

Conclusion. H-type fistula can be diagnosed on a standard upper GI contrast study without any specific methodology. Radiologist should be cognisant of this anomaly in all neonates and infants who undergo 'routine' barium swallow or meals.

Radioembolisation with yttrium-90 micro-spheres for treatment of liver malignancy: First reported series in South Africa

A Chacko, N Nyakale, S Ahmad, M Sathekge (*University of Pretoria*)

Radioembolisation is a technique used to administer radiotherapy internally (selective internal radiation therapy (SIRT)) to non-resectable primary or secondary hepatic malignancies. The technique involves the injection of resin or glass micro-spheres that contain yttrium-90 (Y90) into the arterial supply of the liver tumour. SIRT is becoming widely recognised as a new modality for selectively treating non-resectable liver tumours. SIRT irradiates malignant liver lesions using microscopic beads. It provides micro-embolisation coupled with high-dose interstitial radiotherapy, where conventional external beam radiotherapy is not feasible due to potential damage to normal tissue within the beam path, and where liver lesions are not amenable to surgical removal. The technique used in our hospital is relatively new in South Africa, with no previously reported series in South Africa in the literature. The procedure is performed in two stages and requires a multi-disciplinary approach and planning for success. Both stages require active participation of all departments, with the first stage being the planning and workup phase, and the second stage the actual radio-embolisation procedure. We describe the technique, indications, preparation and procedure involved in Y90 radio-embolisation of liver tumours. We specifically describe a series of four patients who had the procedure at our institution, with special emphasis on the experience and the associated technical issues. Presentation of preliminary follow-up results of treatment is also made in this paper.

The accuracy of after-hour registrar computed tomography (CT) reporting in a tertiary South African teaching hospital

J de Witt (*Division of Radiodiagnosis, Tygerberg Academic Hospital*)

Introduction. The Division of Radiodiagnosis at Tygerberg Academic Hospital, a 1 060-bed tertiary training institution in Cape Town, provides a comprehensive 24-hour clinical radiology service, and has a duty registrar on site at all times. The demand for CT imaging is increasing and plays a pivotal role in patient management.

Aim. The purpose of this study was to determine the accuracy of after-hour registrar CT reporting and identify possible factors that may affect the error rate.

Results. The overall discrepancy rate was 8% (18 of 225) and overall accuracy rate was 92% (207 of 225). The major error rate was 4% (9 of 225) and the minor error rate was also 4% (9 of 225).

Conclusion. We observed that the accuracy of after-hour CT reporting by senior registrars at the Division of Radiodiagnosis at Tygerberg Hospital was on a par with international standards. We investigated three factors which might have affected discrepancy rates, and only found one (time of day) to be significant. Steps can be taken to create awareness of this fact among registrars, which hopefully would result in improved patient care and management.

Adequacy of paediatric renal tract ultrasound requests and reports in a general radiology department

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Background. According to current guidelines, ultrasound (US) is the most important modality for imaging urinary tract infections (UTIs) in children.

Objectives. (i) To assess the adequacy of paediatric renal US requests and reports in a general radiology department, and correlate the request adequacy and the performing radiologist's experience with report adequacy; and (ii) to determine the yield of abnormal findings.

Materials and methods. Retrospective review of renal US requests. The information was scored: requests 0 - 3 (3 as highest adequacy) and reports 0 - 21 (21 as highest adequacy, based on the RSNA reporting guidelines). Correlation tests used included Spearman's correlation, Kruskal-Wallis test, chi-square test of independence and Fisher exact test.

Results. Mean report adequacy score was 6.67/21. Trainees did 87% of all scans and performed better (score 6.76) than the staff radiologists (score 6.08). Hydronephrosis was the most common abnormality. There was no correlation between request or reporter rank and reporting adequacy.

Conclusion. Renal US requests and reports are inadequate. To improve reporting standards for trainees and specialists, a renal ultrasound reporting template was designed for use.

Introduction of a pictorial poster of radiographic errors for improving the quality of paediatric chest radiographs in an unsupervised unit

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Background. Chest radiography is the most commonly performed diagnostic X-ray examination. The radiation dose to the patient for this examination is relatively low but, because of its frequent use, the contribution to the collective dose is considerable. Optimised image quality not only allows more accurate diagnosis but also supports radiation protection and should be targeted, particularly in children because of the radio-sensitivity of immature organs.

Aim. The aim of this study was to determine whether the introduction of a poster of technical errors in paediatric radiography accompanied by a 'crash course' on common errors could sustainably decrease the number and rate of these in an unsupervised unit of a general hospital.

Method. A retrospective study was performed at the Charlotte Maxeke Johannesburg Academic Hospital. Technical errors in frontal chest radiographs performed in one unsupervised paediatric radiology unit were assessed by QA analysis using a customised QA ticksheet. The QA review was performed before and after an 'intervention' which involved a 'crash course' of 30 mins and a poster display in the department. Comparisons were made of the technical errors made before and after the 'intervention'.

Results. There was statistically significant improvement ($p < 0.0083$) between the radiographs performed immediately after the 'intervention'. There was statistically significant decline ($p < 0.0083$) in the quality of radiographs performed in the review periods that were ≥ 2 months from the intervention.

Conclusion. Good radiographic technique is the most important factor in improving quality without the cost of increased dosage. Regular QA is critical as a means of ensuring superior image quality. Simple, regular interventions such as lectures and posters highlighting common errors show improvement in image quality. Optimised image quality therefore supports radiation protection in paediatric imaging units and should be targeted through repeated QA interventions, particularly in unsupervised departments.

Accuracy of 'red-dot' after-hour trauma-radiograph triage by radiographers in a South African regional hospital

S Hlongwane, R Pitcher (*Stellenbosch University*)

Introduction. The global demand for diagnostic imaging exceeds the supply of radiologists and is of particular significance in poorly resourced healthcare environments, where many X-rays are unreported. Delayed or absent reporting may negatively affect patient management. In well-resourced countries, it is recognised that extending the role of radiographers to radiological reporting tasks helps to meet service demands.

Aim. To determine the accuracy of acute fracture detection by South African radiographers working in an after-hour setting.

Method. A retrospective study of radiographers at a Western Cape regional hospital during 2 months in 2011. The sensitivity and specificity of radiographer fracture detection were compared with that of a consultant radiologist. Differences were evaluated using the McNemar chi-square test, with $p < 0.05$ achieving significance.

Results. Three hundred and sixty-nine radiographs were analysed. Overall radiographer reporting accuracy was 93.7%, with 74.4% sensitivity for fracture detection. Experienced radiographers performed better than inexperienced ones; adult fractures were more consistently identified than paediatric fractures, and appendicular fractures better visualised than axial fractures. There was significant difference in all instances between radiologists and radiographers. Experienced radiographers evaluating appendicular fractures in adults achieved the highest sensitivity (89.9%), which was not significantly different from a consultant radiologist ($p = 0.88$).

Conclusion. The performance of experienced radiographers in our study is comparable to that of experienced radiographers internationally, who have no specific training in trauma radiograph reporting. However, additional training is required if role extension is to be considered.

