

**Radiology** <sup>Asia</sup>

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# ABSTRACT E-BOOK

Quality Medical Imaging for Better Patient Outcomes

Organised by:



## **FOREWORD**

The 4<sup>th</sup> Radiology Asia organising team has received more than 80 quality submissions from the medical community in preparation for its oral and poster presentation. The Organisers would like to take this opportunity to thank all participants who have dedicated their time to showcase their latest research at the conference.

The organisers would also like to express their special gratitude to the esteemed judges,  
**Prof Bernard Laya** (St. Luke's Medical Center-Global City, Philippines)  
**A/Prof Dinesh Varma** (The Alfred Health & Monash University, Australia)  
**A/Prof Hong-Jen Chiou** (Taipei Veterans General Hospital, Taiwan)  
Who have dedicated their precious time in evaluating the research and deciding on the winners for these sessions.

We would also like to express our heartfelt congratulations to the following winners for winning the competition:

### **Category 1: Oral presentation**

<b>Winner</b>	<b><i>ID 160- Dose Finding Study of Gadopiclenol, a New Macrocyclic Gadolinium-Based Contrast Agent, in MRI of the Central Nervous System</i></b> Benjamin P. Liu, Northwestern University, Northwestern Memorial Hospital, United States of America
<b>Second Prize</b>	<b><i>ID 129- Lessons Learnt From Assessment Of Technical Adequacy Of Hysterosalpingography Exams In A Regional Hospital - Practical Tips To Improve HSG Technique, And Important Findings To Look For Other Than Fallopian Tube Patency</i></b> Rois L S Chan, Siu Chun Wong, Wing Hang Luk, Princess Margaret Hospital, Hong Kong S.A.R. (China)
<b>Third Prize</b>	<b><i>ID 144- Relevant renal vascular anatomical variants -a surgeon want to know before partial or total laparoscopic/ robotic Nephrectomies And The Accuracy of MDCT In Evaluating Them</i></b> Della Harigovind, Harish Babu, Abin Ummer, <b>BMH calicut, India</b>

### **Category 2: Poster presentation**

<b>Winner</b>	<b><i>ID 163- MRI-Guided In-Bore Prostate Biopsy For Prostate Cancer: A Retrospective Review From A Single Tertiary-Centre</i></b> Yen Huynh, Paul Simkin, Stefan Heinze, Royal Melbourne Hospital, Australia
<b>Second Prize</b>	<b><i>ID 140- Role of Diffusion Tensor Imaging (DTI) Parameters in Evaluating Clinical Severity of Cervical Spondylotic Myelopathy</i></b> Dian Noriza Eddy Suryono, UNIVERSITY MALAYA MEDICAL CENTER, Malaysia
<b>Third Prize</b>	<b><i>ID 158, Glioblastoma Location Predicts Survival</i></b> Gail Wan Ying Chua, Grace Kusumawidjaja, Kevin Lee Min Chua, National Cancer Centre, Singapore

We look forward to meeting you again next year.

Sincerely,  
Radiology Asia 2019 Organising Team

**ID: 102**

**Scientific Abstract**

*Topics:* Abdominal Imaging/GI Tract

*Keywords:* shearwave, hepatic fibrosis, fatty liver, steatosis, fibroscan, hepatosteatois, cirrhosis, fatty infiltration of the liver

**Prevalence of Hepatic Fibrosis Using Shearwave Elastography Among Filipino Patients Sonographically Assessed With Fatty Liver Disease**

**Jonathan Agustin Rosario Castro**

Cardinal Santos Medical Center, Philippines

**OBJECTIVES:**This study reveals the overall prevalence of fibrosis on patients with fatty liver disease. Determine its significance and reveals the association between the two factors.

**MATERIALS AND METHODS:**Liver Shearwave examination results from February 1, 2017 until January 31, 2018 were reviewed for evidence of hepatic steatosis. Mean Shearwave values were recorded and classified according to degree of severity. Demographics were also recorded. Overall prevalence was computed and tested for significance using Fisher's exact test CI=95%. Tests for association were implemented using Chi-square contingency test CI=95%.

**RESULTS:**Of the 208 patients having hepatic steatosis, 142(68.3%) had evidence of fibrosis. 126(88.7%) had mild fibrosis, 12(9.2%) had moderate fibrosis and 3(2.1%) had severe fibrosis. 23(16.2%) were 20-39 years, 67(47.2%) were 40-59 years, 47 (33.10%) were 60-79 and 5(3.5%) were ≥80 years. 77(54.2%) were male and 65(45.8%) were female. The test for significance of the prevalence of hepatic fibrosis showed a p-value; <0.0001, which was significant. Tests for association revealed a p-value <0.98072 for age range and <0.932294 for gender; both having no statistical significance while the association of steatosis and fibrosis revealed a p-value <0.0001, which was significant.

**CONCLUSION:**The prevalence of hepatic fibrosis on patients with fatty liver disease is statistically significant and significant association between both factors been proven. Gender and age range shows no predisposition for fibrosis.

**ID: 103**

**Scientific Abstract**

*Topics:* Genitourinary

*Keywords:* Renal Parenchymal Disease, RPD, Ultrasound-Guided Kidney Biopsy, Acute Kidney Disease, Chronic Kidney Disease

**Accuracy of Transabdominal Sonography in Detecting Renal Parenchymal Disease at Cardinal Santos Medical Center From January 1, 2014 to December 31, 2017**

**Beatrix Hannah Chua Tanbonliong, Jonathan Agustin Rosario Castro**

Cardinal Santos Medical Center, Philippines

**OBJECTIVES:** The purpose of this study is not to classify a disease by its specific difference in echogenicity but rather to assess the accuracy of the operator in diagnosing diffuse renal parenchymal disease by ultrasound with the help of the gold standard in diagnosis through histopathology.

**MATERIALS AND METHODS:**All patients who underwent ultrasound-guided biopsy of the native kidneys in our institution from January 1, 2014 to December 31, 2017 were included in the study population. Patients' recent ultrasound reports were reviewed, recorded, tallied and arranged in categorical variables. Frequencies were then computed. Sensitivity, specificity, PPV, NPV and accuracy were determined using MedCalc with a CI=95%.

**RESULTS:** Out of 86 patients representing the study population, 58(67.4%) showed a finding of chronic renal parenchymal disease on ultrasound while 28(32.6%) revealed normal findings. Of the 58 with chronic parenchymal disease, 50(82.2%) were histopathologically positive for renal parenchymal disease. 8(13.8%) patients showed normal histopathology. Of the 28 with normal kidneys on ultrasound 18(64.3%) patients tested positive for chronic renal parenchymal disease while 10(35.7%) showed normal histopathology. Estimated computed values for diagnostic accuracy revealed as follows: sensitivity (74%), specificity (56%), PPV (86%), NPV (36%) and accuracy (70%).

**CONCLUSION:** This study revealed a statistically significant sensitivity, PPV and accuracy of ultrasonography in predicting presence of chronic renal parenchymal pathologies. However, a slightly lower rate of specificity and NPV were revealed. Overall, this study corresponds with the current available data regarding use of ultrasound as screening and diagnostic tool in assessing chronic renal parenchymal diseases.

**ID: 105**

**Scientific Abstract**

*Topics:* Interventional Radiology

*Keywords:* sclerotherapy, hemangioma

**Vascular Anomalies –Percutaneous Sclerotherapy**

**Niyati Sharma, Pankaj Banode**

JNMC, Sawangi, Maharashtra, India

**INTRODUCTION**–Vascular anomalies include a wide spectrum of pathologies, like vascular malformations, hemangiomas etc.. Embolization procedures to treat vascular anomalies are multifactorial and include sclerotherapy, coagulation by laser and embolic therapy. In this paper, my emphasis is on sclerotherapy on top to toe vascular anomalies.

**OBJECTIVES-**

- To discuss various vascular tumors, their types.
- To give an overview of endovascular treatments with concentration on the technique and related complications.

**MATERIALS AND METHODS–**

**TYPE OF STUDY–Prospective study**

**DURATION–JAN, 2018 to AUG, 2018**

**SAMPLE SIZE-20**

**INCLUSION CRITERIA–**

- All sexes and all age groups

**EXCLUSION CRITERIA–**

- Patients protected by law
- Poor surgical candidates.

The data has been prospectively collected from the database of all cases performed by the interventional neurology team at AVBRH, Sawangi, Wardha, India. Demographic information: age, sex and ethnicity was collected. Procedure was performed on Philips Alura X Per FD 20 machine.

**RESULTS**– High and low flow vascular malformations were seen in 6 and 5 patients respectively. Majority of cases were hemangiomas, 9 in number out of 20 patients. The various agents used – gelfoam, PVA particles, glue and oynx. Locations for vascular lesions were – head and neck – 6, arm – 2, hand – 2, foot – 1, leg – 4, genitals – 1, buttocks – 1, shoulder – 2, chest -1. complications like skin necrosis was seen in 1 patient.

**CONCLUSION** – Embolization of vascular lesions is a safe and effective procedure with minimal complications. Sclerotherapy can be effective alone in lower flow malformations.in high flow malformations, preoperative embolization followed by surgical excision was effective.

**ID: 106**

**Scientific Abstract**

Topics: General Radiology

Keywords: Image Interpretation, Arab World, Radiographer, Radiologist.

**1.Associate Professor and 2.Teaching Assistant**

**Awad Elkhadir<sup>1</sup>, Bashair Alhidri<sup>2</sup>**

<sup>1</sup>King Abdulaziz University,Diagnostic Radiography Technology Department, Faculty of Applied Medical Sciences, Jeddah, Saudi Arabia, Saudi Arabia; <sup>2</sup>King Saud bin Abdulaziz university for health sciences, College of medicine, Jeddah, Saudi Arabia

**Objective:** To know the perceptions of the Radiologists in Arab World in relation to Plain Image Interpretation of Adults by Radiologic Technologist Specialist (RTS).

**Methods and Materials:** A questionnaire was distributed to some Arab consultant radiologists and resident working on the Kingdom of Saudi Arabia and Sudan.

**Results:**103 participants were surveyed. 28 % know RTS has some role in writing image reports in Arab World, while 59 % didn't know. 43 % agreed on the possibility of image reporting role for RTS, but on the other hand, 36 % do not agree. 37 % see that Image interpretation by RTS will helps in diagnosis of unreported radiographs where the radiologist unavailable such as health care centers and emergency departments, while 46.5 % they don't see that. 46 % think that by allowing reporting for RTS will result in reduce the workload and stress on radiologist, 35 % they don't think that. 42 % believe that image interpretation by RTS can be introduces into the Middle East in the future, 33 % do not.

**Conclusion**

Arab radiologists are willing to support the development of RTS. However, mentoring is required on the medical and accountability aspects of radiographers adjusting their new authority. Radiologists supervision and involvement in the educational process and training acquirement for new roles may increase their confidence and trust in radiographers to be able to work within the limitations of their competency and within their training limits.

**ID: 108**

**Educational Abstract**

*Topics: General Radiology*

*Keywords: HYPERTROPHIC INTRACRANIAL PACHYMENINGITIS*

**Hypertrophic Intracranial Pachymeningitis: Importance of Contrast Enhanced MRI**

**Wei Chia Lim, Menaga Sellamuthoo**

Hospital Sibul, Sarawak, Malaysia

**Learning Objectives:**

Hypertrophic pachymeningitis is an uncommon condition, resulting in non-specific neurological symptoms. Here, we report a case of idiopathic hypertrophic intracranial pachymeningitis which is interesting due to its subtle findings on plain MRI but shows marked enhancement after gadolinium administration. Clinicians and radiologists should be vigilant to avoid delay in diagnosis.

**Background:**

Hypertrophic pachymeningitis is a rare disorder with progressive local or diffuse thickening of dura mater. Depending on its location, it can be divided into intracranial, spinal or rarely, craniospinal. Chronic headache and cranial nerve palsy are the common presentations in patients with hypertrophic intracranial pachymeningitis. Gadolinium-enhanced MRI is the modality of choice in diagnosing this condition. Corticosteroid therapy and immunomodulating agents are the mainstay of treatment. However complete remission is rare.

**Findings:**

In our patient, non-contrast MRI study might appear normal at first glance. Following gadolinium administration, there was an uniform enhancement of pachymeninges of tentorium suggestive of hypertrophic intracranial pachymeningitis. Dura thickening and effacement of the adjacent left ambient cistern and cerebral sulci also became more apparent. Our patient was treated as idiopathic hypertrophic intracranial pachymeningitis as no cause was found despite extensive investigations.

**Conclusion:**

Hypertrophic intracranial pachymeningitis is a rare condition. Many patients with hypertrophic pachymeningitis presented with nonspecific symptoms such as a headache and cranial nerve palsy. The diagnosis can be missed in non-contrast MRI as the findings might not be obvious. Hence gadolinium administration is encouraged in this group of patients. Both clinician and radiologist should remain more vigilant to avoid missing the diagnosis.

**ID: 109**

**Educational Abstract**

*Topics: Abdominal Imaging/GI Tract*

*Keywords: focal nodular hyperplasia, atypical, MRI*

**MRI Imaging Findings of Atypical Focal Nodular Hyperplasia**

**Zhen Jiang Lee, Adina Borsaru, Jan Riley, Hock Kua, Cathryn Hui**

Monash Health, Australia

**Objectives**

To determine the MR imaging findings of atypical Focal Nodular Hyperplasia (FNH)

To describe the varying enhancement patterns of atypical FNH in the hepatobiliary-phase of MRI with hepatocyte-specific contrast

**Methods**

The MRI findings of pathologically diagnosed FNH were retrospectively reviewed. The lesions were defined as atypical, as the imaging findings were not characteristic for FNH and the radiological diagnosis was uncertain, leading to biopsy or resection. Several MRI features of the lesions were documented including size, signal intensity on T1 and T2-weighted sequences, the presence of a central scar, diffusion restriction and enhancement pattern, with particular emphasis on the pattern of enhancement in the delayed hepatobiliary phase.

