BCR 2012

4th Baltic Congress of Radiology

October 11th – 13th, 2012
Vilnius, Lithuania

Abstracts
of the 4th Baltic Congress of Radiology

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Lithuanian Radiologists Association

Latvijas Radiologu Asociācija

Eesti Radioloogia Ühing

WELCOME
to the 4th Baltic Congress of Radiology

It is a great pleasure to welcome you at the 4th Baltic Congress of Radiology - BCR 2012.

Every two years BCR is organized jointly by three societies: Lithuanian Radiologists Association, Latvian Association of Radiology and Estonian Society of Radiology. Lithuanian Radiologists Association is happy to welcome all radiologists to Vilnius once again in October 11-13, 2012.

The Congress will present an overview of the latest developments in radiology, both in theoretical fields and in areas of application, through keynote lectures and scientific presentations, given in several parallel sessions. We hope that the Congress will provide a forum for the international exchange of knowledge among radiologists and all specialists, who are interested in Imaging, as well as will facilitate improvements in international relations.

Vilnius, the host city of the Congress, is the historical capital of Lithuania and dates back to the 14th century. The remarkable old town of Vilnius has been awarded the status of World Cultural Heritage by UNESCO. We hope that friendly atmosphere of the modern city will mesmerize and leave you with unforgettable memories.

4th Baltic Congress of Radiology

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Jurate Dementaviciene

4th Baltic Congress of Radiology (BCR)

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SCHOOL OF RADIOLOGY

October 11, 2012, Thursday	
Lambda hall	
14:00-14:20	**Opening ceremony** *A. Laucevicius (LTU), A. E. Tamosiunas (LTU), J. Dementaviciene (LTU)*
14:20-14:50 *L	**CMR indications and contraindications** *N. Valeviciene (LTU)*
14:50-15:10 L	**Evaluation of cardiac masses: the role of MRI and CT** *E. E. Williamson (USA)*
15:10-15:40 L	**Cardiac MRI - clinical utility and future horizons** *M. Ugander (SWE)*
Lambda hall	
16:00-16:30 L	**CMR "The Inteventionalist´s Magic Wand"** *L. Hellsten (SWE)*
16:30-17:00 L	**Hybrid imaging (SPECT/CT) in coronary artery disease** *M. Mataciunas (LTU)*
17:00-17:30 L	**What does a radiologist need to know about pacemakers** *P. Magnusson (SWE)*
17:30-17:40 **S	Case report: TB pericarditis *D. Palionis (LTU)*
17:40-17:50 S	Case report *A. Jankauskas (LTU)*
17:50-18:00 S	Case report *I. Kulakiene (LTU)*
18:00-18:30 L	**Round table discussion with lecturers** *All lecturers*

CONGRESS LECTURES AND SCIENTIFIC PRESENTATIONS

October 12, 2012, Friday			
Alfa hall			
10.00-11.30	Congress openning ceremony *J. Dementaviciene (LTU), K. Kupcs (LVA), A. Simisker (EST)*		
10:30-10:50 *L	**Radiology and Philosophy** *M. Briedis (LTU)*		
10:50-11:10 L	**Endovascular treatment of ischemic stroke** *K. Kupcs (LVA)*		
11:10-11:30 L	**10 years PET in Baltics** *S. Nazarenko (EST)*		
Alfa hall		Lambda hall	
12:00-13:30	**Session I** **Neuroradiology** *Moderators:* *R. Gleizniene (LTU)* *S. Dzelzite (LVA)*	12:00-13:30	**Session II** **Thorax/Breast Imaging** *Moderators:* *R. Briediene (LTU),* *A. Samarin (EST)*
12:00-12:20 L	**Perfusion MRI of brain tumours** *E. M. Larsson (SWE)*	12:00-12:20 L	**CT mediastinum - all what you can find** *I. Priedite (LVA)*
12:20-12:40 L	**The role of Fetal MRI** *N. C. Moreira (PRT)*	12:20-12:40 L	**BIRADS 3 breast lesions** *R. Briediene (LTU)*
12:40-12:50 **S	CT perfusion aspects in early acute stroke *M. Radzina (LVA)*	12:40-13:00 L	**Lung cancer staging: when do we need PET/CT?** *A. Samarin (EST)*
12:50-13:00 S	Radiological characterisation and differentiation of primary central nervous system lymphomas *T. Kakkar (LVA)*		
13:00-13:10 S	Volumetric analysis of the brain in acute psychotic patients *A. Muursepp (EST)*	13:00-13:10 S	Effectiveness of mammography screening with mobile units *I. Laur (EST)*
13:10-13:20 S	Neurosarcoidosis: a case report and review of the manifestations of the disease on MRI *G. Randakeviciene (LTU)*	13:10-13:20 S	The sentinel node in breast cancer *M. Kalnina (LVA)*
13:20-13:30 S	Multimodal CT in acute stroke patients treated with intravenous thrombolysis *K. Orav (EST)*	13:20-13:30 S	Chest tomosynthesis *S. Stadalnykaite (LTU)*

Alfa hall			
14:30-16:00	**Interactive case presentation** *Moderators:* *A. Basevicius(LTU), J. Skucas (USA), A. Tonnov (EST), K. Kupcs (LVA)*		
Alfa hall		Lambda hall	
16:30-18:00	**Session III Abdominal/Pelvic Imaging** *Moderators:* *A. Basevicius (LTU),* *J. Skucas (USA)*	16:30-18:00	**Session IV Musculoskeletal Imaging** *Moderators:* *E. Monastyreckiene (LTU),* *M. Epermane (LVA)*
16:30-17:00 L	**Interventional uroradiology - an overview** *K. Geterud (SWE)*	16:30-17:00 L	**Diagnosis, staging and response assessment in bone tumors** *M. F. Reiser*
17:00-17:30 L	**Radiology in adnexal masses and ovarian cancer - strategies in Sweden** *H. Leonhardt (SWE)*	17:00-17:25 L	**Lumbar spinal stenosis: contemporary approach** *S. Jakstiene (LTU)*
17:30-17:40 S	Computed tomography colonography after incomplete colonoscopy in VUH Santariskiu Klinikos *D. Rutkauskaite (LTU)*	17:25-17:50 L	**Added value of bone SPECT - CT** *I. Kulakiene (LTU)*
17:40-17:50 S	Radiological staging of colorectal cancer *R. Laguns (LVA)*		
17:50-18:00 S	Castelman's disease of retroperitoneum *D. Macyte*	17:50-18:00 S	Radiographic progression of early knee osteoarthritis over 9 years in a population - based cohort *J. Kumm (EST)*

October 13, 2012, Saturday			
Alfa hall		Lambda hall	
09:00-10:30	**Session V Neuroradiology** *Moderators:* *M. Shroff (CAN),* *P. Ilves (EST)*	09:00-10:30	**Session VI Thorax/Cardiovascular Imaging** *Moderators:* *N. Valeviciene (LTU),* *L. Zvaigzne (LVA)*
09:00-09:20 *L	**Imaging of pediatric demyelination (acquired white matter disease)** *M. Shroff (CAN)*	09:00-09:30 *L	**CT evaluation of transcatheter aortic valve implantation** *E. E. Williamson (USA)*
09:20-09:40 L	**Stroke in childhood** *P. Ilves (EST)*	09:30-10:00 L	**Myocardial T1 mapping and extracellular volume imaging by MRI** *M. Ugander (SWE)*
09:40-10:00 L	**Histiocytoses in pediatric central nervous system** *E. Laurencikas (SWE)*		
10:00-10:10 **S	Brain morphometry in addicts with manganese-methcathinone exposure *J. Juurmaa (EST)*	10:00-10:10 S	CMR for detection of myocardial viability *S. Glaveckaite (LTU)*
10:10-10:20 S	Endovascular embolisation of intyracranial arteriovenous malformations with embolisation system Onyx *K. Kupcs (LVA)*	10:10-10:20 S	Intra-arterial trombolytic therapy in acute limb ischemia. Single centre experience, guidelines *S. Ponomarjova (LVA)*
10:20-10:30 S	The relation between mild cognitive impairment and vertebrobasilar circulation *S. Rutkauskas (LTU)*	10:20-10:30 S	Cardiac adrenergic innervation imaging: added value of MIBG SPECT imaging *D. Vajauskas (LTU)*
Alfa hall		Lambda hall	
11:00-12:30	**Session VII Abdominal/Pelvic Imaging** *Moderators:* *A. E. Tamosiunas (LTU),* *A. Strazdina (LVA)*	11:00-12:30	**Session VIII Head/Neck Imaging** *Moderators:* *R. Grigiene (LTU),* *P. Ross (EST)*
11:00-11:30 L	**Imaging of liver metastases: what is evidence based?** *A. E. Tamosiunas (LTU)*	11:00-11:30 L	**Head and neck cancer: how to evaluate treatment response** *A. Trojanowska (POL)*
11:30-12:00 L	**Imaging of prostate cancer** *A. Strazdina (LVA)*	11:30-12:00 L	**Imaging of temporal bone cholesteatoma and otosclerosis** *S. Dzelzite (LVA)*

12:00-12:10 S	Prostate cancer: diagnostic value of MRI for prediction of extraprostatic extension *E. Brinuma (LVA)*	12:00-12:20 S	To Be Announced
12:10-12:20 S	Scintigraphy of neuroendocrine tumors. VUH SK Radiology and Nuclear medicine department experience *J. Sejoniene (LTU)*		
12:20-12:30 S	Transarterial chemoembolization of unresectable hepatocellular carcinoma with drug eluting beads *A. Veiss (LVA)*	12:20-12:30 S	To Be Announced
Alfa hall			
12:45-14:15	**Plenary lectures** *Moderators: J. Dementaviciene (LTU), A. Platkajis (LVA), P. Ross (EST)*		
12:45-13:15 L	**Biliary system imaging** *J. Skucas (USA)*		
13:15-13:45 L	**Current concepts of medical radiation protection** *G. Bartal (ISR)*		
13:45-14:15 L	**The European society of radiology and its collaboration with the Baltic states** *M. Reiser (GER)*		
14:15-14:45	**Closing ceremony** *J. Dementaviciene (LTU), K. Kupcs (LVA), A. Simisker (EST)*		

POSTERS

NO	TITLE	MAIN AUTHOR
ABD01	Pneumatosis cystoides intestinalis as incidental finding mimicking submucosal large bowel lesions	J. Vaiciuliene (LTU)
ABD02	Comparable value of diffusion-weighted and standard MRI for differentiating focal liver lesions	E. Bieliuniene (LTU)
ABD03	Case report: hyperfunctioning intrathyroidal parathyroid adenoma	J. Grinceviciute (LTU)
ABD04	Application of tomographic radiologic methods in diagnosis of primary small bowel neoplasms	N. Teresius (LTU)
ABD05	Case report: gallstone ileus	M. Tirane (LVA)
ABD06	ERCP outcome correlation with diagnostic informativity of routine radiology methods used before ERCP	A. Pukitis (LVA)
ABD07	Case report: persistent urachus	O. Krivicha (LVA)
ABD08	Case report: the carcinoid tumor of the small bowel	O. Krivicha (LVA)
ABD09	2D and 3D ultrasound in pelvic floor disorders	A. Medne (LVA)
ABD10	Endometrial stromal sarcoma in a patient with atypical symptoms of constant fever	A. Salujarv (EST)
ABD11	First clinical experience in salvage prostate cryotherapy - presentation of 2 cases	A. Grybas (LTU)
ABD12	Endosonographic imaging of pancreatic cystic lesions: ten year experience of single center	A. Pukitis (LVA)
CAR01	Unexpected finding on cardiac CT in eligibility evaluation for TAVI	L. Zvaigzne (LVA)
CAR02	Effectiveness of duplex dopplerography in diagnosing extracranial carotid artery stenosis	N. Ezite (LVA)
CAR03	Pulmonary CT findings in Hodgkin lymphoma patients recieving specific treatment	H. Vahur (EST)
CAR04	Hybrid imaging in suspected CAD: initial experience in VUH Santariskiu Klinikos	M. Mataciunas (LTU)
CAR05	SPECT/CT in determination of choice of revascularization in patients with congestive heart failure	I. Rjabceva (LVA)
GEN01	Diagnostics of metatstatic process in blood vessels	L. Zvaigzne (LVA)
GEN02	Artifacts in MRI: overview, causes and possible correction methods.	T. Budrys (LTU)
GEN03	The use of CT in pediatric practice	L. Kargenberg (EST)

INT01	Superselective embolization of renal pseudoaneurysm	A. Grybas (LTU)
INT02	Positional stability of Nellix endograft after EVAR	J. Savlovskis (LVA)
INT03	Haemodynamical correlation of abdominal aortic aneurysms new style stent endoprosthesis deformation	N. Ezite (LVA)
INT04	Transcatheter endovascular embolization (TAE) for treatment of acute renovascular diseases (RVD)	A. Kratovska (LVA)
INT05	Mid-Term Results of Stent-Assisted Coiling of Intracranial Aneurysms: Single Center Experience	H. Kidikas (LVA)
INT06	Endovascular treatment of traumatic bleeding from peripheral and visceral arteries	P. Ivanova (LVA)
INT07	Transjugular Intrahepatic Portosystemic Shunt: A Single Centre Experience from Latvia	V. Lobarevs (LVA)
INT08	The role of TLPS in arteriovenous shunting malformation assessement	M. Kurminas (LTU)
MUS01	Primary leiomyosarcoma of bone: case report and literature review	R. Titarenke (LTU)
NEU01	Spinal glioblastoma multiforme: a case presentation and review of the literature	G. Randakeviciene (LTU)
NEU02	Defining epilepsy using diffusion tensor imaging	A. Efimtcev (RUS)
NEU03	Combined intravenous thrombolysis and thrombectomy in acute stroke patients in Tartu, Estonia	D. Loorits (EST)
NEU04	MR imaging of primary central nervous system lymphoma in immunocompetent patients	A. Bajorinaite (LTU)
NEU05	MR-spectroscopy and voxel-based morphometry in complex MR-diagnostics of multiple sclerosis	A. Sokolov (RUS)
NEU06	Application of the semiautomated program in glioma volume measurement	O. Voika (LVA)

ORAL PRESENTATIONS

ENDOVASCULAR TREATMENT OF ISCHEMIC STROKE

Karlis Kupcs

Pauls Stradins University Hospital, Riga, Latvia

According to data by WHO, ischemic stroke is the second most common cause of death and disability worldwide. In European countries, the average incidence of stroke ranges from 200-250 (in Latvia the number reaches 350) cases per 100,000 inhabitants. Every year in Latvia there are 7,000-8,000 cases of stroke. Because of the aging population, increase in the number of such patients is expected during the next 20 years.