Uterine artery embolisation for uterine leiomyomata: A multicentre study in South Africa

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Aim. To introduce uterine artery embolisation (UAE) as an effective and safe treatment option in patients with symptomatic fibroids in the Western Cape Provincial Service.

Method and materials. Prospective observational multi-centre study at Groote Schuur and Tygerberg Hospital, Western Cape Province. 36 women (average age 37 years, range 30 - 47) with symptomatic fibroids were treated with UAE between November 2009 and February 2012. Pre-procedure MRI followed by a 6-month follow-up MRI or ultrasound was performed. Embolisation was achieved using Boston Hi-Flow Renegade microcatheters

as the particle delivery system and polyvinyl alcohol (PVA) particles 300 - 500 mm as embolic agents.

Results. The presenting symptoms were menorrhagia, dysmenorrhoea, pressure symptoms and intermenstrual bleeding. Three were treated for primary infertility. The average uterine volume was 1 576 cm³ (range 473 - 5 506) pre-embolisation. 5.5% (2/36) had concomitant adenomyosis. Uterine artery sub-selection and embolisation was successful in all patients. 14% (5/36) had additional arterial fibroid supply from the ovarian arteries that were not embolised. 8% (3/36) had low-grade pyrexia during their hospital stay. 3% (1/36) were re-admitted after 2 weeks with a low-grade pyrexia. Mean clinical follow-up was 15 months (range 7 - 32). 81% (29/36) were satisfied that their symptoms had been treated effectively. 8% (3/36) did not respond to embolisation. The average reduction in uterine volume at 6 months was 45%.

Conclusion. Uterine artery embolisation is associated with a high clinical success rate. Provisional results suggest that UAE should be offered as an attractive alternative to surgery in our practice.

Chest X-ray findings in HIV-infected children starting HAART at a tertiary institution in South Africa

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Introduction. Respiratory infections are common in HIV-infected children. There is limited information on the radiographic presentation of children eligible to start HAART in resource-limited settings.

Aim. To determine the radiographic patterns on pre-HAART chest X-rays (CXRs) in children and assess the inter-observer variability between 3 paediatric radiologists.

Methods. Children (0 - 8 years) participating in a cohort study of TB and BCG-IRIS who had an acceptable routine pre-HAART CXR were included. CXRs were independently assessed by 3 radiologists, blinded from clinical data, using a standardised assessment form. All 3 readings were used to create a majority consensus finding.

Results. Among 161 children, the median age was 2.3 years (41/161 < 1 year), 54% (87/161) were on TB treatment and 62% (100/161) were immune-suppressed (CD4% < 25% or CD4 count < 350). The majority (71%) had an abnormal CXR finding, predominantly air space disease (42%) and parenchymal interstitial disease (20%). Of the 112 (70%) CXRs that could also be assessed for lymphadenopathy (i.e. evaluable airways), 74 (66%) had lymphadenopathy. Among the 112 children with a CXR that could be fully evaluated, 67% (75/112) had ≥ 1 abnormalities suggestive of TB (74 lymphadenopathy, 2 cavities, 18 milliary infiltration). The inter-observer variability was fair ($\kappa = 0.22$) for airspace disease, moderate ($\kappa = 0.54$) for parenchymal interstitial disease and slight ($\kappa = 0.051$) for lymphadenopathy.

Conclusions. Among children eligible to start HAART, most (71%) presented with abnormal CXR findings, and the majority (67%) had ≥ 1 CXR signs suggestive of TB. Of concern was the high proportion of CXRs that were of insufficient quality to be assessed for lymphadenopathy and the relatively poor inter-reader agreement for radiological features of TB.

Diagnostic quality of neonatal radiograph images after 50% radiation dose reduction on a computed radiography system

F Naude (University of the Free State)

Aim. A prospective study to reduce the radiation burden to neonatal intensive care patients by reducing mAs.

Background. Greater emphasis is placed on the Image Gently approach, with the object of radiation dose reduction and safety in children. Most radiology departments use radiation dose settings as per the old screen film systems, with 3.2 - 3.6 mAs and 55 - 60 kV. It is possible with the newer computed digital film screen radiography systems to reduce radiation exposure, without losing significant image quality.

Method. In this study, mAs was reduced to 1.6 (approximately 50% reduction) without changing kV (kept at 55). The images were compared with those at higher mAs setting. Ethics approval and parents' consent were obtained for neonatal ICU patients at Universitas Hospital to lower mAs of the second X-ray film of the day. Consultants of the Radiology Department and Neonatal ICU Department compared 60 pairs of lower and higher dose X-ray films, on a Philips Isite PACS system. Reviewers were blinded to the radiation dose, time of acquisition and patient name. Each consultant had to complete a questionnaire where they had to choose the film with the best image quality. Additional questions concerned quality of lung parenchyma, mediastinum, diaphragm borders, and visibility of lines and tubes. If a difference was observed, indication was given whether it was of diagnostic significance.

Conclusion. Radiation dose can be reduced in the neonatal ICU by approximately 50%, without losing diagnostic image quality. Even if the lower dose is used only for X-rays requested for line and tube position, the radiation burden to neonatal patients will decrease significantly.

Assessment of MRI accuracy in predicting operability and tumour stage in Wilms' tumours (nephroblastomas) when correlated with surgical findings and histopathology

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Pre-operative imaging of Wilms' tumours is critical in determining the timing of surgery, by providing detailed anatomical information to decide on operability and aid in planning a surgical approach. Staging of the tumour can be predicted by imaging but is primarily based on findings at the time of surgical exploration and final tumour histology. Traditionally, CT scanning has been the main cross-sectional imaging modality used, as it is readily available and quick to perform in small children. However, concerns over the radiation burden in the long-term risk of radiation-induced malignancy have made it a less attractive option. MRI has therefore taken on a greater role in the imaging of childhood tumours; it is now the preferred imaging modality. The sensitivity of MRI for identification of nephroblastomatosis and volumetric response of the tumour to chemotherapy has been well documented, but its ability to predict operability, tumour stage and potential tumour rupture is less clear. This study is a retrospective review of the pre-operative MRIs of 38 patients with Wilms' tumours treated at our institution between 2008 and 2012. The scans were assessed for tumour multifocality and bilaterality, volume, presence of necrosis and haemorrhage, rupture, capsular integrity, infiltration into adjacent structures, vascular extension, nodes,

ascites and liver metastases. Based on this information, the pre-operative imaging stage was documented. The results were compared with the findings at surgery as well as the final histology. The accuracy of MRI in predicting operability and tumour stage is presented.

Persistent chest radiographic abnormalities in HIV-infected South African children

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Introduction. There are limited data on persistent chest X-ray (CXR) abnormalities in HIV-infected children in low- and middle-income countries (LMICs) and on the impact of antiretroviral therapy (ART) on such abnormalities.

Aim. To document the incidence, radiographic features and natural history of persistent CXR abnormalities in HIV-infected South African children, with emphasis on the impact of ART.