**Results**

The total number of lesions analysed was 19. 12 lesions were T1 hypo-intense, 3 were T1-isointense and 4 were T1 hyper-intense. 17 were T2 hyperintense and 2 were isointense. 16 lesions demonstrated hyperenhancement in the arterial phase and 3 were iso-enhancing. In the portal venous phase, 14 were hyper-enhancing, 3 were iso-enhancing and 2 were hypo-enhancing. 8 demonstrated restricted diffusion and 12 showed a central scar. In the hepatobiliary phase, 15 lesions appeared heterogeneous. 3 lesions were predominantly hyper-enhancing, 4 lesions were iso-enhancing and 12 lesions were predominantly hypo-enhancing. 9 of these 12 lesions demonstrated hypo-enhancement with a rim of hyperenhancement.

**Conclusion**

Atypical FNH demonstrated a variety of imaging appearances on MRI with hepatocyte-specific contrast. The most common pattern of enhancement in the delayed hepatobiliary phase was hypo-enhancement with a hyper-enhancing rim.

**ID: 112**

**Educational Abstract**

*Topics:* Neuroradiology

*Keywords:* dual pathology, intracranial schwannoma, cerebral aneurysm

**Concurrent Intracranial Schwannoma And An Angiographically Occult Cerebral Aneurysm: A Case-report**

**Xin Min Yong, Norzaini Rose Mohd Zain, Sarawana Chelwan Muniandy**

Department of Radiology, Hospital Kuala Lumpur, Malaysia

**Background**

Co-existence of intracranial tumour and cerebral aneurysm is rare, and the previously reported cases include meningioma, glioma, pituitary adenoma, etc. There are hypotheses postulating causal relationships between these two pathologies.

**Case presentation**

A 46-year-old female presented with worsening of right eye vision and multiple cranial nerves palsy. Preoperative CT and MRI brain revealed an extra-axial mass with solid-cystic and haemorrhagic components with “onion-skin” appearance on T2WI that demonstrates strong wall enhancement in the right middle cranial fossa. Right pterional craniotomy and excision of subfrontal-temporal lesion was performed. Intraoperatively there was a ruptured aneurysm within the mass. Subsequent histopathology examination concluded a schwannoma and also a thrombosed vascular lesion.

**Conclusion**

We report this uncommon case of intracranial schwannoma concurrent with a cerebral aneurysm. From the literature review, the causal relationship between intracranial neoplasm and aneurysm has not been established. This rare dual pathology may pose a diagnostic challenge, and in certain clinical settings of atypical haemorrhagic tumour, angiography is typically done to rule out aneurysm. Nevertheless, a completely thrombosed aneurysm may be angiographically occult and this is where MRI may be superior in raising the suspicion of an aneurysm.

**ID: 116**

**Educational Abstract**

*Topics:* General Radiology, Academics, Neuroradiology

*Keywords:* HIV, Neuroradiology, CNS, Opportunistic Infections.

**Clinical and Radiological Findings of HIV Associated Central Nervous System Opportunistic Infections: A Diagnostic Map.**

**Hans W. Hess, Luis M. Montes, Amanda Marrero, Edgar Morales, Eduardo Labat**

University of Puerto Rico School of Medicine, Puerto Rico (U.S.)

**Objectives:**

1. Recognize common clinical CNS manifestations in HIV infected patients.
2. Determine which imaging modality is most appropriate depending on the clinical presentation and suspected disease
3. Identify imaging findings of most common CNS manifestations in HIV infected patients

**Background**

HIV has reached every country and nearly all populations throughout the world, despite advances in antiretroviral therapy (ART) a large number of patients do not receive adequate treatment. Patients that are not adequately treated commonly suffer from HIV associated CNS opportunistic infections.

**Findings/Procedural Details**

CNS opportunistic infections have unique clinical findings in patients with HIV when compared to an immunocompetent patients. Commonly associated CNS lesions include toxoplasma encephalitis, primary CNS lymphoma, progressive multifocal leukoencephalopathy (PML), HIV encephalopathy, and CMV encephalitis. A clinician must be able to accurately recognize the presenting symptoms of each disorder and choose the most efficient diagnostic study for the suspected condition. In turn, accurate clinical imaging evaluation is imperative for timely and appropriate patient management.

**Conclusions**

In this educational exhibit, we discuss the most common clinical presentations, and radiological findings of CNS-specific opportunistic infections with the intent of achieving accurate and precise recognition, diagnosis, and treatment.

**ID: 117**

**Educational Abstract**

*Topics:* Neuroradiology

*Keywords:* Trauma, CNS, CT, MR, Injury

**Acute TBI: What to expect? What is commonly missed?**

**Luis Manuel Montes Chinaea, Hans Hess Arcelay, Amanda Marrero, Edgardo Morales, Eduardo J Labat Alvarez**

University of Puerto Rico Medical Sciences Campus, Puerto Rico (U.S.)

**Learning Objectives**

1. Review indications for imaging modalities in Trauma settings.
2. Recognize the different types of TBI including intra-axial, extra-axial, and secondary injuries.
3. Discuss pertinent imaging findings in TBI and identify pathologies that may require prompt intervention.

**Background**

Traumatic brain injury (TBI) occurs when trauma causes damage to intracranial structures. TBI can result when a patient's head suddenly and violently hits an object, when an object pierces the skull and enters brain tissue, or during episodes of rapid acceleration-deceleration without the need for direct contact. TBI affects 1.7 million people annually and contributes to 30.5% of all injury related deaths in the United States

**Findings and procedure details**

TBIs are medical emergencies and merit a quick assessment. Furthermore, imaging plays an integral part in determining trauma severity and appropriate management. In cases of moderate and severe trauma, a noncontrast multi-detector CT (MDCT) is the study of choice given that it rapidly identifies multiple pathologies including: Calvarial injury, foreign body presence, hemorrhage, nonhemorrhagic axonal injury, herniation, and hydrocephalus. MRI is also a common tool used for diagnostic and prognostic purposes, particularly in cases of shearing injury

**Conclusion**

TBIs can result in significant neurological damage and carry a high morbidity and mortality rate, hence it is important to quickly assess the severity through the use of imaging such as MDCT and MRI.

**ID: 119**

**Educational Abstract**

*Topics:* Neuroradiology

*Keywords:* primary, bone lymphoma, mandible, head and neck

**Primary Lymphoma Of Mandible: Case Report And Literature Review.**

**Kasturi Nair Tangaraju, Thamaiyanthi Gurusamy**

MINISTRY OF HEALTH MALAYSIA, Malaysia

Primary bone lymphoma is an uncommon condition and accounts for less than 5% of all primary bone tumours. In head and neck region, mandibular involvement accounts for only 0.6 % of isolated malignant non-Hodgkin's lymphoma.

We report a rare case of a patient, histopathologically proven primary non-Hodgkin lymphoma of the mandible, exploring the diagnosis with discussion of imaging features.

**ID: 120**

**Educational Abstract**

*Topics:* Neuroradiology

*Keywords:* Ewing's sarcoma, primary, paranasal sinus

**Ewing's Sarcoma Masquerading Sinonasal Carcinoma**

**Kasturi Nair Tangaraju, Thamaiyanthi Gurusamy**

MINISTRY OF HEALTH MALAYSIA, Malaysia

Ewing's sarcoma is malignant small round-cell tumour, mostly affecting children and young adults and classically involving the long bones of limbs, pelvis and ribs. Primary Ewing's sarcoma of maxillofacial region is rare accounting less than 3% of all cases, mostly mandible and maxilla and even rarer in nasal cavity, paranasal sinuses or orbit. We herein present a case of Ewing's sarcoma presenting as paranasal sinus mass in a 22 year old male.

**ID: 121**

**Educational Abstract**

*Topics:* Neuroradiology

*Keywords:* giant cell tumour, rare, primary

**Left Neck Swelling; Is It Just Another Malignant Peripheral Nerve Sheath Tumour?**

**Kasturi Nair Tangaraju, Nurliyana Izyan A Halim**

**MINISTRY OF HEALTH MALAYSIA, Malaysia**

We present a case of a middle-aged man with cervical giant cell tumour (GCT). He presented with a one-year history of painless cervical swelling that was steadily increasing in size, hoarseness of voice, dysphagia and loss of appetite. On examination, there was a 4.0 x 5.0cm swelling at left level II with a smooth surface and soft to firm in consistency. Flexible scope showed medialisation of the left lateral and posterior pharyngeal wall with a mass obstructing the epiglottis. Radiological evaluation (CT and MRI of the cervical spine) revealed a large mass with its epicenter at left prevertebral region that extends anterolaterally to the left parapharyngeal area; complicated with local infiltration to the paraspinal muscles, C2 and C3 vertebra and minimal intraspinal extension without significant spinal canal stenosis or spinal cord involvement. The differential diagnosis was malignant peripheral nerve sheath tumour, lymphoma and metastasis. It was confirmed cytologically as GCT. GCT of the bone is a rare, locally aggressive osteolytic tumour that is approximately 5% of all primary bone tumours [Mendanha]. GCT has a low incidence in the cervical spine.

**ID: 123**

**Educational Abstract**

*Topics:* Abdominal Imaging/GI Tract

*Keywords:* MRI, hepatocellular, adenoma, Bordeaux, subtypes

**MRI Appearances Of Hepatocellular Adenomas According To Molecular Subtype**

**Zhen Jiang Lee, Cathryn Hui, Adina Borsaru**

Monash Health, Australia

**Aims**

- To review the molecular subtypes of hepatocellular adenoma
- To illustrate the MRI imaging findings of each subtype of adenoma
- To explore the clinical implications of adenomas

**Background**

Hepatocellular adenomas (HCAs) are a heterogeneous group of tumours characterised by specific genetic, pathological abnormalities and tumour biology. Relatively recently, in 2010 and 2011, the World Health Organisation formally endorsed the Bordeaux group classification which classifies hepatocellular adenoma into 4 subgroups according to genotypic and phenotypic characteristics and clinical features.

**Findings**

The first of the 4 subgroups is the HNF-1 $\alpha$ -mutated HCA group (H-HCA). These lesions contain fat and tend to demonstrate signal drop out on the opposed-phase sequences on MRI. The second subtype are the beta-catenin positive adenomas ( $\beta$ -HCA) which are often iso- or hyperintense in the hepatobiliary phase on MRI with liver-specific contrast. This subtype has the potential for malignant transformation. The third subtype are the inflammatory adenomas (I-HCA) which may demonstrate an atoll sign on T2-weighted sequences. Strong arterial phase enhancement and persistent portal venous/equilibrium phase enhancement are reported characteristic findings. The fourth subtype of adenomas are unclassified (U-HCA), with have no specific genetic mutations, immunohistochemical nor imaging features.

**Conclusion**

Distinct imaging features of the various subtypes of adenomas allows the radiologist to assist in classification of these lesions which determines treatment pathways. In particular, specific MRI findings may indicate subtypes that are more at risk of haemorrhage and have malignant potential.

**ID: 124**

**Scientific Abstract**

*Topics:* Interventional Radiology

*Keywords:* Vasculopathy, Takayasu Arteritis, Cerebral Angiogram

**Young Patient with Absence Seizures and Stroke Eventually Diagnosed as a Case of Takayasu's Arteritis**

**Justin Karlo Bautista Chavez**

Philippine Heart Center, Philippines

This is case of a 16 year-old female who presented with acute-onset absence seizure followed by left-sided hemiplegia and claudication. Cranial CT scan revealed acute ischemic cerebral infarction in the left frontal lobe and malacic changes in the right frontal lobe. Conventional catheter angiography demonstrated narrowing of several branch vessels of the thoracic aorta and arteries in the cervical region, compatible with a vasculopathy. The diagnosis of Takayasu's arteritis was made and medical treatment was eventually started.

**ID: 126**

### **Educational Abstract**

*Topics: Academics, Genitourinary, Pediatric Radiology*

*Keywords: Voiding cystourethrogram(VCUG), vesicoureteral reflux (VUR), urinary tract abnormalities*

### **Voiding Cystourethrogram in Children: Vesicoureteral Reflux and Anomalies of the Urinary System**

**Fatt Yang Chew<sup>1</sup>, Pei Hua Lee<sup>1</sup>, Cheng Chih Hsieh<sup>2</sup>, Tzu-Chin Wang<sup>1</sup>, Chun-Lin Huang<sup>1</sup>, Yung-Fang Chen<sup>1</sup>**

<sup>1</sup>China Medical University Hospital, Taiwan; <sup>2</sup>Department of Radiology, Mackay Memorial Hospital

#### **Learning Objectives**

- Identify the key features for each grade of vesicoureteral reflux (VUR).
- Describe a wide spectrum of anomalies involving urethra, bladder, ureter and kidney in voiding cystourethrogram(VCUG).

#### **Background**

VCUG has gained wide acceptance in the diagnosis of VUR and it is also the method of choice in evaluation various anomalies of the urinary system, particularly the urethra, urinary bladder and distal ureter as well as the kidney when there is associated high-grade reflux.

#### **Findings & Procedure Details**

VCUG is a fluoroscopically monitored examination involves retrograde instilling of a detectable substance into the bladder by urethral catheter into the bladder in mimicking the process of filling and emptying of the bladder. Intermittent fluoroscopic monitoring was carried out throughout the entire examination to detect the presence and extent of the VUR, as well as the evaluation of both anatomic defects and functional anomalies of the urinary system. The principle of “as low as reasonably achievable” (ALARA) was adhered to assure that radiation doses to the children are appropriate. To optimize the performance and interpretation, cyclic VCUG for at least twice with oblique or lateral position was recommended to improve the accuracy of the examination and to identify the severity of VUR together with anomalies of urinary systems in children.

#### **Conclusion**

VCUG is an efficient, accurate and reproducible method to detect and characterize VUR and urinary tract abnormalities in children. Adherence to basic principles in performing the examination and interpretation are essential in establishing a diagnosis and treatment plan.

**ID: 127**

**Scientific Abstract**

*Topics:* Interventional Radiology

*Keywords:* EVAR, Doppler ultrasound, CTA, endoleak, diameter of aneurysm

**Difference Between Doppler Ultrasonography And Computer Tomographic Angiography Of Aorta In The Measurement Of Aneurysm Diameter And The Detection Of Endoleak In Cases Of Post Endovascular Aneurysm Repair Surveillance**

**Kullanan Langkorn**

Songklanagarind hospital, Thailand

**Objective:** This study evaluate the accuracy of Doppler ultrasound (DU) compared with CTA aorta in measurement aneurysm diameter and detection of endoleak.