During the past decades, the treatment of stroke patients has significantly improved and changed. Immediate treatment organization for stroke patients should provide the fastest possible transfer of the patient to a hospital where stroke units and modern imaging equipment is available.

Currently the most common methods are: thrombolytic therapy within 3 hours after the event, aspirin within 48 hours of stroke onset, decompressive surgery for supratentorial malignant stroke – these interventions are with proven positive benefit. Several other treatment methods are currently being investigated as well.

One of the latest and most promising treatment methods for stroke is intracranial thrombectomy. Comprehensive application of mechanical thrombectomy was initiated after observing its efficiency when using an intracranial stent, which originally was designed as an accessory in treatment of intracranial aneurysms. This method is progressively applied in the leading clinics in Europe and United States. The method is relatively new – in Pauls Stradins Clinical University Hospital Institute of Diagnostic Radiology the first patient received a thrombectomy treatment in year 2006. Currently there are approximately 100 patients who have been treated using this technique. From patients treated approximately 25% has basilar artery occlusion and remaining 75% internal carotid or/and middle cerebral artery occlusion. The mean NIHSS score before treatment was 18,4. The recanalisation rate TICI 2b or TICI 3 after thrombectomy was achived in 92%. The mean NIHSS score at discharge was 7,5. Overall mortality at discharge was 13,5%, after 3 months 23%.

These results suggest that endovascular revascularization for patients with acute ischemic stroke and large artery occlusion is relatively save and effective giving chance for good outcome for stroke patients who can’t benefit from i/v thrombolysis.

Session I
Neuroradiology

PERFUSION MRI OF BRAIN TUMOURS

Elna-Marie Larsson

Uppsala University, Uppsala University Hospital, Uppsala, Sweden
Linkoping University, Linkoping, Sweden

Patients with brain tumours are usually treated with surgery, radiation therapy and/or chemotherapy. Previous studies have shown that perfusion MRI improves the pre-treatment characterization of brain tumours. High-grade gliomas have larger cerebral blood volume (CBV) than low-grade gliomas, and lymphomas usually have smaller CBV than gliomas or metastases. Perfusion imaging may also predict the recurrence of gliomas. In the clinical follow-up, treatment decisions are presently to a large extent based on MRI assistance assessing the tumour size compared with the previous MR examination. The tumour size is usually estimated by diameter measurements but volume measurements may become clinically available with improved analysis tools in the PACS workstations. Perfusion MRI with dynamic susceptibility contrast (DSC) imaging has been used to assist the tumour characterization and the evaluation of therapy response. In malignant gliomas, perfusion MRI may reflect the effects of antiangiogenic treatment better than tumour size/volume. DSC perfusion requires post processing and the evaluation is not straightforward without quantitative analysis (normalised values of cerebral blood volume, rCBV, and cerebral blood flow, rCBF, relative to a reference region in normal appearing tissue). Because of this, perfusion MRI has so far been used in multiple scientific studies but has not yet gained widespread use in daily clinical radiological practice. T1-weighted dynamic contrast enhanced (DCE) MRI is a second perfusion MRI technique, that can be used to assess perfusion as well as vascular permeability, which may add useful information, e.g. for the differentiation between radiation necrosis and recurrent tumour. DCE MRI can be combined with DSC perfusion with two subsequent contrast injections in the same examination. DCE perfusion is performed first and the injected contrast agent will then also serve as pre-saturation of the extracellular space for the subsequent DSC scan of tumours with blood-brain-barrier leakage. A third perfusion MRI technique, arterial spin labeling (ASL), has recently become commercially available for clinical use at 3T MRI. ASL does not require any contrast injection and can therefore be used in brain tumour patients with renal insufficiency or previous severe adverse effects from gadolinium based contrast agents.

In conclusion, perfusion MRI can improve the pre- and post treatment evaluation of brain tumours also in daily radiological practice.

THE ROLE OF FETAL MRI

Nuno Maria Canto-Moreira

Uppsala University Hospital, Uppsala, Sweden

Ultrasound (US) is the primary modality for fetal imaging. Its accuracy upon detecting anomalies in is nevertheless quite variable, with rates that range from 0 to 100% depending on the type of anomaly, operator skills, equipment, gestation age, national pregnancy management policy or level of diagnostic centre. An average sensitivity of 61% for anomaly detection in foetuses has been reported.

Fetal MRI is not a screening method but it often reveals additional important findings that may alter patient counselling and case management.

Indications. Indications for a fetal MRI may be related to the mother, the fetus, or both. Maternal causes include obesity or other aspects that might difficult a US examination, whereas fetal causes involve a) the clarification of previous US findings, b) the screening for genetic pathology or c) rule out diseases that might not be detectable by US.

Traditionally fetal MRI has been mostly targeted for the central nervous system, since this field is particularly challenging for US and the fast T2-weighted sequences that were available initially proved ideal to provide image contrast both within the unmyelinated fetal brain and towards the surrounding cerebrospinal fluid.

Major fetal-related indications for performing a fetal MRI in Neuroradiology include all neuronal migration disorders, corpus callosum dysgenesis and posterior fossa malformations. Guidelines for the use of MRI exist, but the indications and timing for this procedure still vary widely from country to country.

Some limitations. The "working horses" for fetal MRI are single-shot T2-weighted sequences that overcome fetal movement, but at the expense of a relatively low space resolution and a heavily water-based signal contrast. Therefore the assessment of areas with a low-water content - as the skull base and viscero cranium - has been a major limitation of the method and the topic of our research.

Our research

1) The ear is involved in hundreds of congenital syndromes, but its correct visualisation with prenatal imaging is very difficult on MRI and US. In order to assess this, we evaluated retrospectively 16 MRI studies performed post mortem (15 to 22 gestation weeks (GW)) and 122 brain-targeted MRI studies in vivo of fetuses ranging from 20 to 38 GW.

The components of the inner and middle ear could be fully delineated in 100% of the post-mortem examinations but in the in vivo group the imaging detail was much lower. Cochlear turns could be identified in 75 % of the fetuses, the vestibule and the lateral semicircular canals in 72 % and ossicles in 70%. Before 25 GW, the ability to identify these individual parts was 50%, 30%, and 33%, respectively, and above it was 89%, 93% and 90%. In most cases, the external auditory canals could only be seen after 29 GW.

So, even if it was possible to depict the components of the ear in the majority of the fetuses in vivo, we believe that MRI does not provide enough detail to rule out pathology of the ear before the end of the second trimester.

2) The fetal face is routinely evaluated with US, but oro-facial clefts may go undetected. Therefore, to know how does MRI independently evaluate this area in brain-targeted studies is important, as unsuspected clefts or other pathology may be revealed.

Two independent readers made a blind retrospective review of 60 brain-targeted MRI of fetuses from 20 to 38 GW. 55 MRI were normal and 5 had oro-facial anomalies. Both normality and the clefts had post-natal confirmation.

Normality was correctly scored in 96-100% of the normal lips and primary palates and in 93-97% of the normal secondary palates, depending on the reader. The readers identified all pathological cases.

We concluded therefore that MRI is highly accurate for the evaluation of the lip and palate in fetuses above 20 GW, regardless of gestational age. The assessment of the secondary palate was however slightly more limited than the lip or primary palate.

CT PERFUSION ASPECTS IN EARLY ACUTE STROKE

Radzina Maija[1], Kupcs Karlis[1], Savlovskis Janis[1], Veiss Andris[1], Kidikas Helmuts[1], Miglane Evija[1], Krumina Gaida[2]

[1] *Paula Stradina clinical university hospital, Riga, Latvia*
[2] *Riga Stradins University, Riga, Latvia*

Imaging plays a key role in current guidelines for acute stroke management. CT imaging that include nonenhanced CT, perfusion CT (CTP), and CT angiography (CTA), requires evaluation of combined parameters.

Most accurate parameter that confirmed presence of hypoperfusion was increased MTT with decreased cerebral blood flow (CBF) and normal or increased cerebral blood volume (CBV). Proposed relative threshold values for necrosis: CBF < 30-40% and CBV < 40% compared with contralateral hemisphere. Penumbra is characterized by increased or normal CBV or decrease <60%, while CBF is decreased and MTT increased. CTP penumbra lesion in 4-6 hours correlate with CTA carotid artery stenosis <50%, suggesting of underlying hypoperfusion and good collaterals.

CT perfusion relative threshold values can be used to differentiate ischemic tissue viability grade, but use of multimodal CT imaging can reveal factors that influence the imaging result e.g. collaterals or underlying atherosclerotic disease.

RADIOLOGICAL CHARACTERIZATION AND DIFFERENTIATION OF PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMAS

Kakkar Tarun, Dzelzite Sarmite

Diagnostic Radiology Institute, Paula Stradina Clinical University Hospital, Riga, Latvia

Aim: To depict radiological characteristics which are significant for Primary CNS Lymphomas (PCNSL) by use of MRI and to find out statistically significant methodology for its differential diagnosis.

Materials & Methods: Among 49 patients taken, 24 had histologically proven PCNSL - group I and 25 had histologically proven other malignant intra-axial tumors – group II. T2 and contrast-enhanced T1 (CE T1) available in all tumors. Diffusion Weighted Imaging (DWI), Apparent Diffusion Coefficient (ADC map), Fractional Anisotropy (FA map), Susceptibility Weighted Imaging (SWI), relative Cerebral Blood Volume (rCBV map) available in some tumors. Tumor minimum, maximum, mean (min, max, mean ADC) values and mean FA value considered. Maximum relative CBV (rCBVmax) calculated, given in ratio with contralateral normal appearing tissue. Tumor appearance graded on T2, CE T1, DWI, SWI, and inter-group comparison done by Chi-square test. 2-sample t-test used to compare minADC, maxADC, meanADC, mean FA, and rCBVmax in 2 groups. A p value < 0.05 indicated statistically significant difference. Receiver Operating Characteristic (ROC) curve analysis of minADC, meanADC, mean FA and rCBVmax done to calculate sensitivity.

Results: On CE T1 PCNSL are homogenous and intensively enhanced ($p \leq 0.01$). On SWI, PCNSL are mostly without signal-void points ($p \leq 0.02$). Inter-group comparison revealed p= 0.000010, 0.000015, 0 .00001, 0.00174, 0.0038 for meanADC, minADC, maxADC, mean FA and rCBVmax respectively. ROC analysis showed rCBV to be the most sensitive (80.34% and 85.97%) using two cut-off values.

Conclusion: Combination of ADC (min, max, mean), rCBVmax and mean FA calculations aids routine MR imaging in the differentiation of PCNSL.

VOLUMETRIC ANALYSIS OF THE BRAIN IN ACUTE PSYCHOTIC PATIENTS

Muursepp Andreas[1], Haring Liina[1], Zharkovski Aleksander[2], Tomberg Tiiu[1], Ilves Pilvi[1]

[1] *Tartu University Hospital, Tartu, Estonia (Presenting author)*
[2] *Institute of Pharmacology, Tartu University, Tartu, Estonia*

Aim. To implement the methods for volumetric analysis and to evaluate morphometrical changes of different brain structures in patients with first onset of psychosis

Method. The study group consisted of 45 acute patients with first onset of psychosis and of 20 healthy volunteers. 3D T1-weighted images were acquired using 3T MRI (Philips Achieva, Utrecht) and processed with Freesurfer volumetric analysis software (surfer.nmr.mgh.harvard.edu). Volume and thickness of different brain structures were calculated.

Preliminary results. Significant bilateral volumetric differences ($p<0.05$) were found between control and study group in entorhinal, fusiform, inferior temporal, pericalcarine, lateral orbitofrontal, middle temporal and precentral regions. Volumes were increased in patients compared to controls.

Conclusion. Our study reveals morphometrical changes in various brain areas in acute patients with first onset of psychosis.

NEUROSARCOIDOSIS: A CASE REPORT AND REVIEW OF THE MANIFESTATIONS OF THE DISEASE ON MRI

Randakeviciene Goda, Gleizniene Rymante, Zaveckiene Jurgita, Lukosevicius Saulius

Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Kaunas, Lithuania

Objective: Neurosarcoidosis (NS) is a rare systemic disease manifesting by inflammation and abnormal deposits in parts of the central nervous system and its coverings. There is a wide spectrum of radiological findings and clinical manifestations of the condition, so the diagnosis is often a challenge.

Case description: We report a case of NS in a child, who clinically presented with neurological deficits. He was treated in a neurological department for a demyelinating disease because his clinical symptoms and radiological exams were suggestive of ADEM or SD. Later he developed a pulmonary insufficiency and was hospitalized in a pediatric intensive care department. The CT of the chest was consistent with a typical sarcoidosis. The MRI of the brain was interpreted as an atypical sarcoidosis with no meningeal involvement.

Conclusions: We discuss the multifaceted manifestations of sarcoidosis affecting the brain and spinal cord and diagnostic difficulties regarding it.

MULTIMODAL CT IN ACUTE STROKE PATIENTS TREATED WITH INTRAVENOUS THROMBOLYSIS

Kateriine Orav[1], Tiiu Tomberg[2, 3], Riina Vibo[2], Janika Korv[2], Pilvi Ilves[3]

[1] *Faculty of Medicine, University of Tartu*
[2] *Department of Neurology and Neurosurgery, University of Tartu*
[3] *Radiology Clinic, Tartu University Hospital, Tartu, Estonia*

Aim. To evaluate pretreatment time delay and to assess the effectiveness of thrombolysis depending on the results of multimodal CT in acute stroke patients.