Methods. A 24-month prospective longitudinal study of 330 HIV-infected children, documenting clinical, immunological, nutritional and CXR parameters. CXRs were systematically reported and findings stratified as normal, minor abnormality or severe abnormality. A first-order transition model assessed the association of baseline parameters and time-dependent variables with severity of radiological findings.

Results. Two hundred and twenty-eight patients (69.0%; median age 28.2 months) had comprehensive follow-up. At baseline, 205 (89.9%) had moderate/advanced clinical HIV disease, the median CD4+ was 21.0% (IQR 15.4 - 37.8), 118 (51.7%) showed severe CXR abnormality and 49 (21.5%) were on ART. Almost half ($n=113$; 49.5%) commenced ART during the study. By conclusion, the cohort had demonstrated overall immunological and radiological improvement; the median CD4+ was 28%, and less than a third had severe radiological abnormality ($n=74$; 32.5%). During follow-up, 211 (92.5%) showed persistent CXR abnormalities that were severe in most cases ($n=131$; 57.4%) and persisted for an average of 44% of follow-up. Severe CXR abnormality was positively associated with (i) severe abnormality on the preceding CXR (55%; $p=0.000$) and (ii) multifocal or diffuse CXR abnormality at enrolment (7%; $p=0.008$) and negatively associated with (i) ART usage (13%; $p=0.000$) and (ii) time since enrolment (8%; $p=0.000$).

Conclusion. There is a high incidence of persistent, severe CXR abnormality in HIV-infected children from LMICs. Early initiation of ART is recommended for prevention of persistent CXR abnormalities.

Fluoroscopy guided dilatation of benign oesophageal strictures in children – a 12-year experience

M Van Wyk, A Reinders (Department of Radiology, University of the Free State)

Benign oesophageal strictures (BES) are a debilitating health concern in the paediatric populations of developing countries, leading to impaired weight gain, second only to malnutrition. Causes include oesophageal atresia (EA),

caustic ingestion (CI), achalasia and gastro-oesophageal reflux (GER). A retrospective review of the procedure and clinical notes as well as swallow reports of procedures performed during January 2001 - June 2012 was made. All patients aged 12 years and younger who underwent oesophageal dilatation in the Unit of Interventional Radiology, Universitas Hospital, were included. Over 12 years, 432 dilatations in 63 patients (57% male; aged 21 days - 142 months) were performed. The most common indication for dilatation was EA (59%), followed by CI (20%), GER (9%), post-surgical strictures other than atresia repair (9%), and foreign bodies (3%). Exclusive balloon dilatation was used in the majority (71%) of patients, bougienage in 19%, and a combination in 10% of cases. The success rate, and the ability to pass and dilate the stricture, was 99%. No perforations occurred. Atresia secondary to tracheo-oesophageal fistula repair was the most common indication for dilatation. Although balloon dilatation was used in most cases, neither the combined nor the exclusive use of Savary-Gilliard bougienage resulted in complications. In our centre, the use of over-the-wire, fluoroscopy-assisted, exclusive or combined balloon or Savary-Gilliard oesophageal dilatation is a safe and successful treatment modality for benign oesophageal strictures.

Poster presentations

(in alphabetical order according to presenting author's surname)

Spinal segmental dysplasia v. caudal regression syndrome

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Spinal segmental dysplasia (SSD) and caudal regression syndrome (CRS) represent two faces of a single spectrum of segmental malformations of the spine and spinal cord that differ embryologically. The presence of a cord segment within the caudal spinal canal is a unique feature of SSD. However, when the lumbosacral spine is involved, the level of the segmental anomaly may be too caudal for a cord segment to develop below the level; in such cases, the imaging features are indistinguishable from CRS. SSD is a congenital spinal anomaly characterised by localised dysgenesis of the thoracolumbar spine. The X-ray features include a kyphosis; vertebral anomalies demonstrated at different levels; and a spinal stenosis. MRI features are variable but the presence of a distal cord segment is a unique feature. Four types of caudal vertebral dysgenesis characterise CRS. The common imaging findings include a sacrococcygeal defect and a blunt distal cord or wedge-shaped cord terminus, as well as an association with Currarino triad. Clinically, the two disorders may be indistinguishable, with neural tube defects, anorectal and urogenital malformations, and lower limb anomalies. The radiological characteristics may be the only distinguishing features. It is important to separate these two syndromes to assist in the surgical approach; SSD is less likely to benefit from untethering procedures. Our poster aims to compare and contrast the two entities by using annotated diagnostic images of both conditions alongside each other.

The paranasal sinuses in children

A Ahmed (*Visser, Erasmus, Vawda and Partners*)

The air-filled spaces of the facial and skull bones are dynamic and evolving structures in children. There are a number of normal variations related to the sinuses that are well demonstrated with imaging. The importance of these variations increases with the increasing surgery and imaging being performed on children. The paranasal sinuses are affected by a wide spectrum of conditions including congenital abnormalities and inflammatory,

traumatic and neoplastic diseases. The purpose of this review is to highlight some salient features regarding the anatomy and development of the sinuses in children. A spectrum of pathologies affecting the paediatric paranasal sinuses is also covered. This is primarily a pictorial review with emphasis on imaging features. Mention is also made of suggested imaging guidelines for sinus imaging in vulnerable paediatric patients. The diagnostic algorithm is developing and needs to be continuously adapted for the paediatric population.

Where's the line/tube?

A Ahmed (*Visser, Erasmus, Vawda and Partners*)

This pictorial review outlines correct and suggested positioning of commonly used vascular lines and tubes in the paediatric patient, including incorrect positions and positions related to anatomical anomalies and congenital abnormalities. Common complications related to placement and positioning of these catheters is also outlined. Neonatal anatomy can provide challenges in interpreting locations of catheters, and variations are seen, in particular with the commonly used umbilical venous and arterial lines. Issues relating to gastro-intestinal tubes, ventriculo-peritoneal shunts and other vascular lines are also outlined. Radiologists are confronted with a spectrum of catheters placed in various locations in routine paediatric radiology practice and have to be familiar with the different catheters, their uses and acceptable positioning for suggested safe practice.

The unusual suspects: Making the case for spinal MR imaging

B Barnard, B Van Der Merwe, J De Witt (*Department of Radiodiagnosis, Tygerberg Hospital*)

The spectrum of spinal disease is broad and complex; patients often present with non-specific signs and symptoms. We present an assortment of unusual cases of spinal pathology of varying aetiology, from metabolic to idiopathic, in both the paediatric and adult population. We emphasise the importance of the role of appropriate and accurate MR imaging in the resolution of diagnostic dilemmas.

How to mend a broken heart: the Tygerberg diagnostic approach

F Bezuidenhout (*Stellenbosch University*)

The correct interpretation of chest radiographic findings in congenital heart disease is difficult. In most instances, a definitive diagnosis is not possible. However, utilisation of a few key radiographic signs facilitates narrowing of the differential diagnoses. This poster highlights a simplified diagnostic approach based on the appearance of the pulmonary arteries, which has been shown to be effective and accurate in its application.

