 36 patients were males and 23 were females with an average age of 48.03 years \pm 18.065 (range 23 to 85 years). Out of 59 patients, D-dimer levels were raised in 28 cases (47.4%) while 31 patients showed normal levels. Pulmonary embolism was detected by computed tomography pulmonary angiography in 30 cases (50.8%) while 29 patients were without obvious abnormality.

CONCLUSION: Plasma D-Dimer levels show low sensitivity, specificity and negative predictive value and cannot exclude pulmonary embolism without computed tomography pulmonary angiography. Computed tomography pulmonary angiography remains diagnostic modality of choice for definitive assessment of pulmonary embolism in patients reporting at the emergency reception.

O-42

Chest CT severity score as an auxiliary grading Tool to COVID-19 pneumonia imaging classification - A tertiary care experience in Pakistan

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INTRODUCTION: To identify the utility and accuracy of chest computed tomography severity score (CT-SS) as an additional tool to COVID-19 pneumonia imaging classification in differentiating clinical severity of COVID-19.

STUDY DESIGN: Prospective cross sectional study

PLACE AND DURATION OF STUDY: Armed Forces Institute of Radiology & Imaging, Rawalpindi, from 1st April 2020 to 3rd June 2020.

MATERIALS AND METHODS: 500 cases referred to our set up for high resolution computed tomography - chest for suspicion of COVID-19 were included in the study. Cases were categorized by radiological findings using the COVID-19 pneumonia imaging classification proposed in the Radiological Society of North America Expert Consensus Statement on Reporting Chest CT Findings Related to COVID-19. CT-SS was calculated for all scans. Based on clinical data patients were classified according to disease severity as stated by "Diagnosis and Treatment Program of Pneumonia of New Coronavirus Infection" recommended by China's National Health Commission on February 5, 2020. The relationship between radiological findings, CT-SS and clinical severity was explored.

RESULTS: Based on radiological findings 298 cases were graded as Typical, 34 as Indeterminate, 15 as Atypical and 153 Negative for pneumonia. The apical and posterior basal segments of lower lobes were most commonly involved in disease process. The CT-SS showed higher values in patients of Severe group as compared to those in Moderate group (p value less than 0.05). Cut off of CT-SS for recognizing Severe COVID-19 in our population was 18.5 (area under curve, 0.960), with 84.3% sensitivity and 92.5% specificity.

CONCLUSION: CT-SS in coherence with COVID-19 pneumonia imaging classification can provide a comprehensive and objective assessment of disease severity in COVID-19 patients.

O-43

Chest X-ray (first tool of imaging) in COVID-19 patients – A tertiary care experience

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BACKGROUND/OBJECTIVES: The aim of this study was to correlate the CXR findings of all symptomatic COVID-19 patients admitted in COVID-19 isolation ward, JPMC Karachi and assess the extent of baseline illness with either progression or regression of disease radiographically through serial chest imaging as well as clinically and with repeated viral nucleic acid testing during the course of treatment. For COVID-19 positive patients portable chest X-rays playing a role of major diagnostic tool, easily available and inexpensive bedside modality alongside RT-PCR (real time reverse transcription polymerase chain reaction).

METHOD: A prospective observational study done at JPMC from 1st May to 31st May 2020, including all RT-PCR COVID-19 positive admitted patients. Baseline and serial portable CXRs were performed. Most common presenting complaints of the patients admitted were of fever, dry cough and myalgia

while a percentage admitted in critical or unstable state had an additional symptom of shortness of breath with varying % oxygen saturation.

RESULTS: There were 64 hospitalized patients studied over a period of one month out of which 42 males (66%) and 22 females (35%) in the age range of 16-75 years, their clinical symptoms at presentation and during the course of stay at hospital were observed and correlated with their serial chest X-ray imaging. Out of 64 patients 10 (15%) had normal while 46 (70%) showed chest X-ray features varying in severity with involvement of predominantly lower zones showing bilateral, peripheral consolidation or /and bilateral peripheral consolidation with ground glass haze. (9%) patients had unilateral peripheral, while 3 (4%) had diffuse unilateral or bilateral lung involvement giving a white-washed appearance.

CONCLUSION: Chest X ray is the cost effective, quick, key base line imaging modality in COVID-19 patients in assessing the severity of disease with real time reverse transcription polymerase chain reaction (RT-PCR). Most of the CXR's of symptomatic COVID-19 positive patients showed abnormal chest findings of subpleural and peripheral distribution with range of ground glass opacities in mild form and consolidation in severe cases.

O-44

Audit of adequacy of the ultrasound reports in the patients of obstructive jaundice presented to tertiary care hospital radiology department

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PURPOSE: According to ACR appropriateness criteria for jaundice, ultrasound is the initial modality of choice in investigation and management of the patients presenting with the obstructive jaundice. For accurate reporting of the ultrasound in these patients, few important points should be kept in the mind to guide clinicians regarding further investigations and intervention. The purpose of this study was to investigate the adequacy of the ultrasound findings in these patients without standard reporting method.

MATERIALS AND METHODS: This study was conducted in the ultrasonography center of Radiology Department, Mayo Hospital Lahore, which is a tertiary care hospital. From 1st August 2020 to 30th September 2020, ultrasound reports of 50 patients presenting with obstructive jaundice included in this study and assessed on basis of following points.

1. Bile duct diameter
2. Comment on transition zone
3. Factor causing obstruction
4. Level of obstruction

The ultrasound was performed by junior residents, senior residents, medical officers and senior registrars and adequacy of reporting was assessed according to ranks. Radiologists were guided about standard reporting in obstructive jaundice and re audit is planned after two months to check the improvement.

O-45

Spectrum of neurological manifestations evidenced in Corona patients during Corona pandemic

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Corona pandemic has affected the whole World in a very extensive and catastrophic manner. A lot has been documented regarding the plain Chest X-ray and HRCT Chest features of Covid-19. However, neurological symptoms like stroke, delirium, altered consciousness, seizures and encephalopathy-like symptoms are also not uncommon in severe cases of Corona infection.

AFIRI was the main affiliated radiology Institute with Corona-declared Military hospital (MH). MH only admitted and managed Corona patients during the pandemic. We as radiologists, therefore were able to identify and experience a wide variety of neurological complications of Corona including ischemic strokes, intra-cranial hemorrhage, encephalopathy, Dural venous sinus thrombosis etc. Out of these, the commonest was acute ischemic stroke which was of multi-focal form in many cases. The main modality utilized in emergency cases was CT scan as a basic screening tool but MRI was also performed in cases where CT findings required further complete elaboration or in cases where CT was normal but clinical suspicion of neurological involvement was high. This presentation will highlight and create an awareness regarding the various neurological manifestations of Corona and familiarize the young radiologists with the wide clinical and radiological spectrum evidenced in severe cases of Corona with neurological involvement.

O-46

MRI breast – Initial five-year experience at Fauji Foundation hospital, Rawalpindi

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PURPOSE: Dynamic magnetic resonance imaging (MRI) of breast is a functional technique. It is relatively newer imaging modality for breast imaging. We aim to share initial five-year experience after installation of MRI machine at our teaching hospital.

MATERIAL AND METHODS: This study was carried out at Fauji Foundation Hospital, Rawalpindi, from April 2015 to September 2020. Demographic details and indications for MRI breast according to recommendations by American College of Radiology (ACR) relating to each patient were recorded. Mean and standard deviation of quantitative variables were worked out; frequency and percentages were calculated for qualitative variables.

RESULTS: Majority of the patients (59%; n=28) were referred from specialists outside our institution. Age range was 25–66 years (mean 46; median 44 years). Out of 28 subjects, 13 (46.42%) were referred for additional evaluation of imaging or clinical findings. Screening was performed in 32.14% patients. This included patients at risk of developing breast carcinoma, screening of malignancy in contralateral breast and in augmented breast. Six out of twenty eight (21.42%) subjects were sent for evaluation of extent of known malignancy. This included ruling out multifocality and multicentricity, relationship to deep fascia and evaluation of treatment response.

CONCLUSION: Appropriate patient selection, according to ACR practice parameters for performance of contrast-enhanced MRI of breast, is the most important criterion for adequate and accurate reporting of MR mammogram. Effective communication with referring clinicians helps to avoid unnecessary use of resources.

O-47

Central nervous system cavernomas – 10 year clinical outcome based cohort

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INTRODUCTION: Cavernous malformation accounts for 5–10% of all vascular malformations of the central nervous system. It can occur as a sporadic or a familial autosomal dominant disorder. Contrary to the name, these lesions are not neoplastic and are merely slow flow venous malformations. Many cavernous malformations are asymptomatic and can be treated conservatively. However, symptomatic lesions should be treated surgically. Symptoms can relate to mass effect, epileptic activity or repeated haemorrhage.

METHODOLOGY: Retrospective review of all cases of cavernoma over a period of 10 years was performed. Cases were extracted using search engine on PACS with keywords of cavernoma and cavernous angioma. Lesions were reviewed for important inherent radiologic findings such as size of the lesion, complete or incomplete hemosiderin rim and location of the lesion and also for evidence of hemorrhage. Patients' clinical outcome was searched using electronic medical records for complications like hemorrhage, seizures, stroke, death or stable disease.

RESULTS: Total 88 cases were reviewed. 40 cases showed atypical features and 48 cases were typical. 21 patients were symptomatic and showed complications including hemorrhage and seizures. Out of these, 7 cases were atypical and 14 cases were typical. 31 cases were stable or showed decrease in size. Out of these, 19 cases were atypical and 12 cases were typical. 35 cases were lost to follow up.

CONCLUSION: In our review of cases, cavernoma with typical features were more associated with symptoms and complications than cavernoma with atypical features.

O-48

Quality checks of molybdenum breakthrough test in molybdenum-99 / technetium-99m generators: 6 years experience at Sindh Institute of Urology & Transplantation (SIUT)

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OBJECTIVES: The objective of our study is to ensure and checks the molybdenum breakthrough test within the limits of European pharmacopeia and American pharmacopeia and to improve the imaging quality and reduction in radiation dose to the patients as a part of Good Medical Practice (GMP).

METHODS: The Molybdenum-99 breakthrough test to check the impurity in Technetium-99m elute for 192 generators was studied during the year 2014-2019. The generators received in Sindh Institute of Urology & Transplantation (SIUT) facilitate from Eczacibasi. Monrol, Turkey. 99mTc is eluted on site from generator and used with pharmaceutical kit. Eluted 99mTc may contain some impurities which need to be contained within predefined allowed limits. One of the impurities is molybdenum. For molybdenum, there are two protocols being used worldwide. European pharmacopeia declares the allowed activity of Moly in 99mTc elute to be less than 1 μCi of 99Mo for every mCi of 99mTc, while American pharmacopeia set the limits to be less than 0.15 $\mu\text{Ci}/\text{mCi}$. MONROL is using American standards for its generators. SIUT is using 99mTc-99Mo generators since 2012, purchased from Eczacibasi, Monrol, Turkey. The measurements were made using dose calibrator CRC-15 (CAPINTEC Inc, USA) and a standard canister thickness (6mm) at the time of first elution of the generators. The dose calibrator displays result after executing various steps in a sequence.

RESULTS: From January 12, 2014 to December 30, 2019, first elutions were performed when generator was received. Through the elution of time most of the generators eluted have shown very low value of Moly assay test (0.000 $\mu\text{Ci} / \text{mCi}$) which is very less as compared to limit proposed in American pharmacopeia (0.150 $\mu\text{Ci} / \text{mCi}$) and European pharmacopeia (1 $\mu\text{Ci} / \text{mCi}$). The study reflects good manufacturing and quality control of the generator of Eczacibasi, Monrol, Turkey which provides an evidence of safe medical practices.

CONCLUSION: The molybdenum breakthrough was according to recommended standards of European and American pharmacopeia in most of the generators. The removal of high contents of Molybdenum-99 enabled the institute to continue routine imaging services by improved image quality and reduction in radiation dose to the patients. Therefore, 99Mo contents in elution

are kept with a prescribed limit to reduce the patient dose and enhance image quality. European and American pharmacopeia set limits on molybdenum contents present in 99mTc elution based on the sensitivity of dose calibrators need to ensure consistent elutions from alumina column and to keep the dose as low as possible and for good imaging in diagnostic tests.