Materials and Methods. In total, 88 stroke patients treated with i.v. thrombolysis in Tartu University Hospital (2010–2011) were included. Multimodal CT (unenhanced CT, CT-angiography and CT-perfusion) before treatment and unenhanced CT 24 h after treatment were performed. Severity of the neurological state was estimated by the NIHSS (National Institutes of Health Stroke Scale).

Results. Onset to treatment median time was 2h 25min. After treatment the clinical condition of 73% patients improved. Thrombolysis was more effective when perfusion deficit consisted mainly of penumbra. Occlusion of intra- or extracranial arteries, dense ACM, brain swelling, large perfusion deficit and infarction were related to a more severe disease course ($p<0.05$).

Conclusion. Multimodal CT helps select patients and predict outcome of thrombolysis.

Session II
Thorax/Breast Imaging

EFFECTIVENESS OF MAMMOGRAPHY SCREENING WITH MOBILE UNITS. ESTONIAN EXPERIENCE (2002 – 2011)

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Aim: The aim of breast cancer screening is to reduce breast cancer mortality. Our study evaluated the effectiveness of mobile screening units compared to stationary units.

Materials and Methods: Nationwide breast cancer screening began at 2002. The target group is 50-65 years old women, who are invited to screening by personal invitations every 2-nd year. Stationary units (8) are located in five cities. First mobile unit began to work in 2002. Two new mobile units were purchased in 2009, which has improved the availability of screening in smaller settlements.

Results: In three years (2009 – 2011) 95 335 women participated at screening. Participation rate in mobile units was 58%-80% and in stationary units 45%-52%. 76,3% of breast cancers detected by screening were at an early stage. Breast cancer death rate is decreased in 50-65 years old women by 17% compared to 2002.

Conclusion: Participation rate in mobile units is significantly higher than in stationary units.

Most important for mobile unit is the location (in town centers), which provides easy access and bus security. Stable electricity supply and high-speed internet connection are mandatory. Full-field digital mammography system provides the best quality, archived in nationwide PACS. Two highly-skilled technicians are working on the bus (weekly rotations). Technical support is provided constantly and technicians have an opportunity to consult with the radiologist via phone. In order to create a successful breast cancer screening program, the use of mobile units is highly recommended.

THE SENTINEL NODE IN BREAST CANCER

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Aim. To determine most effective sentinel node diagnostic method and to evaluate the influence of tumour characteristics and patient age and weight on it.

Methods. The technique involved inratumoral or peritumoral injection of 130 MBq of technetium-99m nanocolloid into the breast (167 patients, Group I) or intradermal injection of 30 MBq nanocolloid above the tumor (39 patients, Group II) and SPECT or SPECT/CT. Additional diagnosis with a gamma probe and peritumoral injection of blue dye.

Results. The rate of identification of hot spots in group I 74.3%, in group II 94.9% ($p<0.005$). In group I mean patient age 58.4, group II 61.7 years ($p=0.117$), mean patient weight 77.6 and 74.7 kg ($p=0.714$) respectively. In group I mean tumor size 19.9 mm, group II 21.5 ($p=0.427$), metastasis in sentinel node in group I 75.4%, II 76.4% ($p=0.727$). Sentinel lymph nodes in medial quadrant unefective diagnosis 31.7%, lateral quadrant 20.5% ($p=0.142$). The sentinel nodes were detected with gamma probe 89.9% and 45.8% blue dye. Combining methods we found in Group I overall sentinel lymph node detection rate together with gamma probe was 96.7% and in Group II 97.4% ($p=0.545$).

Conclusions. Sentinel node detection rate is not affected by patient weight, breast cancer size, metastasis in sentinel node, but there is a tendency of lower rates in older patients and in medial quadrant cancers. Gamma probe is more effective than blue dye. Combination of intradermal 30 MBq SPECT/CT and gamma probe is the most effective method combination.

CHEST TOMOSYNTHESIS

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Chest digital tomosynthesis (DT) is a radiological technique for sectional imaging. Now the use of DT is on the increase. The ability to detect pathological findings in chest radiograms is limited by the overlapping anatomy. Computed tomography (CT) is a gold standard in lung imaging. However, there are disadvantages. DT takes place between chest radiography (CR) and CT. DT allows analyzing every single plane of the chest, avoiding the overlapping anatomy, using conventional digital x-ray equipment. Sensitivity and specificity is bigger than CR. Radiation dose, cost and queue of patients is less than CT. Nowadays DR is used to specify pulmonary tumor or nodule when they are suspicious in chest radiography or to identify new pulmonary metastasis and follow up them. DT has no clear positions in radiological diagnostic algorithm. It could optimize the use of CT examinations, thereby reducing the radiation dose to the patient population.

Session III
Abdominal/Pelvic Imaging

INTERVENTIONAL URORADIOLOGY – AN OVERVIEW

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The lecture will give an overview of current practice of interventional uroradiology at Sahlgrenska University Hospital, Gothenburg, Sweden. Basic procedures like percutaneous nephrostomy as well as more unusual and perhaps controversial interventions will be addressed.

POSSIBILITIES OF RADIOLOGICAL DIAGNOSIS IN DETECTION OF ADNEXAL MASSES AND OVARIAN CANCER

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It is not unusual to find adnexal masses in women examined with computed tomography (CT) for various indications. In this lecture we will discuss strategies for the radiologist in how to report (or not report) on it, and how to move on towards a diagnosis in co-operation with the gynecologist.

The clinical impact of defining whether an indeterminate adnexal mass is benign or malignant is significant. Benign masses may be either managed conservatively or undergo resection by a general gynecologist. Women with ovarian cancer should be transferred to a specialist institution.

Transvaginal ultrasound (TVUS) is the first-line modality in diagnosis of adnexal masses, and the lesion can be classified as benign, indeterminate or probably malignant. Image guided needle biopsy should be avoided, because of the risk of seeding of a potentially curable stadium I ovarian cancer. Pelvic magnetic resonance imaging (MRI) is a useful complement in the cases of indeterminate adnexal masses. Most of them are actually complex benign lesions and specific diagnosis, such as teratoma, endometrioma, fibroma/thecoma, or stalked uterine fibroids, can often be made by MRI. A low signal intensity on T2-weighted and diffusion-weighted images (DWI) (b=1000 sec/mm2) in a solid component are the best criteria to predict that an adnexal mass is benign.

For all imaging modalities, signs of malignancy of an adnexal mass are:

- Heterogeneous solid or multicompartment cystic with solid component
- >4 papillary vegetations
- Necrosis
- Increased perfusion (contrast enhancement)
- Size >10 cm
- Ascites

Thick cyst walls or septations (>3 mm) are less reliable signs of malignancy, since this can also be observed in cases of tubo-ovarian abscess, endometrioma etc. A simple cyst of less than 5 cm in size can be regarded as benign, also in postmenopausal women. Co-existence of enlarged lymph nodes (short axis >10 mm), peritoneal implants, growth involving the pelvic walls, or pleural effusion increase the probability of malignancy.

CT is the imaging technique of choice in the pre-treatment planning of suspected ovarian cancer. MRI is an alternative in cases of contraindications to contrast-enhanced CT and a complement before advanced pelvic surgery. In cases of severe renal dysfunction or pregnancy, DWI may be a good substitute for contrast-enhanced sequences. Positron emission tomography (PET)/CT is an alternative in cases of contraindications to contrast-enhanced CT and a complement to CT in cases of indeterminate findings. What the gynecologist/oncologist wants to know will be presented.

COMPUTED TOMOGRAPHY COLONOGRAPHY AFTER INCOMPLETE COLONOSCOPY IN VUH SANTARISKIU KLINIKOS

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AIM

To report our experience with computed tomography colonography (CTC) systematically performed in subjects with clinical suspicion of colorectal cancer and in whom colonoscopy was incomplete.

MATERIALS AND METHODS

The study population consisted of 11 adults (mean age, 61years; 10 (91%) women, 1 (9%) men) in whom from February 2009 to February 2012 CTC after incomplete colonoscopy with sedation was done. In one center routine CTC imaging of the insufflated colon was performed with a 16-MDCT scanner in both the supine and the prone positions after standart catharic bowel preparation. The CTC was done in the same day (n=3), other with 1-87 day interval (mean=19). We calculated the CTC findings after incomplete colonoscopy.

RESULTS

All blocks in colon were in the distance from rectosigmal angle to right hepatic angle and commonest block location was sigma (27%). Colonic pathologic findings was seen in 9 (82 %) of 11 total CTC studies. Six (55%) of 11 CTCs showed polyps or masses.CTC correctly identified all colonic masses and all polypoid lesions with postoperative findings. In 27% pathologic findings was in proximal colonic segment not visualized in fibrocolonoscopy.

CONCLUSION

Computed tomography colonography is alternative investigation where colonoscopy is incomplete, with the examination of the proximal bowel.

RADIOLOGICAL STAGING OF COLORECTAL CANCER

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Purpose. The authors' objective was to assess patients diagnosed with colorectal cancer in our hospital and to compare clinical signs with radiological stage of disease.

Introduction. Colorectal cancer is the third most prevalent cancer worldwide. Its prevalence is 1000 new patients per year in populations in Latvia.

Methods and materials. In this retrospective study we included 50 patients treated in our hospital during time period of 6 months. We used the data collected from medical files in our hospital: we compared gender, age, clinical symptoms, tumor localization and stage. For our study we evaluated computed tomography (CT), magnetic resonance imaging (MRI), X-rays, ultrasound (transabdominal and endorectal) images of colorectal cancer. Two authors analysed radiological images of the patients.

Results. There were included 18 male and 32 female patients. The mean decade at diagnosis was 7th and 8th. The three most common presenting clinical symptoms were ileus 52%, rectal bleeding 16% and 32% anemia. Regarding the stage of cancer according to TNM staging system, 6% of patients were in stage I, followed by 30% in stage II, 22% in stage III, and 42% in stage IV. In our study dominated stage IV. For the most of patients the tumor was located in left sided colon that correlated with literature.

Conclusion. Patients are admitted in our hospital too late only in IV stage and also in case of severe complications. Colorectal cancer continues to be associated with a poor prognosis.

Session IV
Musculoskeletal Imaging

DIAGNOSIS, STAGING AND RESPONSE ASSESSMENT IN BONE TUMORS

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Diagnosis, staging and follow up of musculoskeletal tumours are very important for selection of adequate therapeutic measures and prognosis of patients. Modern imaging technologies have greatly contributed to improvement.

With modern MRI systems high contrast of neoplastic tissue vs. normal uninvolved structures is achieved. This allows for adequate delineation of intraosseous and soft tissue extension and thereby facilitating high precision in staging. Compartmental infiltration is readily detected. Dynamic, contrast enhanced studies allow for assessment of vascularity and perfusion, which provides valuable information concerning malignancy and benign character of a particular tumour. With diffusion weighted imaging and diffusion tensor imaging, microstructural information can be obtained, which correlates with response to chemotherapy and viability of the tissue.

Malignant bone tumours may spread within the bone or to distant organs. Therefore, whole body imaging modalities hold great potential for comprehensive assessment. Whole body MRI incorporating multiple channels and receiver coil elements allow for large anatomical coverage and enable to detect spread of the tumour within various parts of the body.

In computer tomography major advances have been achieved recently. The combination of CT and PET in hybrid systems allows to assess function and morphology within one session. With FDG-PET the metabolic activity of a particular lesion can be analyzed. The standard uptake value (SUV) can be utilized for differentiation of benigne malignant lesions. However, there are various benign lesions, which result in false positive findings, such as NOF, fibrous dysplasia, eosinophilic granuloma and aneuysmal bone cysts as well as inflammation and infection. False negative results in FDG-PET may be found in low grade chondrosarcoma, multiple myeloma, low grade osteosarcoma, Ewing´s sarcoma and low grade soft tissue sarcomas. Therefore correlation with other imaging findings such as plain radiographs and MRI are required in order to avoid misdiagnoses.

Another new application of CT in diagnosis of musculoskeletal tumours may be dual energy CT. This method enables to differentiate iodine from calcium. Enhancement within a particular lesion can be differentiated from other reasons of high tissue attenuation. The potential of dual energy in CT has to be explored in further studies.

RADIOGRAPHIC PROGRESSION OF EARLY KNEE OSTEOARTHRITIS OVER 9 YEARS IN A POPULATION-BASED COHORT

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Objective: To investigate the radiographic progression of knee osteoarthritis (KOA) over 9 years in middle-aged subjects with chronic knee pain.

Design: Tibio-and patellofemoral (TF/PF) radiographs were graded for OA in 113 subjects (mean age 45 years) at four different time points. Radiographic progression was defined as: the presence of osteophytes and/or JSN in subjects with no previous OA or an increase in the grade or number of osteophytes and/or JSN.

Results: Progression rate of radiographic KOA over 9 years was 69% (78/113). Among progressors, 26 had only TFOA progression, 23 only PFOA progression and 29 had progressive TFOA and PFOA in combination. Individual assessment revealed distinct subgroups of radiographic progression.

Conclusions: Over 9 years, 69% of middle-aged subjects with chronic knee pain had progressive course of KOA. The radiographic course of early KOA turned out to be heterogenuous and non-linear with intermittent periods of progression and stabilization.

Session V
Neuroradiology

MR IMAGING OF ACQUIRED DEMYELINATION IN CHILDREN

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Introduction. Acute demyelinating disease (also called as Acute Demyelinating Syndrome – ADS) is not uncommon in children. Common ADS presentations include optic neuritis (ON), transverse myelitis (TM), brainstem syndromes, polyfocal neurological deficits, and polyfocal deficits accompanied by encephalopathy (termed acute disseminated encephalomyelitis, ADEM). For some patients, ADS occurs as a monophasic illness, for others it represents the first clinical manifestation of multiple sclerosis (MS). Multiple sclerosis (MS) is the most common autoimmune demyelinating disease of the central nervous system (CNS), characterized by immune-mediated inflammation and progressive neurodegeneration, causing intermittent and accumulating neurological deficits. Pediatric-onset MS is being increasingly recognized worldwide, and it is estimated that approximately 2.2 – 4.4% of patients are diagnosed with MS prior to age 18 years. ADEM is another pediatric demyelinating disease which is not uncommon. MR plays a very important role in the diagnosis and differentiation of MS from other causes of ADS.