Supratentorial lobulated bubbly tumour

G Bignaut (*University of the Free State*)

Introduction. Astroblastomas are rare CNS tumours and represent 0.4 - 2.8% of all glial tumours, with 40 cases reported in the literature since 1930. Astroblastomas are seldom seen in practice and can easily be misdiagnosed. They share a common radiological and histopathological appearance with other glial neoplasms.

History. A 42-month-old girl from Lesotho presented to us with a 4-day history of right-sided hemiparesis, associated with nausea and vomiting.

Imaging findings. MRI of the brain revealed a large left frontoparietal multicystic lobulated mass with a solid component that had a bubbly appearance and was iso-intense to gray matter on T2-weighted imaging. The mass caused raised intracranial pressure. Little peritumoural oedema was present.

Outcome. The patient was referred to neurosurgery. She received a biopsy and complete surgical resection of the tumour. The histopathological differential diagnosis included: astroblastoma, papillary meningioma and ependymoma. The pathology specimen was also sent to a neuropathologist in Cape Town who confirmed the diagnosis of a low-grade astroblastoma.

A rare entity: Macrodystrophia lipomatosa involving the entire foot
N Browning, S Jeetoo, V du Plessis (*Department of Radiology, Pietermaritzburg Metropolitan Hospital Complex*)

Introduction. Macrodystrophia lipomatosa (MDL) is a rare congenital cause of local gigantism, diagnosed by exclusion of other causes of macrodactyly, that refers to hypertrophy of all mesenchymal elements, particularly fibroadipose tissue.

Discussion. We describe a case of a 1-year-old girl who presented with progressive swelling of the left mid- and fore-foot noted from the age of 1 month. There was no history of trauma or family history of congenital disorders. We systematically excluded differentials for macrodactyly.

Radiological findings. On X-ray, there was enlargement of the metatarsals and to a lesser extent the phalanges of the left foot; no periosteal reaction, enchondromas or calcifications; soft-tissue swelling of the left mid- and fore-foot on the dorsal and plantar aspect. On MRI, there was excessive fat tissue involving the dorsal and plantar aspects, predominantly the tendon sheaths. No haemangiomas, neurofibromas, enchondromas, haemosiderin deposition, and vascular or neural sheath anomalies. The fat was not encapsulated. These findings helped us to differentiate from other causes of local gigantism.

Conclusion. MDL is a rare entity that can only be diagnosed on the basis of exclusion of other causes of local gigantism. Our case is believed to be unique in that there is diffuse involvement as opposed to the more common involvement of the 2nd and 3rd digits of the limb.

Acetabular column sizes specific to percutaneous fixation of acetabular fractures

A Chacko, P Mostert, C Snyckers, F Ismail (*University of Pretoria*)

Acetabular fractures can be difficult to treat surgically owing to high operative risks and complications of open approaches. Percutaneous fixation of these fractures is a novel technique with reduced complications and better outcomes. The procedure and technique requires an experienced surgeon and meticulous planning as well as specialised intra-operative views with appropriately sized screws used in actual fixation of the fracture. There is, however, a paucity of studies on what is a safe screw diameter to use, especially in the South African population. We therefore describe the measurements obtained of the lengths and diameters of the anterior and posterior acetabular columns using computed tomography (CT) three-dimensional (3D) volume reconstructions of the normal pelvis, specific to the South African population. We check correlation with previous similar international studies and make recommendations for selecting percutaneous

fixation screws to treat fractures of the acetabular columns. A retrospective study using data obtained from CT of adult patients was used. 3D volume reconstructions of the pelvis were used to take the measurements of the anterior and posterior acetabular columns in 500 patients (250 male; 250 female) with exclusion criteria being previous trauma to and fractures of the pelvis; congenital abnormalities; and tumours involving the bony pelvis. We present the preliminary results of a pilot feasibility study performed using 108 patients (62 male; 46 female) and provide recommendations regarding the safe sizes for the South African population as well techniques to accurately and safely measure the columns for individual outliers.

Imaging of disease progression in a case of idiopathic moyamoya

A Chacko, J Smal, E Lubbe, N Adroos (*University of Pretoria*)

Moyamoya is a rare cerebrovascular disease characterised by progressive stenosis of the terminal portion of the internal carotid artery and its main branches. We present a pictorial poster of disease progression in a 3-year-old boy confirmed to have idiopathic moyamoya disease, over 6 years, using serial MRI with MR angiography. Comparison is also made with conventional angiography at the last visit. Characteristic imaging appearances of asymmetric narrowing of the internal carotid arteries (especially the supra-clinoid portion) with multiple collateral vessels around the brainstem especially within the ambient and quadrigeminal plate cisterns are demonstrated with progression.

Imaging of interesting lumps and swellings of the head and neck, trunk and extremities in children with pathological correlation

R Dixon, V Tang (*Royal Manchester Children's Hospital, UK*)

Lumps and swellings in the head, neck, trunk and extremities in children from infants to teenagers are common. There is a wide variety of pathologies including congenital, infection and neoplastic, often requiring several imaging modalities including ultrasound, MRI and CT, given their non-specific imaging findings. We present a variety of unusual pathologies with histological correlation to demonstrate the imaging findings, and to highlight the malignant potential of swellings, even though they may, clinically and radiologically, appear to be benign.

Vertebral body shapes – a clue to the underlying diagnosis

R Dixon, M Kaleem (*Royal Manchester Children's Hospital, UK*)

Vertebral body shape anomalies can occur as part of congenital or acquired conditions. Recognition of anomalies of vertebral body shapes can help in radiographic identification of the underlying disease/condition. 3D CT reconstructions are invaluable for assessing the anomalies. We present radiographs and CT findings of various known underlying conditions with vertebral body anomalies. We include examples from our centre of congenital anomalies such as block vertebra and dysplasia, as well as acquired deformities due to such conditions as sickle cell and metabolic conditions.

Accuracy of radiology voice recognition reports at a tertiary South African hospital

J du Toit (*Stellenbosch University*)

Introduction. Voice recognition (VR) technology (the process whereby spoken words are converted to digital text) has been used in radiology reporting since 1981. VR has the potential to dominate radiology

reporting, with the latest software claiming up to 99% accuracy, reduced report turnaround times and significant cost savings. However, to date these expectations have not been realised. VR reports have been shown to contain significantly higher levels of inaccuracy than traditional dictation transcription (DT) reports, to require thorough proofreading and editing, and to have greater aggregate costs when radiologists' time is incorporated. The Radiology Department of the Tygerberg Academic Hospital (TAH) introduced limited use of English language VR software in January 2010.

Aim. To compare the accuracy of VR and DT reports at TAH, and to establish the clinical significance of any errors.

Method. The first 300 VR reports and the first 300 DT reports generated at TAH during March 2010 were retrieved from the hospital's picture archive and communication system (PACS), and reviewed by a single observer. Text errors were identified and recorded on a study data sheet, and then classified as either clinically significant or insignificant, based on the potential effect on patient management. Ethics approval was obtained from the Health Research Ethics Committee of Stellenbosch University.