O-49

Assessment of personnel dosimeter practise in nuclear medicine/PET-CT in Sindh Institute of Urology & Transplantation (SIUT)

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OBJECTIVES: The purpose of this study is to assess the amount of radiation dose of workers exposed by personnel dosimeter of optically stimulated luminescence dosimeters (OSLDs) and thermoluminescence dosimeters (TLDs) within annual limit 20 mSv in diagnostic nuclear medicine and PET-CT at SIUT.

METHODS: To detect the worker radiation doses, the radiation workers of SIUT had been issued TLDs and OSLDs. In this study, workers were using TLDs badges in the year of 2017 and then in 2018 and 2019 worker using OSLDs. The readings were analyzed annually to the dose limit and recommendations were made. The annual dose readings of occupationally exposed personnel to the national and international dose limit (20 mSv/year).

RESULTS: The results show that annual doses of workers using TLDs in the year of 2017 are ranging of 0.5 mSv to 1.69 mSv, the annual doses of workers using OSLDs in the year of 2018 are ranging of 0.11 mSv to 0.706 mSv and the annual doses of workers using OSLDs in the year of 2019 are ranging of 0.037 mSv to 0.486 mSv were recorded.

CONCLUSION: The radiation doses received by personnel workers dosimeter according to acceptable limits of 20 mSv of PNRA and International regulatory bodies and decreases gradually with years due to improvement of radiation awareness and training of our workers and improve our primary and secondary shielding.

O-50

Incidental pulmonary findings of COVID-19 associated pneumonia on CT scan in patients undergoing CT imaging for some other indication

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PURPOSE: To evaluate the cases of contrast enhanced CT scans done for some pathological indication which incidentally revealed concurrent CT findings consistent with COVID-19 infection in the imaged lungs during COVID 19 pandemic.

MATERIALS AND METHODS: This study was conducted in the Department of Diagnostic Radiology, Mayo Hospital Lahore which is a tertiary care hospital and a primary referral in Punjab. PACS database was searched for CT scans of patients who were referred from different sources with complaints other than those of respiratory system during April to August 2020 (peak period of COVID-19 in the city).The study yielded 10 cases in which incidental pulmonary findings typical of COVID-19 associated pneumonia were found.

CONCLUSION: Other than diagnosis,treatment and prognosis,CT imaging has been critical in detection of asymptomatic/subclinical/atypical cases of COVID-19 infection hence aiding in adopting prompt optimal practices for safely isolating and managing such patients which may prove to be a havoc if go undiagnosed.

E-POSTERS (P)

P-1

Ultrasound is the first line tool to diagnose the antenatal & postnatal cystic hygroma

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INTRODUCTION: Lymphatic malformation (LM) is synonymous with cystic-lymphangioma (CLA), was first described in 1828 by Redenbacker & Wernher described in 1843. It is a birth-defect that appears as a sac filled with embryonic-lymphatic-tissue with a thin wall, occurs in the head & neck of fetus/infant (75%), axilla (20%), retroperitoneum and intra abdominal organs (2%), limbs-bones (2%) & mediastinum (1%). After birth, a cystic hygroma usually looks like a soft bulge under the skin. The incidence 1/6000 at birth and about 1/750 in spontaneous abortion. About 50% of fetal cystic hygromas are found with chromosomal abnormalities-Trisomy 21 and Turner syndrome.

METHODS: Ultrasound findings of cystic hygroma include thin-walled and serpiginous or multiseptated intradermal fluid collections which are often found at cervical regions. Ville et al, consisted of two symmetrical-cavities separated by a midline-septum, measured at its widest part from the intact-skull or skin at the transverse view. NT is the presence of unilocular collection of nuchal fluid < 3mm. Prenatal ultrasound of cystic hygroma may show increased nuchal thickness (> 3mm), with or without septation at the neck region or thin-walled, sonolucent, and multilocular structure at other regions. color Doppler may show no obvious internal flow which can be distinguished from hemangioma. Other postnatal diagnosis by physical examination, X-ray, MRI & CT scan.

Management may be by surgical excision or by injection with OK-432, chemotherapy medications, injection of sclerosing medications, radiation therapy & Steroids.

RESULT: We have diagnosed three antenatal cystic hygroma & single neonatal unilateral cystic hygroma successfully within first examination during last 06 months at Karachi (AKHW&C, KHA & GRD) .

CONCLUSION: Antenatal & neonatal evaluation by ultrasounds and appropriate counseling can result in better outcome for the fetuses & neonates.

P-2

Rare presentation of hydatid in orbit

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INTRODUCTION: Echinococcus is a parasitic disease found in developing countries. This is acquired by humans through accidental ingestion of echinococcus eggs

CASE REPORT: A 52 y female, resident of Afghanistan presented with right eye proptosis, watery discharge and irritation for past 9 months. MRI brain and orbit was performed which showed a large cystic lesion in right lateral orbit, intraconal retrobulbar location measuring 6.4 x 3.8 x 4.4 cm. There was significant mass effect on right globe. The eye globe was pushed anteromedial and inferior. The cyst was abutting the orbital apex with expansion and optic nerve was not separately visualised in orbit. Intracranial portion of optic nerve and optic chiasm was preserved. Postcontrast images show thin rim enhancement, no diffusion restriction, septations or solid components noted. This was diagnosed as hydatid cyst of orbit and detailed road map was discussed with

surgeon. The diagnosis was confirmed on surgical exploration on histopathological diagnosis, also correlating with our imaging findings.

CONCLUSION: Although orbital hydatid cyst is a rare entity (0.3-2%). Positive serologies can be seen in half of the patients. Our patient was serology negative and hydatid cyst was diagnosed on imaging with further confirmation on histopathology. Surgical removal is treatment of choice. Patient is doing well after surgery.

P-3

Imaging spectrum of rare scenario with SCC developing along margins of epidermoid cyst

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INTRODUCTION: Squamous cell carcinoma is a rare sequela of benign cerebral epidermoid cysts.

CASE REPORT: A young 27y male, presented with right temporal lobe epidermoid cyst. Surgery was done. This was a difficult surgery with perioperative uncontrollable bleeding. Patient developed large epidural and subdural hematoma, serial followup CT and MR was performed for over 4 months. Large scalp swelling which was reported as enhancing masses along the margins of residual cystic lesion. These developed in 2 months interval. Persistent rapid increase in sizes on followup, further re-biopsy and histopathology revealed squamous cell carcinoma. Imaging spectrum will be displayed as poster for this rare case.

CONCLUSION: This is a rare case report with serial imaging representing development of squamous cell carcinoma along the margins of epidermoid cyst in short interval.

P-4

Mammographic breast density: Patterns in Pakistani women, factors affecting it and inter-observer variability in assessment

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BACKGROUND: Density on a mammogram reflects the amount of glandular tissue in the breast. This can affect the sensitivity of breast cancer detection on mammogram besides being an independent risk factor for breast cancer. The incidence of breast cancer in Pakistani women is reported to be highest in Asia. There is no published local data to our knowledge describing the patterns of mammographic breast density in our population. We undertook this study to:

- 1) To assess the BI-RADS patterns of breast density on mammogram;
- 2) To find factors that affect breast density
- 3) To assess interobserver variability in breast density assessment.

MATERIALS AND METHODS: Bilateral breast mammograms done during the study period in department of Radiology, AKUH were retrospectively reviewed for breast density by two separate readers. Breast density was categorized into four types according to the BIRADS lexicon. Type 1 and 2 were grouped into non dense and type 3 and 4 into dense breasts. Clinical data was obtained from the proforma filled at the time of mammographic examination. Factors affecting breast density were assessed using chi square test, a p value of < 0.05 was considered statistically significant. Inter observer variability was calculated using Cohen's kappa coefficient.

RESULTS: A total of 612 women underwent mammography in the study period. Heterogeneously dense breast parenchyma was the most frequent

pattern seen in 51.6% followed by scattered fibro glandular in 38.9%. Fatty parenchyma and extremely dense parenchyma were least common. Breast density was inversely related to age and parity with p value of 0.001 and 0.002 respectively. Breast density was also lower in postmenopausal women with p value of 0.001. There was no statistically significant difference in mean age at menarche, age at first birth, family history of breast cancer or presence of cancer among women with dense and non-dense breasts. The interobserver agreement was almost perfect among the two readers with Cohen's kappa coefficient of 0.86.

CONCLUSION: Majority of women in our study population (56.9%) had dense breasts (BI-RADS type 3 and 4). Breast density reduced with increasing age, parity and post-menopausal status. Breast density assessment was almost perfect among the resident and the radiologist indicating optimal training according to standardized guidelines.

P-5

Radiographic imaging findings in admitted COVID-19 patients -What to know!

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INTRODUCTION: Coronavirus Disease 2019 (COVID-19) pandemic is greatly affecting healthcare systems, world's economy and behaviors of mankind. Familiarity with disease presentation, imaging patterns and disease outcome is important for patients' care and management. Therefore, we aim to describe imaging findings, disease course and outcomes in admitted COVID-19 patients.

METHODS: This retrospective study was conducted in our Radiology Department at King Fahad Military Medical Complex Dhahran, from March to August 2020. All laboratory confirmed COVID-19 positive (admitted) cases were evaluated for their symptoms, stay in hospital (ward or ICU), and chest radiographic findings (on chest radiographs and computed tomography studies). Disease course and outcomes in terms of recovery (with regression or resolution of radiographic findings), worsening of condition (transfer from ward to ICU), and unfavorable outcomes (persistent ICU stay or death) were recorded. Imaging findings were interpreted by two experienced radiologists and consensus reporting was made for documentation of results. Demographic information and imaging findings were compared to hospital stay and unfavorable outcomes. Chi-square test was used to determine association.

RESULTS: Out of 106 patients, majority were males. Less than half of admitted patients had chest radiographic abnormalities, with mostly unilateral or bilateral peripheral opacities, followed by consolidations and others (atelectasis, reticulation, bronchovascular thickening, pleural effusion). Advanced age, comorbidities, and worsened radiographic findings were seen associated with unfavorable outcomes (P-values, 0.0005).

CONCLUSION: COVID-19 is seen mostly affecting males, with peripheral opacities and GGOs (with or without consolidations) as common imaging findings. Elderly patients with co-morbidities, immunocompromised statuses and worsening radiographic findings show unfavorable outcomes.

P-6

Failure to reposition the arms on portable NICU chest radiograph mimics lamellar effusion

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INTRODUCTION: A number of patient factors can lead to technical limitations while performing portable chest radiographs in NICU setting. The purpose of

this study was to evaluate the frequency of arm malposition on portable NICU chest radiographs and determine the proportion mimicking lamellar effusions.

METHODS: This was a retrospective study of 42 neonates who underwent portable chest x-rays in NICU portable settings from June 15 to June 30, 2019 at AKUH radiology. 300 consecutive chest x-rays (600 hemithoraces) were reviewed by a pediatric radiologist. For each patient, various parameters were recorded.

RESULTS: Out of 600 hemithoraces, true lamellar effusion was found in 400 hemithoraces (66%). The arm was positioned in abducted position in 332 (55%) and in adducted position in 268 (44%) of hemithoraces. In 200 (33%) hemithoraces, linear opacity along the chest wall mimicking lamellar pleural effusion was present. However, in 68 (11%) of hemithoraces, no false pleural effusion was found.

CONCLUSION: Proper positioning of arms while performing chest radiographs in portable NICU setting is critical to reduce false positive interpretation of lamellar pleural effusion. Radiology technicians/radiographers awareness regarding adequate patient has a pivotal role in this regard.

P-7

Benign entities mimicking pathology on PET CT

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Pathology on PET CT is indicated by tracer uptake. That forms the basis of imaging in PET. However the discerning reader should be aware of uptake in benign lesions that may mimic disease. I present a series of examples where FDG uptake mimics disease. This is necessary to avoid pitfalls while reading PET-CT scan

P-8

Impact of gender on metabolic response in patients with non-Hodgkin's lymphoma using interim 18FDG PET/CT

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The purpose of this study was to determine the impact of gender on response in patients with non-Hodgkin's lymphoma (NHL) based on interim 18-fluorodeoxyglucose (FDG) positron-emission tomography/computed tomography (PET/CT).

This retrospective study was conducted at PET/CT section of a JCI-accredited healthcare facility from January 2019 to February 2020. Patients with baseline and interim 18FDG PET/CT scans were selected. Interim scans were performed not earlier than 2nd or later than 4th chemotherapy. The study population was divided on the basis of gender and various demographic factors were compared among them. Furthermore, predictors for responders between two groups were analysed using receiver operating characteristics (ROC) and logistic regression analysis (LRA).