In this presentation, we will discuss how to use MR for the diagnosis of MS and differential features of various other demyelinating diseases, like ADEM, NMO (neuromyelitis optica), CNS vasculitis, and other inflammatory diseases of the central nervous system. Table I provides a diagnostic scheme for the work up of children who have suffered an acute demyelinating syndrome.

Table 1: Diagnostic Evaluation for Children Evaluated for Suspected Acquired Demyelinating Syndromes and Multiple Sclerosis

The following investigations should be performed, as clinically indicated:	
MRI	• Brain MRI in all children • Spine MRI in all children with clinical spine involvement • Orbital MRI for children with visual loss The following MRI sequences are suggested: • FLAIR or T2-weighted sequences in at least 2 planes • Pre- and post- gadolinium T1-weighted images • Diffusion-weighted sequences
Evoked Potentials	• VEPs • SSEPs

Laboratory screening for NMO and MAS	Serum NMO IgG CSF NMO IgG (if serum negative) Ferritin Triglycerides
Infection Screening	CBC + differential Serum viral serologies (EBV, mycoplasma, HSV serology) VDRL Lyme disease (seasonal) Cysticercosis (based on travel to endemic areas only) HTLV (based on travel to endemic areas only)
Endocrine	TSH, T4, anti-TPO antibodies if Hashimoto's encephalopathy is a consideration
Mitochondrial lactate – serum + CSF	Pyruvate – if higher than normal lactate, calculate lactate to pyruvate ratio DNA studies, skin and muscle biopsy if mitochondrial disease strongly suspected
Rheumatologic Disease	ESR, CRP ANA, dsDNA Anticardiolipin and antiphospholipid antibodies Angiotensin converting enzyme CXR (if sarcoidosis is strongly suspected)
Nutritional	B12 (serum) 25-hydroxy-vitamin D (25(OH)D)
CSF studies	Glucose, Lactate, Protein Cell count Culture and sensitivity, gram stain when appropriate Oligoclonal bands (compared to concurrently obtained serum)* CSF viral cultures + PCR Herpes Viruses Cytology (if indicated)

ANA=antinuclear antibody; CBC=Complete Blood Count; CRP=C-reactive protein; CSF=Cerebrospinal Fluid; CT= computed tomography; CXR=Chest x-ray; DNA=deoxyribonucleic acid; dsDNA=double-stranded deoxyribonucleic acid; EBV= Epstein-Barr virus; ESR=Erythrocyte Sedimentation Rate; FLAIR=fluid attenuated inversion recovery; HSV=Herpes Simplex Virus; HTLV=Human T-lymphotrophic Virus; IgG=immunoglobulin G; MRI=magnetic resonance imaging; NMO=neuromyelitis optica; PCR=Polymerase Chain Reaction; SSEP=somatosensory evoked potential; T4=Thyroxine test; TPO=Thyroid peroxidase; TSH=Thyroid-Stimulating hormone; VEP=visual evoked potential; VDRL=Venereal Disease Research Laboratory.

*The accuracy of oligoclonal band measurement depends on the diagnostic test used and on the experience of the laboratory performing the test. Isoelectric focusing has the highest sensitivity.

Standardized MR protocols. Standardized protocols and sequences across different institutions and clinics are a must to enable radiologists and neurologists follow up patients with MS. For e.g. it is important to use the same imaging plane for axial FLAIR images, viz. the subcallosal or the AC-PC plane, so that comparisons for new lesions is easy. Also it is recommended that contrast be injected before obtaining the FLAIR sequence so that the contrast 3D T1 images are acquired approximately 5 minutes after the injection, this increased the detection of contrast enhancement. Table 2 summarizes the use of consensus protocols.

Table 2: Proposed MRI Protocol for Pediatric Demyelinating Disease

Order	Sequence	Recommendation	Comment
Brain Imaging			
1	3-plane localizer	Recommended	Prescribe oblique axial images†
2	3D T1-weighted spoiled gradient-recalled echo imaging	Recommended	By increasing TR to 30 ms, contrast is comparable to the contrast on SE imaging – important in assessment of T1-hypointense lesion formation
3	Sagittal FLAIR	Recommended*	
4	Axial T2-weighted FSE or TSE	Recommended*	
5	Axial DWI	Recommended	In children presenting with acute symptoms, DWI is important to rule out arterial ischemic stroke
6	Contrast Administration		
7	Axial FLAIR	Recommended	Acquired during 5-minute delay between contrast injection and post-contrast imaging
8	Axial T1-weighted post-contrast spoiled gradient-recalled echo imaging	Recommended	By increasing the TR to 30 ms, the conspicuity of gadolinium enhancement is more comparable to that of SE imaging
Optional Orbital Imaging (acquired following contrast administration)			
1	3-plane localizer	If clinically indicated	Prescribe oblique axial images†
2	Coronal and axial T2-weighted fat saturated imaging	If clinically indicated	Should include imaging of the optic nerves through to and including the optic chiasm
3	Coronal and axial T1-weighted post-contrast fat saturated imaging	If clinically indicated	If acquired with brain protocol, acquire after sequence #8 under Brain Imaging
Optional Spinal Cord Imaging (acquired following contrast administration)			
1	3-plane localizer	If clinically indicated	
2	Sagittal T2-weighted FSE or TSE¶	If clinically indicated	Acquire in superior, middle and inferior sections
3	Axial T2-weighted FSE or TSE	If clinically indicated	Acquire only through regions of interest
4	Sagittal T1-weighted post-contrast SE	If clinically indicated	If acquired with the brain protocol, acquire after sequence #8 under Brain Imaging

Abbreviations: TR, repetition time; SE, spin-echo; FLAIR, fluid attenuated inversion recovery; FSE, fast spin-echo; TSE, turbo spin-echo; DWI, diffusion weighted imaging

MRI features of pediatric MS. MS lesions typically appear as focal ovoid areas of hyperintensity on dual echo and FLAIR images, ranging from a few millimeters to more than one centimeter in diameter. White matter lesions, such as those involving the juxtacortical and periventricular regions, the corpus callosum, as well as the brainstem and cerebellum can be visualized on conventional T2-weighted or FLAIR images. In children with established MS, T2 lesions have the highest probability of being located in the occipital periventricular white matter followed by the frontal periventricular white matter. Tumefactive lesions, defined as large lesions (>2 centimeters) with marked perilesional edema, as initial presentation of MS may be difficult to distinguish from malignancy at onset. Gadolinium-enhanced T1-weighted imaging permits differentiation of active or newly formed lesions from inactive ones, since contrast enhancement occurs as a result of increased blood-brain barrier permeability and corresponds to active immune cell transmigration into the CNS. Enhancing lesions are typically nodular or open-ring in contour. In a prospective cohort study of children with ADS, contrast-enhancing lesions were present in 22% of patients (10% of patients who had a monophasic illness and 70% of children subsequently diagnosed with MS). Lesions typically enhance for approximately three weeks, but the duration may be shorter in the context of treatment with methylprednisolone. Both number and volume of new T2 and contrast-enhancing lesions are often used as an outcome measure of in vivo inflammatory activity in treatment trials because they capture sub-clinical disease activity with a higher frequency than clinical relapses.

Finally, a subset of T2 hyperintense lesions appears hypointense on T1-weighted imaging, ranging in intensity from isointense to grey matter to isointense to cerebrospinal fluid.These T1 lesions or “black holes”, which may enhance with gadolinium initially but persist as non-enhancing lesions on serial T1-weighted images, represent focal areas of severe tissue damage and irreversible axonal loss. Decreasing brain volume over time can be observed in children when comparing serial MRI scans.

Differential Diagnosis for Acquired Pediatric Demyelination. Although well characterized clinically and radiologically, the clinical features of acute demyelination are not specific. Clinicians must be alert to other neurological disorders with similar signs. The diagnosis of monophasic ADS and MS requires exclusion of other diagnoses. Table 3 highlights some of the MRI features that should prompt clinicians to consider diagnoses other than ADS and MS.

Table 3: MRI Red Flags for the Diagnosis of Children with Acquired Demyelinating Syndromes

MRI	Leptomeningeal Enhancement	SVcPACNS Infection Tumor HLH	Leptomeningeal enhancement is not a feature of MS in adults, and emerged as a red flag for vasculitic or malignant processes in our pediatric cohort.
	Lesion expansion	Tumor Lymphoma PML Sarcoidosis	Increased size of T2 lesions on serial imaging is well-recognized in MS, although this should always prompt consideration of malignancy. Increasing size of a white-matter predominant lesion without lesion enhancement in a patient treated with immunosuppressant therapy (or a patient with known HIV) should prompt consideration of PML. PML is a risk for MS patients exposed to more intense immunosuppressive therapies.
	Hemorrhage	ANE Stroke Cerebellitis AHLE Large-vessel CNS vasculitis SVcPACNS	While susceptibility-weighted imaging reveals tiny microfoci of hemosiderin in MS patients, hemorrhage large enough to be visible on conventional MRI sequences is not a feature of ADS or MS and should prompt consideration of disorders in which the cerebral vasculature is specifically involved.

ADS=acquired demeylinating syndrome; AHLE=acute hemorrhagic leukoencephalitis; CNS=central nervous system; HIV=human immunodeficiency virus; HLH= Hemophagocytic Lymphohistiocytosis; MS=multiple sclerosis; PML= Progressive multifocal leukoencephalopathy; SVcPACNS=small vessel childhood primary angiitis of the central nervous system.

Conclusion. Conventional MRI has played a key role in identifying the imaging features of MS in children, and in predicting MS outcome in children at risk. As only 30% of children with an acute demyelinating episode will herald further attacks leading to a diagnosis of MS, MRI will be important in aiding the clinician to identify children who will not experience relapsing disease. With the mandate of Pediatric Investigation Plans for all new drug trials, treatment trials for pediatric MS are soon to be launched. The ability to identify children at highest risk for MS diagnosis will be important in determining eligibility for such therapeutic trials.

PEDIATRIC STROKE: THE RADIOLOGICAL VIEW

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Pediatric stroke is divided to perinatal (PS) and childhood stroke (CS). Based on the age at diagnosis, PS is classified to neonatal (NS) and presumed perinatal stroke (PPS). CS is defined as a cerebrovascular event that occurs in children between 29 days and 18 y.

Aim. To identify the differences in radiological findings in patients with CS or PS.

Material and methods. Patients with PS and CS were identified from Estonian pediatric stroke database. All available images were reviewed retrospectively.

Results. In total, 28 of 69 PS patients had NS and 41 PPS. Eighteen infants with NS had ischemic (IS) and 10 haemorrhagic stroke (HS), including 4 with sinovenous thrombosis (SV). Significantly more children had periventricular white matter venous territory infarction in infants with PPS (in 27 of 41 cases) compared to NS (in 3 of 18 cases) (p=0.0001). In PS 18 of 48 had HS including 2 with SV, 24 had IS, 6 had transient ischemic attack.

Conclusions. Radiological findings in PS and CS are different.

HISITIOCYTOSES IN PEDIATRIC CENTRAL NERVOUS SYSTEM

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Histiocytoses are proliferative disorders that most commonly occur in children. These disorders originate from a group of immune cells called histiocytes that include dendritic cells (DC) and macrophages.

Classification of histiocytoses is rather complicated. According to cell-lineage these disorders could be classified into: dendritic cell- related disorders, macrophage-related disorders and malignant histiocytic disorders.

Histiocytoses compound a rather heterogeneous group of disease, have variable clinical presentation and creates a significant diagnostic challenge. They may involve any organ or system and may present as focal or systemic disease. One of the most devastating complications of these disorders is involvement of the central nervous system (CNS).

This presentation will focus on two most common entities: Langerhans cell histiocytosis (LCH) – disorder of dendritic cell-line and hemophagocytic syndrome – a group of disorders of macrophage cell-line.

In LCH almost one third of patients develop CNS involvement during course of the disease. Most common CNS manifestation is involvement of hypothalamic-pituitary region which causes most common clinical CNS presentation – diabetes insipidus. Other, less common radiological signs include neurodegenerative changes in basal ganglia, cerebellum and cerebral white matter structures, but also leptomeningeal and dural involvement. Skeletal involvement of the skull base and orbita is also significant when predicting course and outcome of the disease.

Less common histiocytic disorder is hemophagocytic lymphohistiocytosis (HLH), which could be divided in two forms: familial form, also called familial lymphohistiocytosis (FHL) and secondary form. Involvement of CNS in HLH varies n different studies but it could be present in up to 70%. Isolated CNS disease without involvement of other systems has been also reported. Radiological findings are also variable and relatively unspecific. In severe form of HLH-CNS disease extensive asymmetric encephalitis with cortical/subcortical cytotoxic edema can be demonstrated. Pathophysiology of CNS disease is not completely understood. Damage of the microvasculature by inflammatory cells and primary agents is one of the mechanisms.

Clinical and radiological findings in histiocytic syndromes commonly are non-specific and diagnosis is challenging, in particular regarding CNS involvement. Radiologists therefore should be familiar with different patterns of CNS involvement to be able to recognize different disorders and improve diagnostic accuracy.

BRAIN MORPHOMETRY IN ADDICTS WITH MANGANESE-METHCATHINONE EXPOSURE

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Aim. During the last decade, cases of toxic parkinsonism-dystonia syndrome have been reported, caused by intravenous self-administration of a „designer" psychostimulant drug that is synthesized by oxidizing pseudoephedrine to methcathinone in the presence of potassium permanganate. We aimed to identify structural changes in the brain associated with the development of this syndrome.

Materials and methods. 12 subjects and 12 age- and sex-matched controls were studied using MRI on a 3.0 T tomograph. Per subject, 146 axial 1.0 mm thick slices of the whole head were acquired with an in-plane resolution of 1.0 mm × 1.0 mm. Cortical reconstruction and volumetric segmentation was performed via a semi-automated process.

Results. There were a total of 11 clusters, 6 on the left hemisphere and 5 on the right hemisphere, where patients showed a statistically significant loss in cortical thickness when compared to controls ($p < .001$, corrected). When compared to abstinent users, active users had 2 clusters with increased cortical thickness ($p < .05$ on both hemispheres, corrected). In addition, patients showed a possible loss of volume in the putamen and in the nucleus accumbens when compared to controls.