**Materials and methods:** The additional DU was performed by two radiologists in 100 post EVAR patients who underwent surveillance CTA aorta in the study period. The maximal AP and transverse diameter in axial view, maximal sagittal diameter of aneurysm and endoleak detection were corrected from DU. These results were evaluate the correlation, mean different diameter of aneurysm and sensitivity, specificity, PPV, NPV of endoleak with level of agreement using CTA as the gold standard.

**Results:** DU showed excellent correlation of measurement aneurysm diameter compared with CTA aorta in maximal AP, transverse and sagittal diameter with  $r= 0.98-0.99$ . But only the transverse diameter showed no significant different between DU and CTA (P-value 0.08), which was 0.1 cm larger than actual size from CTA. There was no significant difference of the intra-observer agreement for aneurysm diameter measurement. The inter-observer agreement was excellent.(ICC 0.9-0.97) The results of endoleak detection showed 69.2% sensitivity, 95% specificity, 90% PPV and 82.8% NPV with good agreement. (Kappa 0.79)

**Conclusions:** The DU is accurate and better cost effective modality for post EVAR surveillance cases.

**ID: 128**

**Scientific Abstract**

Topics: Thoracic/Chest Imaging

Keywords: Image quality, computed tomography angiography, thoracic endovascular aortic repair, blunt traumatic aortic injury, elimination phase

**Dual-Phase Chest CTA Versus Single-Phase Chest CTA In Blunt Traumatic Aortic Injury Patient Underwent TEVAR: Comparison Of Image quality And Radiation Dose**

**Suchanar Rungrojanarak, Ruedeekorn Suwannanon, Jitpreedee Sungsiiri**

Songklanagarind hospital, Thailand

**Objective:** To compare the image quality and radiation dose of single arterial phase and single delayed phase alone with the reference dual-phase (arterial and delayed phase) of chest CTA in follow up case of blunt thoracic aortic injury patients underwent thoracic endovascular aortic repair.

**Material and method:** Follow-up chest CTA 127 examinations performed between January 2010 and July 2018 in 45 patients underwent TEVAR were evaluated for thoracic aorta and branches, major thoracic organ related trauma, and aortic stent. Image quality was evaluated using a subjective scale assessed by two cardiovascular radiologists. Effective dose and DLP in an arterial phase and a delayed phase were compared.

**Results:** High overall percentage of agreement was found for image quality, artifact, aortic contour and stent scores(85.8%-100%). Compared with the dual-phase, a single delayed phase showed statistically significant difference of scores in image quality at heart and artifact at mediastinum. While, there were statistically significant difference between scores of a single arterial phase and dual-phase: the image quality parameter of U/D aortic disease, branch of aorta; artifact parameters of U/D aortic disease, branch of aorta; aortic contour parameter of ascending aorta an branch of aorta. The median effective dose of single delayed phase was significantly lower than that of single arterial phase (6.4 (5.2,8.7)mSv VS 7.6 (6.1,9.8),  $P<0.001$ ).

**Conclusion:** Single delayed phase reached overall image quality as similar to the dual-phase except nonaortic image quality at heart and artifact at mediastinum while reducing radiation dose 54% in surveillance chest CTA of patients underwent TEVAR.

**ID: 129**

**Scientific Abstract**

*Topics: Genitourinary*

*Keywords: Hysterosalpingography*

**Lessons Learnt From Assessment Of Technical Adequacy Of Hysterosalpingography Exams In A Regional Hospital - Practical Tips To Improve HSG Technique, And Important Findings To Look For Other Than Fallopian Tube Patency**

**Rois L S Chan, Siu Chun Wong, Wing Hang Luk**

Princess Margaret Hospital, Hong Kong S.A.R. (China)

**Objectives:** Hysterosalpingography (HSG) was first performed 100 years ago, but remains a first line examination for female subfertility. We aim to assess the technical quality of our HSG studies and identify methods for improvement, as despite the clinical importance of HSG, there is very limited literature or textbook description of practical tips for obtaining good HSG images.

**Methods&Materials:** Technical quality of all 41 HSG examinations performed in 2017 for subfertility in a regional hospital in Hong Kong was reviewed. After implementation of changes, 31 HSG examinations performed in 2018 further reviewed.

**Results:**

Adequate technique performed in all studies to exclude tubal occlusion.

However, 44%(18/41) had no images of uterine filling phase, and 51%(21/41) had no image acquired after Foley balloon deflation and catheter removal. These images are necessary for adequate assessment of endometrial cavity according to international guidelines.

None of these suboptimal studies identified any uterine anomalies, in contrast to 15%(3/20) of studies with adequate imaging of endometrial cavity identifying treatable uterine anomalies (polyp, synechiae, fibroid).

Techniques for improvement of HSG image quality were also identified (such as smaller volume injected to foley balloon, head down position when deflating balloon, limiting contrast volume injected etc).

After improvement, reassessment of all 31 HSG examinations performed in 2018 show adequate imaging of endometrial cavity in all cases, and improved quality of HSG images.

**Conclusion:** Assessment of quality of HSG studies and implementation of simple techniques is easy yet helpful in improving HSG image quality for accurate diagnosis of tubal and uterine anomalies for prompt treatment of subfertility.

**ID: 130**

### **Educational Abstract**

*Topics:* General Radiology, Abdominal Imaging/GI Tract, Informatics, Thoracic/Chest Imaging, Pediatric Radiology

*Keywords:* Situs inversus totalis, Chest x-ray

### **Situs Inversus Totalis, The Twisting Mirror Anomaly, A Pitfall**

**Harley Septian, Pande Putu Yuli Anandasari, Ni Nyoman Margiani**

Udayana University Faculty of Medicine, Radiology Department, Sanglah Central General Hospital, Bali, Indonesia

### **Learning objectives**

To describe the characteristics of situs inversus totalis and its appearances on chest x-ray (CXR) in order to help clinicians to avoid mishaps in making diagnosis and further medical procedures, especially in emergency setting and limited radiology resources.

### **Background**

Situs inversus, a rare congenital anomaly, characterized by transposition of abdominal organs and mostly the cardiac apex relative to normal (situs solitus). The incidence rate is 1 to 10,000 live births and generally, it was an incidental x-ray finding. Usually, CXR is the first-line imaging modalities that's mostly used in emergency setting and limited resources. On CXR findings, situs inversus totalis will show an opposite of the normal anatomical location of cardiac apex, aorta, abdominal organs and gastric gas.

### **Findings & Procedure details**

Special attention was put on the x-ray marker position and anatomical location of cardiac apex, aorta (which was quite hard in pediatric patients), abdominal organs and gastric gas on CXR. We reported five cases with CXR findings of situs inversus totalis from august 2017 to august 2018. Three of them established an accompanying congenital malformation and while the rest were incidental findings.

### **Conclusion**

Using CXR study solely with focusing on the x-ray marker position and anatomical location of cardiac apex, aorta, abdominal organs and gastric gas, may help clinicians to avoid mishaps in making diagnosis and further medical procedure.

**ID: 131**

**Educational Abstract**

*Topics:* General Radiology, Informatics, Musculoskeletal Imaging

*Keywords:* osteogenesis imperfecta, conventional imaging studies, osteoporosis, bone deformity, Brittle Bone

**Brittle Bone Brothers: Osteogenesis Imperfecta Conventional Imaging Case Series**

**Marsha Ruthy Darmawan, Elysanti Dwi Martadiani, Dewa Gde Mahiswara Suadiatmika**

Udayana University Faculty of Medicine, Radiology Department, Sanglah Central General Hospital, Bali, Indonesia

**Learning objectives**

To characterize Osteogenesis Imperfecta (OI) in adults through skeletal conventional imaging

**Background**

Osteogenesis Imperfecta (OI) or “brittle bone disease”, is a genetic disorder characterised by increased bone fragility and decreased bone density due to abnormalities of type I collagen. The diversity of OI clinical expression depends on its classification and age. One OI type may lead to death, alongside multiple bone fractures, osteoporosis, short stature and adult-onset hearing loss. Type I OI were reported to survive up until adulthood. There are many cases found in babies but these 3 brothers' cases were the only OI adult case in our hospital.

**Findings & Procedure details**

A skeletal conventional imaging was performed to the 3 brothers and all of them has identical results such as bowing deformities of long bones, old union and some non-union fractures with extreme angulation and severe osteoporosis. The 34 year-old presented with bowing of his ribcage and all extremities with some bone destruction of both humeral bones and several old fractures. The 36 year-old presented with bowing deformity of all long bones. The 39 year-old has many current fractures and several old ones which were non-union fractures. There were no cardiopulmonary abnormalities observed in these 3 brothers.

**Conclusion**

These 3 brittle brothers with the same type of OI can give awareness on how hereditary this disease can be. Conventional x-ray plays a role as the imaging modality needed to diagnose OI.

**ID: 132**

**Educational Abstract**

*Topics:* General Radiology, Radiation Oncology, Informatics, Neuroradiology

*Keywords:* Soft Tissue Mass, Chronic Inflammatory Disorder, Kimura's Disease, CT Scan

**Kimura's Disease, A Neoplasm Mimicking, Benign Rare Form of Chronic Inflammatory Disorder**

**Harley Septian, Made Widhi Asih, Nyoman Srie Laksmningsih**

Udayana University Faculty of Medicine, Radiology Department, Sanglah Central General Hospital, Bali, Indonesia

**Learning Objectives**

To describe characteristics of Kimura's Disease (KD) and give an insight into the role of Computed Tomography (CT) scan in identifying KD and its imaging characteristics.

**Background**

KD is a benign, rare form of chronic inflammatory disorder of unknown origin which is found almost exclusively in Asian males in their 2<sup>nd</sup> to 4<sup>th</sup> decades of life. This rare condition mostly present as soft tissue mass consists of multiple painless solitary subcutaneous nodules mostly localized in head and neck region, with coexisting lymphadenopathy and eosinophilia. CT findings showed multiple ill-defined enhancing soft tissue masses within and around the parotid gland with associated regional lymphadenopathy.

**Findings & Procedure details**

We reported a case of an Asian man with history of 18 years left sided painless facial mass, gradually increase in size with no history of hoarseness, epistaxis, previous facial mass or malignancy, and familial malignancy. CT scan findings showed an inhomogeneous contrast enhancement soft tissue mass, located on the left parotid-submandibular region with multiple neck lymphadenopathy and left parotid gland involvement. Eosinophilia was found persistently in the laboratory outcomes and this mass had been confirmed with histological findings consistent with KD features.

**Conclusion**

Recognizing the characteristics of KD and its imaging findings on CT scan as an accessible and first-line diagnostic tools, will help in facilitating the diagnosis and spare the patient from potentially harmful and unnecessary procedures.

**ID: 133**

### **Educational Abstract**

*Topics:* Informatics, Musculoskeletal Imaging

*Keywords:* osteoporosis, Singh Index (SI), trabecular pattern

### **Revealing The Forgotten Singh Index For Osteoporosis Screening: A Review With Illustrative Case**

**Marsha Ruthy Darmawan, Elysanti Dwi Martadiani, Dewa Gde Mahiswara Suadiatmika**

Udayana University Faculty of Medicine, Radiology Department, Sanglah Central General Hospital, Bali, Indonesia

#### **Learning objectives**

To visualize and evaluate femoral trabecular pattern using Singh Index (SI) for osteoporosis screening in different adult age through conventional imaging.

#### **Background**

Osteoporosis is a common bone metabolic disease due to aging. It is characterized by low bone density and disruption of bone micro architecture which leads to compromised bone strength and increase risk of fractures. Bone mineral density is the gold standard to diagnose osteoporosis; however it's rather expensive and limited in some remote areas. Therefore a simple femoral x-ray, using Singh Index (SI), can evaluate bone trabecular status in order to grade bone density and eventually osteoporosis.

#### **Findings & Procedure details**

Singh Index (SI), a method to describe trabecular bone loss in the proximal femur, has been used as an indicator of osteopenia for decades. This grading system uses a scale from 1 to 6 with 1-3 as a definite osteoporosis and 4-6 as osteopenia to normal. In this review SI was evaluated through 6 female pelvic x-rays with different ages. Our illustrative cases range from 36 – 92 years old patients with grade 1 being the oldest while grade 6 being the youngest.

#### **Conclusion**

There are various advance methods to evaluate osteoporosis, however in resource-limited settings where advance techniques are not available, SI can be an inexpensive diagnostic tool for early predictions of osteoporosis.

**ID: 134**

**Educational Abstract**

*Topics:* Neuroradiology

*Keywords:* Cranial nerves, Neurovascular compression syndrome, Neurovascular conflict, MRI

**Imaging Findings In Cranial Nerves Neurovascular Compression Syndromes: Cases Illustration**

**Ho Lim William Wong, Hin Yui Lau**

Tuen Mun Hospital, Hong Kong S.A.R.

Thanks to the advance in development of imaging technology, neurovascular compression syndrome or neurovascular conflict (NVC) are increasingly recognized as a cause of several common cranial nerves hyperactivity syndromes, including trigeminal neuralgia, hemifacial spasm and glossopharyngeal neuralgia. Studies have also shown that some cases of tinnitus and positional vertigo may also be entities in the clinical spectrum.

Neurovascular compression syndrome occur when a blood vessel directly contact with a cranial nerve, causing mechanical irritation. The offending arterial loops are commonly originating from the posterior inferior cerebellar artery (PICA), anterior inferior cerebellar artery or vertebra-basilar artery. In as many as 40% of cases the compression site maybe multiple.

High-resolution 3D T2-weighted MRI sequences such as CISS; FIESTA; balanced steady-state free precession, are considered the standard imaging studies for the detection of neurovascular compression (NVC). With the following cases we aimed to showcase some typical findings of neurovascular conflict in MRI.

**ID: 135**

**Educational Abstract**

Topics: Pediatric Radiology

Keywords: Klippel Trenaunay Weber Syndrome

**Klippel-Trenaunay Weber Syndrome: A Case Report In An Adolescent Child**

**Mariaem Medrano Andres, Alexa Edna Mae Jusi**

St. Luke's Medical Center, Global City and Quezon City, Philippines

This case report presents the clinical and radiologic findings of a child with Klippel-Trenaunay syndrome from infancy until adolescent years. Pictures shall be presented and several pathognomonic imaging findings of the syndrome shall be detailed in this study.