Total 330 patients with NHL were categorized on the basis of gender into male (211/330) and female (119/330) cohorts. Female group was significantly obese (Body Mass Index ≥ 30 kg/m²). Rest of the demographic factors (age, fasting blood level, FDG dose, uptake time, mean liver uptake, baseline highest SUVmax and the largest lesion size) were statistically similar. Male group was found to have significantly higher Stage III disease while rest of disease burden was found to have similar distribution in both groups. Significantly

higher proportion of female was found as responders (with Deauville Score: 1-3) than males (82% vs. 66%; p value <0.05). Among responders, obesity was found significantly higher in female responders (32% vs. 19%; p-value <0.05). Rest of the factors were found non-significant in both groups. Using ROC, baseline BMI (>26.8 Kg/m²) was found to be an independent predictor of response in female responders. While stage IV disease, was found to be a predictor of non-responders in male. Using LRA, a negative correlation was found for baseline highest SUVmax for BMI >26.8 Kg/m² in female responders.

We conclude that prevalence of NHL is higher in males but females are good responders and baseline BMI >26.8 Kg/m² is an independent predictor in female responders. Furthermore, baseline SUVmax has inverse correlation with baseline BMI in female responders.

P-9

Hepatic lesions on MRI: Discrimination of benign lesions from malignant lesions with heavily and moderately T2-weighted fast spin-echo imaging

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LEARNING OBJECTIVES: To describe role of combined use of heavily and moderately T2-weighted images in differentiation of benign from solid malignancies.

To discuss diagnostic ability of T2-weighted images along with dual echo and diffusion weighted sequences.

BACKGROUND: Liver has relatively low signal on T2WIs, whereas most of the hepatic lesions have higher signal than background liver parenchyma (cysts and hemangiomas). The spin echo technique represents the standard for T2 imaging of the liver, mostly based on FSE and SSFSE sequences. FSE are usually acquired with respiratory triggering or gating, navigators, or breath held. SSFSE has a rapid acquisition time (<1s/slice) and can be acquired breath-held. The design of this sequence is suitable for acquisition with long echo time (TE) and heavy T2-weighting.

FINDINGS AND PROCEDURE DETAILS: Vast majority of focal liver lesions are hyperintense on T2-weighted images. Some hepatic lesions may appear totally or partially hypointense like with deposition of iron, calcium, or copper, or solid lesions like focal nodular hyperplasia, hepatocellular adenoma, hepatocellular carcinoma, metastases. The conjunction of other MR imaging findings and their integration in the clinical setting may allow a correct diagnosis in a considerable proportion of cases. There is role of value of TE in T2 weighted images. In heavily weighted T2 images or SSFSE with a TE of more than 100, any lesion appearing hyperintense to the surrounding liver parenchyma is benign, like hemangioma, cyst etc. Moderately weighted T2 images with TE value of 80-100 would show slight hyperintensity for a solid malignant lesion.

CONCLUSION: T2 weighted imaging is useful for distinguishing benign from malignant lesion without use of contrast-enhanced images.

P-10

Role of MDCT in planning treatment of hepatocellular carcinoma and imaging findings in treated lesions

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LEARNING OBJECTIVE:

- 1) To describe role of imaging in treatment planning of HCC.
- 2) To define the role of CT in diagnosing local residual disease or recurrence.

BACKGROUND: CT scan done with dedicated dynamic phase protocol can easily diagnose the presence of HCC by depicting arterial phase enhancement and washout of contrast in venous or delayed phases. CT scan is usually performed on multidetector CT. Development of HCC in cirrhotic liver is multiphase process from regenerative nodule, through dysplastic nodule progressing to HCC focus within dysplastic nodule and develops into a mature HCC.

FINDINGS AND PROCEDURE DETAILS: CT findings in HCC vary depending on type of HCC, which can be infiltrative, well defined, angioinvasive, fat rich, hypovascular or exophytic. Imaging plays a vital role in deciding the treatment option for HCC, whether it is suitable for curative option of treatment like thermal ablation and transplant or palliative option like transarterial embolization. Imaging depicts involvement of biliary tree, nodal disease and extrahepatic disease. In addition, background extent of portal hypertension effects can be assessed. Multidisciplinary meeting and planning is essential to ensure correct pathway. Following treatment, follow up imaging and regular multidisciplinary discussion is adopted.

CONCLUSION: Importance of learning radiological findings is vital in treatment planning of HCC. Familiarity with the imaging findings of HCC, its variant types and extent of disease can be helpful in the differential diagnosis of HCC.

P-11

Alveolar microlithiasis

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BACKGROUND: Pulmonary alveolar microlithiasis (PAM) is a rare disease characterized by the widespread intra-alveolar accumulation of minute calculi called microliths. We report the CT findings in a patient with the typical plain radiographic features of pulmonary alveolar microlithiasis.

CASE PRESENTATION: A 38 year old female patient was referred to the radiology department of RMI on 14th November 2019 for HRCT. In childhood, she suffered from several lower respiratory tract infections and asthma. She is a nonsmoker. There was no known family history of respiratory diseases. She presented with complaints of shortness of breath on exertion and dry cough of 2 years duration. She is a house wife by profession There was no history of fever, chest pain, hemoptysis, or weight loss. On auscultation, there were wheezes and coarse crackles bilaterally. Cardiac auscultation was normal, and no cyanosis/clubbing/peripheral edema was observed. The routine blood examination was found to be normal, and the pulmonary function tests showed mild restrictive lung disease.

Chest radiograph postero anterior view revealed the presence of innumerable widespread, small, dense nodules-diffusely involving both the lungs-predominantly in the basal regions with obscuration of the mediastinal, cardiac, and diaphragmatic borders. There is narrowing and left shift of trachea.

HRCT reveals bilateral extensive hyper dense calcifications seen almost throughout both lungs. There is bilateral patchy intra alveolar, interlobular septal and sub pleural calcifications, interstitial septal thickening, patchy areas of crazy paving i.e ground glass haze interspersed with septal thickening and small nodules with centrilobular predominance seen. There is calcification of pleura. No evidence of bronchiectasis. Calcified densities seen also involving the sub pleural regions. Right paratracheal large 4.5 x 4cm thyroid nodule seen causing compression on airway and moderate tracheal narrowing. Main stem bronchi are normal. There is mild cardiomegaly with dilated LV. No pleural effusion seen. There are multiple large mediastinal lymph nodes in paratracheal, sub-carinal and bilateral hilar regions.

CONCLUSIONS: The patient was advised to undergo broncho alveolar lavage and lung biopsy.

P-12**Giant pedunculated hepatic hemangioma: Masquerading as intra abdominal gastrointestinal stromal tumour (GIST)**

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Hepatic haemangioma is the commonest benign liver lesion encountered. The lesion is mostly intra hepatic with right lobe predilection and female predominance. It shows characteristic imaging appearances of a homogeneously hyperechoic lesion on USG demonstrating progressive centripetal pattern of blood pool enhancement on Triphasic computed tomography (CT) and MRI with extra cellular contrast agent showing light bulb sign on T2 HASTE sequences. Diagnostic difficulty is encountered in instances when haemangioma shows atypical imaging appearances in the form of flash filling haemangioma, hyalinised haemangioma, haemangiomas with capsular retraction, fatty infiltration and fluid - fluid level in which case distinction from neoplastic primary, metastatic and lymphomatous deposits becomes difficult. Giant pedunculated haemangioma is an exceedingly rare atypical manifestation with 24 reported cases in available literature till date. Because of its exophytic extra hepatic bulk it is commonly misdiagnosed as sinister abdominal neoplasm derailing the roadmap for further management.

We report a case of 55 years old female known case of HCV infection who presented with 01 year history of intermittent abdominal pain and vomiting. Ultrasound abdomen revealed a large intra abdominal mass right half of abdominal cavity inseparable from bowel loops and liver. Triphasic CECT liver was done which showed a large heterogeneous progressively enhancing mass lesion sub hepatic region with central non enhancing necrotic component closely abutting and inseparable from ascending colon. It showed a thin vascular stalk connecting the lesion to inferior visceral margin right hepatic lobe segment VI with its subsegmental and segmental branch supplying the vascular pedicle. Correlative MRI revealed characteristic light bulb appearance on T2 HASTE seq substantiating the diagnosis of giant pedunculated hepatic haemangioma. RBC scintigraphy was also done which revealed intralesional Tc 99m pertechnetate labelled RBC accumulation on delayed SPECT/CT images in background of normal excreting liver parenchyma. On account of significant size of the lesion and potential risk of complications patient underwent laparoscopic surgical resection with histopathological confirmation of subhepatic venous malformation.

P-13**Giant tumefactive perivascular Virchow Robin spaces (VR): A disregarded imaging finding of significant diagnostic confusion**

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Cystic brain lesions are a commonly encountered entity in cross-sectional imaging and have a wide range of differentials ranging from benign to malignant etiologies. Perivascular spaces (PVS), synonymously known as Virchow Robin (VR) spaces are pial-lined, interstitial fluid-filled cystic structures in the brain, characteristically seen accompanying cerebral vessels as they penetrate the brain substance in typical anatomical distribution. In healthy individuals, a PVS diameter of <2 mm is considered normal and can typically be seen within the white matter on magnetic resonance imaging (MRI). However, when considerably sizeable these can pose great deal of diagnostic confusion especially in absence of sinister imaging features of enhancement, mass effect, parenchymal volume loss and edema; thus serving as potential mimickers of cystic brain lesions.

A 42 years old male patient presented with single episode of headache and syncopal attack for which he was hospitalized and underwent plain CT brain. It revealed multiple cystic lesions of variable shapes and sizes predominantly in supra-tentorial location centered within the white matter of all lobes of left cerebral hemisphere and right frontal lobe region. Contrast enhanced MRI with additional spectroscopic mapping was done for further characterization of cystic lesions with background clinical suspicion of neurocysticercosis. The lesions were redemonstrated with absence of associated significant cerebral atrophy, mass effect, midline shift or marginal/ central enhancement. Moreover, these lesions showed characteristic anatomical distribution remaining in peri medullary location propagating centrifugally outwards on coronal imaging planes. Few peri ventricular cystic spaces were also seen with marginal rim of gliosis. Corresponding multivoxel MR spectrum revealed background preserved brain metabolic markers, however, peri lesional and intralesional voxel placement sites revealed characteristic lactate doublets attributable to early cellular marginal gliosis. Pathological screening was negative for protozoal infection with unremarkable CSF analysis, therefore, on the basis of characteristic MR features and anatomical distribution diagnosis of Giant tumefactive VR spaces was made in a clinically asymptomatic patient with reiteration of the finding as an important differential consideration in cystic brain lesions.

P-14**Peliosis hepatis - A radiological eye opener non neoplastic centrifugally enhancing hepatic vascular lesions in a known case of chronic liver disease**

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Hepatitis B and C virus associated chronic liver disease (CLD) is significantly prevalent worldwide with high incidence of development of cirrhosis associated nodules and hepatocellular carcinoma (HCC), with the latter demonstrating arterial phase hyper-enhancement and subsequent porto-venous phase washout. However, any atypically enhancing liver lesion in background of chronic parenchymal fibrosis should be an eye roller for the reporting radiologist and distinction must be made from focal enhancing 'Touch me not' vascular lesions before intervention is planned to obviate the risk of fatal catastrophic hemorrhage. One such benign entity is 'hepatic peliosis'; an acquired condition histologically characterized by central cystic sinusoidal dilatation secondary to hepatocyte destruction which mostly is idiopathic but can be seen secondary to medications including steroids and as sequelae of long standing infectious disease processes.

A 65 years old male patient, known case of HCV infection presented with recent onset history of abdominal pain. His USG raised suspicion of diffusely scattered variable echogenicity ill defined lesions both lobes in background of features of chronic hepatic parenchymal disease. With strong suspicion of multifocal HCC patient underwent a triphasic CECT for further lesion characterization which revealed diffusely scattered areas of differential enhancement both lobes more discrete and numerous in right lobe and geographically scattered in left lobe. These lesions showed central nodular enhancement on portovenous phase of imaging with gradual centrifugal progressive enhancement on delayed phases along with peripheral hypodense rim of non enhancement representing vascular steal effect. The lesions in left lobe of liver were relatively larger showing similar enhancement pattern with concurrent partially thrombosed and markedly attenuated left lobar division portal vein with large secondary vascular perfusion defect manifesting as Transient hepatic attenuation difference (THAD). Characteristically and strikingly these lesions showed close proximity to segmental and subsegmental tributaries of portal vein representing areas of sinusoidal contrast accumulation. On basis of characteristic enhancement pattern and anatomical location diagnosis of hepatic peliosis was made which contraindicates biopsy for histopathological confirmation.