Results. Of the 300 VR reports analysed, 77 (25.6%) contained errors, of which 29 (9.6%) were clinically significant. Only 28 (9.3%) DT reports contained errors, with 7 (2.3%) being potentially clinically significant. This VR error rate was significantly greater than the DT error rate ($p = 0.00000$). The difference in clinically significant errors between the two groups (9.6% v. 2.3%) was also statistically significant ($p = 0.00016$). **Conclusion.** VR technology significantly increases the clinically significant inaccuracies found in radiology reports.

Individual thigh muscle volume quantification: 3D slicer-based ModelDraw semi-automated segmentation technique

H Gongxeka (Pretoria University and Steve Biko Academic Hospital)

Objective. There is a need to develop, validate and implement a semi-automated ModelDraw 3D slicer image segmentation technique for quick, accurate determination of individual muscle volume from MRI series.

Method. Axial MRI slices from thigh muscles of 16 healthy human subjects (age 21 - 61 years; mean 32) were acquired using a 1.5 Tesla machine, Q-body coil and proton density weighted spin echo pulse imaging sequence. A manual and a semi-automated 3D slicer software were used by two blinded observers to segment each of the selected MRI thigh muscles, build their ModelDraw and quantify the volume of each ModelDraw.

Results. One-way ANOVA statistical assessments of the degree of inter-observer variability of the acquired ModelDraw volumes between the two observers showed a good one-on-one correlation as noted on the manual ($G=1.05 \times 19970$, $R^2=0.99$ and $p<0.0001$) and the semi-automated ($G=1.045 \times -18143$, $R^2=0.99$ and $p<0.0001$) muscle segmentation methods respectively. The semi-automated analysis of the four muscles of each subject with a reduced set of slices (an average of 17) took about 45 minutes, as opposed to 3 hours when using all the slices during the manual segmentation.

Conclusion. 3D Slicer is an open source-based and a multi-platform computer software program. The inter-observer correlations observed higher precision point with the semi-automated tool regarding G values (5%) than the 10% obtained for manual segmentation. Future work related to this effort includes application to non-healthy subjects, to quantify the specific outcomes of medical interventions that may counteract the negative regulators of muscle physiology.

The use of positron emission tomography/computed tomography in characterising the lymph nodes in patients infected with *Mycobacterium tuberculosis* and *Mycobacterium avium intracellulare* infection

H Gongxeka (Pretoria University and Steve Biko Academic Hospital)

Aim. To compare the characteristics of the chest lymph nodes in the positron emission tomography - computed tomographic (PET/CT) study of *Mycobacterium tuberculosis* (MTB) infection and *Mycobacterium avium intracellulare* (MAI) infection in patients with human immunodeficiency virus type 1 (HIV) infection.

Methods. A retrospective review of the chest lymph node PET/CT findings of 61 patients with HIV and proven MTB ($n=20$) or MAI ($n=41$) infection was conducted. Images were reviewed by a radiologist and nuclear physician blinded to the diagnosis, and the radiological findings involving the lymph nodes in the axilla and mediastinal regions were characterised and compared.

Preliminary results. MTB lymph node appearances range from normal to abnormal morphological and metabolic features. MAI lymph nodes were not significant.

Preliminary summary. MAI appears to predominantly affect the lung parenchyma and interstitial elements more than the lymph nodes.

Reducing radiological error rates

M Govind, R Hift (University of KwaZulu-Natal)

Formulating a radiology report is complex and fraught with many potential mishaps. Radiological error rates have changed little over the last 50 years, and research into the aetiology and impact of intervention is gaining momentum. The persistence of such a high error rate despite medical and technological advances is surprising, until one appreciates that the most common reason for error is cognitive perception. Perception is an individual skill, not correctable by departmental policies. The debate around inherent and trained perceptual capabilities still rages, but it is evident that changes occur in the functioning of the brain early (within the first 18 months) in training and are a good predictor for eventual radiological ability. Reliable and reproducible formative assessment of trainees is difficult as the course work is not structured and is opportunistically encountered in daily work. Those trainees who do not show these changes may benefit from intervention that is tailored to hone perceptual skill and ability. Experience and an expanding knowledge base play a great role in ability later in training and are assessed on summative assessments appropriately. In the early training period, a tool is needed to assess evolving capabilities and to identify those trainees who need assistance. We discuss these issues in the context of a study we are about to commence to investigate the perceptual and psychological factors and processes that underlie the development of radiological accuracy and avoidance of error during the training of radiologists.

The impact of HIV infection when superimposed on pulmonary tuberculosis on the success of bronchial artery embolisation

M Govind (*University of KwaZulu-Natal*)

Introduction. Pulmonary tuberculosis (PTB) is often associated with HIV co-infection in South Africa. Bronchial artery embolisation (BAE) is a specialised, expensive and risky procedure.

Aim. To investigate the effect of co-infection with HIV and PTB on the success of BAE.

Method. A retrospective cross-sectional study of sequential BAE procedures during 2006 and 2007 was performed. Rates of procedural and clinical outcome, reasons for procedural failures and the effect of CD4 levels on procedural and clinical failure was investigated. Cases were included if they presented with massive or life-threatening haemoptysis with a diagnosis of previous or active PTB in whom HIV status was known, for the first 2 attempts at BAE only.

Results. The study population comprised 74 HIV-positive and 33 HIV-negative cases. The median CD4 level was 176 cells/ μ l. Statistically, procedural success did not imply clinically successful outcome. HIV status and CD4 level did not correlate significantly with procedural success. Statistically, no technical reason influenced the success of the procedure when correlated with HIV status. The detection of lymphadenopathy was noted in 19.1% of HIV-positive cases and 42.4% of HIV-negative cases, and was the only feature of significance.

Conclusion. Co-infection with HIV does not affect the success of BAE in patients with active or sequelae PTB who present with massive or life-threatening haemoptysis. Technical success does not imply clinical success regardless of HIV status. Improvement in technique locally may produce better results.

Mapping the lungs – iodine mapping in pulmonary emboli

W Harmse (*University of the Free State*)

Background. CT pulmonary angiography is the current preferred imaging for the diagnosis of pulmonary emboli. Sensitivity, however, decreases in the peripheral smaller vessels for which nuclear medicine perfusion studies are often needed. Dual energy CT pulmonary angiography (DECTPA) allows creation of iodine maps of the lung fields, simulating perfusion scans which can be used to identify perfusion defects. This is done by material decomposition which separates two different elements or compounds on the basis of their attenuation co-efficients at different energy levels.

Aim and methods. We present 3 patients who received DECTPA at Universitas Hospital for possible pulmonary emboli. The pulmonary arteries were initially evaluated for filling defects as per routine single-energy CTPA, after which iodine maps were created to detect perfusion defects.

Results. Patients A and B had multiple large and smaller emboli in virtually all the segmental bronchi. This correlated well with all the perfusion defects seen on the iodine maps. In patient C, no large emboli were seen, with only small partial occlusions in 3 sub-segmental bronchi. After review of the iodine maps, several other segmental perfusion defects were seen. Retrospectively, thrombi were seen in 4th and 5th generation pulmonary

arteries of 10 further segments, which correlated with the perfusion defects. The mean iodine content of all lung segments was measured and was 3.85 mg/ml ($n=11$) in those with no thrombi, 2.06 mg/ml ($n=44$) in those with partial occlusion, and 0.43 mg/ml ($n=5$) in those with complete occlusion.