**ID: 137**

**Educational Abstract**

*Topics:* Pediatric Radiology

*Keywords:* SMA syndrome, rare, young patient, acute abdomen, duodenal obstruction

**Superior Mesenteric Artery Syndrome: A Rare Presentation of Acute Abdomen in a Young Healthy Boy**

**Li Yuen Nyin**

Malacca General Hospital, Malaysia

**Learning objectives:** Superior mesenteric artery (SMA) syndrome is a rare clinical entity whereby the third part of duodenum is locally compressed by the SMA against the abdominal aorta. This causes a constellation of symptoms due to duodenal compression, which often imposes a delayed or missed diagnosis in a young patient. This case reveals the challenges to diagnose SMA syndrome and the need to include this condition in the arsenal of differential diagnoses for acute abdomen.

**Background:** We report a 13-year-old boy who presented with subacute intermittent abdominal pain for a week following recent hospitalization for acute pharyngitis. It was also associated with nausea, poor oral intake, bilious vomiting and altered bowel habits. He presented repeatedly to the Emergency Department with similar symptoms after he was discharged from hospital. However, he was treated on an out-patient basis until he was admitted for dehydration.

**Findings and procedure details:** Clinically he was thin. His abdomen was soft with mild tenderness at left iliac fossa. Contrast-enhanced Computed Tomography of abdomen demonstrated a sudden luminal narrowing of the third duodenum with proximal dilatation of the duodenum. A decreased aortomesenteric angle and distance were suggestive of SMA syndrome.

**Conclusion:** SMA is a rare diagnosis in upper gastrointestinal obstruction in a young patient. However, it should not be left out as one of the differential diagnoses when a patient presents with obstructive upper gastrointestinal symptoms and a recent weight loss.

**ID: 140**

**Scientific Abstract**

*Topics: General Radiology*

*Keywords: spine, diffusion tensor imaging, DTI parameters*

**Role of Diffusion Tensor Imaging (DTI) Parameters in Evaluating Clinical Severity of Cervical Spondylotic Myelopathy**

**Dian Noriza Eddy Suryono**

**UNIVERSITY MALAYA MEDICAL CENTER**

**Background and Objectives:** Conventional MRI sequence has not been able to demonstrate a consistent association with neurologic function in patients with cervical spondylotic myelopathy. Thus, the purpose of this study is to prove diffusion tensor imaging (DTI) technique is useful to characterize microstructural integrity and functional impairment in patients with cervical spondylosis.

**Methods:** 25 cervical spondylosis patients with or without spinal cord signal change underwent MRI-DTI using 3.0T SIEMENS Magnetom Prisma along with functional assessment based on modified Japanese Orthopedic Association (mJOA) scoring system during their first visit and 6 months' follow-up. Fractional anisotropy (FA), axial diffusion coefficient (ADC), radial diffusion (RD) and axial diffusion (AD) were evaluated at the pre-stenotic, maximal stenotic and post-stenotic segments.

**Results:** FA, ADC and AD values differed significantly ( $p < 0.03$ ) between the pre-stenotic, maximal stenotic and post-stenotic segments. There is a statistically significant difference between the FA values and grades of cervical canal stenosis; FA values decreases as the grades of cervical canal stenosis increases ( $p = 0.009$ ). Significant correlation ( $p = 0.002$ ) between spinal canal AP diameter at stenotic level and mJOA scores at first visit ( $r = 0.605$ ,  $p = 0.001$ ) and at 6 months' follow-up ( $r = 0.582$ ,  $p = 0.002$ ).

**Conclusion:** DTI is capable of detecting cervical spinal cord neuronal microstructure complementing conventional MRI assessment. However, no significant association between DTI parameters and severity of cervical spondylotic myelopathy demonstrated in this study.

**ID: 142**

**Scientific Abstract**

*Topics:* Interventional Radiology

*Keywords:* PTBD, Interventional radiology, Clinical audit

**Percutaneous Transhepatic Biliary Drainage Success Rates and Major Complication Rates- Experience of a Local Hospital Practice**

**Ka Yuk Chan, Chong Boon Tan**

Tuen Mun Hospital, Hong Kong S.A.R. (China)

**Objectives**

To evaluate technical success rates and complication rates of PTBD in our institution when the procedure is done only in dilated biliary system and with consideration of relative contraindications.

**Methods and materials**

All PTBD cases from July 2017 to June 2018 were retrieved. Recommendation from Society of Interventional Radiology (SIR) was taken as standard. 51 cases were generated and 5 cases were excluded as PTBD was not performed due to causes such as unstable clinical conditions or non-dilated biliary system after initial ultrasound scan.

**Results**

All cases undergoing PTBD had dilated biliary system. No case had relative contraindications including underlying hepatic cystic diseases or gross ascites. Most patients had no relative contraindication of coagulopathy except 4 (8.7%) who had INR>1.5 despite concomitant fresh frozen plasma infusion. PTBD was still proceeded in these cases due to underlying sepsis.

Out of 46 cases, successful opacification of biliary tree was achieved in 45 cases (97.8%). After successful percutaneous transhepatic cholangiography (PTC), cannulation was achieved in 44 cases (97.8%). Both PTC and PTBD success rates are beyond 95% as recommended by SIR.

Regarding major complications mentioned in SIR guideline, only 2 cases (4.3%) had developed sepsis after the procedure. No case developed any post-procedure hemorrhage, pleural complications or intraprocedural death.

All these complication rates were below the suggested specific threshold (5%) from SIR.

**Conclusion**

With careful consideration of relative contraindications and choosing patients with dilated biliary system, PTBD technical success rates and complication rates can be maintained within SIR standard in our hospital.

**ID: 143**

**Scientific Abstract**

*Topics:* Neuroradiology

*Keywords:* corpus callosum, MRI, gender, age, sex

**An MRI Study Of Age And Sex Related Developmental Changes In Corpus Callosum.**

**Dr. Jamanjit Kaur Sidhu, Dr. Ramesh Chander, Dr. Daisy Gupta**

GOVERNMENT MEDICAL COLLEGE AMRITSAR , PUNJAB , INDIA, India

**Objectives:** We aimed to track the development of corpus callosum and explore the sex related and age related differences in various age groups.

**Material and methods:** A cross-sectional prospective study, in a sample of 100 healthy individuals, in a tertiary care hospital were segregated into subgroups – infants(0-2),children (2-10), adolescent (10-18), young adult (18-25),middle age adults (25-45),older adults (45-65) and old(65 and above).The size of CC was measured on midsagittal section in 59 males and 41 females. The cross-sectional area of seven segments of the CC– rostrum , genu , rostral body , anterior midbody , posterior midbody , isthmus and splenium were calculated and correlated with brain dimensions: AB ( maximum longitudinal dimension), CD (maximum vertical dimension) and EZ( total longitudinal dimension of CC). Statistical analysis involved spearman correlations, Anova tests and Mann Whitney tests.

**Results and conclusions:** Various segments of CC showed significant effects of the age groups but not of gender. AB and CD tend to be smaller in women. The brain and CC both showed variation in size with age. Significant intersegmental correlation existed between brain and CC dimensions.

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**ID: 144**

**Scientific Abstract**

Topics: Genitourinary

Keywords: MDCT, Renal vasculature, Renal surgery, variations

**Relevant renal vascular anatomical variants -a surgeon want to know before partial or total laparoscopic/ robotic Nephrectomies And The Accuracy of MDCT In Evaluating Them**

**Della Harigovind, Harish Babu, Abin Ummer**

BMH calicut, India

**Introduction**

Partial or total nephrectomies are indicated in different laparoscopic or robotic renal surgeries. Accurate preoperative road map of the vascular anatomy is important to avoid surgical complications. CT angiography can reliably and accurately depict the renal arteries and veins and the accuracy approaches that of conventional angiography in the assessment of most vascular abnormalities.

Objectives

- To study the variations in the number and branching pattern of the renal arteries
- To study the the number and variations of the renal veins.
- To know the prevalence of each variation.

**MATERIAL AND METHODS**

This study included data from 100 randomly selected patients who underwent CT angiography of abdomen during a period of 11 months. All scans are done using 128 slice MDCT. Collected renal angiographic images of all patients were analyzed for the variations in renal vasculature.

**Results and conclusion**

Amongst the 100 patients, 66 patients showed at least one type of vascular variation. 51 patients had presence of arterial variation including right accessory renal artery, left accessory renal artery, right prehilum branching and left prehilum branching.

Total renal vein variations including right and left accessory veins, right and left late venous confluence, retro aortic renal vein and circum aortic renal vein was 25. Our study shows accuracy of MDCT in delineating the renal vasculature.

**ID: 145**

**Educational Abstract**

*Topics:* Thoracic/Chest Imaging

*Keywords:* CDH, pulmonary hypoplasia, mediastinal shift, antenatal, USG/MRI.

**Congenital Diaphragmatic Hernia: An Unusual Case Report In Antenatal Imaging.**

**Dr. Jamanjit Kaur Sidhu, Dr. Ramesh Chander**

**GOVERNMENT MEDICAL COLLEGE AMRITSAR , PUNJAB , INDIA, India**

**Learning objectives:** Congenital diaphragmatic hernia (CDH) affects approximately 1 in every 4000 live births. Advances in prenatal assessment and antenatal management has lead to improved survival rate.

**Background:** CDH has traditionally been classified as posterolateral (Bochdalek hernias- more common variety) and anterior (Morgagni hernias),but it is more practical to classify CDH as intrapleural and mediastinal, for purpose of diagnosis and prenatal counselling.<sup>1</sup> Intrapleural hernia(Bochdalek Hernia) due to mass effect within the thorax, cause pulmonary hypoplasia and contralateral mediastinal shift.<sup>1</sup> The diaphragm fails to close completely during fetal development and abdominal viscera herniates into chest. Left-sided hernias are more frequent than right sided ones<sup>2</sup>. The presence of intraabdominal contents in thorax arrests the development of normal lung causing ipsilateral pulmonary hypoplasia. Sometimes,abdominal contents cause cardiac shift to the contralateral side.

**Findings and procedure details:** Ultrasound is the mainstay of initial diagnosis. Bowel loops are seen as fluid filled echogenic cystic masses. Mediastinal deviation is often seen first and is the most obvious ultrasound sign of congenital diaphragmatic hernia.<sup>2</sup> Fetal MR imaging can help identify the site of the diaphragmatic defect and the hernia contents.<sup>1</sup>

**Conclusion:** once diagnosed on antenatal USG/MRI, foetuses with CDH should be referred to tertiary care centre for managementand hence reducing the mortality rates.

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**ID: 146**

**Educational Abstract**

Topics: Musculoskeletal Imaging

Keywords: renal, calcification, periarticular, imaging findings, tumoral .

**An Extreme Rare Case Of Tumoral Calcinosis In An End Stage Renal Disease Patient On Dialysis –Teutschlander Disease.**

**Dr. Jamanjit Kaur Sidhu, Dr. Ramesh Chander**

GOVERNMENT MEDICAL COLEGE AMRITSAR , PUNJAB , INDIA, India

**Learning objective :** Tumoral calcinosis is a rare and severe sequel seen in patients of end-stage renal disease, characterised by large amorphous calcific densities surrounding periarticular soft tissues , lobulated masses with no soft tissue component (shoulder, elbow and wrist). characterised by fibrous septa and fluid/calcium levels ( milk of calcium).

**Background:** We are describing a case of 60 year old male with end stage renal disease, on hemodialysis with tumor-like, subcutaneous swellings in right shoulder and left elbow , which exhibited waxing and waning over time.

**Findings and procedure details:** **Radiograph** showed large, well demarcated, lobulated calcified masses adjacent to right shoulder joint and left elbow joint.

**Ultrasonography** showed thick walled multiloculated cystic lesion with multiple echogenic foci in the fluid suggestive of mineral deposition.

**CT** scan demonstrated periarticular heterogenous mass with - **cystic collections** showing low attenuation centers and calcific walls, containing fluid-calcium levels and **multilobulated soft tissue masses** with chalky amorphous calcifications, associated with minimal lytic cortical erosion of humerus .

**MR** imaging, gave low signal on T1WI and T2WI with alternating areas of high signal on T2W. No diffusion restriction is seen.

**Conclusion:** Tumoral calcinosis is an uncommon and severe complication of hemodialysis therapy which needs to be diagnosed correctly.

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**ID: 147**

**Educational Abstract**

*Topics:* Musculoskeletal Imaging

*Keywords:* tuberculosis, deformity, types, MR imaging, early diagnosis

**Spinal Tuberculosis : A Villain In The Generation Of Artificial Intelligence.**

**Dr. Jamanjit Kaur Sidhu, Dr. Ramesh Chander**

GOVERNMENT MEDICAL COLLEGE AMRITSAR , PUNJAB , INDIA, India

**Learning objectives:** Tuberculosis is re-emerging globally, more so in the immunocompromised population.<sup>1</sup> Early recognition of the disease is, therefore, most important and has become possible due to advanced imaging technologies

**Background:** Tuberculosis of spine, a most clinically important extrapulmonary and musculoskeletal form of TB, results in residual spinal deformity and/or permanent neurological deficit. Commonest in the thoracolumbar junction, the primary focus of infection can be the vertebral body or the posterior elements.

**Findings and Procedure details:** A lesion adjacent to the intervertebral disk causing its narrowing is paradiscal type (most common). MR imaging shows low signal on T1W and high signal on T2W in the endplate, narrowing of the disk, and large paraspinal/epidural abscesses. A subperiosteal lesion under the anterior longitudinal ligament results in spreading of pus over multiple vertebral segments, stripping the periosteum and anterior longitudinal ligament. MR imaging shows the subligamentous abscess involving multiple segments and sparing of discs. The central lesion spares disc and is centered in the vertebral body and cause collapse giving rise to vertebra plana, ( indistinguishable from lymphoma or metastasis). Tuberculosis in the posterior elements is rare and shows evidence of bone erosion and the associated abscess.<sup>2</sup>

**Conclusion:** Early diagnosis is enabled by MRI imaging prompting earlier management and avoiding complications.

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**ID: 148**

**Educational Abstract**

*Topics:* Abdominal Imaging/GI Tract

*Keywords:* Keywords: Xanthogranulomatous inflammation, XGI, colon, inflammation, Chron's disease

**Xanthogranulomatous Inflammation of the Colon Presenting as Chron's Disease : A rare case report**

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Radiology Department Faculty of Medicine Gadjah Mada University/RSUP Dr.Sardjito, Indonesia

**Learning objective:** To gain knowledge in clinical, radiology and pathology features of Xanthogranulomatous Inflammation of colon

**Background:** Xanthogranulomatous inflammation (XGI) is a uncommon pathological condition. Firstly reported in genitourinary tract, with kidney and gallbladder as the main involved organs. Other possible sites are endometrium, ovary, fallopian tubes, vagina, testis, epididymis, gall bladder, stomach, bone, skin, appendix, urinary bladder, thyroid and adrenal glands. Occurrence of XGI in gastrointestinal tract is very rare.