P-15**Radiation dose during the transarterial embolization of hepatocellular carcinoma**

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AIM: To assess the dose during the procedure of transarterial embolization (TAE) in patients of hepatocellular carcinoma (HCC).

METHODS: A cross-sectional retrospective study was performed at Rehman Medical Institute, Radiology department, Peshawar from June 2020 to September 2020. Total number of 136 procedures of TAE were done during this time period on Artis zee imaging system from Siemens. The fluoroscopy time, number of exposures and total dose for each procedure was recorded and maintained in a register along with patient's details including age, gender, weight and BMI. The doses are maintained to obtain a data of doses of all patients. Those patients in which doses are relatively high were assessed retrospectively to take steps in future to maintain low radiation doses of patients for TAE.

RESULTS: The average fluoroscopy time is 18.2 minutes with average total exposures of 9 and total dose of 12393 mGym³. This data will help in taking steps for reduction of doses in patients undergoing TAE procedure.

CONCLUSIONS: With the increasing use of TAE as a treatment for HCC, it is important to employ exposure-reducing methods to complete the procedure safely and at the lowest achievable dose. Even considering the given relative safety of this procedure as currently performed, operators need to be aware of the techniques that can be employed to minimize those risks. This study has outlined those steps that can be taken to enhance the margin of safety for avoiding radiation injury without compromising the success of the procedure.

P-16**Look for every funny bubble in the field when all seems normal!**

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Air is normally seen in some body structures, such as in paranasal sinuses, respiratory and gastrointestinal tract. Air when present outside these aforementioned areas, whether in subcutaneous tissues, cervical, mediastinal, retroperitoneal, extraperitoneal abdomen and pelvis spaces, intracranial, intravascular, involving muscular fibres or interstitial tissues is abnormal, indicating a "pathological process", and represents a challenge to search for the underlying etiology.

It can be associated to a wide range of disorders. Although it usually is an innocuous condition, it should prompt a search for the underlying etiology, since some of its causes impose an urgent treatment. In rare instances, it may itself represent a life-threatening condition, depending on the site involved and how quickly it evolves. Abnormal air beyond viscera and serosal spaces, reaches its location following some anatomic boundaries, such as fascia, which may help search the source and helps in the management of the patient. Ectopic air represents a challenge to the radiologist. The search for the underlying etiology may be tricky since air can be detected almost anywhere (away from its source). Here, we have compiled an imaging series of possible etiologies of ectopic air owing to underlying hidden abnormality including subcutaneous emphysema, pneumocephalus, pneumothorax, pneumoretroperitoneum, intravascular air and air within the walls of hollow viscus.

P-17**MRI brachial plexus with anatomical and pathological details our experience at SIH; A pictorial review**

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Brachial plexopathies, present with vague symptoms and often is a diagnostic challenge for clinicians. Clinical examination and electrophysiological studies are useful but may not localize the lesion accurately. Magnetic resonance imaging (MRI) with its high soft tissue contrast resolution and multiplanar imaging capability has an important role in evaluation of the pathologies involving brachial plexus. The objective of this study is to provide the radiologist with a basic approach to understand the anatomy, pathology, and imaging of the brachial plexus.

METHOD: We retrospectively reviewed anatomical details and pathologies encountered in 36 MRI brachial plexus performed at SIH using 1.5T and 3T scanner from January 2017 to September 2020.

RESULTS: We found normal study in 16.7%. The most common pathology being post traumatic pseudomeningoceles in 22.2%, followed by pseudomeningoceles with nerve root avulsion in 16.7%, perineural edema and enhancement in 13.9%, perineural cysts in 8.3%, nerve root edema in 5.6%. other pathologies including brachial plexus cord injury, post-traumatic neuritis, chest wall infection involving brachial plexus cords, C7 nerve injury, neuroma and right scalene muscle edema were seen in 2.8%.

CONCLUSION: Diagnosing brachial plexus pathology can be clinically challenging, often necessitating further evaluation with MRI. MRI is capable of depicting beautifully anatomical details as well as above mentioned pathologies in brachial plexus.

P-18**The different flavors of hepatocellular carcinoma on computed tomography liver dynamic; A pictorial review and diagnostic strategy**

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BACKGROUND/INTRODUCTION: Hepatocellular carcinoma (HCC) is currently the second most common cause of cancer-related deaths globally with expected increase in its incidence. Most cases of HCC are present in middle to low resource countries like Pakistan due to increased burden of viral hepatitis. As it is a common disease; hence different types and rare imaging features are also encountered. CT liver dynamic is a non-invasive and highly accurate tool for diagnosis of HCC.

OBJECTIVE: The aim of this article is to familiarize radiologists with different types and rare forms of HCC highlighting the CT spectrum of atypical appearances.

CONCLUSION: The knowledge of different forms and atypical HCC is essential for the general radiologist to avoid unnecessary biopsy in suspected HCCs.

P-19**HRCT scan chest features of COVID-19 in relation to day after becoming symptomatic**

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INTRODUCTION: Despite the fact that much has been written on various aspects of COVID-19, literature lacks a detailed and accurate description of HRCT findings in relation to the duration of the disease. The aim of this study was to investigate the difference in HRCT scan findings depending on the duration after onset of the disease.

The objective of the study is to identify and compare findings of HRCT scan at different time points after onset of the disease.

SUBJECTS AND METHODS: A total of 224 patients, scanned over a period of 2 months, were placed in one of the four groups at the time of their scan depending on the days lapsed after their symptoms appeared. All scans were carried out on the same machine. Findings in each group were recorded and compared. A finding showing significant difference between groups indicates its importance in describing the course of the disease. Analysis was done on SPSS 23.

RESULTS: Ground glass opacities in posterior segments of one or more lobes was the most common feature and had a significant association with first 5 days of the disease ($p=0.027$). Interlobular/ intralobular thickening and subpleural reticulation, are found between 3 to 5 days or later in the course of the disease ($p=0.000$). Fever was found to be a feature in only 54.5% of patients. HRCT showed a greater sensitivity as compared to PCR, although it is not significant statistically ($p=0.673$).

CONCLUSION: Ground glass opacities located in posterior segments are the predominant feature in patients who are scanned up to 5 days after their symptoms appear. This feature is the most common in scans done in asymptomatic cases too. Intralobular septal thickening and subpleural reticulation start appearing at 3 days of disease process

P-20**Monsters in the eyes; A review of orbital pathologies**

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Orbit being a complex structure in the body is challenging area for radiologists when comes to abnormalities due to their multiple etiologies and variable imaging appearances. Usually encountered abnormalities include benign and malignant neoplasms, congenital, vascular, inflammatory-infectious lesions and miscellaneous etiologies. Certain lesions require tissue sampling to establish the diagnoses which requires highly experienced surgeons with adequate surgical planning. Hence imaging has a major role in the diagnosis process in ocular and extra ocular abnormalities. Therefore, radiologists must be aware of key imaging features that may help to differentiate benign and malignant lesions and give a diagnostic approach. Usually CT scan is the first imaging modality to evaluate orbital masses in emergency departments. However, MRI is the modality of choice due to better soft tissue contrast and spatial resolution. We will illustrate orbital pathologies from patients who presented in our radiology department for CT and MRI including tumors (uveal melanoma, retinoblastoma, meningiomas etc), infections/inflammation (cellulitis, optic neuritis etc), mets, and miscellaneous (orbital pseudotumor, thyroid ophthalmopathy, retinal detachment, carotid cavernous fistula and vascular abnormalities etc).

Radiologist must be familiar with appearances of these orbital pathologies for timely diagnosis and intervention hence playing a critical role in improving patient's prognosis.

P-21**Left hepatic lobe agenesis with ectopic gall bladder – A case report**

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An ectopically located gallbladder is a rare entity. Here we present a case of an ectopic gall bladder with left hepatic lobe agenesis. In this study we described a case of a 56 years male known diabetic patient who presented with abdominal pain since last two weeks. In screening CT abdomen with contrast an incidentally found ectopic gall bladder along the right posterior inferior margins of liver. Associated reported complete agenesis of left hepatic lobe including absent segment II, III and IV. Ectopic gall bladder with 0.1-0.7% incidence are found in a wide range of location. Most of the commonly encountered ectopic positions include intrahepatic, transverse, retro-hepatic, retroperitoneal, supra-hepatic, falciform ligament or under the left liver lobe. In review of relevant literature, ectopic gallbladder with left lobe agenesis is rarest with only two studies from 1987 and 2004. Ectopic gallbladder have clinical significance as they alter clinical presentation of cholecystitis. This may create technical problems during cholecystectomy and other biliary operations causing misdiagnosis in imaging. Thorough inspection of biliary tract in patients undergoing surgery is suggested before electrocoagulation. A radiologist must always inform the clinician about the existence of an aberrant gallbladder.

CONCLUSION: We conclude that ectopic gallbladder with left lobe agenesis constituting an incidental finding is a rare entity.

P-22**Utility of dual-energy CT for evaluation of tophaceous gout- Our initial experience at Shifa international hospital, Islamabad**

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Dual energy CT (DECT) is a non-invasive method for the visualization, characterization and quantification of monosodium urate crystal deposits which aids the clinician in the early diagnosis of gout. DECT can be used to differentiate urate crystals from calcium by using specific attenuation characteristics and can aid in problem solving of complex and atypical presentations of gout. It is also useful as a means of disease quantification in the follow-up of patients with gout.

Here we will present our initial experience at shifa international hospital with a pictorial review of gout imaging performed at dual energy CT scanner; proving it to be a unique and clinically relevant modality in the diagnosis and management of gout.

P-23**CT in detection of emphysematous pyelonephritis**

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PURPOSE: To ascertain the rare case of emphysematous pyelonephritis with extra renal extension.

MATERIAL AND METHOD: We want to present a rare case of emphysematous pyelonephritis with extra renal extension. A 24 years old diabetic female presented with fever and right flank pain. On examination a mass was palpable in the right lumbar region.

RESULTS: 160 S CT chest abdomen and pelvis with slice thickness of 5mm showed enlargement of right kidney, with few wedge shaped hypodense areas. Renal and pararenal fluid collections with Air locules as well as adjacent peri renal fat stranding and local reactive lymph nodes accompanied by small sub capsular hepatic abscess and extensive right lung consolidation. No definite renal and right ureter calculus seen.

CONCLUSION: CT has made possible accurate diagnosis of emphysematous pyelonephritis with its extra renal extension predicting overall prognosis with greater certainty.

P-24

CT in detection of RCC in association with Nutcracker syndrome

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PURPOSE: We want to showcase a rare case demonstrating coincidence of renal cell carcinoma with nutcracker syndrome.

BACKGROUND: Renal cell carcinoma is by far the most common malignant tumor of kidney in adults making up to 2.5% of all adult cancers with a prevalence of 16 cases per 100,000 population and is twice as common in males with peak incidence between 65 and 75 years of age and is uncommon before 40. Nutcracker syndrome refers to compression of left renal vein between abdominal aorta and superior mesenteric artery. These two entities are extremely rare and their coincidence has not previously been described in literature.

CASE REPORT: A 45 year old female presented with low grade fever for 1 month, haematuria, lower abdominal pain, nausea, anorexia and weight loss for 15 days.

RESULTS: CT abdomen of a patient was done which showed a large heterogeneously enhancing mass lesion with internal foci of calcification was seen arising from the lower pole of left kidney. Remaining left renal parenchyma was normal. No invasion of left renal vein or IVC was noted. The mass was seen compressing the splenic vein with resultant engorgement of vessels in left hemiabdomen and pelvis. Slight delayed excretion of contrast was noted from left kidney. The left renal vein was seen compressed between superior mesenteric artery and abdominal aorta leading to "NUTCRACKER PHENOMENON". Para aortic lymphadenopathy was not seen. Hepatosplenomegaly was also noted in this case. Contralateral kidney was normal.

CONCLUSION: CT imaging has made it possible to recognize the character of mass, involvement of the renal vein or IVC, contralateral kidney, staging of tumor, and metastasis to different areas of the body.

P-25

A very rare tumour in the urinary bladder

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PURPOSE: Imaging characteristics of a very rare solitary fibrous tumor of urinary bladder in CT scan.