Conclusion. Results confirm cortical and point to possible subcortical changes in drug addicts with prolonged exposure to methcathinone and manganese. The observed pattern of cortical changes appear to be consistent with methcathinone-induced neuroinflammation and reactive gliosis aggravated by exposure to manganese.

ENDOVASCULAR EMBOLISATION OF INTRACRANIAL ARTERIOVENOUS MALFORMATIONS WITH EMBOLISATION SYSTEM ONYX

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Aim. Endovascular therapy of intracranial arteriovenous malformations (AVMs) is being used with ever increasing frequency. We report our experience in the treatment of AVMs with ethylene-vinyl alcohol copolymer (Onyx).

Materials and methods. For the period March 2005 to March 2012 an endovascular Onyx liquid embolisation system was applied in 29 patients who underwent a total of 41 sessions. The study included 11 female patients and 18 male patients. The mean age for the sample was 36.03 years. Of the patient sample, 22 (96.5%) were symptomatic.

Results. Complete obliteration at the end of all endovascular procedures was achieved in 11 of the 29 patients (37.9%), with an average of 98.7% (range, 50%–100%) volume reduction. A higher level of obliteration was achieved if the IAVM was located supratentorialy or cortically, having compact nidus. Embolization related complications were observed in 3 cases (10%). No embolisation procedures resulted in mortality.

Conclusion. The liquid embolisation system Onyx allows safe and controllable approach for the penetration of IAVM nidus and their obliteration. The risk associated with the procedure is slightly lower than stated in literature. Evaluations of hemorrhage after embolisation procedures are still being conducted.

THE RELATION BETWEEN MILD COGNITIVE IMPAIRMENT AND VERTEBROBASILAR CIRCULATION

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Mild cognitive impairment (MCI) is recognized as a risk factor for Alzheimer's disease. The aim of study was to determine the relationship between MCI and vertebrobasilar circulation.

The Alzheimer's Disease Assessment Scale-Cognition (ADAS-Cog) was used. The patients were assorted into 2 groups: ADAS-Cog≤16 points (group A, n=39), ADAS-Cog≥17 points (group B, n=38). Systolic peak (SPFV), diastolic (DFV), mean (MFV) flow velocities (cm/s) were registered.

In total 77 patients (18 male) with a mean age of 68±9 years were included in the study. The average ADAS-Cog points were 17±6. Comparing group B vs. A, the linear flow velocities were as follows: 4th segment of vertebral artery (V4) PSFV (39±12 vs. 44±13, p=0.01), V4 DFV (18±6 vs. 21±7, p=0.01), V4 MFV (25±8 vs. 29±9, p=0.01), PCA SPFV (41±8 vs. 49±10, p<0.001), PCA DFV (19±4 vs. 22±6, p=0.001), PCA MFV (26±5 vs. 31±7, p<0.001).

The patient group with higher ADAS-Cog scores had lower PCA and V4 flow velocities.

Session VI
Thorax/Cardiovascular Imaging

CT EVALUATION OF TRANSCATHETER AORTIC VALVE IMPLANTATION

Eric Williamson

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Since its initial introduction just over a decade ago, transcatheter aortic valve implantation (TAVI) has become an important therapeutic option for patients with severe aortic stenosis who are not considered appropriate candidates for conventional surgical valve repair. During the last ten years, over 20,000 of these valves have been placed worldwide. As our collective experience with catheter directed valve placement increases, the role of preprocedural multidetector row CT in evaluation of these patients has evolved significantly. Although echocardiography remains the mainstay for assessment of aortic stenosis and insufficiency, CT evaluation of aortic root anatomy, including measurement of aortic annulus dimensions, has become a crucial part of the preprocedural work-up of these patients. Additionally, CT can facilitate valve deployment by providing important information regarding the appropriate route of access, as well as guiding approach angles for valve placement. As TAVI procedures continue to increase in number, the use of CT in these patients will also increase. The purpose of this lecture is to review the indications for CT examination prior to TAVI procedure, outline the CT protocols used for this examination, and provide a step-by-step guide for image evaluation and post-processing.

MYOCARDIAL T1 MAPPING AND EXTRACELLULAR VOLUME IMAGING BY MRI

Martin Ugander

Karolinska University Hospital, Stockholm, Sweden

Myocardial extracellular volume (ECV) imaging is an emerging MRI technique which utilizes T1 mapping to generate quantitative parametric images where each pixel has a value between 0-100%, reflecting the fraction of tissue comprised of extracellular space. Myocardial pathologies such as diffuse and focal fibrosis, edema and inflammation can disturb the myocardial extracellular volume fraction, thus illustrating the clinical utility of ECV imaging. The presentation will cover the theoretical basis, pre-clinical validation and clinical utility of quantitative myocardial tissue characterization with T1-mapping and ECV imaging by MRI.

VALUE OF CARDIOVASCULAR MAGNETIC RESONANCE FOR THE PREDICTION OF LEFT VENTRICULAR FUNCTIONAL RECOVERY AFTER REVASCULARISATION

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Background: This study sought to prospectively and directly compare three cardiovascular magnetic resonance (CMR) viability parameters: contractile reserve (CR) during low-dose dobutamine (LDD) administration, late gadolinium enhancement transmurality (LGE) and thickness of the non-contrast-enhanced myocardial rim surrounding the scar (RIM). These parameters were examined to evaluate their value as predictors of segmental left ventricular (LV) functional recovery in patients with LV systolic dysfunction undergoing surgical or percutaneous revascularisation.

Methods: In 55 patients (63 years old [SD, 10 years]) with chronic coronary artery disease (CAD) and LVD (LVEF 35% [SD, 8%]), wall motion and the above mentioned CMR parameters were evaluated before revascularisation. Wall motion and LGE were repeatedly assessed 6 months after revascularisation. Logistic regression analysis models were created using 410 dysfunctional segments at rest.

Results: The functional recovery of the myocardium decreased with increasing LGE transmurality (82% of segments with functional recovery in LGE 0% to 25%, 67% in LGE 26% to 50%, 41% in LGE 51% to 75%, and 13% in LGE >75% were found). CR was superior to an LGE threshold value of 50% (LGE50) and a RIM threshold value of 4 mm (RIM4) for predicting segmental recovery. When the areas under the ROC curves are compared, the combined viability prediction model (LGE50 + CR) was significantly superior to CR alone in all analysed sets of segments. Taking into account that most of the segments (around 82%) without any LGE recovered and that most of the segments (around 88%) with LGE >75% did not recover function after revascularisation, the evaluation of additional viability parameters besides LGE seemed to have little additional value in those subsets of segments. Thus, the addition of LDD-CMR seemed to have the greatest additional value in segments with 1% to 75% LGE, whereas measurement of the RIM thickness had no superiority over LGE50 in this LGE subset.

Conclusions: LGE- and LDD-CMR provide complementary information regarding myocardial viability, and a combination of both techniques is valuable for more accurate prediction of segmental and global recovery irrespective of the degree of left ventricular dysfunction. LDD-CMR is superior to LGE-CMR as a predictor of segmental recovery. The advantage is greatest in the segments with an LGE from 1% to 75%.

INTRA-ARTERIAL TROMBOLYTIC THERAPY IN ACUTE LIMB ISCHEMIA. SINGLE CENTRE EXPERIENCE, GUIDELINES

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Riga East University Hospital, Riga, Latvia

Aim: Using local interventional radiologist, vascular surgeon experience and trial data create local guidelines for acute limb ischemia management.

Materials and methods. Since 2010 to 2012 51 patients with critical limb ischemia underwent local trombolytic therapy. All patients underwent vascular surgeon clinical examination, radiological examination. Patients were assessed using Rutherford RB scale and selected for thrombolythic therapy. All patients had DSA prior to trombolysis. Patients with positive wire test had local intra-trombal injection of recombinant tissue plasminogen activator in bolus chase, following perfusion. Control angiography performed 8 – 12 h after therapy. Results were assessed using radiological and clinical evaluation.

Results. 51 patients treated with local thrombolytic therapy; 4 (7.84%) aortic occlusion, 8 (15.68%) supraingvinal arteries, 13 (25.49%) infrainguinal native arteries and 26 (50,98%) grafts. Time window from onset of symptoms to treatment 3 hours to 14days. Significant or complete recanalisation achieved in >80%, TICI score III 35 cases (68.62%), IIb 11 (21.57%). 39 (76.47 %) of patients had significant clinical improvement, amputation of the limb performed in 5 patients (9.8%). In-hospital mortality 5 (9.80%). Additional vascular treatment performed in 23 (45.09%).

Conclusions: local intra-arterial trombolytic therapy has lower limb amputation, mortality rate, helpful in graft thrombosis. Thrombolytic therapy has wide treatment time window. It is a method of choice for patients with acute thrombotic lesion. Revascularisation, amputation rates in our hospital correspond to data from other studies.

CARDIAC ADRENERGIC INNERVATION IMAGING: ADED VALUE OF MIBG SPECT IMAGING

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Vilnius University Hospital, Santariskiu clinics, Radiology and Nuclear medicine center, Vilnius, Lithuania

Aim. Cardiac MIBG global adrenergic innervation showed good results for heart failure risk stratification. New data confirms MIBG SPECT value predicting cardiac events for heart failure patients. Although cardiac MIBG SPECT data significantly differs from myocardial perfusion imaging data, and this difference could lead to investigators misinterpretation.

Materials and methods. Cardiac MIBG imaging data were acquired for 91 subjects with NYHA II – IV heart failure. Images acquired at early and late phase in planar and SPECT mode.

Results. Cardiac regional innervation heterogeneity was detected despite normal global adrenergic innervation values and even adrenergic innervation were found for patients with impaired global cardiac adrenergic innervation.

Conclusion. Our results suggest that regional cardiac adrenergic innervation provide additional information next to global innervation. This information could lead us to better cardiac events risk assessment for heart failure patients.

Session VII
Abdominal/Pelvic Imaging

PROSTATE CANCER: DIAGNOSTIC VALUE OF MRI FOR PREDICTION OF EXTRAPROSTATIC EXTENSION

Brinuma Evija, Strazdina Arta

Riga East Clinical University Hospital, Garkalne, Latvia

Aim. To retrospectively assess the diagnostic value of magnetic resonance imaging for prediction of extraprostatic extension (EPE) in patients with prostate cancer.

Materials and methods. 70 patients with biopsy-proved prostate cancer underwent MR imaging (1.5 T, 2 endorectal coil, 68 pelvic phased-array coil) prior to radical prostatectomy (RP). The following sequences were used: 70 (100%) T2W, T1W+C; 21 (30%) DWI (without ADC maps); 64 (91%) T1W; 0 (0%) MRS, DCE-MR. The likelihood of ECE was scored on the basis of MR imaging reports. The criteria evaluated in each patient were extracapsular extension, seminal vesicle invasion and bladder neck invasion. The results were compared with the histopathological findings after RP.

Results. The overall accuracy of MRI for prediction of EPE was 71%, sensitivity 13%, specificity 79%, NPV 87%, PPV 7%.

Conclusion. MRI tends to understage prostate cancer. To improve sensitivity and PPV of MRI should be using functional techniques (MRS, DCE).

SCINTIGRAPHY OF NEUROENDOCRINE TUMORS. VUH SK RADIOLOGY AND NUCLEAR MEDICINE DEPRATAMENT EXPERIENCE

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Neuroendocrine tumors (NETs) are characterized by the presence of neuroamine uptake mechanisms and/or peptide receptors at the cell membrane. These features constitute the basis of the clinical use of specific radiolabeled ligands, both for imaging and therapy. Scintigraphy with radiolabeled metaiodobenzylguanidine (MIBG) and somatostatin receptor analogues (SRA) is regarded as a first-choice imaging technique for diagnostic work-up (diagnosis, staging, restaging, follow-up, evaluation, therapy selection) in patients with chromaffin cell tumors and NETs, expressing somatostatin receptors.

We present the results of NETs scintigraphy performed in Vilnius University Hospital Santariskiu klinikos Radiology and Nuclear medicine department since 2008 up to 2012 09. We exhibit an impact of scintigraphy on estimating strategy of treatment and depict the major clinical significance of false-positive results and non-specific accumulation of MIBG and SRA.

TRANSARTERIAL CHEMOEMBOLIZATION OF UNRESECTABLE HEPATOCELLULAR CARCINOMA WITH DRUG ELUTING BEADS

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Aim. To present our initial experience in using the drug eluting beads (DEB) loaded with doxorubicin in patients with hepatocelular carcinoma (HCC).

Materials and methods. Our retrospective study was conducted over 15 months (March 2011–June 2012). 13 patients with liver cirrhosis and unresectable uni- or multifocal HCC underwent transarterial chemoembolisation (TACE) with drug-eluting beads (DC Bead™). The mean intrahepatic tumor size, considering the sum of diameters of all lesions treated, was 7.2 cm. Computer tomography imaging was performed before and after TACE.

Results. 13 patients received a total number of 29 TACE treatments with DC beads. At 15 months a complete response was seen in 30.8%, an partial response in 53.8%, progressive disease in 15.4%. Mean tumor necrosis 66.2%. Severe procedure-related complications were not observed. Postembolization syndrome was observed in all patients. At the time of data analysis 9 (69%) out of 13 patients were alive.

Conclusion. TACE with drug eluting beads in unresectable HCC offers efficient treatment resulting in tumor response within a very short time. The technique is simple to perform and seems to be well tolerated by patients.

Session VIII
Head/Neck Imaging
Plenary lectures

CURRENT CONCEPTS OF MEDICAL RADIATION PROTECTION AND TRAINING - EUROPEAN PERSPECTIVES

Gabriel Bartal

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Today Medical applications are the main contributor to the public exposure to Ionizing radiation. Radiation protection authorities and relevant professional Societies are making constant efforts to improve radiation protection by optimizing the methods and without compromising quality of diagnosis and treatment. Current status of Medical Radiation Protection education and training of medical professionals as well as legal and practical arrangements in the European Member States have been evaluated by conducting a European Union wide study. Radiation protection authorities and relevant professional Societies from 35 European countries were requested to respond to online questionnaire on issues related to current status of medical radiation protection education and training.