**Findings and Procedure :** Herein we report a case of 53 years old Javanese female with complaint of abdominal palpable mass of the left lower quadrant 5 months prior to hospital admission. There were no history of diarrhea, vomiting, nausea or fever. Blood analysis only showed mild anemia, tumor markers analyzed for CEA, CA 19-9, Ca -125 and AFP were within normal values. Contrast abdominal CT examination showed inhomogenous lesion of the anterior aspect of the left lumbar region adhered to the abdominal wall with fat stranding and thickening of the muscular layer surrounding lesion and inflammatory signs were found, highly suggestive of a Chron's disease. Laparotomy explorative followed by tumour excision and anastomosis resection of the large intestine was performed. Histopathological analysis from intrabdominal specimens and colon revealed XGI.

**Conclusion:** Although XGI of the colon has a rare oddity in nature, since its presentation may lead to clinical and radiological misinterpretation. Hence requires clinical suspicion and intraoperative pathological examination for accurate diagnosis.

**ID: 149**

**Scientific Abstract**

*Topics:* Neuroradiology

*Keywords:* Thyroid nodule, Ultrasonography, Core needle biopsy, Fine needle aspiration

**Diagnostic Efficacy and Safety of Core Needle Biopsy as a First-line Diagnostic Method in Thyroid Nodules: a Prospective Cohort Study**

**Min Ji Hong**

Gil Medical Center, Korea, Republic of (South Korea)

**Objective:** To evaluate the diagnostic efficacy and safety of core needle biopsy as a first-line diagnostic method in thyroid nodules.

**Methods:** From February 2016 to February 2018, core needle biopsy was performed in all consecutive patients with thyroid nodules indicated for fine-needle aspiration by the recommendations of the Korean Society of Thyroid Radiology. Three patients refused this protocol. Finally, consecutive 248 thyroid nodules of 212 patients were enrolled in this prospective study. The nodule size was  $15.7 \pm 9.4$  mm. The diagnostic efficacy of core needle biopsy was evaluated by the rate of inconclusive results and the safety of the procedure was evaluated by major and minor complication rate. Ultrasonography evaluation was performed to assess any hemorrhage before and after self-manual compression of the biopsy site for 20–30 minutes, and delayed complication was assessed 5-7 days after biopsy. Any symptomatic hematoma requiring no hospitalization was classified as a minor complication.

**Results:** Core needle biopsy alone was performed in 82.7% and simultaneous core needle biopsy/fine-needle aspiration in 17.3% of nodules. The number of core needle biopsy sampling was  $1.5 \pm 0.5$ . The diagnostic results of core needle biopsy was nondiagnostic 0.8%, benign 63.3%, indeterminate 10.1%, follicular neoplasm 3.2%, suspicious malignant 2.4%, and malignancy 20.1%. There was no major or delayed complication. There were 2 cases (0.9%) of minor complication.

**Conclusion:** Core needle biopsy is effective for reducing inconclusive results and safe, and might be used as an alternative first-line diagnostic method for thyroid nodules for an experienced operator.

**ID: 150**

**Scientific Abstract**

*Topics:* Pediatric Radiology

*Keywords:* effective dose, Computed tomography dose index

**Optimization Of Pediatric CT Brain Protocol To Achieve Reduced Patient Dose**

**Julnar K, Dr. Prakashini K, Nitika C. Panakkal, Dr. Suresh Sugumar**

Manipal academy of higher education, India

**Objectives**

The purpose of this study was to develop a low dose, age-specific protocol for pediatric CT brain without jeopardising image quality and also to evaluate the reduction of effective dose in the modified protocol.

**Materials & Methods**

A total of 69 Subjects referred for routine CT brain were included in the study and categorized into three groups according to their age [1-4, 5-9, 10-16 years]. All the scans were performed in a 64 slice brilliance CT Philips using a newly developed brain protocol with automatic tube current modulation. The technical factors like rotation time and pitch were adjusted and kept constant for all the three age groups. However, the mAs used was adjusted for the different age groups. Effective dose was calculated from the Dose length product using age-specific conversion factors, and the image quality was evaluated qualitatively using a 4 point scoring system by a radiologist.

**Results**

The effective dose was found to be  $1.3 \pm 0.3$  mSv for 1-4 years,  $1.2 \pm 0.2$  mSv for 5-9 years and  $1.63 \pm 0.09$  mSv for 10-16 years resulting in a dose reduction up to 71 %, 59 % and 35 % respectively. None of the low dose CT- head studies was rated diagnostically unacceptable, however, for age groups [1-4, 5-9 years], the noise and image acceptability was graded suboptimal quality.

**Conclusion**

There was a significant reduction in radiation doses imparted to patients undergoing CT examination of the brain without much loss of diagnostic information.

**ID: 151**

**Educational Abstract**

Topics: Interventional Radiology, Genitourinary

Keywords: Renal CTA, kidney transplant donor

**Renal CT Angiography Evaluation For Kidney Transplant Donor In Dr.Kariadi General Hospital Semarang**

**Fenny Susilo, Gunawan Santoso**

Radiology Department of Dr.Kariadi General Hospital/ Medical Faculty of Diponegoro University, Semarang, Central Java, Indonesia

**Learning Objectives**

- To define information that is needed in Renal CT angiography (CTA) for kidney transplant donor.
- To review normal anatomy and its variant in renal arteries.

**Background**

Incidence rate of end stage renal disease (ESRD) increased in the past few years and became one of major health problems in Indonesia. Kidney transplantation has been increased as a therapy of choice for ESRD. Nowadays CTA has been used to evaluate renal vascularization of the donor.

**Findings and Procedure**

Twenty two potential kidney transplantation donors underwent Renal CTA with 90 ml IV bolus injection of water soluble iodinated contrast between January until December 2018 in Dr. Kariadi General Hospital of Semarang. Both of right and left renal artery and vein were evaluate based on its number, size, distance between renal hilus with proximal branching and presence of stenosis with MIP.

**Details**

Sixteen donors has one renal artery and vein on its respective site with mean diameter of renal artery is 5.3 mm and 10.4 mm for renal vein. In six patients we found multiple renal arteries with diameter 1,3-4,2 mm. Three patients have two renal vein with range diameter 3,19-13,2 mm. Distance between renal hilus and the proximal branching of artery ranging between 0,76-4,52 cm, which is important to determine the cutting point. Vascular without calcification, stenosis, nor thrombus is preferred.

**Conclusion**

Renal CTA can provide useful information of renal vascularization that are used for transplantation procedure planning.

**ID: 152**

**Educational Abstract**

*Topics:* Neuroradiology, Pediatric Radiology

*Keywords:* Neuroradiology, Pediatric Radiology, MRI

**Enterovirus Rhombencephalitis – A Case of Notifiable Disease in Hong Kong with Specific MRI Features**

**Ka Yuk Chan, Wing Ki Ng, Chi Wai Jimmy Siu**

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**Learning Objective**

To illustrate the radiological features of a case of enterovirus rhombencephalitis with typical clinical presentation.

**Background**

Enterovirus 71 infection is a notifiable disease in Hong Kong. The disease is common among pediatric patients. It can have various disease manifestations including hand-foot-mouth disease, respiratory infection and aseptic meningitis. One of the uncommon and potentially fatal disease manifestations is enterovirus rhombencephalitis, which essentially means inflammatory condition affecting hindbrain.

**Findings**

Our case illustrates an 11-year-old boy who had good past health presented with fever and coryzal symptoms. After a while, he developed carpopedal spasm, hyperventilation, neck pain and headache. Later, the patient was found to suffer from acute bilateral upper limb flaccid paralysis. Urgent CT brain showed no space occupying lesion, abnormal parenchymal attenuation or intracranial hemorrhage. Urgent MRI revealed T1 hypointensity and T2 hyperintensity at posterior aspect of midbrain, pontine tegmentum and posterior aspect of medulla. No restricted diffusion is seen at these regions. Features are suggestive of rhombencephalitis. MRI of cervical spine shows long segment T2 hyperintensity at central grey matter of cervical cord, with cord expansion of cervical cord, giving the characteristic “H-shape appearance” on axial T2W images. Rectal swab and throat swab of patients came back showing presence of enterovirus 71. Diagnosis of enterovirus rhombencephalitis was confirmed. Patient was treated with pulse steroid and recovered afterwards.

**Conclusion**

Diagnosis of enterovirus encephalitis can be made with conjoint evidence from clinical presentation, neuroradiological features and detection of the virus as illustrated in this case.

**ID: 153**

**Educational Abstract**

*Topics:* Abdominal Imaging/GI Tract

*Keywords:* CEUS, Haemangiomas, Abdominal Imaging, Liver

**Haemangiomas and Contrast Enhanced Ultrasound; Re-imaging the Convention**

**Ashwin Suri, Azhar Ali, Sabeeh Syed, Adnan Kabeer, Arthikkaa Thavakumar, Taha Khan, Sudeep Biswas, Ruhaid Khurram, Nazia Malik, Noreen Rasheed, Sami Khan, Imran Syed**

Basildon and Thurrock University Hospital NHS Foundation Trust, United Kingdom

**Objectives:**

To compare the efficacy of contrast enhanced ultrasound (CEUS) with conventional imaging in the diagnosis of hepatic haemangiomas.

**Background:**

Haemangiomas are benign liver lesions commonly identified on radiological imaging. Appearances can be classic or atypical determined by size, echogenicity, density and respective rate of filling. Conventional imaging revolves around non-contrast ultrasound scans (NCUS), computed tomography (CT) and magnetic resonance imaging (MRI), however CEUS is being increasingly used as a second line investigation.

**Findings:**

We identified 122 cases (29 male and 93 female) of CEUS conducted over a 5-year period at a district general hospital. Median age of patients 54 and range 27 – 91 years. Sub group analysis showed that alongside CEUS patients also had NCUS in 76 cases, CT in 53 and MRI in 14 cases. The diagnosis of haemangiomas in all three modalities were lower in comparison to CEUS respectively; NCUS (n=50, 66% vs n=72, 95%), CT (n=25, 47% vs n=72, 94%) and MRI (n=6, 43% vs n=14, 100%). CEUS was also noted to be more effective in differentiating atypical haemangiomas when compared to its partner modalities; NCUS (0% vs 16%), CT (2% vs 23%) and MRI (14% vs 29%).

**Conclusions:**

Our study of over 120 cases demonstrates the relative and comparative advantage of CEUS over NCUS, CT and MRI in the identification of classic and atypical haemangiomas. However, further prospective studies are recommended to ascertain the role of CEUS in liver pathology in order to clearly establish its role in being a first line investigation.

**ID: 154**

**Educational Abstract**

*Topics:* Interventional Radiology

*Keywords:* Splenic Artery Aneurysm, Interventional Radiology, Embolization

**The Serpiginous Splenic Artery: A Herculean Approach to Embolization**

**Taha Khan, Azhar Ali, Noreen Rasheed, Sudeep Biswas, Ashwin Suri, Arthikkaa Thavakumar, Arathi Menon, Adnan Kabeer, Imran Syed**

Basildon and Thurrock University Hospital NHS Foundation Trust, United Kingdom

**Learning Objectives**

Feasibility of selective embolization in highly tortuous and anatomically challenging splenic arteries is highlighted.

**Background:**

With an annual incidence of 0.8%, splenic artery aneurysms are rare amongst the general population. However, mortality in patients following rupture ranges between 30 - 90%.

We describe a rare case of an 86-year-old gentleman presenting with haematuria who, following a CT urogram, was incidentally found to have a 20mm saccular splenic artery aneurysm. Endovascular intervention was undertaken due to rupture risk. Interestingly, on cannulation of the splenic artery, a fascinating tortuosity of the artery was seen.

**Findings & Procedure Details**

Vascular access was obtained through a right common femoral arterial approach. A 6-French sheath was sited in the aorta and a Sos-omni catheter was used to access the splenic artery. Angiogram demonstrated a complex serpiginous tortuosity of the splenic artery with acute afferent and efferent arterial entry and exit into the aneurysm. The numerous turns of the artery including an astonishing 180° bend were navigated with the use of a microcatheter. Packing Ruby penumbra coils were successfully deployed. Final angiogram revealed preservation of flow into the efferent artery to the spleen.

**Conclusion**

This case demonstrates pictorially the extent of tortuous anatomical variants in the splenic artery. Furthermore, in a situation where no consensus exists with regards optimal technique, we demonstrate the efficacy of control obtained by microcatheters in successful navigation and embolization of splenic artery aneurysms.

**ID: 155**

**Scientific Abstract**

*Topics:* Abdominal Imaging/GI Tract, Academics

*Keywords:* contrast enhanced ultrasound, CEUS, MRI, diagnostic radiology, Liver, Haemangiomas

**MRI or CEUS; Who Is The Front-Runner In Characterising Hepatic Haemangiomas?**

**Arthikka Thavakumar, Azhar Ali, Taha Khan, Sudeep Biswas, Adnan Kabeer, Sabeeh Syed, Ashwin Suri, Nazia Malik, Ruhaid Khurram, Noreen Rasheed, Sami Khan, Imran Syed**

Basildon and Thurrock University Hospital NHS Foundation Trust, United Kingdom

**Objectives:** Hepatic haemangiomas are benign liver parenchymal lesions that are typically incidentally identified on radiological imaging. This study aims to comparatively assess the diagnostic use of magnetic resonance imaging (MRI) and contrast enhanced ultrasound (CEUS) in accurately characterising these lesions.

**Methods:** A retrospective analysis was conducted on all patients diagnosed with haemangiomas who underwent both an MRI and CEUS scan over a 5-year period. The two imaging modalities were then compared using three variables: location, size and diagnosis of the lesions specified on the reports.