BACKGROUND: The primary bladder tumor comprises mostly of the

epithelial layer or all the four layers however, the solitary fibrous tumor arises from the submucosal layer of the bladder.

Solitary fibrous tumor (SFT) is an exceedingly rare neoplasm of mesenchymal origin comprising less than 2% of all the soft tissue tumors although most of them are benign, 20% are found to be malignant. SFT were found mostly to be of pleural location but now recently has been reported to be found in numerous anatomic locations like mediastinum, dura and pelvis. They are mostly incidental and occur mostly in males with the age group of 42 to 67 years. SFT clinically masquerade as malignant growth due to their clinical significance.

MATERIALS AND METHOD: We want to present a rare case of solitary fibrous tumor of urinary bladder. A 60 year old male had presented with lump in lower midline area near suprapubic region since 6 months associated with hematuria since 2 months.

RESULTS: 160 slice CT scan of abdomen and pelvis with contrast showed a heterogeneously enhancing multiloculated soft tissue density mass in the pelvis arising from urinary bladder measuring 16.4x11x10.4 cm. It also showed internal calcification. There were areas of internal non enhancing tissues representing large necrotic component of mass along its superolateral aspect. The residual urinary bladder was seen pushed superoanteriorly by the mass and compressed by the anterior abdominal wall. The fat plane present posteriorly between the mass and rectum was lost. Multiple bilateral enlarged superficial inguinal lymph nodes were seen largest measuring 1.5 x 1.0 cm on left side.

CONCLUSION: Various imaging modalities have made possible for the imaging characteristics of a very rare tumor.

P-26

CT appearances of abdominal hydatidosis at various stages : A pictorial review

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INTRODUCTION: Echinococcus infection, also known as hydatid disease, can affect many regions of the body including CNS, chest, abdomen and musculoskeletal system. Out of these, abdomen is the most commonly affected region as hepatic hydatidosis accounts for more than 75% of the cases. Hydatid cyst has classic radiological appearances on ultrasound, CT and MRI, which however vary slightly depending on the disease stage. Recognizing these appearances is vital in order to guide the clinician towards proper diagnosis, importantly because unplanned intervention in hydatidosis can potentially prove to be fatal if the diagnosis is not suspected.

MATERIALS AND METHODS: We present a case series of abdominal hydatid disease affecting various organs in abdomen including liver, spleen and kidney. These cases show hydatid cysts at various stages ranging from simple cysts to classic honeycomb appearance with cyst-within-cyst appearance, peripherally calcified cysts and completely calcified cyst with calcified internal whorled appearance. These cases show classic CT appearances of hydatid disease at different stages to help understand the various appearances of this disease during the life cycle of the pathogenic organism.

CONCLUSION: Hydatid disease can affect different organs with classic radiological appearances at different stages. A radiologist should be familiar with these appearances to help guide the clinician regarding the correct diagnosis for proper management.

P-27**Not every mottled air on CT is a gossypiboma : Importance of communication between clinician and radiologist**

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INTRODUCTION: Gossypiboma is one of catastrophic complications of surgery not only for the patient, but also for the surgeon in terms of implications on his reputation. Its appearance on CT has classically been described as spongiform with mottled lucencies. However, this can be mimicked by a few other pathologies, proper knowledge of which is important for the reporting radiologist.

MATERIALS AND METHODS: A 50 years old female presented with complaint of lower abdominal pain and wound discharge 1 week after subtotal hysterectomy. The surgeon requested for ultrasound, the findings of which were concerning for possibility of retained surgical sponge. Alarmed by the situation, he arranged for a CT abdomen and pelvis with contrast. Before the CT scan could be reported, the distressed surgeon acquired films of the scan and sent them to a couple of radiology colleagues, who seconded the sonologist's opinion. Alarmed by now, the surgeon contacted the reporting radiologist. The CT scan showed a couple of almost symmetrical curvilinear lucencies within a fluid collection, which although suggestive of gossypiboma, were not typical of it. A detailed discussion between the surgeon and radiologist revealed that these findings in fact represented inflammatory changes around hemostatic material placed during surgery. The patient was discharged on antibiotics and follow up showed complete resolution.

CONCLUSION: Good communication between clinician and radiologist is essential for proper management of patient and can help avoid misdiagnosis.

P-28**Adrenal metastases of Osteosarcoma: Case Report**

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INTRODUCTION: Osteosarcomas are the second most common primary malignant bone neoplasms affecting the younger population, commonly involving the long bones of the body and the pelvic bones. The tumor is notorious for its hematogenous spread. Metastasis to the adrenal gland is highly unusual. Here we report a case of osteosarcoma with adrenal metastasis.

CASE PRESENTATION: An 18 year old female presented to orthopedic department of Rehman Medical Institute with complaints of slow growing left distal femur mass over a period of six months. Biopsy confirmed osteogenic sarcoma. She underwent neoadjuvant chemotherapy before presenting for a follow-up six months later. Follow-up leg MRI showed interval worsening. CT chest with contrast showed multiple pulmonary nodules with calcifications. Included sections of abdomen showed calcified 11 mm lesion in right suprarenal region abutting right adrenal and diaphragm with mean density of 276 HU.

DISCUSSION: To the best of our knowledge, only four cases of adrenal metastasis from osteosarcoma have been reported so far. The first two cases were in their second decade. The last two cases were in their fourth and fifth decades respectively. In our case the patient is in her second decade. 3 of the previous reports have been reported in males while that by Sandip Basu et al and the present study report incidence in females (male to female ratio 3:2). In all the previous studies as well as the present one the primary site was in long bones. In previous 3 out of 4 cases, and the present study there have been unilateral adrenal metastasis. Our study, like all the previous studies had associated pulmonary metastasis.

P-29**Relationship of dolichoectasia with hypertension - Is it strong enough?**

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PURPOSE: To establish an association of hypertension with dolichoectasia of vertebro-basilar system on MRI brain.

METHOD AND MATERIALS: Ours was a retrospective cross-sectional study between June 2017 and June 2019 in which we studied MRI brain of 200 patients of age 40 years and above. Of these 100 patients were clinically normotensive (described as having normal blood pressures according to age on at least 2 separate settings and a normal blood pressure recorded on the day of examination). Rest of the 100 patients were clinically hypertensive and receiving antihypertensive medication. We studied the vertebro-basilar system of these patients and described dolichoectasia as a greater than 4.5 mm dilatation of basilar or vertebral artery, deviation of any portion of greater than 10 mm from shortest expected course, basilar artery length of > 29.5 mm or intracranial vertebral artery length > 23.5 mm.

RESULTS: Among 100 normotensive patients, 37 had dolichoectasia of vertebro-basilar system. A close detail of history of these normotensive patients with dolichoectasia revealed 23 were diabetic, 3 patients had chronic kidney disease, 2 were treated for SLE, 1 had Wegener's granulomatosis, 2 had been treated for cancer, while 6 had no known comorbidities. Among the 100 hypertensive patients, 88 had dolichoectasia of vertebro-basilar system. The incidence of this pathology was more frequent in male population.

CONCLUSION: Our study demonstrates a strong association of dolichoectasia with hypertension (frequency of 88% in hypertensive versus 33% in normotensive patients). Where dolichoectasia is encountered in normotensive patients there is usually another underlying comorbid condition.

CLINICAL RELEVANCE/APPLICATION: The prevalence of dolichoectasia is more frequent in patients with underlying comorbidities and while it appears more prevalent in hypertensive population, where patient is normotensive its presence is more frequently associated with another underlying comorbidity of which most common appears to be diabetes.

P-30**How can you think outside the box when you have never been inside it? Unexpected perfusion findings in cerebral hemisphere of a patient with symptoms ipsilateral to the side of imaging abnormalities**

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TEACHING POINTS:

- 1) Enlighten audience of abnormalities in perfusion study in symptomatic and asymptomatic ICA stenosis with discussion of their patho-physiopathology.
- 2) Describe findings of perfusion study in our patient with imaging abnormality of cerebral hemisphere ipsilateral to symptomatic side.

TABLE OF CONTENTS/OUTLINE:

- 1) **Aim:** To explain differences in imaging findings of perfusion study between symptomatic and asymptomatic ICA stenosis through case report of an elderly patient in our sitting.
- 2) **Teaching Points:** Review patho-physiology of symptomatic and

asymptomatic ICA stenosis. Describe parameters of CBV, CBF, MTT in perfusion study, as well as how and why they are affected in symptomatic versus asymptomatic ICA stenosis. Identification of perfusion abnormalities in asymptomatic ICA stenosis can prevent potential stroke through early management.

3) Table of Contents:

- Our patient's case report.
- Review of patho-physiology of symptomatic and asymptomatic ICA stenosis.
- Discussion of parameters CBF, CBV, MTT in perfusion study in symptomatic versus asymptomatic ICA stenosis. Describe TTS (Time To Start) and TTD (Time To Drain).
- Describe time attenuation curves.
- Discussion of importance in identification of perfusion abnormalities in asymptomatic ICA stenosis.

BRIEF OVERVIEW OF OUR CASE PRESENTATION: We report an elderly male patient presenting in emergency department with acute history of left sided weakness. Immediate non-contrast CT brain with perfusion and CTA carotid were ordered as a part of stroke protocol since findings were suspicious of right cerebral vascular insult. CT brain however remained normal, right sided cerebral vasculature was patent in CTA and perfusion study demonstrated no significant abnormality of right cerebral hemisphere. Diffusion and gradient MR study of brain confirmed no acute ischemia or hemorrhage. There was incidental finding in CT perfusion in left lobe which was expected to be normal considering left sided symptoms. A reduction in CBF, increased CBV and MTT was observed. CTA showed a dense calcified atherosclerotic plaque involving left petrous, cavernous and supraclinoid ICA resulting in more than 75% luminal stenosis with almost complete occlusion of the petrous portion. Left MCA and ACA remained patent.

Thorough review of pathophysiology of described perfusion findings was made in literature and explained the findings: Stenosis of ICA decreases cerebral perfusion pressure (CPP) and results in dilatation of intracranial vessels to maintain CBF; this results in an increase in CBV. When vasodilatation is maximum further fall in CPP results in a fall in CBF. Through our poster presentation we aim to enlighten audience of this phenomena, abnormalities in perfusion values in asymptomatic ICA stenosis and its difference from acute stroke.

P-31

Not all veins are great for starting intravenous injections! A rare case report of saccular diverticulum of inferior vena cava

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TEACHING POINTS:

- 1) Diverticular aneurysms of IVC are very rare entity.
- 2) Through a case report we highlight imaging features of IVC diverticulum. We aim to create awareness amongst radiologist to keep it among differentials as misdiagnosis may lead to fatal consequence of biopsy.
- 3) Recognition is also important since early management can prevent complications such as diverticulitis or a possible rupture.

TABLE OF CONTENTS/OUTLINE:

- 1) We will present case report of patient with IVC diverticulum initially misdiagnosed as a focal hepatic lesion.
- 2) The purpose of this exhibit is: To discuss presentation, imaging features of IVC diverticulum and its possible complications. To review classification of IVC diverticulum. To explain the utility of triphasic CT and MRI in diagnosis
- 3) **Table of Contents:**
 - Case Description of our patient,
 - Presentation/ symptoms of IVC diverticulum/ when to suspect,

- Imaging features, Classification system, Differentials and Mimics,
- Complications & Management plan by Intervention Radiologists

BRIEF OVERVIEW OF CASE REPORT: We report a 40 years old female patient presenting with abdominal pain. She underwent an initial work-up contrast enhanced CT abdomen for evaluation in which liver lesions were reported and triphasic CT was advised for characterization. The patient returned after a few months and triphasic CT was performed in which an enhancing lesion on portal venous phase was documented and differentials of hepatic mass were given. Due to atypical enhancement features which did not exactly fit into enhancement criteria of any hepatic lesion an MR evaluation was considered. On MR liver dynamic imaging, 3.8 x 3.6 cm abnormal signal area was seen in communication with the inferior vena cava within the liver and in subhepatic location following the signal of vessels on all sequences. Few collaterals were seen joining inferior vena cava in segment VIII on venous phase images. Complimentary Doppler ultrasound was performed which further affirmed and consolidated the final diagnosis of IVC diverticulum. Targeted Doppler ultrasound of lesion confirmed that given lesion was a diverticulum like projection with a communication with inferior vena cava and showed complete filling on the color Doppler and venous flow on spectral analysis. Inferior vena cava in this area appeared to be significantly narrowed and stenosed. Same area on MR images showed intraluminal hypointensity raising concern for a concomitant IVC web.