A substantial proportion (36%) noticed that National regulations in their country do not include requirements for continuing education and training in radiation protection for radiologists, radiation oncologists, nuclear medicine physicians, interventional radiologists and interventional cardiologists.

The data from the responses of all three Baltic States have been processed and will be presented at BCR'12 symposium. The general picture from the questionnaire shows significant efforts made by regulatory and professional bodies.

An example of a question which has not been addressed yet in none of the Baltic States is: Does your institution operate a school or permanent course on medical radiation protection for health professionals? This and some other questions have to be analyzed and actions taken accordingly.

The impact of the new (coming) European Directive on Basic Safety Standards in Diagnostic and Interventional Radiology will be discussed in detail.

Common European "Diagnostic and Interventional Dose Reference Levels" is promoted by ICRP and will comprise current National levels for each EU State. New occupational dose limits for the lens of the eyes will be presented. Are the Medical professionals ready to comply with new recommendations and upcoming regulations? With many significant advances in technology, how industry is helping the Medical community to improve radiation safety?

Implementation of Patient dose reporting and tracking in PACS and RIS systems will allow a reliable documentation of cumulative doses for each individual as well as real time monitoring of the exposure and its compliance with the ALARA

principles. Practical recommendations on dose management principles and there implementation in Clinical Practice will be provided.

There is a need for action by regulators and Professional Societies in implementation of the medical exposure directive's requirements on radiation protection education and training in EU states.

THE EUROPEAN SOCIETY OF RADIOLOGY AND ITS COLLABORATION WITH THE BALTIC STATES

Maximilian F. Reiser

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The European Society of Radiology (ESR)

The European Society of Radiology (ESR) was founded in December 2005 by merging the European Congress of Radiology (ECR) and the European Association of Radiology (EAR), thus establishing a single house of radiology in Europe, allowing for the interests of the field of radiology to be represented more effectively to European authorities and throughout the world. The society is an apolitical, non-profit organisation, exclusively and directly dedicated to promoting and coordinating the scientific, philanthropic, intellectual and professional activities of radiology. The society's mission at all times is to serve the healthcare needs of the general public through the support of science, teaching and research, and the quality of service in the field of radiology, which is defined as diagnostic and interventional radiology, biomedical and molecular imaging.

The merger thus resulted in the world's biggest radiological society with nearly 54,000 individual members from 195 countries worldwide. The Estonian, Latvian and Lithuanian radiological societies figure among the 42 European national member societies of ESR. The number of ESR members from the Baltic States (Estonia, Latvia and Lithuania) increased from 82 in the year 2007 to over 500 today (as of August 29, 2012). There are numerous advantages of being an ESR member, such as reduced registration fees, free access from home to all ESR resources, exclusive option to participate in the European Diploma in Radiology (EDiR) and in the activities of the European School of Radiology (ESOR).

ESR resources

Main goals of the ESR include raising standards in radiological services throughout the world. Therefore, the ESR produces teaching material and publishes regular electronic newsletters and the professional journals European Radiology and Insights into Imaging with free online access for ESR members. The promotion of EPOS™, the electronic poster online system, and EURORAD, a huge collection of radiological teaching files, and the intensive communication between the members of the society, also help to achieve the society's aims.

ECR + Baltic States

One of the primary tasks of the ESR is the organisation of ECR, the leading annual meeting in radiology. The event has continuously evolved over the years, offering an increasing range of scientific and educational sessions and regularly introducing new features and services with a constant dedication to excellence. It is the largest radiological meeting in Europe, attracting more than 20,000 participants from over 100 countries. Between 2007 and 2009 there were over 150 attendees each year from the Baltic States at the ECR; in 2010, there was a slight decrease with 102 attendees. Nevertheless, in 2011 and 2012, there were over 175 attendees from Estonia, Latvia and Lithuania at the ECR in Vienna. In

2011 and 2012 the number of submitted and accepted abstracts from the Baltic States rose significantly compared to the years before.

The next ECR takes place from March 7–11, 2013, in Vienna. It is hoped that the attendees, as well as abstract submissions from Estonia, Latvia and Lithuania will continue rising, as it has been the case in the last two years.

EIBIR + EU Affairs

ESR is also very active in the field of research and thus established the European Institute for Biomedical Imaging Research (EIBIR), which is a multi-disciplinary service organisation for scientists run by scientists. It offers services such as networking, research communication or research training. EU Affairs is also an item that is very important on the ESR agenda. ESR's European Affairs activities ensure proper representation of the ESR's interests and mission at the European institutions and recognition of ESR as major stakeholder in European healthcare politics. Important topics are for example, the European legislation on electromagnetic fields, eHealth or radiation protection legislation.

ESOR

In addition, main goals of the ESR include the harmonisation and coordination of teaching activities within and beyond Europe through ESOR – the European School of Radiology, and assistance in raising training standards in radiological services throughout the world. ESOR programmes for 2012 include visiting schools and scholarship programmes within and beyond Europe, visiting seminars and offering exchange programmes and online courses with a self-assessment test.

IDoR

In order to raise awareness of the importance of radiology worldwide, ESR organised together with the American College of Radiology (ACR) as well as the Radiological Society of North America (RSNA) the International Day of Radiology (IDoR). It will take place on November 8 with oncologic imaging as the main topic this year. The mission of the IDoR is to build greater awareness of the value that radiology research, diagnosis and treatment contribute to safe patient care, and to build understanding of the vital role radiologists perform in the healthcare continuum. Many international and European organisations support the IDoR. The concept of the IDoR, evolving around the number five, is based on the first ever x-ray image which shows a hand. The ESR will provide a basic package to all participating societies, which should distribute it to the local media and can translate the PR material into their language. Estonia, Latvia and Lithuania are among the 27 national societies which have confirmed their participation so far.

EBR

The ESR recently founded the European Board of Radiology (EBR) in Barcelona, Spain.

This independent body has been created to organise activities that can no longer be directly performed by the society. The main activity that will be transferred to this independent body is the administration of the European Diploma in Radiology (EDiR); future activities, such as accreditation, will be defined later.

EDiR - European Diploma in Radiology

Essential to the success of this young venture is production of a high quality and robust evaluation of radiologic knowledge which has the active support of national and subspecialty societies of ESR. Examination material collection is undertaken by experienced educators of international repute.

The technology employed in the examination is web-based and interactive reflecting work place practice in a modern radiology department. An oral examination component assesses not alone knowledge but competence in save and appropriate decision making.

Four examinations have already been performed, today a success rate of 79% has been recorded, which is in line with well established national examinations.

In addition to an annual examination at ECR other examination sessions are taking place in collaboration with national society meetings; on such occasions the oral part of the examination can be taken in the local language or English. Collaboration with national societies is a major focus of future plans.

SCHOOL OF RADIOLOGY

CARDIAC MRI - CLINICAL UTILITY AND FUTURE HORIZONS

Martin Ugander

Karolinska University Hospital, Stockholm, Sweden

The presentation will review the current clinical role and evidence based basis for both the diagnostic accuracy and prognostic value of Cardiac MRI in assessing cardiac function, stress/rest perfusion and viability. The presentation will also touch upon the emerging applications for quantitative myocardial tissue characterization using parametric mapping of myocardial T1, T2 and extracellular volume fraction.

CMR ”THE INTEVENTIONALIST´S MAGIC WAND”

Lasse Hellsten

Gavle Hospital, Gavle, Sweden

CMR guided PCI to taylor the clinical treatment of of coronary desease.

What needs to be treated according to viability patterns?

Clinical cases to illustrate the everyday PCI with the use of CMR in specific clinical setting as CTO (Chronic Total Occlusions) and patients with previous MI (Myocardial Infaction)

POSTERS

PNEUMATOSIS CYSTOIDES INTESTINALIS AS INCIDENTAL FINDING MIMICKING SUBMUCOSAL LARGE BOWEL LESIONS

Vaiciuliene Jurgita[1], Rutkauskaite Dileta[2], Tamosiunas Algirdas Edvardas[2], Mikalauskas Saulius[3], Poskus Eligijus[3], Strupas Kestutis[3]

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Aim: We present the rare case of pneumatosis cystoides intestinalis who was diagnosed in Vilnius University Hospital Santariskiu Klinikos.

Introduction: Primary pneumatosis intestinalis known as pneumatosis cystoides intestinalis (PCI) is a rare benign idiopathic condition in which multiple thin-walled cysts develop in the submucosa or subserosa of the large bowel. Usually, PCI has no associated symptoms, the cysts may be found incidentally through radiography or colonoscopy (CS). Computed tomogaphic colonography (CTC) more sensitive for the diagnosis of PCI. The spontaneous rupture of pneumatosis is complication of PCI.

Case presentation: We present the case history of asymptomatic 70 year old woman who was diagnosed multiple submucosal lesions in the sigmoid colon and polyp during screening CS. After CTC sigmoid colon PCI with microperforation was confirmed. There was no indications for surgery treatment.

Conclusion: We report a case of asymptomatic pneumatosis cystoides intestinalis as incidental finding in sigmoid colon. PCI should be suspected when a thin-walled cysts are present in submucosa or subserosa of the large bowel.

COMPARABLE VALUE OF DIFFUSION-WEIGHTED AND STANDARD MRI FOR DIFFERENTIATING FOCAL LIVER LESIONS

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Aim: to compare research data from Hospital of Lithuanian University of Health Sciences Kaunas Clinics and world research data of MRI DWI and regular MRI when dealing with FLL.

Materials and Methods: a prospective study of liver MRI in patients with FLL was conducted using Siemens Magnetom Avant (1,5 Tesla) device.

Results: 17 patients with different FLL were examined. 31(37,8%) was benign. Malignant - 51(62,2%). SI of benign FLL in DWI sequences decreased when b value was raised and SI of malignant FLL increased. ADC value was calculated using ADC map where SI of benign FLL was high and SI of malignant FLL was low. Specificity of T2 sequences are 33,33%, sensitivity-89,04%. T1 with contrast imaging amplification: specificity is 44,44%, sensitivity-65,75%. Specificity of MRT DWI is 11,11%, sensitivity-97,26%.

Conclusion: MRI DWI imaging is more informative than regular MRI for detection of FLL and helps to differentiate effectively between benign and malignant FLL.

CASE REPORT: HYPERFUNCTIONING INTRATHYROIDAL PARATHYROID ADENOMA

Grinceviciute Judita, Vajauskas Donatas

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Learning objectives. Primary hyperthyroidism caused by rare intrathyroidal parathyroid adenoma case presentation and review of related articles.

Background. Hyperparathyroidism can be classified into three forms: primary, secondary, and tertiary. An intrathyroidal parathyroid adenoma is an uncommon cause of PHPT. In patients with PHPT pathological parathyroid glands, can be located in various places depending on the embryological development process.

Imaging findings or procedure details. Neck ultrasound and FNA revealed benign thyroid nodules, no evidence of parathyroid adenomas. Delayed-phase MIBI scan depict a focus intrathyroidal uptake of the right lobe. Histological examination of the operated intrathyroidal nodule confirmed the diagnosis of an intrathyroidal parathyroid adenoma.

Conclusion. Intrathyroidal parathyroid adenomas may present as an apparent thyroid nodule. Accurate diagnosis and preoperative localization is important for a successful surgical outcome.

APPLICATION OF TOMOGRAPHIC RADIOLOGIC METHODS IN DIAGNOSIS OF PRIMARY SMALL BOWEL NEOPLASMS

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Purpose: to evaluate patients with confirmed primary small bowel neoplasms, application of tomographic radiologic methods in depicting this pathology

Materials and Methods: using digital case summaries we found 95 patients treated at our institution during the 6 year period (2006–2011).

Results: the most frequent site of tumour was p.Vateri–56 cases (59%),duodenum–10(11%),jejunum–9(10%),ileum–8(8,4%),non-localized lymphoma–8(8,4%) cases.Diagnostic CT was performed in 28(50%) patients with p.Vateri tumour,duodenum–6 of 10(60%),jejunum–5 of 9(55,5%),ileum–4 of 8(50%),in cases of lymphoma–4 of 9(44,4%).Diagnostic MRI was rarely used–for 2 patients with p.Vateri tumour (3,5%),and only for 1 patient with jejunum or ileum primary neoplasm.

Conclusion: Patients with primary small bowel neoplasms account for only a small part of all treated patients.Most frequently diagnosed tumours were adenocarcinomas of p.Vateri.Diagnostic CT was used only in about 50%,MRI in <10% of all cases.

CASE REPORT: GALLSTONE ILEUS

Tirane Mara, Laganovskis Andris, Brikuns Andrejs

P.Stradins Clinical University hospital, Riga, Latvia

Gallstone ileus is infrequent cause of mechanical bowel obstruction and unusual complication of cholelithiasis. It is caused by impaction of gallstone in small bowel after passing biliary-enteric fistula. Gallstone ileus usually occurs in elderly patients, who often have other concomitant diseases and is associated with high mortality rate. The diagnosis is often delayed since symptoms may be intermittent and first investigations fail to identify the cause of obstruction.

We describe a case of 72 year-old woman with 3 day history of intermittent vormiting, distension and abdominal pain, with chronic cardiovascular pathology and anamnesis of complicated cholelithiasis. Plain abdominal x-ray film showed dilated small bowel in left part of abdomen. Patient was hospitalized in surgery department and the following small bowel water-soluble contrast follow-through x-ray examination confirmed the diagnosis of mechanical ileus indicating the cause and level of obstruction by ectopic gallstone.

ERCP OUTCOME CORRELATION WITH DIAGNOSTIC INFORMATIVITY OF ROUTINE RADIOLOGY METHODS USED BEFORE ERCP

Pukitis Aldis, Ozola – Zalite Imanta, Pokrotnieks Juris

Paul Stradins Clinical University Hospital, Riga, Latvia

Aim: Study aim was to compare the informativity of routinely applied imaging techniques before ERCP and to evaluate correlation with ERCP outcome. Materials and Methods: 125 patients who have undergone both ERCP and at least one of examinations: US, CT, MRCP, EUS were divided into groups according to US data, complaints, liver transaminases and amylase levels in a prospective study. Results: Diagnostic sensitivity of US in choledocholithiasis - 58.33%, specificity 92.68% (PPV 66.67%, NPV 89.40%). Diagnostic sensitivity of CT for stricture of papillae - 52.9%, specificity 100% (PPV 100%, NPV 81%). The CBD diameter correlation between US and ERCP was r=0.54. CT r=0.76.