**Results:** Out of a cohort of 79 patients, 17 met the inclusion criteria; male 2 (12%), female 15 (88%). A total of 32 lesions were identified and the following diagnoses made were made on MRI and CEUS respectively; haemangioma (n=20, 62.5% vs n=28, 87.5%) and indeterminate or cyst (n=12, 37.5% vs n=4, 12.5%). Subcategory analysis of haemangiomas showed the following in MRI and CEUS respectively; classic haemangioma (n=18, vs n=22,) atypical haemangioma (n=0, vs n=5) and flash haemangioma (n=2, vs n=1). Size was reported in 29 (90.6%) of MRI lesions but only in 16 (48.5%) of CEUS lesions. Furthermore, locations were reported in 29 (90.6%) MRI lesions and only in 19 (57.6%) lesions on CEUS.

**Conclusion:** Our limited study demonstrates a propensity for better detection and de-differentiation of haemangiomas on CEUS in comparison to MRI. However, reports on MRI are still superior in detailing characteristics of size and location in comparison to CEUS.

**ID: 156**

### **Educational Abstract**

*Topics:* Interventional Radiology, Genitourinary

*Keywords:* Ureteric Stent Insertion, Interventional Radiology, Hydronephrosis, Urethral Catheter, BPH, Antegrade Stenting

### **How Far Is Too Far? Antegrade Stent Insertion Failure Secondary To Distal Ureteric Urethral Catheterisation!**

**Azhar Ali, Taha Khan, Noreen Rasheed, Arthikkaa Thavakumar, Adnan Kabeer, Ashwin Suri, Kurran Gujral, Arathi Menon, Sudeep Biswas, Imran Syed**

Basildon and Thurrock University Hospital NHS Foundation Trust, United Kingdom

### **Learning Objectives**

Identify an unusual cause of failed ureteric stent insertion.

### **Background**

A 90 year old male presented with abdominal pain and acute kidney injury. Ultrasound confirmed bilateral hydronephrosis secondary to benign prostatic hyperplasia. He was subsequently referred for bilateral ureteric stent insertion.

### **Findings & Procedure Details**

The procedure was performed percutaneously using an antegrade approach. The left vesicoureteric junction was occluded and so was dilated to 4 mm using a Mustang balloon to allow the successful placement of a 7-French 24 cm Vortex JJ stent. However, on the right side, this same technique failed. It was not possible to push the stent across the wire from the ureter into the bladder. The procedure was abandoned and an urgent CT KUB was ordered to rule out right ureteric injury or avulsion.

The CT KUB astonishingly demonstrated the tip of a urethral catheter sited within the right distal ureter having passed through the ureteric orifice. This was the cause of the initial ureteric stent failure. The urinary catheter was repositioned but the right sided hydronephrosis persisted and thus a right antegrade urinary stent was successfully placed. The hydronephrosis was likely caused by the BPH rather than the urinary catheter. Misplacement of urinary catheters has also been previously reported as leading to failed ureteric stent insertion<sup>1</sup>.

### **Conclusion**

This case highlights a highly unusual case of ureteric obstruction from a mal-positioned urethral catheter, for which consideration needs to be given in potential failure of stent placement in the distal ureter.

**ID: 157**

### **Educational Abstract**

*Topics:* Abdominal Imaging/GI Tract, Genitourinary

*Keywords:* Renal Imaging, Bosniak Cysts, CEUS, Abdominal Imaging

### **Contrast Enhanced Ultrasound; An emerging differentiator of complex renal cysts?**

**Adnan Kabeer, Azhar Ali, Ruhaid Khurram, Nazia Malik, Sabeeh Syed, Sudep Biswas, Ashwin Suri, Taha Khan, Kurran Gujral, Arthikkaa Thavakumar, Noreen Rasheed, Sami Khan, Imran Syed Basildon and Thurrock University Hospital NHS Foundation Trust, United Kingdom**

#### **Learning objective**

To determine the efficacy of contrast enhanced ultrasound (CEUS) in improving the diagnostic yield in patients with equivocal radiological studies.

#### **Background**

Renal cysts are often detected incidentally during non-contrast ultrasound scans (NCUS). Distinction between Bosniak type IIF and III often leads to further imaging for clarification.

CEUS is a modality increasingly used by radiologists to address this distinction and avoid the need for adjunct investigations such as CT or MRI.

#### **Findings**

A total of 30 cases (16 male and 14 female) of CEUS of the kidneys were identified over a 5-year period. Mean age of 66 years with range 38 – 85 years. Indications for CEUS included the following: inconclusive from NCUS/CT/MRI (n=26, 86.7%), inability to tolerate CT due to poor renal function (n=3, 10%) and surveillance in (n=1, 3.3%). Confirmatory diagnosis was achieved by CEUS in 12 cases (40%) and further clarification in 15 (50%) of cases. The remaining 3 (10%) of cases yielded indeterminate results. In addition, CEUS confirmed a diagnosis of malignancy in 4 cases (13.3%) that otherwise were ambiguous. In 6 cases (20%) CEUS confirmed no renal lesions when previous studies had suggested so. In 5 cases (16.7%), CEUS was able to clarify Bosniak 2f/3 cysts with accuracy.

#### **Conclusion**

We have objectively demonstrated an improvement in the recognition of Bosniak 2f/3 renal cysts which are often difficult to validate. CEUS is therefore an important adjunct to imaging of kidneys and further studies are encouraged strengthen its role in this radiological pathway.

**ID: 158**

## **Scientific Abstract**

*Topics:* Radiation Oncology

*Keywords:* Glioblastoma, Radiotherapy, Eloquent areas

## **Glioblastoma Location Predicts Survival**

**Gail Wan Ying Chua, Grace Kusumawidjaja, Kevin Lee Min Chua**

National Cancer Centre, Singapore

### **Objectives**

Location of glioblastoma(GBM) can be divided into silent or eloquent areas using functional MRI(fMRI), the latter showing inferior overall survival(OS). Our single-institutional study classified tumour location based on diagnostic MRIs, without requiring costlier fMRIs. We hypothesized that patients with tumours in non-eloquent areas had better OS than those in near-eloquent and eloquent areas.

### **Methods and Materials**

We analysed outcomes of 68 GBM patients receiving concurrent temozolomide and radiotherapy(60gy/30#) between 2007-2016. Pretreatment MRIs were reviewed by 2 radiation oncologists. Eloquent areas were defined as cortical areas controlling sensory, linguistic, or motor ability. Near-eloquent areas were <8 mm from eloquent areas. OS and progression-free survival(PFS) were analysed with log-rank test.

### **Results**

Tumours in non-eloquent, near-eloquent and eloquent areas were found in 23.6%, 35.3% and 41.1% of patients. Median OS was 22.0mo, 15.8mo and 12.9mo. Compared to those in non-eloquent areas, those in near-eloquent areas had poorer OS (hazard ratio: 0.449[0.197-1.02], p=0.056), likewise for those in eloquent areas (HR 0.435[0.189-1.00], p=0.050). 46.0% tumours in non-eloquent areas had limited resection. Interestingly this subset also had improved OS (median 20.2mo). Median PFS was similar (9.0mo) across groups.

### **Conclusion**

Location of GBM in non-eloquent areas predicts for significantly better OS than near or eloquent areas, regardless of resection extent. Difference in PFS was insignificant, suggesting equivalent disease control between groups. However, treating tumours in/near eloquent areas may lead to physical deficits, resulting in poorer OS. We aim to incorporate other factors to create a prognostic scoring system, and develop MRI reporting guidelines specifying eloquent/near/non-eloquent areas.

**ID: 159**

**Educational Abstract**

*Topics:* General Radiology, Interventional Radiology

*Keywords:* Uterus, Arteriovenous Malformation, Embolization

**Rare But Deadly:Case Report Of Uterine Arteriovenous Malformation**

**Cindy Chin<sup>1,3</sup>, Fatimah Ismail<sup>3</sup>, Norhafizah Ehsan<sup>2</sup>, Dhayal Balakrishnan<sup>2</sup>, Ganeshwara Lingam<sup>2</sup>, Salinawati Bakin<sup>2</sup>, Hamzaini Abdul Hamid<sup>3</sup>, Lau Jia Him<sup>2</sup>**

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**Learning Objective:** We choose to report this case to understand this condition better and explore the possible management options, as this is a rare condition which may lead to fatal death if misdiagnosed.

**Background:**Uterine arteriovenous malformations(AVMs) have less than 100 cases reported.The true incidence remain unknown with 30% complicated with hypovolaemic shock. It can be congenital or acquired. Both differentiated only by their causes.Management of uterine AVMs depends on many factors including the patient's hemodynamic status, age, and desire for future fertility. UAE is the preferable choice for patient with desire for fertility. However considering 17 % of recurrence, hysterectomy would be the treatment of choice especially in post-menopausal women. Post-embolization pregnancy and other alternative treatment remain debatable.

**Case Findings and Procedure Detail:** This case reported a 23 years old Malay lady Para 1+2 with history of several miscarriages and curettage, complaint of per vaginal bleed more than 2 months after her suction and curettage on September 2018. Proceeded with CECT Pelvis and Pelvis angiogram after bedside ultrasound noted suspicious of AVM features. Successful uterine artery embolization(UAE) with 5 Micronester coils and 10% Histoacryl glue.

**Conclusion :**Uterine AVMs remain rare as it is only diagnosed in symptomatic patients during pregnancy or miscarriage.An accurate diagnosis and prompt management are of utmost importance as misdiagnosis may lead to a catastrophic outcome.

**ID: 160**

**Scientific Abstract**

*Topics:* Neuroradiology

*Keywords:* gadolinium-based contrast agent, randomized clinical trial, gadopiclesol, gadobenate dimeglumine

**Dose Finding Study of Gadopiclesol, a New Macrocyclic Gadolinium-Based Contrast Agent, in MRI of the Central Nervous System**

**Benjamin P. Liu**

Northwestern University, Northwestern Memorial Hospital, United States of America

**Objectives**

To determine a safe and effective dose of gadopiclesol, a new high relaxivity macrocyclic GBCA, based on the Contrast-to-Noise Ratio (CNR) as compared to gadobenate dimeglumine.

**Methods and Materials**

This double-blind, randomized, dose-parallel group and cross-over study included patients with known or highly suspected focal areas of disrupted blood brain barrier. Patients were randomized to one of the four doses of gadopiclesol (0.025, 0.05, 0.1, 0.2 mmol/kg) and to one series of two MRIs: gadopiclesol and then gadobenate dimeglumine at 0.1 mmol/kg or vice versa. Three independent blinded readers performed the signal intensity measurements off-site. Adverse events were collected up to one day post second MRI.

**Results**

The study population included 272 patients (58.5% females) with a mean±SD age of 53.8±13.6 years. The superiority of gadopiclesol over gadobenate dimeglumine was statistically demonstrated at 0.2 and 0.1 mmol/kg for all readers with an increase in CNR>30%. At 0.05 mmol/kg, gadopiclesol showed a similar CNR as gadobenate dimeglumine at 0.1 mmol/kg. The relationship between CNR and dose of gadopiclesol was linear for all readers. Similar results were observed for the other quantitative assessments (lesion-to-brain ratio and contrast enhancement percentage).

Rates of adverse reactions were comparable with gadopiclesol (11.7%) and gadobenate dimeglumine (12.1%).

**Conclusion**

When compared to gadobenate dimeglumine at the standard dose of 0.1 mmol/kg, the doses of 0.05 and 0.1 mmol/kg can be considered as effective and safe clinical doses of gadopiclesol.

**ID: 161**

**Scientific Abstract**

*Topics:* Musculoskeletal Imaging

*Keywords:* MRI knee, internal derangement, arthroscopy

**Accuracy Of MRI Knee In Detection of Traumatic Internal derangements And Comparison With Arthroscopy**

**Della harigovind Pothiyedath, Schiller Jos, Harish Babu**

BMH calicut, India

**Introduction**

Traumatic internal derangements of the knee can be assessed by MRI or arthroscopy. Arthroscopy has been considered as the gold standard in evaluating knee pathologies. However it is invasive , high cost procedure and has some inherent complications . MRI has now become the first line investigation. It has high sensitivity and specificity.

**Objectives**

To find various types of intra-articular traumatic lesions of the knee on MRI.

To compare and correlate the performance of MRI with arthroscopy.

Establish the accuracy of MRI

**Methods and materials**

Cross sectional study including 116 patients. Evaluated with dedicated MRI knee prior to arthroscopy. Interpretation of data was done for ligamentous , meniscal and articular cartilage injuries. After reaching a MRI diagnosis, the patients are subjected to an arthroscopy using standard portal and systematic complete evaluation of the knee was performed. MRI findings were revealed to the surgeon after the initial independent assessment. A relook was done in appropriate cases. Comparison of findings were done using a statistical soft ware and assessed for sensitivity, specificity, positive predictive value, negative predictive value, and accuracy

**Results and conclusion**

MRI showed excellent sensitivity in detecting intra-articular knee injuries.MRI detected more number of medial and lateral meniscus injuries compared to Arthroscopy.MRI detected slightly more number of ACL tears compared to arthroscopy. MRI had high sensitivity and specificity in relation to arthroscopy for the detection of PCL tears

**ID: 163**

**Scientific Abstract**

*Topics:* Genitourinary

*Keywords:* Prostate, MRI, in-bore, biopsy

**MRI-Guided In-Bore Prostate Biopsy For Prostate Cancer: A Retrospective Review From A Single Tertiary-Centre**

**Yen Huynh, Paul Simkin, Stefan Heinze**

Royal Melbourne Hospital, Australia

**OBJECTIVES**

- Evaluate lesion characteristics referred for MRI-guided in-bore prostate biopsies performed at a tertiary institution.
- Correlate imaging findings based on the PI-RADS (prostate imaging and reporting data system score) with histopathological cancer grading.

**MATERIALS AND METHODS**

- A retrospective review of all MRI-guided in-bore prostate biopsies performed between September 2016 and December 2018 at a tertiary centre was undertaken.
- Spearman's rank analysis was performed to identify correlation between PI-RADS and histological grading.
- A Gleason score of  $\geq 3+4=7$  (i.e. an ISUP, International Society of Urological Pathology, score  $\geq 2$ ) was considered clinically significant disease.