Conclusion. CT pulmonary angiography employing a dual energy technique provides a single, quick examination from which to evaluate the pulmonary arteries, lung parenchyma, and indirectly the pulmonary perfusion — all with a high spatial resolution, and a higher sensitivity in diagnosing pulmonary emboli than single energy scanning alone.

Assessing a broken heart

L Huang, Z Lockhat, F Ismail (*Department of Radiology, Steve Biko Academic Hospital and University of Pretoria*), **L Mitchell** (*Department of Paediatric Cardiology, Steve Biko Academic Hospital and University of Pretoria*)

The term 'single ventricle heart' includes a heterogeneous group of complex congenital cardiac malformations characterised by a univentricular atrioventricular connection; i.e. both atria are completely or predominantly connected to a single ventricle. This ventricle has to maintain both the pulmonary and systemic circulations, and inevitably its function will deteriorate. Surgical cavopulmonary shunts reduce the workload of this sole ventricle, increasing its longevity. Timeous assessment of morphology on echocardiography and physiology at cardiac catheterisation is essential in planning the surgical management of such patients to optimise their life expectancy. This is especially true of our case series in South Africa, where end-stage cardiac transplantation is not readily available. Systematic radiological assessment is a guide to prompt surgical intervention and thus to optimising the patient's outcome. Chest radiographs assess the cardiac silhouette, cardiac size, pulmonary vasculature and great arteries. Two-dimensional echocardiography remains the mainstay for the sequential segmental analysis of these complex lesions and associated abnormalities. Diagnostic cardiac catheterisation evaluates the haemodynamics with calculation of the pulmonary bloodflow (Qp), mean pulmonary pressure and pulmonary vascular resistance (PVR) as well as demonstrating venous return to assess suitability for cavopulmonary shunts. Cardiac MRI, if available, is also effective. In this case series, we demonstrate the anatomical variants found in the spectrum of univentricular or 'single' ventricle hearts and describe the imaging modalities needed to accurately delineate the features of these complex cardiac defects to ensure the best outcome for such patients.

Walking the tightrope: when to intervene in rheumatic heart disease

L Huang, Z Lockhat, F Ismail (*Department of Radiology, Steve Biko Academic Hospital and University of Pretoria*), **L Mitchell** (*Department of Paediatric Cardiology, Steve Biko Academic Hospital and University of Pretoria*)

Rheumatic fever is a disease of poverty. Poor socio-economic circumstances including overcrowding, malnutrition and limited access to primary healthcare contribute to this epidemic in sub-Saharan Africa and other third-world economies. In our series, children as young as 6 years have established, severe rheumatic heart disease necessitating prosthetic valve replacement. However, owing to their small annular size, placing a prosthesis that will be adequate for future growth is impossible, and serial valve replacements will be needed, which contributes significantly to their morbidity and mortality. Delaying surgery until the child is older is also not the answer as the progressive dilation of the left ventricle (LV) inevitably leads to its dysfunction. Vigilant monitoring of the valvular pathology and LV size and function is therefore needed for

timeous surgical intervention. The role of radiological imaging in rheumatic heart disease is to systematically evaluate the severity of valvular pathology and its impact on LV function, and to ascertain when surgical intervention is needed to preserve ventricular function. Chest radiography monitors cardiac size, chamber enlargement and pulmonary congestion. Rheumatic valvular pathology has classic echocardiographic features. The resultant severity of valvular incompetence and/or stenosis can be graded and its effect on the LV size in systole and diastole and the ejection fraction can be assessed. Serial echocardiography in the child with rheumatic heart disease is therefore invaluable for ascertaining the ideal time for surgical intervention.

This is the left, right?

L Huang, Z Lockhat, F Ismail (Department of Radiology, Steve Biko Academic Hospital and University of Pretoria), L Mitchell (Department of Paediatric Cardiology, Steve Biko Academic Hospital and University of Pretoria)

Heterotaxy is a complex of malformations involving abnormal right-left axis determination with an incidence of 1 in 10 000 births. Thoraco-abdominal visceral laterality is deranged, often accompanied by midline defects of the face and brain. Studies suggest that heterotaxy represents a spectrum of laterality defects with variable expression. Syndromes of left or right atrial isomerism have been well-described. Patients may present incidentally when chest X-ray shows dextrocardia or an inverted stomach bubble, or with symptoms associated with cardiac defects, intestinal obstruction or immune deficiencies. Radiological studies such as echocardiography define the cardiac orientation and any associated cardiac defects. Abdominal ultrasound identifies the liver, gallbladder and spleen, and the position of the aorta and IVC. Upper gastro-intestinal contrast procedures are recommended to evaluate intestinal malrotations. If anatomical uncertainty persists, further investigation with CT, MRI or angiography may be necessary for surgical planning. For our case series, we describe the classification of heterotaxy syndromes with their associated spectrum of anatomical abnormalities. Understanding the situs abnormalities facilitates a logical, systematic imaging approach. Thorough radiological examination of every organ system is needed to delineate all rotational abnormalities and their associated complications to plan optimal management.

Laryngotracheal papillomatosis complicated by squamous cell carcinoma

F Ismail, Z Lockhat, F Suleman (University of Pretoria)

Laryngotracheal papillomatosis is a condition caused by human papilloma virus infection of the larynx, the trachea and occasionally the bronchi and alveoli. The virus enters the tracheo-bronchial tree of the neonate at childbirth, during passage past an infected cervix. The granulomas are a common cause of a benign mass lesion of the larynx and trachea in children. Some granulomas undergo cavitation, which may be visible on chest radiographs. Patients usually present with stridor, wheezing and recurrent infections. The condition does not usually complicate. Very rarely (2 - 3% of cases), the granulomas undergo malignant transformation to squamous cell carcinoma, which has a poor prognosis. We present a case report of a child with recurrent laryngotracheal papillomatosis (RLTP), complicated by squamous cell carcinoma, where imaging played a significant role in diagnosis and detecting malignant transformation.

The mystical foot with pink mushrooms: Imaging findings in maduromycosis – a rarity in southern Africa

G Jackson (Kalafong and Steve Biko Academic Hospitals, and University of Pretoria)

Maduromycosis is an insidious, debilitating granulomatous infection of the subcutis. Infrequently encountered by physicians in countries outside an endemic global belt, it is often misdiagnosed as a neoplasm or other aggressive lesion, with the diagnosis of maduromycosis often not even considered. The diagnosis relies on direct examination of the grains formed by the organisms and isolation of the aetiological agents. Imaging studies are useful not only for defining the extent of the infection, but also to act as a guide for the clinician as to the correct pathology. We present a case of advanced, recurrent maduromycosis in a teenager (an uncommon age for the disease to occur), in a non-endemic region, but having typical radiological features that are considered hallmarks of the disease.