P-32

Seeing the brain pathologies through magnetic resonance spectroscopy: What are the peaks telling us?

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TEACHING POINTS:

- 1) Explain the physics of magnetic resonance spectroscopy (MRS).
- 2) Enumerate the metabolites of MRS with their respective peak location and causes of their increase and decrease.
- 3) Explain the pathophysiology of alterations of various metabolites in different diseases.
- 4) Role of MRS in detection of various pathologies.
- 5) MRS artefacts.

TABLE OF CONTENTS/OUTLINE:

1. The presentation will focus on role of Magnetic Resonance Imaging in neuroradiology. The MRS findings of various diseases will be presented along with the cause of alteration of peaks.

2. Teaching Points:

- Explain the physics of Magnetic Resonance Spectroscopy.
- Enumerate the metabolites of MRS with their respective peak location and causes of their increase and decrease.
- Explain the pathophysiology of alterations of various metabolites in different diseases.
- Role of MRS in detection of various pathologies.
- MRS artefacts.

3. Table of Contents/Outline:

- Physics.
- Metabolites of MRS.
- Pathophysiology of alteration of metabolites.
- MRS in different diseases.
- MRS artefacts

P-33**Role of L5 nerve root morphology in identification of lumbosacral transitional vertebra. Is it a reliable indicator?**Sara Khan,¹ Adil Qayyum,¹ Nazia Dildar,² Asma Bangash³¹Department of Radiology, Combined Military Hospital (CMH), Multan, Pakistan.²Department of Radiology, Combined Military Hospital (CMH), Kharian, Pakistan.³Department of Radiology, Combined Military Hospital (CMH), Abbotabad, Pakistan.

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OBJECTIVE: To determine whether L5 nerve root morphology can assist in identification Lumbosacral Transitional vertebra**STUDY DESIGN:** Retrospective study**PLACE AND DURATION OF STUDY:** This study was carried out at Radiology department, Combined Military Hospital (CMH) Multan. The images of patients who underwent MRI whole spine between April 2019 to April 2020 were retrospectively reviewed.**METHODOLOGY:** Patients of both genders, 15 to 50 years age who underwent whole spine MRI were included in the study. Patients were referred from CMH Multan, from neighboring CMHs and Civil. Sagittal and axial T1WS and T2WS were performed along with coronal T2WS/FS sequences. Axial images were assessed for identification of L5 nerve root arising from LV5-SV1 level and hence vertebra was identified as LV5. Correlation was done with sagittal images for presence of Transitional vertebra, further confirmed by counting vertebral bodies from C2 vertebra upto sacrum using cross referencing tool.**RESULTS:** A total of 135 patients were included in the study. Out of these, transitional vertebra was confidently labeled in 23 patients by nerve identification method which was confirmed on vertebral counting method. However, in four patients, L5 nerve root morphology was not clear and we had to rely on vertebral counting method for identification of transitional vertebra.**CONCLUSION:** Neuroanatomy and morphology of exiting L5 nerve roots can act as a reliable method for numbering of lumbosacral vertebra and identification of transitional vertebra.**P-34****Congenital high airway obstruction syndrome (CHAOS); A rare antenatal sonographic diagnosis of unfavourable outcome**

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INTRODUCTION: Congenital high airway obstruction syndrome (CHAOS) is a rare congenital malformation involving the fetal airways, ranging from atresia to complete airway stenosis with significantly high documented rates of perinatal and immediate post natal mortality. There is no concerted statistical data available on total number of documented cases of CHAOS to date, however, a literature review search conducted between 1965 and January 2006 using the MEDLINE bibliographic database yielded 36 prenatally diagnosed cases of upper airway obstruction in forty years timeline and only a few documented case reports in Southeast Asia in last decade. The syndrome culminates in a spectrum of systemic manifestations identification of which on prenatal sonographic scrutinisation can prove to be helpful in identifying significant number of undiagnosed causes of still births and in future can pave way towards exploring new neonatological management advancements, notably the internationally proclaimed in utero EXIT(ex utero intrapartum treatment) procedure.**CASE DESCRIPTION:** A 32 years old female presented for regular antenatal scan at 21 weeks 2 days gestational age with background suspicion of fetal

hydrops. Ultrasound showed moderate fetal abdominal ascites with generalized fetal skin thickening and polyhydramnios. Fetal survey showed markedly expanded echogenic lungs causing diaphragmatic inversion. Fetal heart appeared dysmorphic and centrally compressed with poor delineation of cardiac chamber anatomy. A tubular anechoic flow void structure was seen traceable in the mediastinum showing abrupt caliber change and narrowing in the region of larynx superiorly raising possible suspicion of laryngeal stenosis. Correlative complementary fetal MRI was done which redemonstrated the described pathology.

DISCUSSION: CHAOS was first identified by Hedrick et al in 1994 as a disease entity characterized by upper airway obstruction most commonly by laryngeal or tracheal stenosis, atresia, membranous webs or laryngotracheomalacia. Consequently, in instances where airway obstruction is complete and not concurrently associated with trachea-esophageal fistulous communication, there is increased accumulation of fetal airway secretions into the lungs with classical systemic sonographic features commensurate with described pathogenesis. Imaging has a central role in identifying and making the diagnosis of CHAOS with majority of the cases being identified early antenatally on second trimester targeted imaging for fetal anomalies (TIFFA) performed between 18 week to 23 weeks of gestation. MRI can be used as a confirmatory imaging investigation for substantiating the sonographic diagnosis and identifying the exact level of airway stenosis which is sonographically difficult to detect.**CONCLUSION:** CHAOS although a rare disease entity needs to be evaluated sonographically especially in suspected cases of non immune fetal hydrops with echogenic fetal lungs.**P-35****MRI features of pelvic endometriosis: A pictorial review.**Javaria Aleem,¹ Pir Abdul Ahad,¹ Nosheen Kanwal,¹ Amir Iftkhar,¹ Shehla Imad²¹Department of Radiology, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan.²Department of Oncology, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan.

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INTRODUCTION: Endometriosis, which is defined as the presence of ectopic endometrial glands and stroma outside the uterus, is a common gynecological cause of pelvic pain and infertility, affecting as many as 10% of premenopausal women. MRI helps in differentiating and characterizing different pelvic masses. Laparoscopy, which allows visualization only of superficial endometriosis, is complemented by pelvic MR imaging provide a comprehensive evaluation of disease extension. It can present with complex adenexal mass, solid fibrotic mass or hydrosalpinx. MR also helps in locating deep pelvic endometriosis that is defined as subperitoneal invasion that exceeds 5 mm in depth.**MATERIAL AND METHODS:** 10 cases were included in study. All patients underwent MRI scan on 3T MRI scanner (MAGNETOM Vida) including T1 fat suppressed, T2, DWI /ADC and T1 GD+ fat suppressed images. Cases were reviewed by two radiologist and findings were confirmed on laparoscopy. Histopathology was considered as gold standard.**CONCLUSION:** Endometriosis can present a diagnostic challenge owing to the difficulty in assessing their origin and the overlap in imaging features. MRI provides an interpretative algorithm for approaching an unknown pelvic lesion at MRI.

P-36**Positive Biopsy rate of BI-RADS IV breast lesions on ultrasound**

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INTRODUCTION: All BI-RADS-IV breast lesions on ultrasound are recommended biopsy as they have a probability of being malignant ranging from 2% to 95%. As this is a broad range, BI-RADS IV lesions are further categorized into IVA, IVB and IVC with increasing suspicion for malignancy respectively. The purpose of this study was to calculate the positive biopsy rate of different subcategories of BI-RADS IV breast lesions on ultrasound and compare with accepted standards.

METHODS: This retrospective study was conducted at Aga Khan University Hospital, Karachi. All consecutive patients with BI-RADS IV lesions on ultrasound, undergoing breast biopsy from June 2019 to December 2019, were included. Lesions with no sub-categorization into IV A, IV B or IV C on initial ultrasound were re-categorized by a breast radiologist who was blinded to the histopathological results. The lesion subcategorization on ultrasound and histopathological results were recorded on a structured proforma.

RESULTS: A total of 73 patients were included with a mean age of 48.49 years [Range 16-74]. Based on ultrasound, 35.61% (n=26) were IV A, 16.4% (n=12) were IV B and 47.94% (n=35) were IV C. Overall, 52.05% of the lesions were benign on histology and 47.95 % were malignant. IDC II (21.9%) was the most frequent diagnosis, followed by fibroadenoma (13.6%) and IDC III (10.95%). The malignancy rate was 7.69% in BIRADS A lesions, 25% in BIRADS IV B and 85.7 % in BIRADS IV C lesions. This falls within the accepted reference range of 2-10% for subcategory IV A, 10-50% for subcategory IV B and 50-95% for subcategory IV C.

CONCLUSION: Study revealed good diagnostic performance of ultrasound BI-RADS IV subcategories, comparable to prior studies and within the accepted reference standards.

P-37**HRCT chest findings in a chromosomally abnormal child**

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PURPOSE: To know the structural lung changes that could be a leading cause of recurrent chest infection in a chromosomally abnormal child especially in a down syndrome patient, trisomy 21.

MATERIAL AND METHOD: The source of study was a seven years old child who have been presenting in emergency department of Peadiatrics due to recurrent shortness of breath from last 3 years and was being treated on the lines of acute chest infection. The child was mentally retarded and below other child. He has abnormal facial features along with congenital heart disease. The mother conceived him a little later, she was 43 years old at the time of his birth. Birth history was unremarkable.

RESULT: HRCT chest was performed and it showed bilateral patches of air space opacifications (exudate or aspiration) along with multiple subpleural cysts, tiny fluid filled cavities communication with terminal subpleural alveoli.

CONCLUSION: HRCT CHEST helped us in identifying structural lung changes (bilateral subpleural cyst) in a chromosomally abnormal trisomy 21 patient which could be a leading cause of frequent encounter to a peadiatrician.

P-38**Role of indirect radionuclide cystography compared to MCUG in paediatric patients with VUR**

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PURPOSE: The purpose of this study is to find out the sensitivity of indirect radionuclide cystography over MCUG.

MATERIALS AND METHODS: This analytical study was conducted on 35 patients with urinary tract disorders. In order to diagnose urinary reflux, 69 ureters (one child had a single kidney) were evaluated using IRNC and MCUG methods. Kappa coefficient was used to determine the agreement rate test was employed to compare the ability of two methods in the diagnosis of VUR.

RESULTS: In this study, 69 ureters of 35 children were investigated. The mean age of the children was 6.37 years (minimum 1.5 months and maximum 15 years). A total of 7 children (20%) were female and 28 (80%) were male. According to the significant difference between the two method and the Kappa coefficient (Kappa: 0.227) and (P value is 0.008), The findings of this study revealed that IRNC has Sensitivity of 23.33%, Specificity 97.44%, Positive Predictive Value 87.50%, Negative Predictive Value 62.30 % and an accuracy of 65.22%. After analysis it is concluded, that these two methods did not show agreement in the diagnosis of VUR in children. MCUG was found to be more sensitive in diagnosing VUR.

CONCLUSION: In comparison with MCUG, indirect radionuclide cystography can be used for follow up of patients with VUR as indirect radionuclide cystography cannot show precise anatomical changes, but it has less radiation exposure. Therefore, MCUG is found to be the best method to use for the diagnosis of VUR.

P-39**Emerging role of portable X-ray in COVID 19: A pictorial review from Pakistan.**

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PURPOSE: The objective of this pictorial review is to describe the common patterns of abnormality in chest radiograph in COVID-19 to familiarize the medical community with them and help deal with this pandemic.

INTRODUCTION: Outbreak of infection caused by novel coronavirus (COVID-19) has spread across the globe since the beginning of 2020 and healthcare systems world over have struggled to cope with this pandemic. Radiological investigations including radiography, CT scanning and ultrasonography have been used globally to help detect the infection, grade its severity and determine prognosis. However, no perfect diagnostic tool has been developed yet, with the gold standard PCR also having limited sensitivity for detection of the virus. CT scan has been most thoroughly studied among the imaging modalities. However, there are several drawbacks of CT including its availability, lack of portability and risk of cross infection. Chest radiography overcomes these disadvantages. Despite its lack of sensitivity, its availability and portability imply that it is likely to be the most widely used imaging modality for this purpose in our part of the world. Recognition and familiarization with the most common chest radiographic findings in COVID-19 is extremely important for all frontline healthworkers striving to deal with this public health emergency.