**RESULTS**

- 107 lesions were referred for MRI-guided in-bore biopsy in 100 patients. Of these, 9 patients did not undergo biopsy (8 target lesion no longer present, 1 patient MRI intolerance).
- One PI-RADS 2 lesion was biopsied and was benign.
- 23 PI-RADS 3 lesions were biopsied with 13% returning with ISUP 2 disease, and the remaining as benign or ISUP 1.
- 53 PI-RADS 4 lesions were sampled, of which 51% returned with clinically significant disease.
- 13 PI-RADS 5 lesions were biopsied, with 61% yielding clinically significant disease.
- There is a positive relationship between the PI-RADS of a lesion and the likelihood of it being clinically significant disease,  $r = 0.353$ ,  $p < 0.001$ .
- Two post-procedural complications were identified (rectal bleeding and urosepsis).

**CONCLUSION**

- There is a positive correlation between PI-RADS and returning clinically significant disease on MRI-guided in-bore prostate biopsy.
- MRI-guided in-bore prostate biopsy provides a safe and effective method of performing targeted prostate sampling.

**ID: 164**

**Educational Abstract**

*Topics:* General Radiology, Pediatric Radiology

*Keywords:* Polysplenia syndrome, preduodenal portal vein, short pancreas, CT scan

**Polysplenia Syndrome With Congenital Short Pancreas and Preduodenal Portal Vein: A Case Report and Literature Review**

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Faculty of Medicine Universitas Indonesia, Indonesia

Polysplenia syndrome is a rare congenital disorder of abnormal positioning of the visceral organs and vessels in the chest and abdomen, with incidence of 1 per 250.000 and predominated in females. Polysplenia syndrome presents with a wide range of anomalies with no pathognomonic findings. The range of anomalies include multiple spleens, visceral heterotaxy, right-sided stomach, a left-sided or large midline liver, malrotation of the intestine, a short pancreas, preduodenal portal vein and inferior vena cava anomalies. We reported a case of polysplenia syndrome in child presenting with high fever since 4 days before hospital admission and obstructive jaundice owing to suspected biliary stasis, possibly as a result of compression of the common bile duct by the preduodenal portal vein. Abdominal ultrasound revealed polysplenia and hepatomegaly. Contrast-enhanced abdominal CT revealed multiple left-sided accessory spleens, midline liver, preduodenal portal vein, and short pancreas. Diagnosis of heterotaxy syndrome with polysplenia was established. Good appreciation of the spectrum of situs anomalies and anatomic manifestations can greatly impact the treatment of primary and secondary sequelae of this syndrome. Therefore, radiologists should become familiar with these rare and peculiar anomalies of this syndrome and present valuable report to aid surgeons deciding optimal treatment for the patient.

**ID: 165**

**Educational Abstract**

*Topics:* Academics, Pediatric Radiology

*Keywords:* Triton, PNST, neurofibromatosis, CT, MRI, imaging

**CT and MRI Findings of Congenital Malignant Triton Tumor of the Scalp in a Neonate Unaffected by Neurofibromatosis**

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Malignant triton tumor (MTT) is a very rare subtype of malignant peripheral nerve sheath tumor (MPNST) with rhabdomyoblastic differentiation. MTT occurs more frequently in patients with Neurofibromatosis type 1 (NF1), however, sporadic non-NF-1 MTT cases have also been reported in the literature. Imaging techniques and findings of MTT were rarely documented. We reported a case of a 12 day-old neonate who had neither family history nor clinical signs of NF1, presented with a gradually enlarging left temporal mass which was noted since birth. Computed tomography (CT) scan and magnetic resonance imaging (MRI) were performed for therapeutic plannings. Head CT showed soft tissue density tumor on the left temporal region with erosions of underlying cranial bones. MRI showed a large T2WI high intensity capsulated tumor with hemorrhagic components. Diffusion weighted Image (DWI) and Apparent Diffusion Coefficient (ADC) map showed peripherally dominant restricted diffusions. CT and MRI findings were correlated with histopathological diagnosis including immunostaining which confirmed the diagnosis of MTT. The patient underwent multiple tumor removal surgeries, with recurrent, more progressive growth of tumor on the same area following each surgery. The objective of this report is to document serial CT and MRI findings of the patient throughout the course of multiple surgeries and provide better understanding of MTT imaging features.

**ID: 169**

**Educational Abstract**

*Topics:* Neuroradiology, Pediatric Radiology

*Keywords:* Schizencephaly, Congenital Brain Anomalies, MRI

**Imaging Spectrum of Schizencephaly**

**Fatt Yang Chew, Chang You Song, Yu Chien Lo, Chao Chun Lin, Ying Hsuan Li, Chung Shen Wu**

China Medical University Hospital, Taiwan

**Learning Objectives**

- To review a wide spectrum of the imaging appearances of schizencephaly.
- To understand the type and distribution of schizencephaly.
- To demonstrate the variable brain anomalies associated with schizencephaly.

**Background**

Schizencephaly is an uncommon disorder of cortical malformations due to abnormal late neuronal migration and cortical organization. It is characterized by gray matter-lined clefts that extend through the hemisphere, from the ependyma lining of the lateral ventricle to the cortical surface. Schizencephaly was first described by Yakovlev and Wadsworth in the 1940s through detailed neuropathologic analysis in a number of patients with clefts in the cerebral mantle.

**Findings & Procedure Details**

Schizencephaly could be detected in a variety of imaging modalities such as ultrasonography and computer tomography but the method of choice is magnetic resonance imaging (MRI), which is more sensitive in detecting the clefts as well as their associated abnormalities with its superior differentiation of gray matter and white matter. In MRI, schizencephaly appears as a cleft that often lined with gray matter. The clefts can be unilateral or bilateral with fused or separated lips, which are defined as closed-lip and open-lip schizencephaly. It might associate with heterogeneous brain abnormalities such as absent of septum pellucidum, dysgenesis of the corpus callosum, microgyria, pachygyria, polymicrogyria, and heterotopic gray matter.

**Conclusion**

MRI is a critical imaging tool for the diagnosis of schizencephaly. It is essential to demonstrate the morphology, distribution, and extent of this disorder. Furthermore, it can identify the associated brain anomalies and related syndromes.

**ID: 171**

**Scientific Abstract**

*Topics:* Neuroradiology

*Keywords:* Apparent diffusion coefficient, Deep nuclei, MRI, Normal appearing periventricular white Matter, Tuberculous meningitis

**Apparent Diffusion Coefficient (ADC) Characteristics In Paediatric Tuberculous Meningitis Patients Having Normal Appearing Periventricular White Matter And Deep Nuclei**

**Donboklang Lynser, Aman Yusuf Khan, Pranjal Phukan, Barun Kr. Sharma**

North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, India

**Objectives:** to measure the mean apparent diffusion coefficient (ADC) values of brain using diffusion weighted spin echo-planar magnetic resonance in normal appearing bilateral periventricular white matter (NAWM) and deep nuclei in paediatric patients with tuberculous meningitis (TBM).

**Materials:** We retrospectively reviewed four pediatric tuberculous meningitis and compare them with four age matched healthy normal MRI brain. ADC values were measured in the bilateral centrum semiovale, Caudate, Putamen, Thalami and Cerebelli using region of interest analysis and values were compared between TBM and control groups and between right and left sides. *Statistical analysis:* The Wilcoxon test (nonparametric test), was used to determine the difference between right and left hemisphere of each individual location with significance value at 0.05. However for the total mean ADC values of all the regions a 'student's t' test was used at  $P < 0.05$ . *limitations:* small sample size is the limitation of this study.

**Results:** The total mean ADC value between the TBM and non TBM groups shows no differences between them at  $P < 0.05$  ( $P = 0.731$ ). There was no difference in the mean/ median diffusivities between the left and the right region of each individual structure in the TBM and non TBM groups at  $P < 0.05$  (using non parametric test). *limitations:* small sample size is the limitation of this study.

**Conclusion:** There is no significant difference in the total mean apparent diffusion values of brain in TBM compare to non TBM group. No significant difference can be derived in differences between the right and left side structures.

**ID: 172**

**Educational Abstract**

*Topics:* Interventional Radiology, Neuroradiology

*Keywords:* Arterial feeders, Embolization, Draining veins, MRI, Pial AVF

**A Case Of Pial Fistulae Treated By Arterial Feeder Embolization.**

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North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, India

**Learning objectives:** Pial AVF is a rare vascular anomaly which can be treated by endovascular arterial feeder embolization. Correct diagnosis with careful and proper strategic embolization planning is inevitable for successful treatment results.

**Background:** Pial AVFs are rare vascular anomalies and till date only approximately 150 cases are reported.

**Findings and procedure details:** We report a case of pial AVF diagnosed and treated by arterial feeder embolization. A 18 months old baby presented with complains of generalized tonic clonic seizure since birth for imaging and treatment. MRI shows a pial fistulae supplied by branches from the right MCA with dilated draining veins. The finding was confirmed on digital subtraction angiography. The lesion was treated by coil embolization of the two feeding arteries followed by embolization with onyx. Post procedure angiography show complete resolution of the fistulae. The baby recovered uneventfully and was discharged.

**Conclusion:** The treatment option is controversial, It difficult to precisely deliver the desired embolus to the fistulous point. The usual accepted embolization strategy is Coil placement of the venous sac followed by liquid embolization to the residual fistulae. We however did a coiling of the artery feeder followed by embolization of the residual fistulae.

**ID: 173**

**Educational Abstract**

*Topics:* Abdominal Imaging/GI Tract

*Keywords:* Ascariasis, Biliary, CBD, Obstruction, Ultrasound

**Ultrasound In Hepatobiliary And Pancreatic Ascariasis With Biliary Obstruction**

**Donboklang Lynser, Chhunthang Daniala, Akash Handique**

North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, India

**Learning Objectives:** Ultrasound being cheap and easily available technique, is an invaluable diagnostic tool in hepatobiliary and pancreatic ascariasis with biliary obstruction.

**Background:** Ascariasis is the commonest helminthic disease to infect humans. After wandering in the intestine they migrate into the biliary and pancreatic duct system causing biliary obstruction.

**Findings & Procedure Details:** We report two cases of ultrasound in hepatobiliary pancreatic ascariasis causing biliary obstruction with resultant jaundice. **Case 1:** a 21 years old female presented with history of fever and weakness for 1 week and yellowish discolouration of the eyes of 3 days duration with off and on episodes of vomiting of round worms. Vitals including blood pressure (110/70 mm of Hg) are within normal limits. Physical examination of the abdomen shows palpable liver and non tender. Ultraound shows hepatobiliary and pancreatic ascariasis with biliary obstruction **Case 2:** a 19 years old female carrying a 35 weeks 2 days old live fetus presented for ultrasound abdomen. She give history of constipation and pain epigastrium of 6 days duration. Ultrasound shows dilatation of the hepatobiliary system bilaterally with dilated CBD containing sludge.

**Conclusion:** In our cases we present typical ultrasound imaging findings in hepatobiliary pancreatic ascariasis causing obstructive jaundice. The typical imaging signs depicted include inner tube sign, Spaghetti sign, Inner tube sign etc.

**ID: 174**

**Scientific Abstract**

*Topics:* Thoracic/Chest Imaging

*Keywords:* pseudoaneurysm, septum interventriculare, chest CT

**A Rare Case Of Cardiac Septal Interventriculare Pseudoaneurysms**

**Arif Rahman Wardhani, Bambang Satoto**

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**Objectives:**

Septal interventriculare pseudoaneurysms are uncommon finding and very rare, yet very few study had reviewed about septal interventriculare pseudoneurysms. Unlike ventricular septal aneurysms which caused by spontaneous closure of a membranous ventricular septal defect by apposition of the septal tricuspid leaflet, interventricular septal pseudoaneurysm most often discovered incidentally as a result of catheterization or post traumatic

**Methods and Materials:**

In this case report we are reviewing a 25 years old female presenting a rapidly growing shortness of breath since 4 years ago. Patient has been underwent ventricular septal defect treatment for 2 years and performed catheterization several times. Chest X-ray revealed left ventricular hipertrophy and irregular opacities superposed to heart's structure, suspected as calcification. While chest CT revealed right atrium hipertrophy and left ventricle hipertrophy, a strong-enhanced-round mass presented on septum interventriculare, supposed as septal interventricular pseudoaneurysm with thrombus in it.

**Results:**

Septal interventriculare pseudoaneurysm is may occur in relations of chest trauma, free ventricular wall rupture, or post catheterization. On occasions, a ventricular septal defect (VSD) may caused ruptured of ventricular wall which contained of pericardium and fibrous tissue producing pseudoaneurysm. ECG may not very helpul in diagnosing septal interventriculare pseudoaneurysm case due to less specificity. Contrast-administered chest CT may revealed pseudoaneurysm with higher sensitivity and specificity.

**Conclusion:**

The incidence of septal interventriculare pseudoaneurysm is very rare, and only few cases are reported in literature. No specific findings to distinguish pseudoanurysm or aneurysm of septum interventriculare. Yet, clinical informations such as trauma or congenital history were very helpful.

**ID: 176**

**Educational Abstract**

*Topics:* Academics, Neuroradiology, Pediatric Radiology

*Keywords:* subdural empyema, CT, MRI

**Imaging Features of Massive Bilateral Subdural Empyema in a Child: Case Report and Literature Review**

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A 17 month-old girl was admitted for prolonged fever and right hemiparesis. Initial contrast-enhanced brain MRI revealed massive bilateral subdural empyema as heterogeneous areas of low intensity T1WI and high intensity T2WI and FLAIR, compressing the brain parenchyma and causing subfalcine herniation to the right, along with evident hydrocephalus. Post contrast MRI showed enhancement in the wall of subdural empyema. Septations within the subdural collection were also noted. DWI and ADC maps showed focal areas of restricted diffusion within the subdural collection. Surgical drainage revealed purulent exudate, and *Klebsiella pneumoniae* was isolated from microbial culture. The patient underwent follow-up head CT, which showed progression of the empyema, regardless of treatments given. Craniotomy was done for further drainage along with subdural catheter placement. Several follow-up CT was done, which showed resolvment of the empyema. However, the hydrocephalus progressed, and areas of hypodense periventricular white-matter developed, findings consistent with periventricular leukomalacia. On further clinical follow-up, the patient eventually developed cerebral palsy.

Imaging is the key to the diagnosis of subdural fluid collection. Several imaging features, predominantly on MRI, can help differentiate the contents of subdural collection, such as empyema, hematoma, or hygroma, to assist diagnosis without waiting for pathological analysis, therefore advancing early treatment for the patient. The objective of this report is to describe a case of massive bilateral subdural empyema in a child and reviewed its key imaging features according to today's literatures, providing updated learning points on the crucial role of imaging in diagnosing subdural empyema and its complications.