Biloma and traumatic haemobilia: Two distinct complications of blunt hepatic injury in a patient, successfully treated with a combination of radiological and endoscopic interventions

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Introduction. The conservative management of blunt hepatic trauma is well established. Nevertheless, complications such as the development of bilomas and traumatic pseudo-aneurysms can arise following a conservative management course. We describe the case of a 25-year-old man who presented 10 days after blunt abdominal trauma. CT of the abdomen showed a biloma with no features of arterial injury. This was managed by an ultrasound-guided drain initially and an ERCP with papillotomy following a persistent biliary leak. Subsequently, the patient had a significant episode of haemobilia. A conventional angiogram demonstrated a pseudo-aneurysm of a segmental branch of the right hepatic artery. Selective angio-embolisation resolved this complication.

Discussion. Non-operative management of blunt liver trauma in the haemodynamically stable patient without peritoneal signs has become the standard of care. Complications are related to either ongoing biliary leakage or ongoing haemorrhage. Most bilomas can be drained percutaneously using radiological guidance. If there is a persistent biliary leak, an ERCP with papillotomy can be performed. Traumatic haemobilia is a rare complication with a prevalence of less than 3% of liver injuries. Angio-embolisation is the intervention of choice in the management of this complication. Our patient developed both complications, which were successfully treated using minimally invasive techniques.

Conclusion. Bilomas and haemobilia are two known complications arising from the conservative management of blunt liver injury. Both can be successfully treated by a combination of minimally invasive techniques, as depicted in our case.

Classic tetralogy of Fallot and three odd-balls

C Liebenberg, G Jackson, N Makhanya, J Joshi, S Andronikou (University of Pretoria)

Classic tetralogy of Fallot (TOF) is described as a tetrad of cardiac malformations, i.e. ventricular septal defect (VSD), and right ventricular outflow tract obstruction (RVOTO) with right ventricular hypertrophy (RVH) and an aorta overriding the ventricular septum. We present a case series of the rarer imaging spectra of TOF, namely TOF with a combination of absent pulmonary valve and absent left pulmonary artery, TOF with

pulmonary atresia and associated aorto-pulmonary shunt, and TOF with absent left pulmonary artery.

Breathtaking Africa: Proposed pathogenesis of lymphobronchial TB

S Lucas, S Andronikou (*University of the Witwatersrand*), **Pierre Goussard, Robert Gie** (*Stellenbosch University*)

Lymphobronchial tuberculosis (LBTB) describes lymphadenopathy affecting the airways, which is particularly common in children because of their small, compressible airways. Lung complications distal to an airway narrowing are believed to develop progressively if untreated. This poster is a pictorial representation of a proposed pathogenesis. Recognition of LBTB and its complications is important to help identify those patients with potentially reversible pathology and to guide intervention aimed at salvaging residual vital lung parenchyma.

An approach to a pancreatic mass in a child – the red herring!

N Mahomed, K Mahango, T Westgarth-Taylor (*University of the Witwatersrand*)

Pancreatic tumours are a rare and unusual entity in paediatric patients, accounting for less than 0.2% of cancer-related paediatric deaths; their prognosis and histological spectrum differs from those of adults. Pancreatoblastoma is the most common primary pancreatic tumour of childhood. These tumours are often large, typically compress and displace adjacent structures rather than invade them, and may cause distant metastases. Dilatation of the biliary tree is uncommon. Non-epithelial primary pancreatic tumours include lymphoma, sarcoma, PNET, lymphangioma and haemangioendothelioma. Haemangioendotheliomas are rare benign tumours of vascular origin. The pancreas is a rare primary site of occurrence, with only 9 children with a pancreatic haemangioma/haemangioendothelioma reported in the English literature. Kaposiform haemangioendothelioma is a tumour that contains common features to both Kaposi sarcoma and haemangioma, and has been characterised as a vascular tumour of intermediate malignancy by the WHO because of its local infiltrative growth pattern and low-grade histomorphological features. We present a case of primary pancreatic Kaposiform haemangioendothelioma in an 8-month-old boy who presented with obstructive jaundice and Kasabach-Merritt syndrome. The aim of this poster is to provide a practical approach to pancreatic masses, which encompasses both common and rare causes.

Lipoid proteinosis – radiological and dermatological manifestations

I Matela (*University of Pretoria*)

We present a rare case of lipoid proteinosis. It is a rare autosomal recessive disorder, characterised radiologically by comma-shaped calcifications in the hippocampus bilaterally on plain radiographs and computed tomography (CT). Clinical features include skin scarring, beaded eyelid papules, and laryngeal infiltrations leading to hoarseness of the voice. The latter is usually present at birth or in early infancy, as the first manifestation. Moreover, the infiltrates in the tongue and its frenulum decrease lingual movement, resulting in speech difficulties. On histology lipoid proteinosis is characterised by infiltration of periodic acid Schiff-positive hyaline material in the skin, upper aerodigestive tract and other internal organs. We present a young girl who presented to the ear, nose and throat department with hoarseness of the voice and was subsequently referred to dermatology where the diagnosis of lipoid proteinosis was made. CT and skull radiographs confirmed the diagnosis. She has a sister with a similar clinical picture.

Eyes wide shut: Recognising optic radiation involvement in optic glioma in NF1

H Moodley, N Mahomed, S Andronikou (*Faculty of Health Sciences, University of the Witwatersrand*)

Neurofibromatosis type I is a common phakomatosis with characteristic bilateral optic nerve gliomas. Involvement of the optic radiations, however, is rare. It should be recognised because it may carry a worse prognosis, and to obviate biopsy. This pictorial essay documents the MRI findings of optic radiation involvement in a 7-year-old boy with NF1. Biopsy in the region of the optic tract and thalamus yielded a histological grade II astrocytoma. There are only a few case reports of optic radiation involvement in NF1, while some large series have no documented cases. The significance of optic radiation involvement in terms of contiguous tumour spread v. peritumoural oedema is contentious. Our biopsy result is significant in supporting the hypothesis that this represents true tumour spread.

Inflammatory myofibroblastic tumour – a pictorial essay on diverse imaging findings

C Morkel (*University of Cape Town*)

Inflammatory myofibroblastic tumour (IMT) is a rare benign neoplasm of mesenchymal origin that can affect individuals of any age, but has a predilection for children and young adults. The aetiology and pathogenesis remain unknown. It commonly involves the lung and abdomen in children but has been found in almost every site in the body. The presenting symptoms of these lesions vary widely according to the site of the tumour, and range from fever, malaise, abdominal pain, iron deficiency anaemia, cough and nonspecific respiratory symptoms to asymptomatic patients or patients with a palpable mass. The imaging characteristics of IMTs vary according to their site of origin and underlying histology (varying amounts of fibrosis and cellular infiltration). Some lesions demonstrate calcification, and can be single or numerous, well- or ill-defined and show variable contrast enhancement. The ultrasound and CT features are often non-specific. MRI may point towards the diagnosis, showing low signal on T1 and T2, reflecting the fibrotic nature of the lesions. Definite radiological differentiation between a malignant lesion and IMT may be impossible; as a result, the diagnosis is often only reached after exploratory laparotomy with open biopsy or surgical resection. In this pictorial essay, we present 3 cases (involving lung, stomach and liver) of IMT that presented at our institution, focusing on the diverse imaging features correlated with the histology. We discuss the potential differential diagnoses and offer a review of the literature.