METHODS: This study was conducted in Radiology Dept of Mayo hospital LHR, some of the findings of chest xray in covid 19 patients are; unilateral or bilateral peripheral and lower zone ground glass opacities with reticular shadowing, multifocal and multilobar consolidations that are predominantly peripheral, in severe cases diffuse air space opacities are also reported. Atypical findings may include pneumomediastinum as a complication associated with poor prognosis.

CONCLUSIONS: As the disease burden continues to rise, chest radiography is likely to be used more frequently even if as an ancillary tool in COVID-19. The inherent disadvantages of using CT scan for this purpose particularly in a limited resource country such as Pakistan.

P-40

Rare case of spontaneous and non traumatic vulvar epidermoid cyst

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INTRODUCTION: The epidermoid cyst, also called epidermal cysts or epidermal inclusion cysts are discrete nodules lined by an stratified squamous epithelial cell wall. Many case of epidermoid cyst are reported originating from head, neck, extremities and also in genitals region. The occurrence of epidermoid cyst from female genitals are rare. The main etiology is female genital trauma, episiotomy or most commonly as a secondary effect of female circumcision. Malignant transformation of an epidermoid cyst is a rare event but possible. Overall 1% has been noted to have a malignant transformation to squamous cell carcinoma and basal cell carcinoma.

CASE: We report a case of a young married 25 years old lady with two kids delivered by casearean section. She had complaint of painless vulvar swelling since 2 years. The swelling was gradually increasing in size. She had no recallable history of trauma or surgery. She seeks medical attention because of its large size and discomfort. She was referred to our radiology department for ultrasound of vulvar swelling. It showed a well defined solid looking mass in the subcutaneous tissue arising from labia majora with internal echogenic foci. It roughly measures 67 x 34 mm, showing no definite vascularity on colour doppler. Suspicion of neoplastic lesion was raised and further evaluation with MRI Pelvis was advised. On MRI, an exophytic rounded to oval shaped structure seen involving the vulvar region in the subcutaneous tissue measuring 61 x 36 mm, it appears slightly hyperintense on T1, showing bright fluid signals on T2 weighted images. Thin peripheral rim enhancement seen on post contrast images and high signal on diffusion weighted images. Imaging features are suggestive of epidermoid cyst involving the vulvar region. Surgery was advised to the patient and total excision of cyst done without any complication. later histopathologic examination also confirmed the diagnosis of vulvar epidermoid cyst lined by stratified squamous epithelium.

CONCLUSION: As far as we know from the literature, upto now those vulvar epidermoid cyst are mainly reported from the countries where female genital cutting/ mutilation are practiced in their cultural rituals. However our case is not only different in this respect as such rituals are not followed in our society and there is also paucity of locally published literature on vulvar epidermoid cyst. The radiologist should keep in mind the differential of epidermoid cyst in cases of vulvar swelling even in the absence of history of trauma or surgery.

P-41

Symptomatic cardiac hydatid cyst in left ventricular wall

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INTRODUCTION: Hydatid disease is a zoonosis caused by the larval or adult stage of *Echinococcus granulosus*. The most common sites of the infection are the liver and the lungs. Cardiac involvement is very rare even in endemic areas and accounts for 0.5-2% of all hydatid disease. Cardiac hydatid cyst was first described by Williams in 1836. It has wide range of symptom from asymptomatic to chest pain, ventricular tachycardia, cardiac arrest.

CASE: We report a case of 35 years old male farmer, resident of interior Sindh, with no known co-morbid suddenly become unconscious. He was taken to the nearby hospital where he had pulseless VT for which he was cardioverted. Left heart catheterization was performed which showed stenosis of left circumflex artery. He was referred to tertiary care hospital for further management. Work up was done. On plain X-ray chest cardiomegaly noted with irregular left heart border. Echocardiography revealed a mass compressing the left ventricle. No vascularity seen on color Doppler echocardiography. Further CT scan chest was performed which showed a well defined cystic lesion measuring 5 x 6 cm with multiple internal detached membranes compressing the left ventricle. No sign of cyst rupture or pericardial effusion noted. CT finding are suggestive of hydatid cyst arising from the left ventricular or atrial appendage. The lesion was treated surgically, left thoracotomy was performed under general anesthesia and a large cyst arising from the myocardium of left ventricle is identified. Needle aspiration was done, sample was taken for confirmation. Then cyst was removed surgically, washed with normal saline and 28 Fr drain tube placed. Histopathology report was positive for echinococcal titre. During procedure, patient developed VT for which shock was given. Post procedure no complication noted. Patient was asymptomatic, hence discharged on 6 th post operative day.

CONCLUSION: As far as we know from literature, there are only few cases of cardiac hydatid cyst reported in Pakistan but this is the first case arising from the left ventricular myocardium to the best of our knowledge that has resulted in cardiac arrhythmia. Second in most of the cardiac hydatidosis, it occurs as an isolated finding without involvement of other organs as seen in our case. Increased awareness is essential amongst physicians and diagnosticians especially in endemic areas. Routine screening echocardiography must be kept in mind as it would be useful where infestation is common followed by cross sectional study which has a high diagnostic value in order to avoid the potential life threatening complication of disease.

P-42

Spectrum of COVID-19 pneumonia findings on high resolution computed tomography, experience from territory care center.

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BACKGROUND: Covid-19 is highly contagious RNA virus, which belongs to category of coronaviruses. It is an emerging virus causing great impact on this world. Clinical features vary from asymptomatic, mild to severe. Wide spectrum of findings can be seen on high resolution computed tomography (HRCT), with few patterns being highly suggestive.

OBJECTIVE: To evaluate the spectrum of findings on high Resolution computed tomography, enabling us to detect the disease on earlier stage.

METHOD:

Design: Retrospective cross-sectional study.

No. of patients: 40

Time period: 6 months

Institute: Department of Radiology, JPMC

Confirmation was done with PCR COVID-19 RT-PCR test or antibody Titer.

RESULTS: Peripheral sub pleural multi segmental dense ground glass haze with basilar predominance was observed as most common feature. Followed by multi segmental consolidation, interstitial thickening. Interstitial lung disease pattern was seen in subacute and chronic phase of disease. Mediastinal lymphadenopathy was less common feature. Pleural effusion and hilar lymphadenopathy was not seen in any case.

CONCLUSION: Wide range of spectrum can be observed in Covid 19 suspected patients, with multi segmental dense ground glass haze with peripheral involvement along with basilar predominance was the most commonly observed pattern.

HRCT was helpful in early diagnosis and triage of suspected COVID infected patients along with providing guide map to clinicians about severity of lung involvement.

P-43

Audit of adequacy of the ultrasound reports in the patients of obstructive jaundice presented to tertiary care hospital radiology department

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PURPOSE: According to ACR appropriateness criteria for jaundice, ultrasound is the initial modality of choice in investigation and management of the patients presenting with the obstructive jaundice. For accurate reporting of the ultrasound in these patients, few important points should be kept in the mind to guide clinicians regarding further investigations and intervention. The purpose of this study was to investigate the adequacy of the ultrasound findings in these patients without standard reporting method.

MATERIALS AND METHODS: This study was conducted in the ultrasonography center of Radiology Department, Mayo Hospital Lahore, which is a tertiary care hospital. From 1st August 2020 to 30th September 2020, ultrasound reports of 50 patients presenting with obstructive jaundice included in this study and assessed on basis of following points.

1. Bile duct diameter
2. Comment on transition zone
3. Factor causing obstruction
4. Level of obstruction

The ultrasound was performed by junior residents, senior residents, medical officers and senior registrars and adequacy of reporting was assessed according to ranks. Radiologists were guided about standard reporting in obstructive jaundice and re audit is planned after two months to check the improvement.

P-44

Double outlet right ventricle that presented with dyspnea, fever and tachycardia

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INTRODUCTION: DORV is a type of conotruncal anomaly which includes a wide range of anatomic malformations that are characterized by origin of both the aorta and pulmonary arterial trunks completely or predominantly from the morphological right ventricle. When aortic valve overrides the ventricular septum through a VSD, '50% rule' is applied. By this rule, overriding arterial trunk is considered as arising from the RV when more than half of the

circumference of its valve belongs to the RV. Echocardiography is considered as first imaging modality of choice, it is limited in assessment because of operator dependency and small field of view. Purpose of my study is to understand the spectrum of DORV on cardiac CT in pre surgical evaluation.

METHOD: A case report of 48 years old man who presented in emergency with dyspnea, fever and tachycardia. His heart auscultation revealed pansystolic murmur at lower left sternal edge. Echocardiography and cardiac CT was performed at Punjab institute of Cardiology Lahore.

RESULTS: Echocardiography showed large sized VSD, suspicion of rupture sinus of valsalva into RV with RVOT aneurysm, large aneurysm of interatrial septum. CT showed DORV with subaortic VSD, right sided aortic arch, aneurysmal RCC with rupture into RV cavity, aneurysmal interatrial septum, markedly enlarged MPA and large pericardial effusion.

CONCLUSION: The diagnosis of DORV is difficult because of anatomical diversity. MSCT technology has revolutionized pre-surgical diagnosis and management approach of DORV patients. Outstanding image qualities along with 3D volume rendered images help surgeon understand complex morphology of DORV variants.

P-45

A case of Paget-Schroetter syndrome in a Gaelic football player

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INTRODUCTION: Deep Vein thrombosis is a recognized complication of the lower limb. Upper limb vein thrombosis is very rare and sometime it can happen without any obvious risk or predisposing factor. Paget-Schroetter syndrome (PSS) also known as effort thrombosis is described as thrombosis of the axillary or/and subclavian vein.

CASE REPORT: A 34-year-old patient referred to our hospital by general practitioner with chief complaint of left arm discoloration and swelling for the last 2 days. His vitals were normal. He used to play Gaelic football otherwise there was no history of any recent injury. He underwent Doppler ultrasound (DUS) followed by formal left upper limb venogram which showed lack of opacification of the distal 2.5-3 cm of the subclavian vein corresponding to short segment clot that was seen on the Doppler ultrasound. It was diagnosed as PSS. He was put on the therapeutic anticoagulation and referred to the vascular services for the intervention.

DISCUSSION: PSS usually is more common in the young adults who are involved in repeated strenuous activities of the upper limb. In our case the patient was a Gaelic football player which was recognized as a risk factor for the thrombosis. The clinical presentation varies from being completely asymptomatic to pain, swelling and discoloration of the skin. Initial investigation is DUS followed by CT/MR or formal venogram to confirm the diagnosis. Management options include therapeutic anticoagulation, thrombolysis with consideration of first rib resection. Being a rare presentation, it is important to report such cases to bring awareness especially among the junior doctors.

P-46

Incidental findings on MRI of sacroiliac joints

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INTRODUCTION: Sacroiliitis or inflammation of sacroiliac joints (SIJ) can occur in multiple diseases. In asymptomatic patients, it is difficult to evaluate

on clinical examination only. Many other pelvic and low spinal diseases can mimic sacroiliitis. Magnetic resonance imaging (MRI) is the modality of choice for its diagnosis. Careful scrutiny of extra-articular tissues in MRI scan can reveal important information at no additional cost. This study aims to investigate the frequency, distribution and nature of these incidental findings.

MATERIALS AND METHODS: This study was carried out in Radiology department of Fauji Foundation Hospital, Rawalpindi from January 2018 to September 2020. Data regarding age, sex, MRI findings related to SIJ and extra-articular tissues were recorded. All patients undergoing MRI of SIJ were included. Those patients who could not lie down supine in MR gantry were excluded.

RESULTS: Of 254 patients, 139 (54.72%) were diagnosed with sacroiliitis. Out of these 139, (39.56%) showed at least one incidental extra-articular pathology. Of 115 patients with normal SIJ, 48 (41.73%) had incidental findings. Commonest extra-articular finding was lower lumbar degenerative disc disease seen in 54/254 (21.25%) patients, followed by genitourinary (7.87%), osseous (4.33%), soft tissue (4.33%) pathologies and transitional vertebra (2.75%).

CONCLUSION: Incidental features on MRI of SIJ are commoner than sacroiliitis and must be reported, as these can have important clinical implications.