Conclusion: US, CT applications showed moderate informativity. The CBD diameter correlation between US and ERCP was moderate, for CT - strong. US data, complaints of the patients, liver transaminases are selection criteria for referral to ERCP. Additional examinations (EUS or MRCP) should be made in cases of chronic pancreatitis and bile duct dilatation alone.

CASE REPORT: PERSISTENT URACHUS

Krivicha Olga, Zvaigzne Ligita, Vjaters Egils, Voika Olga

P. Stradins Hospital, Riga, Latvia

The urachus is a remnant of the embryonic tubular structure between the bladder and the allantois. Normally, it should be obliterated and non-functional before the birth, transforming into the umbilical ligament that connects the bladder with the navel. Presence of the persistent urachus (patent or partially open) is found to be an uncommon disease in adults.

Due to high number of examinations performed and advances in the examination techniques, the number of anomalies, previously considered to be a rare condition, increases and is frequently found in asymptomatic patients.

In the last two years there have been three patients with persistent urachus diagnosed and successfully treated in P.Stradins Hospital. One patient developed a complication - urachal abscess, in two others the finding was incidental. The first modality to detect anomaly was US, while CT exam confirmed the diagnosis.

CASE REPORT: THE CARCINOID TUMOR OF THE SMALL BOWEL

Krivicha Olga, Zvaigzne Ligita, Voika Olga

P. Stradins Hospital, Riga, Latvia

Due to advances in diagnostic radiology, nowadays, almost every single organ of the human body can be visualized by means of US, CT or MR. However, small bowel still may be complicated to examine. The patient was admitted to the P.Stradins Clinical University Hospital with a suspected acute surgical pathology. US examination revealed a small bowel mass in the terminal portion of the ileum. A diagnosis of acute perforated diverticulitis was made by CT imaging, and carcinoid was detected additionally. Small bowel carcinoid is a slow growing primary malignant tumor with the common location in the ileocaecal junction. Although in most cases the pathology runs an asymptomatic course, in some cases patients may develop the carcinoid syndrome. The main modality used in carcinoid diagnostics is endoscopy. Radiological methods are rarely used as the primary diagnostic tools, the most popular are CT and barium follow-through.

2D AND 3D ULTRASOUND IN PELVIC FLOOR DISORDERS

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Different pelvic floor disorders (incontinence, bladder overactivity, pelvic organ prolaps) are very common in modern world. About 40% women meets any of those problems. Each 1 of 10 will undergo surgical treatment.

Aim of our study was to evaluate 2D un 3D Utrasound role in Pelvic Floor dysfunction diagnosis.

Ultrasonography is the most widely available imaging modality. As a result of technical progress, novel transducers and more sophisticated software have recently been introduced providing more information about the anatomy of pelvic organs.

First research study in Latvia was done evaluating 64 women with mean age 53y. (34 y.o. to 76 y.o.) who was reffered by urologist with different complains about pelvic organ disfunction. Reserarch group was established to include patients with clinical diagnosis of incontinence (stress, urge, mixed) and Control group - patients without incontinence.

All patients underwent 2D and 3D trasnperineal US and endovaginal US using convex, high frequency biplanar endocavity and 3D rotational probes. Also an interviews were performed.

As a result the large impact of different antropometric factors were discovered. Practical application of these methods allows improoved morphological assessment of the pelvic floor and helps in clinical management of patients especialy high results showing in patients with urethra hypermobilty, combined pelvic organ prolaps, deep muscle damage which can be critically importnat to theirs life quality.

ENDOMETRIAL STROMAL SARCOMA IN A PATIENT WITH ATYPICAL SYMPTOMS OF CONSTANT FEVER

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Endometrial stromal sarcoma (ESS) is a rare uterine malignancy. We describe a case of high-grade malignant ESS in a 62-year old woman with unusual symptoms of constant fever up to 38,8 C for the past two months, lower abdominal pain, vomiting, weight loss over 20 kilograms during the past year. Patient had a history of breast cancer, type 2 diabetes and uterine myomas. Ultrasound and CT examinations did not reveal the cause of fever. PET/CT was performed to discover breast cancer metastases and showed a strong FDG uptake in one of the fibroids. MRI of the pelvis showed that the same fibroid had different MRI signal characteristics: hyperintense signal on T2, hypointense on T1 images and strong diffusion restriction. The contrast enhancement of the tumour was similar to the other fibroids. The patient underwent a total abdominal hysterectomy with bilateral salpingo-oophorectomy. Pathologic examination indicated that tumor was nondifferenciated endometrial sarcoma G4.

FIRST CLINICAL EXPERIENCE IN SALVAGE PROSTATE CRYOTHERAPY - PRESENTATION OF 2 CASES

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Aim: evaluation of cryotherapy as a viable alternative for patients with prostate cancer (PCa) progression after primary treatment.

Material and methods: Cryotherapy is ablation of prostate tissue through local induction of extremely cold temperatures. Real-time transrectal ultrasound guidance allows monitoring of probes insertion and freezing. Using argon and helium gases freezing and thawing cycles are performed. Two patients, 70 and 68 year old males, with PCa treated with 3D conformal prostate radiotherapy, experienced biochemical relaps and were selected for salvage cryotherapy. CT, MR and bone scan showed no metastases or local progression for both patients. Both males received 2-cycles of cryotherapy with real-time ultrasound guidance and temperature change tracking.

Results: Postoperative period was uncomplicated.

Conclusion: The described treatment scheme fulfilled expectations, enabled to deliver two freezing-thawing cycles with 10 probes and uretra-warming catheter.

ENDOSONOGRAPHIC IMAGING OF PANCREATIC CYSTIC LESIONS: TEN YEAR EXPERIENCE OF SINGLE CENTER

Pukitis Aldis

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Aims. Endoscopic ultrasonography (EUS) guided fine-needle aspiration (FNA) in the management of high risk pancreatic cystic lesions with aspirate analysis (cytology, amylase content, carcinoembryonic antigen CEA) can help to distinguish premalignant and malignant cysts from benign ones. With aim to evaluate the role of diagnostic accuracy of EUS-FNA, an retrospective study was performed in Gastroenterology Center Pauls Stradins Clinical University Hospital, Riga.

Materials and methods. Patients who were considered for EUS-FNA examination had one or more pancreatic cystic lesions detected by US, EUS, MRI or CT. In total 218 patients (mean age 71.5 years) were involved.

Results. All pancreatic cystic lesions were considered for at least one single time EUS-FNA. Diagnostic sensitivity of malignancy using EUS alone (sens 80%, spec 77%, PPV 82%, NPV 82%) and EUS+FNA+cytology (sens 75%, spec 91%, PPV 98%, NPV 100%) was less than combined FNA+CEA+cytology+amylase (sens 99%, spec 97%, PPV96%, NPV 98%).

Conclusions. The results demonstrate that EUS-FNA helps in decision making for medical or surgical approach. EUS guided puncture of pancreatic cystic lesions is safe procedure (success rate up to 97,6%). Elevation of cystic fluid CEA is more useful than EUS imaging alone or cytology in diagnosis of potentially malignant mucinous cystic lesions. Combined CEA and cytology studies enhanced diagnostic sensitivity up to 99%.

UNEXPECTED FINDING ON CARDIAC CT IN ELIGIBILITY EVALUATION FOR TAVI

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Objectives: Transcatheter aortic valve replacement (TAVR) procedures show successful results in high-risk patients (PARTNER Trial, NEJM 2010).

Case report description: the patient 72 -year old male with critical aortic valve stenosis was referred for additional investigation and eligibility for TAVR. Results of the cardiac CT examination:

Clinical summary: critical aortic valve stenosis, suspected prior infectious endocarditis resulting in paravalvular abscess formation, leading to paravalvular fistulas with communication between LVOT to LCS and NCS. Differential diagnosis of blood clots or metastasis in the coronary sinuses.

EFFECTIVENESS OF DUPLEX DOPPLEROGRAPHY IN DIAGNOSING EXTRACRANIAL CAROTID ARTERY STENOSIS

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Aim: Clinical decision making for carotid surgery depends largely upon stenosis grade. This study evaluated the effectiveness of duplex dopplerography (DUS) in diagnosing significant stenosis (≥70%) of the internal carotid arteries (ICA).

Materials and Methods: DUS results of patients with ICA stenosis ≥70% who has been operated on in P.Stradina CUH were retrospectively analyzed then correlated with the computed tomography angiography (CTA). A total of 161 patient were analyzed. The degree of stenosis on DUS has been evaluated using: Peak systolic velocity (PSV), End diastolic velocity (EDV), and PSV ratio between ICA and the common carotid artery (CCA) PSVICA/PSVCCA. Obtained data were compared with the data of CTA in diagnosing the degree of stenosis using the NASCET and ECST methodology.

Results: DUS at P.Stradina CUH have high correlation with MDCTA: Pearson's coefficient was r=0,782(p<0,0001), sensitivity and specificity of 96,8% and of 36,11% corresponding.

Conclusion: DUS examinations carried out at P. Stradina CUH were of high diagnostic accuracy and, DUS is an effective method for diagnosing significant stenosis of extracranial carotid arteries. However, due to the current lack of internal quality control, it is necessary to approve the results of DUS with CTA.

PULMONARY COMPUTED TOMOGRAPHY (CT) FINDINGS IN HODGKIN LYMPHOMA PATIENTS RECIEVING SPECIFIC TREATMENT

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Aim: To evaluate the occurrence and typical CT findings in Hodgkin lymphoma patients.

Materials and Methods: In this retrospective study, CT studies of 131 patients (58 men and 73 women, mean age 40,2 years) with Hodgkin lymphoma who were in our hospital during 15 months (Jan 2011 – May 2012) were reviewed by experienced radiologists. All lung tissue changes were divided into three specific groups - drug induced, infection-related, and post-radiation or nonspecific. The most characteristic CT findings in every group were described.

Results: 45 patients had detectable CT changes. 5 patients had chemotherapy induced lung changes (3,8%), 16 had infections (12,2%), 24 had nonspecific or post-radiation changes (18,3%) and 86 patients had no detectable changes in the lungs (65,6%).

Conclusion: The typical radiologic feature in therapy-induced lung disease is acute interstitial reaction. Patchy changes are characteristic to infection and fibrosis is a common nonspecific finding.

HYBRID IMAGING IN SUSPECTED CAD: INITIAL EXPERIENCE IN VUH SANTARISKIU KLINIKOS

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Aim. Exercise electrocardiography (ECG) is one of the first steps in evaluation of patients with chest pain assumed to be of a cardiac origin. However, rather modest sensitivity and specificity, dependency on baseline ECG changes and not infrequently ambiguity of results, makes exercise ECG of limited value and warrants further non-invasive testing. Myocardial perfusion scintigraphy (MPS) with a capability to detect inducible ischemia does not exclude non-obstructive coronary artery disease (CAD), whereas cardiac computed tomography (CCT) accurately detects early CAD with insufficient accuracy in predicting hemodynamic significance of intermediate lesions. Our aim was to evaluate added value of combining MPS and CCT in diagnosis of CAD in stable symptomatic patients and equivocal exercise ECG results.

Materials and methods. 35 patients with ambiguous exercise ECG were referred for non-invasive imaging. Patients with inconclusive non-invasive imaging (15 after MPS and 20 after CCT) underwent CCT or MPS respectively.

Results. After integrated non-invasive imaging invasive coronary angiography was avoided in 27 patients (77,1%). Invasive coronary angiography in 2 patients with 3 vessel disease on CCT showed significant CAD leading to subsequent therapeutic interventions. In 6 patients with abnormalities on CCT or SPECT invasive coronary angiography excluded significant CAD.

Conclusion. Integrated non-invasive imaging allows comprehensive evaluation of suspected CAD in majority of patients obviating the need for diagnostic invasive coronary angiography.

SPECT/CT IN DETERMINATION OF CHOICE OF REVASCULARIZATION IN PATIENTS WITH CONGESTIVE HEART FAILURE

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Aim: This study aimed to evaluate the role of MPI in detection of ischemic myocardial lesion and dysfunction in choice of therapy in patients with congestive heart failure (CHF).

Material and Methods: Patients underwent SPECT/CT MPI. 2 day protocol with 99mTc labeled tracer. Stress test combined - Adenosine stress and low workload exercise test.

Results: 50 patients (28 men and 22 women). 9 had anamnesis of MI. 5 of those had SSS>13 and 4 had scar on ECG. All 9 had diagnosis of CHF, mainly NYHA II class. 30 without ischemic changes in stress test also where negative on MPI. 13 with positive stress test had SSS<4.

Conclusion: Patients with positive stress test and negative MPI, with both negative findings, patients with scar remain on medications. Patients with positive stress test and positive MPI (6) underwent revascularization. MPI helps to reduce unnecessary interventional therapy.

DIAGNOSTICS OF METATSTATIC PROCESS IN BLOOD VESSELS

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Patients with oncologic pathologies commonly have typical location of metastatic processes according to primary process. Metastatic process in blood vessels has been described relatively rare.female, 66 years old, 20 years ago underwent mastectomy due to cancer of glandula mammae,

Cardiac CT and cardiac MRimaging revealed masses in the left side pulmonary vein in upper lung segment. Addititional analysis was performed in order to precise the finding (with heart triggering). Conclusion. Metastatic process in blood vessels is rare but possible clinical finding. Long-term successful clinical data sometimes are not enough for exclusion of relapses of malignant process and carefull imaging methods are useful for identification of possible relapses and complications.

ARTIFACTS IN MRI: OVERVIEW, CAUSES AND POSSIBLE CORRECTION METHODS

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The aim: many different kinds of artifacts can occur during magnetic resonance imaging (MRI) scan. Some of them affecting the diagnostic quality, while others may be confused with pathology. It is important to recognise these artifacts and have a basic understanding of their origin, especially those mimicking pathology, cause wrong diagnosis can have serious after-effects on patients health.