**ID: 177**

**Educational Abstract**

*Topics: Abdominal Imaging/GI Tract, Academics*

*Keywords: atypical, CT, insulinoma, MR, pathological*

**Importance of Clinical, Radiological, and Pathological Correlation in Atypical Insulinoma**

**Diagnosis: Case Report and Literature Review**

**Benedicta Mutiara Suwita<sup>1</sup>, Sahat BRE Matondang<sup>1</sup>, Ening Krisnuhoni<sup>2</sup>**

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A 30-year-old woman was admitted to our center with seizure at 2 days before admission. Laboratory examination showed hypoglycemia and increased fasting insulin level. She had been admitted to different hospital three weeks ago because of similar symptoms, and was discharged after her brain CT and EEG showed no abnormality.

Abdominal contrast-enhanced CT revealed hypovascular nodule in pancreatic tail. Abdominal contrast-enhanced multiphasic MR showed hypointense T1WI, slight hyperintense T2WI nodule with enhancement on arterial phase. Pancreatic duct wasn't obstructed. Pathological examination after surgery was consistent with neuroendocrine tumors, adenocarcinoma was yet to be ruled out with immunohistochemistry. Blood glucose and insulin level became normal after surgery.

Insulinomas occur in 1-4 people per million in the general population. Clinically, Whipple's triad is the classical finding—delays in diagnosis are common because hypoglycemic symptoms often misattributed to neurological disorder, as seen here. Typical CT finding of insulinoma is hypervascular lesion; however, that was not seen in our patient. MR showed a more typical characteristics of insulinoma. Specificity of MRI is generally superior to CT. Adenocarcinoma may be histologically identical to insulinoma, and could display similar enhancement pattern on imaging. Clinical presentation and several imaging features could help differentiating them.

We described the imaging features of atypical insulinoma and reviewed the available literatures on insulinoma imaging. We could learn that high clinical suspicion, combination of imaging modality and clinical-radiological-pathological findings correlation are important to diagnose insulinoma.

**ID: 178**

**Scientific Abstract**

*Topics:* Emergency Radiology

*Keywords:* Traumatic brain injury, optic nerve sheath diameter, Glasgow Coma Scale, Marshall CT Score

**Correlation between Optic Nerve Sheath Diameter and Marshall CT Score with Glasgow Coma Scale In Traumatic Brain Injury**

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**Objective:**

*In traumatic brain injury (TBI), non-contrast brain CT scan is able to detect an increase in intracranial pressure, which is crucial in patient's management. Optic nerve sheath diameter's (ONSD) measurement is a new method that is expected to assess an increase in intracranial pressure noninvasively. Marshall CT score is a valid instrument, a de facto standard to classify head injury patient which correlates with increased intracranial pressure. Therefore this research aims to see the correlation between ONSD and Marshall CT score with Glasgow Coma Scale (GCS).*

**Methods & Materials:**

*This was a retrospective, analytic observational with cross-sectional research's design taken from the patients' medical record admitted in Dr. Kariadi Hospital, Semarang, between March-August 2017. Measurement of ONSD and Marshall CT score were done by a radiologist. Rank Spearman's were used to assess the correlation between variables.*

**Result:**

*There were 34 subjects, the majority were male (67,6%), with the highest incidents in less than 30 years age (41,2%) and mostly caused by a traffic accident (76,4%).\_Statistical analysis showed a moderate negative degree correlation between ONSD and Marshall CT score with GCS.*

**Conclusion:**

*Enlargement of ONSD and higher Marshall CT score were correlated negatively related with the GCS in TBI patients with increased intracranial pressure.*

**ID: 179**

**Educational Abstract**

Topics: Academics, Genitourinary

Keywords: adult, CT, MR, prostate, rhabdomyosarcoma

**Rhabdomyosarcoma of the Prostate in a Young Adult: Importance of Imaging in the Setting of Low Clinical Suspicion**

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A 32-year old male experienced urine retention and underwent urine catheterization. He was diagnosed with prostate enlargement. After a few months, he noticed a lump in his lower abdomen and underwent contrast-enhanced abdominal CT in October 2018 – it showed exophytic prostatic mass, infiltrating seminal vesicles and urinary bladder. There was no metastases. Transrectal biopsy showed prostatic rhabdomyosarcoma. He was referred to our center to undergo chemoradiation.

On admission he had worsening lower abdominal pain and fever. Laboratory examination showed leukocytosis and *Klebsiella pneumoniae* in urine culture. Contrast-enhanced abdominal MR in January 2019 showed enlarged iso-hypointense T1WI prostatic mass (RECIST 1.1 progressive disease) with nodal and spinal metastases. Leukocytosis persisted and procalcitonin serum was still elevated after prolonged antibiotic treatment. Patient didn't undergo chemoradiation and was discharged on his own request.

Rhabdomyosarcoma of the prostate is extremely rare in adults, the available literature is limited to case reports and series. An infiltrative, heterogenous mass can be seen on CT and nonspecific hypointensity can be seen on T1WI MR. CT and MR findings in this patient was consistent with the available literature. Diagnosis delay may happen due to low clinical suspicion in young adults. Rhabdomyosarcoma progresses very fast and aggressively, a few months delay can make significant impact on the cancer staging, as seen in this patient. We could learn CT and MRI features of rhabdomyosarcoma of the prostate, and the importance of early imaging when it's not clinically suspected.

**ID: 180**

**Scientific Abstract**

Topics: General Radiology

Keywords: aneurysm, dissection, CTA

**Dissection Aorta DeBakey type I with aneurysm aorta in hypertension : A Case Report**

**Dieby Adrisyel**

Fatmawati General Hospital, Indonesia

**Background**

Aortic dissection is the most common acute emergency condition of the aorta, often resulting in the death of the patient. Aortic dissection is readily diagnosed using CT scanning, with the reported diagnostic accuracy about 80-100%. In this case who present a man 42 years old with chest pain and has hypertension. We found root aorta aneurysm fusiform with dissection aorta.

**Method**

Case report. Examined using Computed Tomography angiography

**Result :**

A 42-year-old man with complaints of chest pain and had history of hypertension. Chest x ray found aortic dilatation. On CTA was found fusiform aneurysm in the aortic root accompanied by ascending aortic dissection, arch of the aorta to descending thoracic aorta. And to the cranial direction the dissection involves the right ilomate artery, the bilateral carotid communis artery, and the left subclavian artery. Pericardial effusions with enlarged the left ventricle were also found.

**Discussion :**

Aortic dissection and aortic aneurysm are often found together and related. This case a history of hypertension is suspected as the cause of dissection . We found Pericardial effusion as complication . CTA helps to diagnose aortic dissection and aneurysm. Fusiform aneurysm in the aortic root accompanied by ascending aortic dissection, arch of the aorta to descending thoracic aorta. And to the cranial direction the dissection involves the right ilomate artery, the bilateral carotid communis artery, and the left subclavian artery. Based on the findings above we classify DeBakey type I

**ID: 181**

**Scientific Abstract**

*Topics:* Neuroradiology

*Keywords:* methanol intoxication, putamen, computed tomography, magnetic resonance imaging

**Bilateral Hemorrhagic Infarction Of The Putamen Caused By Acute Methanol Intoxication: A Case Report**

**Arif Rahman Wardhani, Nurdopo Baskoro, Sukma Imawati**

Kariadi General Hospital, Indonesia

**ABSTRACT**

**Objectives:**

Acute methanol intoxication causes serious visual problems and permanent neurological dysfunctions. Methanol intoxication can be distinguished from other causes by neuroimaging findings.

**Methods and Materials:**

A 26-years-old male presented with cephalgia and sudden vision loss after oral ingestion of a large amount of liquid mixture with methanol based composition. There was no fever and seizures history nor trauma. Brain multislice computed tomography (CT) showed bilateral hypodense lesions on lentiform nuclei, with an incidental finding formed arachnoid cyst on the left temporal and right occipital lobes. Magnetic resonance imaging also showed late subacute symmetrical hemorrhagic lesions of putamen described on T1-weighted image showed hypo-hyper intensity, and T2WI with hypo-hyper intensity and also hemosiderin staining on GRE unrestricted to DWI. Slightly-enhancement observed after contrast injection.

**Results:**

Susceptibility to methanol poisoning varies so greatly. Methanol intoxication can cause severe metabolic acidosis from the production of formic and lactic acids, visual defects caused by myelin damage at retrolaminar optic nerve and permanent neurological dysfunction ranging from drowsiness to obtundation, seizure and coma. Neuroimaging of methanol poisoning typically characterized by bilaterally symmetrical haemorrhagic necrosis of the putamen on CT contrast and more superiority magnetic resonance (MR) imaging.

**CONCLUSION:**

Due to depressant effects of methanol on central nervous system, brain CT has been considered as the first line diagnostic device in methanol intoxication. MR considered as secondary and more superiority imaging in methanol intoxication. Bilaterally symmetrical lesions on putamen considered as typical neuroimaging finding on methanol intoxication, distinguished from other causes of brain poisoning

**ID: 182**

**Scientific Abstract**

*Topics:* Neuroradiology

*Keywords:* spinal nerve sheath tumor, dumbbell lesion, biopsy, magnetic resonance imaging

**Cervical Spinal Nerve Sheath Tumor : A Case Report**

**Arif Rahman Wardhani, Sukma Imawati**

Kariadi General Hospital, Indonesia

**ABSTRACT**

**OBJECTIVES:**

The objective of this study was to present a case report of a male patient with spinal nerve sheath tumor featured on MR imaging

**MATERIALS AND METHODS:**

We observed MR images obtained from a 44 years old-male presented to emergency unit with back pain. Six months before presented to emergency unit the patient suffered back pain and paraesthesia. The symptoms are worsened around two months earlier, he barely can not move his legs and urinating difficulty. Medical charts and radiographic images were reviewed. Spinal nerve sheath tumors consist of schwannoma, neurofibroma, and ganglioneuroma. The best way to differentiates those tumors are using spinal biopsy

**RESULTS:**

Plain radiograph showed no enlarged neuralis foramina neither pedicle erosion. MR imaging showed a dumbbell-shaped lesion intradural extra medullary of spinal canal parallel to C<sub>6</sub>-C<sub>7</sub>vertebral bodies along with hypointensity signal on T<sub>1</sub>weighted image, hyperintensity signal on T<sub>2</sub>weighted image and T<sub>2</sub>FatSat, post contrast administration showed heterogenous enhancement. The lesion expanded to left paravertebrae through neural foramina. As literature reviewed, dumbbell shaped lesions on paraspinous soft tissue considered as typical nerve sheath tumors imaging

**CONCLUSION:**

Most of nerve sheath tumors are intradural/extramedullary in locations and have intradural or extradural components known as "dumbbell lesions". We emphasizes the importance of pathologic examinations on nerve sheath tumors findings

**ID: 185**

**Educational Abstract**

*Topics: Musculoskeletal Imaging, Pediatric Radiology*

*Keywords: Paediatric Scoliosis*

**Standardized Reporting of Paediatric Scoliosis Series Facilitates Referral and Enhances Specialist Service Use**

**Carol Wing Kei Ng**

Princess Margaret Hospital, Hong Kong S.A.R. (China)

**Introduction**

Writing a good radiology report for paediatric scoliosis requires understanding of the etiology, natural progression of the condition as well as the nomenclature used by orthopedic surgeons.

**Objectives:**

To audit the compliance of radiographic technique and the adequacy of radiology reports for pediatric scoliosis series in accordance with the the ACR-SPR-SSR guideline (American College of Radiology – Society of Paediatric Radiology – Society of Skeletal Radiology) at a regional Hospital in Hong Kong.

**Methodology:**

56 cases of pediatric (<18yro) scoliosis were identified. Data was collected on the radiographic technique, image quality and the radiology reports.

A reaudit was carried out after the following intervention measures were employed: 1) a new radiographic departmental protocol 2) Standardization of reporting 3) Designating cases to be reported by the paediatric radiology team

4) Educational lecture 5) Provision of 'cheat sheets' on reporting stations

**Results and Outcomes**

Inadequacies were identified in the radiographic technique. 1) 97% of cases used AP rather than PA technique 2) 77% radiographs had inadequate inclusion of the pelvis.

70% of radiology reports did not comment on osseous abnormalities. Only 5% had skeletal maturity reported. 50% did not measure Cobb angles while 35% overcalled scoliosis.

Significant improvement in compliance to the international guideline on both radiographic technique and reporting of scoliosis were seen in the second audit cycle.

**Conclusion:**

Standardized radiology reports can help clinicians refer more severe scoliosis cases for earlier specialist attention, and reassure the non-scoliosis cases with minimal spinal listing thus reducing unnecessary use of specialist resources.

**ID: 186**

**Educational Abstract**

Topics: General Radiology

Keywords: Dose reduction techniques, Tube current modulation, peak voltage optimisation, Iterative reconstruction algorithm, dual energy CT

**Recent Advancement Of Dose Reduction Techniques in CT scan**

**Tasleem Ibrahim Shaikh**

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Recent Advancement Of Dose Reduction Techniques In CT Scan

Computed tomography (CT) is an essential tool in diagnostic imaging for evaluation of many clinical conditions. The advancements in CT has made a dramatic increase in the number of investigations with a resultant increase in radiation dose related with CT examinations also. Such an increase in radiation dose has become a matter of serious concern. It's highly essential to optimize CT imaging protocols and adopt radiation dose reduction techniques to ensure the best imaging with lowest dose.

The innovations in this field has developed many dose reduction techniques. The recent developments and commonly adopted techniques are discussed herewith. Introduction Of Tube Current Modulation, Peak Voltage Optimization, Noise-Reduction Reconstruction Algorithms, Extreme Multidetector CT, Iterative Reconstruction Algorithms, Dual-Energy CT, Cone-Beam CT, Adaptive Dose Collimation, And Improved Detection-System Efficiency. These techniques are adopted by various equipment manufactures Like Siemens, GE and Philips as it has become the marketing tool for manufacturing companies.

Conclusion

The radiology community should be aware of radiation dose reduction techniques in CT and apply it to get best image at a lower dose. Radiographers play a vital role in the medical imaging. Current advances in technology have made it essential for nowadays radiographers to constantly learn and cope with new skills. Making awareness and developing best practice on radiation dose reduction is the need of hour and every effort has to be made in this regard.

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