P-47

Large urinary bladder diverticuli, an uncommon presentation of Ehlers-Danlos syndrome

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Four types of diverticula can be found in the literature: congenital, acquired, iatrogenic and syndrome-associated. The incidence of congenital bladder diverticula (BD) is reported to be 1.7%, peaks in children below 10 years of age and is usually has syndromic association. Ehlers-Danlos syndrome (EDS), a heterogeneous group of inheritable connective tissue disorders, is attributed to mutations in connective tissue genes and associated with significant morbidity. Overall, EDS remains understudied and there is a lack of data on prevalence, presentations, and natural history. Limited literature suggests EDS type IV and IX, even type V, are associated to the existence of vesical diverticula. Here we present a case of a 10 year old boy, a known case of Ehlers-Danlos syndrome presenting with abdominal distention and recurrent urinary retention for one month. His contrast enhanced CT abdomen and pelvis showed markedly distended smooth walled urinary bladder with a huge diverticulum along its left lateral wall and a smaller one on right. He also had a right sided inguinal hernia with protrusion of diverticulum through it. These diverticuli were had significant mass effect on bowel, abdominal viscera, prostate and seminal vesicles. Complications of BD include spontaneous rupture, recurrence after surgery, urinary outlet obstruction, and very rarely malignant transformation to transitional cell carcinoma. Considering such complications, a watchful attitude is recommended towards such diverticuli.

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ABSTRACTS

ORAL PRESENTATIONS (O)

O-1

Effect of technical factors on standardized uptake values in performing a follow-up FDG PET-CT

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INTRODUCTION: There is growing interest in using PET/CT for evaluating early response to therapy in cancer treatment. Although widely available and convenient to use, standardized up- take value (SUV) measurements can be influenced by a variety of biologic and technologic factors. Many of these factors can be addressed with close attention to detail and appropriate quality control. We will review factors potentially affecting SUV measurements and provide recommendations on ways to minimize when using serial PET to assess early response to therapy.

METHODOLOGY: This is a retrospective observation of technical factors involving image quality affecting SUVs in a follow up PET-CT scan, which includes pre procedure workup, reconstruction parameters, calibration error between scanner and dose calibrator, injected radioactivity, and contrast material.

RESULTS: A SUV difference of up-to 12% was observed accounting to reconstruction parameters, a 10% variance if calibration error between dose calibrator to scanner and same if injected activity is not measured correctly, 8% variance for timing mismatch between dose calibrator and scanner for 8-minute error, and contrast material injection corresponds to a SUV difference of 5.9%.

CONCLUSION: The observed trend of factors impacting SUVs in a follow-up PET-CT may lead to erroneous representation of a pathology leading to false interpretation. So, attention should be paid by technologist and person injecting activity to overcome these major flaws, and reporting Radiologist/ NM Physician should inquire all the above parameters following any inconsistency on follow-up exam.

O-2

Pediatric imaging tips for radiographers: Educational talk

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Radiological imaging is extremely valuable diagnostic tool in pediatric population with a number of distinct challenges and problems as compared to the imaging of adults. Today's talk seeks to draw attention to various challenges of pediatric imaging and the ways to overcome them. Imaging needs to be child-focused and age specific. Justification and appropriateness of pediatric imaging pathways, environment and protocols is required due to their higher sensitivity to radiation and longer life time expectancy. Pediatric imaging therefore requires specific education, proper training and certification of radiographers that guarantees application of thorough knowledge, expertise and variety of adaptable equipment. Their performance must be reviewed regularly. Imaging in pediatric in a dedicated pediatric imaging department with dedicated pediatric technologists may result in greater compliance with pediatric protocols thus significantly reduced patient dose.

O-3

CT coronary angiography, how i do it and what i have learned

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Senior technician with 10 years work experience in CT coronary angiography and being responsible for image quality optimization will share his experience with image sharing and practical considerations on day to day and case to case basis for maintaining standardized imaging quality.

CONCLUSION: These days, CT coronary angiography is routinely used and needs close supervision by radiologists. Proper education and of training of radiology technicians is of utmost importance for proper image acquisition and reconstruction. Experienced technologists should share experience of their learning curve so that those who are starting this can get benefitted.

O-4

CT pulmonary angiography technical aspects & pitfalls

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CT technician will present data and images derived from CTPA performed from January 2019 to 30th September 2020. These Images will illustrate the factors leading to suboptimal contrast opacification, poor image resolution, and motion or breathing artifacts. Each case will be followed by another slide with learning points & steps to be taken to avoid these artifacts in future.

CONCLUSION: CT Technicians should learn basic steps to avoid artifacts in CTPA. This will improve image interpretation and diagnostic accuracy.

O-5

Artificial intelligence in MRI

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Artificial Intelligence (AI) is progressing rapidly in almost every sector of daily life from Mobile apps to self-driving cars. It has made an impact in the field of medicine especially in clinical imaging. AI applications in MRI are achieving remarkable new possibilities. AI based applications help to improvise scan quality, techniques and protocols. AI innovations provide rapid and precise information to assist radiologist and clinicians in making decisions.

O-6

Challenges of access to limited technology - How to make the best of what we have (Educational Talk)

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The Indus Hospital which is solely run on donations and zakat and that is where I truly realised how challenging it is to work with limited resources. Despite the limitations and challenges it continues to be very rewarding to see so many unaffording people get access to free health care. The motto that we follow at my hospital is - quality health care for all and I truly believe that if you use what you have wisely and innovatively then you can benefit others more then possibly imaginable. Please join me in going through the challenges that I am sure alot of us face in getting access to high technology and how we can overcome those challenges to the best of our abilities.

O-7**The importance of contrast media safety: from iodinated to gadolinium**

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O-8**Advantages and disadvantages of DWI in small bowel imaging at 3T**

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O-9**MRI artifacts and how to correct these to improve image quality**

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O-10**AKUH radiology department response to COVID 19, lesson learnt**

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O-11**Iodine Mapping on CT**

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O-12**Updates on radiation protection**

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O-13**Approach to radiographic research a few tips and tricks (Educational talk)**

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14**Case based interactive session**

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15**Quiz**

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POSTERS (P)**P-1****Role of 68Ga-PSMA PET/CT in patients with recurrent prostate cancer and its comparison with serum PSA levels and Gleason Scores**

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OBJECTIVES: The objective of this study is to find out the detection capability of Ga-68 PSMA PET/CT in recurrent Prostate Cancer (PCa) and its relation with serum PSA level and Gleason Score (GS). **Material and Methods:** A total number of 75 patients (median age 66 years, 50-86 years) who had serum PSA recurrence after any of the treatments, radical prostatectomy (RP)/radiation therapy (RT)/ hormonal therapy (HT)/chemotherapy (CT) during the period of Nov2017 to September-2020 were enrolled in the study. Local recurrences, lymph nodes, bone metastases and other metastatic visceral sites were documented. The data were analyzed by generalized method using statistical computer software.

RESULTS: In 69 patients at least one lesion characteristic for PCa was detected by 68Ga-PSMA PET/CT. The median serum total PSA (tPSA) was 14.7 (0.13-892.0) ng/dl. There was a significant difference between 68Ga-PSMA PET/CT positive and negative in terms of serum total PSA value. No statistical significance was found between positive and negative 68Ga-PSMA PET/CT findings in terms of gleason score. Local recurrence was detected in 53 patients, whereas lymph node metastases were demonstrated in 55 patients and bone metastases were also detected in 40 patients. In the ROC analysis for the study cohort, the optimal cut-off value of total serum PSA was determined as 0.76 ng/ml for distinguishing between positive and negative 68Ga-PSMA PET/CT images, with an area under curve 0.866 (95% CI 0.767-0.965)

CONCLUSION: The outcomes of 68Ga-PSMA PET/CT showed promising results for the detection of recurrent prostate cancer. Serum total PSA values may be used to predict the likelihood of positive 68Ga-PSMA PET/CT results, however there is no relationship found between 68Ga-PSMA PET/CT findings and GS.

P-2**Attitude of imaging personnel towards use of gonadal shielding in general radiography**

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AIMS AND OBJECTIVES: Gonadal shielding plays an important role in the application of "As Low As Reasonably Achievable" (ALARA) principle in clinical practice. However, its use relies on the attitude, education and adequate training of Medical Imaging Technologists and radiographers. The objective of this study is to determine the attitude of imaging personnel towards its use and variables influencing their attitude.

MATERIALS AND METHODS: A pre-designed 5-point scale questionnaire was used to collect relevant data and information regarding attitude and variables from imaging personnel of one public and two private sector hospitals. Descriptive (Frequency, mean and standard deviation) and statistical analysis (chi-square, t-test) was performed over 69 out of 110 returned questionnaires.

RESULTS: The questionnaire response rate was 62.72% (69/110). The results showed that imaging technologists and radiographers considered gonadal

shielding important (mean: 13.8) and that adequate training and education was being provided. However, statistically significant attitude variations were observed among personnel from different sectors ($p < 0.05$), level of education ($p < 0.005$) and experience ($p < 0.03$). No significant correlation between gender and awareness was recorded.

CONCLUSIONS: It was inferred that Imaging technologists and radiographers have a positive attitude towards use of gonadal shielding in general radiography. Adherence to ALARA principle was more in imaging personnel of high educational qualification (MITs) and radiographers with high professional experience. It can be improved further by provision of adequate and frequent training and assurance of availability of shielding equipment in radiology departments.

P-3

Radiation dose assessment in fluoroscopic procedures in Shifa International Hospital

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This abstract and presentation by a senior technician will reveal the results of internal audit of radiation dose in fluoroscopy procedures at Shifa International Hospital in relation with international recommendations. This will highlight the factors to be monitored on a regular basis in each department to control radiation exposure to patients. ALARA principles will be discussed by technologists.

CONCLUSION: Internal audits and quality improvement projects are important for standardized functioning of any radiology department. Fluoroscopy technologists should be well aware of the ALARA principle and must conduct audits to assess radiation doses delivered to patients.

P-4

Challenges in screening mammography

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AIMS AND OBJECTIVES: Breast cancer is the leading cause of death in women from cancer in Pakistan. Most of the breast cancer cases are diagnosed at a later stage in life owing to socio-cultural issues, lack of organized screening programs, unavailability of screening facilities and shortage of radiologists for interpretation of screening mammograms. This study aims to take into consideration the international practices being adopted to counter these issues.

MATERIALS AND METHODS: A pre-designed 5-point scale questionnaire was used to collect relevant data and information regarding attitude and training from mammography technologists of one public and two private sector healthcare units. Also a similar performa was used to collect data from physicians regarding their satisfaction level. Descriptive (Frequency, mean and standard deviation) and statistical analysis (chi-square, t-test, variance) was performed over 53 out of 80 returned questionnaires.

RESULTS: The questionnaire response rate was 66.25% (53/80). The results showed that mammography technologists had great interest and positive attitude towards mammogram interpretation (mean: 12.9). Statistically significant response was recorded from referring physicians over the quality of mammograms ($p < 0.005$), communication skills of technologists ($p < 0.02$), adequacy of technique ($p < 0.05$) and inculcation of mammographic technologists for image interpretation ($p < 0.05$).

CONCLUSIONS: This study suggests that hurdles in screening mammography related to shortage of radiologists can be overcome by adequate and advanced training of mammography technologists keeping in view international standards and scope of practice of Radiologist Assistant now included as an essential member of breast cancer screening workforce.

P-5

Failure to reposition the arms on portable NICU chest radiograph mimics lamellar effusion

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BACKGROUND: A number of patient factors can lead to technical limitations while performing portable chest radiographs in NICU setting. The purpose of this study was to evaluate the frequency of arm malposition on portable NICU chest radiographs and determine the proportion mimicking lamellar effusions.

METHODS: This was a retrospective study of 42 neonates who underwent portable chest x-rays in NICU portable settings from June 15 to June 30, 2019 at AKUH radiology. 300 consecutive chest x-rays (600 hemithoraces) were reviewed by a pediatric radiologist. For each patient, various parameters were recorded.

RESULTS: Out of 600 hemithoraces, true lamellar effusion was found in 400 hemithoraces (66%). The arm was positioned in abducted position in 332 (55%) and in adducted position in 268 (44%) of hemithoraces. In 200 (33%) hemithoraces, linear opacity along the chest wall mimicking lamellar pleural effusion was present. However, in 68 (11%) of hemithoraces, no false pleural effusion was found.

CONCLUSION: Proper positioning of arms while performing chest radiographs in portable NICU setting is critical to reduce false positive interpretation of lamellar pleural effusion. Radiology technicians/radiographers awareness regarding adequate patient has a pivotal role in this regard.