A case of Job Buckley (hyper IgE) syndrome

C Nkabinde (*Pretoria University*)

A 12-year-old black boy presented to Witbank Accident and Emergency with: cough productive of copious purulent sputum and haemoptysis; pyrexia; severe tachycardia; and respiratory distress. Detailed history revealed longstanding illness with numerous consultations at various health centres. On examination, the patient had finger clubbing, pallor, primary and secondary teeth, and mouth sores. Crackles, rhonchi and amphoric breathing were heard in the chest, but no wheezes. Chest radiograph showed a loss of volume on the left side. Pneumatocoeles, bronchiectasis and abscesses were noted bilaterally. CT showed extensively destroyed lungs, more so on the left. There were features of end-stage lung disease. Differential diagnoses of cystic fibrosis, TB or asthma complicated by fungal infection were considered. After noting negative TB and HIV, but positive staphylococcus on sputum culture,

high IgE, eosinophilia and abnormal dentition, a diagnosis of Job Buckley (hyper IgE) syndrome was made.

Walker-Warburg syndrome

J Otto, W Harmse, G Van der Westhuizen (*University of the Free State*)

Walker-Warburg syndrome is a rare autosomal recessive congenital muscular dystrophy with multisystem involvement, including brain and ocular abnormalities. It is the most severe form of a small group of 'muscle-eye-brain' syndromes that include Fukuyama congenital muscular dystrophy (FCMD) and muscle-eye-brain disease (MEB). The condition is also known as cerebro-ocular dysgenesis (COD), hydrocephalus-agyria-retinal dystrophy (HARD) and Chemke syndrome. We discuss the case of a 5-month-old boy who presented with seizures, hypotonia, dysphagia and dysmorphic features. The serum creatine kinase level was severely raised. The imaging findings included cobblestone lissencephaly, hydrocephalus, brainstem and cerebellum abnormalities, agenesis of the corpus callosum and ocular defects. These findings are in keeping with Walker-Warburg syndrome. Our discussion elaborates on the aetio-pathogenesis and genetic aspects of this disorder. Walker-Warburg syndrome is a rare and fatal multisystem condition with an average life expectancy of 3 years. Recognising this condition is important in terms of prognosis and genetic counselling.

The role of MRI in the management of post-traumatic pancreatic pseudocysts in children

T Pillay, T Kilborn, S Cox (*Red Cross War Memorial Children's Hospital*)

Pancreatic damage occurs in 3 - 12% of children with blunt abdominal trauma. The most important complication is the development of pseudocysts owing to duct injury. The clinical course is unpredictable, with spontaneous resolution in 30 - 50%; however, rupture, haemorrhage, infection and maturation occur in up to 70%. Management of high-grade injuries is controversial in paediatric patients. Some centres recommend early aggressive surgical management with ERCP, stenting and in some cases distal pancreatectomy. Conservative management with octreotide acetate and total parenteral nutrition to decrease pancreatic exocrine functions for all duct injuries is more commonly practised in children. Non-resolving pseudocysts are then treated by drainage procedures – usually pseudocystgastrostomy or pseudocystjejunostomy either done sonographically, endoscopically or as an open procedure, depending on resources available. Imaging of pancreatic trauma at initial presentation is done by CT. Ultrasound is unreliable in the acute phase but is accurate in the detection and follow-up of peri-pancreatic fluid collections and pseudocysts. MRI with MRCP has proved to be an accurate way of detecting pancreatic injuries in adults; there are limited data available discussing the routine use of MRI in children. Six cases of high-grade pancreatic injury that developed pseudocysts have been seen at our institution since 2008. All patients were managed conservatively and had MRI scans between 2.5 and 6 weeks post-injury to assess suitability for drainage. This study assesses the use of MRI in predicting the need for drainage, the role of MRCP in defining the ductal injury, and the optimal sequences to define pseudocyst boundaries.

White out of the lung – not so black and white

T Pillay, N Wieselthaler (*Red Cross War Memorial Children's Hospital*)

White-out of the lung on chest X-ray is most commonly caused by either a pleural effusion or consolidation. In a patient with a non-resolving white-

out of the lung, other causes need to be considered. Ultrasound is a good first-line investigation; however, most complicated cases will go on to have further imaging. We highlight 4 patients who presented with white-out of the lung and were found to have unusual pathologies.

Cryptococcal meningo-encephalitis in an immune-competent 7-month-old infant – an unusual radiologic presentation

S Vedajallam, A Chacko, J Smal, E Lubbe (*University of Pretoria*)

Cryptococcal meningitis and meningo-encephalitis is an opportunistic fungal infection and usually a disease of immune-compromised (AIDS) patients. It is an especially rare condition in immune-competent persons. The radiological features of cryptococcal meningo-encephalitis can include normal computed tomography or show meningeal enhancement, single or multiple nodules (cryptococcomas), cerebral oedema or hydrocephalus. MRI is more sensitive for numerous enhancing nodules within brain parenchyma, meninges, basal ganglia and midbrain. We present the unusual radiological findings in an immune-competent 7-month-old girl who presented with a left hemiplegia and no evidence of fulminant infection/sepsis.

Meconium pseudocyst secondary to intra-uterine bowel perforation

S Vlok (*Department of Radiology, Grey's Hospital*)

Introduction. Intra-uterine bowel perforation with consequent intra-peritoneal meconium extravasation causes a sterile chemical inflammatory response known as meconium peritonitis. Peritoneal inflammation caused by the extravasated meconium may lead to peritoneal calcification as early as 12 hours after perforation. Association of meconium peritonitis with CMV and Parvovirus B19 infections is well known.

Discussion We present the case of a 25-year-old RVD-positive woman, G3P2, in her third trimester of pregnancy, in whom antenatal ultrasound investigation at 32 weeks revealed a large, cystic intra-abdominal mass with an irregularly calcified rim and internal echoes within the fetus, as well as polyhydramnios and an oedematous placenta. The diagnosis of a large meconium pseudocyst secondary to intra-uterine bowel perforation was made. This was retrospectively associated with CMV infection, for which the neonate tested positive post partum. An abdominal CT performed for surgical planning on the day of birth again confirmed the diagnosis.

A quiz with a cheeky answer!

T Westgarth-Taylor, N Mahomed, S Andronikou, C Westgarth-Taylor (*University of the Witwatersrand*)

We present a rare case of a unilateral parotid mass in a child. This poster, through a pictorial review and quiz, illustrates the differential diagnosis for parotid masses in children, providing both the clinical and radiological findings for each diagnosis. Through an interactive process, the rare diagnosis in our case (muco-epidermoid carcinoma) is revealed and discussed. The intra-operative, histological and radiological findings are also displayed. Finally, the important learning points demonstrated by this case are provided.