Materials and methods: many MRI radiological images and records were investigated by searching artifacts. We could find many MRI artefacts like chemical shift artifact, aliasing artifact, black boundary artifact, field inhomogeneity problems, Moire fringes, magic angle effects and more.

This article presents an overview of these artifacts also about possible rectifying methods to fix them.

Results: an artifact is an artificial feature appearing in an image that is not present in the original object. Artifacts can be classified as patient related, signal processing dependent, hardware related or even because of physics restrictions. Several techniques are developed to reduce or completely fix these artifacts.

Conclusion: the knowledge of MRI artifacts and noise producing factors is important for continuing maintenance of high iamge quality. Many artefacts are affecting the diagnostic quality, and may be confused with pathology. It is important to recognise these artifacts and have a basic understanding of their origin. It is important to know about possible rectifying methods to fix artefacts and improve image quality and make the right diagnosis.

THE USE OF CT IN PEDIATRIC PRACTICE

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Aim. To identify the indications, radiation doses and findings in CT investigations on children investigated on different machines at Tartu University Hospital.

Materials and methods. The data on radiation doses, indications for examination and findings in CT investigations in pediatric patients were collected Nov'11 to May'12.

Results. In total, 267 CT procedures were fulfilled on 229 children. The main reasons for scanning were headache and head trauma, therefore in 73% of the cases the region examined was head. The children were sent to CT investigations mainly by pediatric neurologists and emergency medicine physicians. Pathological findings were seen in 36% of the CT scans, in 64% of the CT scans no abnormalities were found. The average effective dose the patients received in the head region was discovered to be 1,4 mSv.

Conclusion. Main indications for scanning were headache and head trauma. Approximately two thirds of the studies were described as normal. The average effective dose the patients received in the head region was discovered to be 1,4 mSv.

SUPERSELECTIVE EMBOLIZATION OF RENAL PSEUDOANEURYSM

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Aim: To present a superselective embolization for renal pseudoaneurysm as an effective and minimally invasive technique to avoid unnecessary exploration of the kidney.

Material and methods: A 66-year old man presented with macrohematuria. A month before he had simultaneous partial right nephrectomy and resection of caudal pancreas. Right kidney 3D Ultrasound showed 30mm arterial pseudoaneurysm at medial-dorsal surface. General condition was normal, he had mild anaemia, felt no pain. Arterial pseudoaneurysm was confirmed and superselectively embolized during angiography. 3 spiral coils were placed to subsegmental arteries. 3 additional coils were placed after 4 days, because hemorrhage recurred.

Results: macrohematuria disappeared, renal function sustains normal, patient has no any complaints. CT shows good right kidney blood flow.

Conclusion: superselective embolization of pseudoaneurysms is effective treatment method with maximal preservation of renal function.

POSITIONAL STABILITY OF NELLIX ENDOGRAFT AFTER EVAR

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Aim. Endovascular aneurysm repair (EVAR) is a minimally invasive technique for abdominal aortic aneurysm (AAA) repair. 10-20% of patients with third-generation devices require reparative secondary procedures with the endograft migration as the dominating cause for the secondary intervention. The Nellix sac-anchoring endoprosthesis from Endologix Inc. could potentially eliminate the risk of device migration. The purpose of this study was to evaluate the mid-term incidence of longitudinal and sideway endoframe displacement.

Materials and Methods. Between the year 2008 and 2012, 32 patients were treated with Nellix endograft in three clinical sites (Latvia, New Zealand, Venezuela) participating in prospective multicentre trial. Device position at 1st month post EVAR was compared with the 1st and 2nd year CTA data. Evaluation of device migration in longitudinal direction was assessed relative to the orifice of most caudal renal artery, while transversal migration was assessed relative to most ventral point of reference vertebra.

Results. The very limited device movement was observed in both transversal and longitudinal direction. Average increase of distance between endoframes in antero-posterior direction was by 0.7 mm/year, and between centers of endoframes by 1.0 mm/year ($p<0.0001$). The device average longitudinal displacement was 0.9 mm/year ($p<0.0006$). No one clinical event was related to the detected endograft movement.

Conclusion. Nellix endoprostheses demonstrated very limited stent-prosthesis movement during first 2 year follow-up. More prolonged device positional stability follow-up data are needed to prove the long-term advantages of Nellix EVAR device.

HAEMODYNAMICAL CORRELATION OF ABDOMINAL AORTIC ANEURYSMS NEW STYLE STENT ENDOPROSTHESIS DEFORMATION

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Creation of a new endovascular devices to support the sacs, filled with polymer, can gain a better fixation, effectively excluding the aneurysmal sac from the blood circulation and limiting endoprosthesis stent deformation and migration, as compared with self-expandable stent prostheses. The objective is to show that endoprosthesis stent deformation found by computed angiography(CTA) is correlated with hemodynamic changes following duplex dopplerography(DUS). The degree of stenosis was examined by CTA, using area measurements and angular deflection. The following was assessed by using DUS: peak systolic flow velocity (PSV), hemodynamic profile (PH) in endoprosthesis stent and prosthetic diameter area. The following was assessed by using DUS: PSV, PH in endoprosthesis stent and prosthetic diameter area. The first clinical results show a good correlation between DUS and CTA methods following evaluations of deformation.

TRANSCATHETER ENDOVASCULAR EMBOLIZATION (TAE) FOR TREATMENT OF ACUTE RENOVASCULAR DISEASES (RVD)

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AIM. The purpose of this retrospective study was to evaluate one center experience of TAE for treatment of acute noncanceromatous RVD.

MATERIALS AND METHODS. 15 patients (median age 41 ± 15, 93 years) underwent renal artery TAE for RVD therapy. Etiology, indications, findings in digital subtraction angiography, incidence of complications, technical and short term clinical success were retrospectively analyzed.

RESULTS. 10 noniatrogenic acute RVD cases: 4-bleeding arteriovenous malformations, including arteriovenous fistula, 4- grade III-IV renal trauma, 1-spontaneous bleeding from suprarenal artery, 1-bleeding angiomiolipoma. 5 iatrogenic RVD cases: 1 after renal biopsy, 1 after percutaneous nephrolithotomy, 1 after percutaneous nefrostomy, 2-pseudoaneurysms after sectoral kidney resection. Embolization materials used: peripheral coils in all 15 cases, in 1 case gelatine sponge particals and microbeads were used as an occlusion material. No major postembolization complications noted. All procedures were technically and clinically successful. In 2 patients TAE performed in a solitary kidney. There were no nephrectomies after TAE.

CONCLUSION. TAE is an effective, minimally invasive and potentially kidney preserving method for treatment of acute RVD.

MID-TERM RESULTS OF STENT-ASSISTED COILING OF INTRACRANIAL ANEURYSMS: SINGLE CENTER EXPERIENCE

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Background: Stent-assisted coiling has expanded the treatment of intracranial aneurysms, but the rates of restenosis and recurrence are not yet well known.

Methods: Post-op and FU angiography data from year 2011 were retrospectively analyzed. Treatment was attempted in 35 aneurysms, 54.3% of them ruptured.

Results: In 34 of 35 aneurysms, stent deployment was successful. In 14 (42.4%) aneurysms immediate angiography showed total occlusion. Residual sac perfusion was seen in 19 cases (57.6%). A total of 63.6% of aneurysms treated with stents have been followed with the mean follow-up period of 15.4 months and disclosed no recurrence after primary total occlusion. In 23.8% improvement in aneurysmal occlusion rate was detected. In 14.3% the follow-up disclosed recurrence after initially incomplete sac occlusion. No stent-related restenosis was detected.

Conclusion: Stent-assisted coiling was associated with decrease of recurrences after initially complete aneurysmal sac occlusion.

ENDOVASCULAR TREATMENT OF TRAUMATIC BLEEDING FROM PERIPHERAL AND VISCERAL ARTERIES

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Purpose. To analyze one center experience of transcatheter endoarterial embolization (TAE) for treatment of acute traumatic bleeding.

Materials. 8 patients underwent TAE for traumatic bleeding. Trauma type, findings in CT and digital subtraction angiography, embolization material and technical/clinical success were analyzed.

Results. TAE was performed in: 2 patients with spleen laceration and active intraparenchymal/subcapsular bleeding, 4-grade III-IV blunt renal trauma, 1-pelvic fracture with retroperitoneal bleeding, 1-after blunt trauma with active retroperitoneal lumbal artery bleeding. In 6 patients peripheral coils were used as solitary embolization material, in 2 patients "sandwich" technique was used. In all patients TAE was technically and clinically successful, no rebleeding was detected. No significant intraoperative or postoperative complications noted.

Conclusion. TAE is safe, minimally invasive and effective treatment for acute traumatic peripheral and visceral bleeding.

TRANSJUGULAR INTRAHEPATIC PORTOSYSTEMIC SHUNT: A SINGLE CENTRE EXPERIENCE FROM LATVIA

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Background: TIPS is the formation of a low resistance canal between a portal vein and a hepatic vein by placement of an intrahepatic stent. TIPS are used for managing complications of portal hypertension.

Aim: The aim of our study was to review our experience with TIPS and analyze the results with emphasis on patient selection, indications, relief of symptoms and 1 year survival.

Materials and Methods: A retrospective case note review of 29 TIPS procedures performed in Riga Eastern Clinical University Hospital from January 2009 to November 2011 was completed. Data included: demographics, indications for TIPS, underlying liver disease, Child-Pugh, model of end-stage liver disease (MELD) and EMORY scores. Shunt type, patency, hepatic veins-portal gradient (HVPG), time of procedure, additional procedures and method of follow-up were also recorded. Statistical analysis was performed using SPSS Statistics 17.0 software package.

Results: 29 patients (mean age 49, range 19-72) were treated with TIPS over the study period. We were able to obtain follow up information about 21 (78%) patients. After 1 year of follow up 2 (10%) patients had shunt dysfunction, 9 (43%) patients had serious complications. In all other patients (47%), the result was good.

Conclusion: Our first experience with TIPS in Latvia is positive. We were able to achieve optimal reduction of HVPG and our outcomes post-TIPS are similar to those reported by other institutions.

PRIMARY LEIOMYOSARCOMA OF BONE: CASE REPORT AND LITERATURE REVIEW

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Introduction: Leiomyosarcoma is an aggressive soft tissue sarcoma derived from smooth muscle cells typically of uterine, gastrointestinal or soft tissue origin. Sarcomas are malignant tumors arising from mesenchymal cell lines. They comprise a heterogeneous group of cancers, each with unique clinical, histologic, and radiographic characteristics. Of all soft tissue sarcomas, approximately 5-10% are leiomyosarcomas.

Primary leiomyosarcoma of bone is a distinct entity, which is quite rare (approximately 0,1-0,64 % of all confirmed primary bone tumors, in the literature in English from 1965 are only about 100 publications), histologically similar to soft tissue leiomyosarcoma and often occurs in long bones such as the femur and tibia. Clinical and imaging findings including radiographs, CT, ultrasound and MRI are described. The final diagnosis was made by histopathological, immunohistochemical, and ultrastructural study after biopsy.

Case description: we are presenting a rare case of moderately differentiated (G2) primary leiomyosarcoma and pathological fracture of the right distal tibia in a 48 year woman who suffered from pain in the right distal tibia and ankle. A lytic right distal tibia mass with soft tissue component and vascularization was observed on conventional radiology, CT and CT angiography studies, and extension to surrounding soft tissue mass was observed with ultrasound and magnetic resonance imaging. Histopathology and immunohistochemical results of biopsy and curettage of the lesion confirmed the diagnosis.

Discussion: This case illustrates the main radiological methods in the management of diagnosis of the rare primary bone tumor.

SPINAL GLIOBLASTOMA MULTIFORME: A CASE PRESENTATION AND REVIEW OF THE LITERATURE

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Objective: Being the most common glial cell tumor of the adult brain, glioblastoma multiforme (GBM) is an extremely rare condition of the spinal cord. It may present with unspecific findings, making the diagnosis difficult to make.

Case description: We report a case of GMB of the conus medullaris in a young man who presented with an increasing weakness of the right foot, progressing to the paraparesis. MRI of the spinal cord revealed an unspeciffic diffuse lesion of the conus medullaris with moderate enlargement of the surrounding veins. The differential diagnosis was a demyelinating lesion, a tumor, probably AV fistula. The pathologic evaluation of biopsy was consistent with GMB.

Conclusions: We discuss the rarity of the GMB of the spinal cord and the related literature with regard to diagnostic difficulties. The most common intramedullary tumors are ependymomas and WHO grade II astrocytomas. GMB is a WHO grade IV astrocytoma - it‘s presentation in the conus medullaris is very rare.

DEFINING EPILEPSY USING DIFFUSION TENSOR IMAGING

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Aim of the study was to identify areas of fractional anisotropy changes in patients with TLE.

18 patients with TLE examined, 8 female, 10 male. All underwent MRI to obtain DT images. Statistical analysis was performed in FSL. We found decrease in FA: temporal lobes WM, frontal lobes WM, inferior longitudinal fascicle, superior longitudinal fascicle. There is decrease of FA in TLWM, in projection of lower hook and LongitFasc in patients with left-TLE. In patients with right-TLE FA was reduced in WM of left and right TL, in projection of SLF, left and right. Reduce of FA on affected side was observed in patients with left-TLE in left TL, SLF and the left hook. Differences between FA in patients with left-TLE and controls were present in projection of optic radiation, SLF and anterior thalamic radiance. In patients with right-TLE FA was lower in right temporal lobe, ILF, but percentage ratio, compared to rates in patients with left-TLE, was less.

COMBINED INTRAVENOUS THROMBOLYSIS AND THROMBECTOMY IN ACUTE STROKE PATIENTS IN TARTU, ESTONIA

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Intracranial mechanical thrombectomy is a new promising method for selected patients when i.v. thrombolysis has been unsuccessful or is contraindicated.

Aim. To present our first experience with intracranial thrombectomy in acute stroke patients.

Method. In Tartu University Hospital 4 patients (2 women, 2 men, age range 44–64 y) were treated with intracranial thrombectomy after unsuccessful i.v. thrombolysis during 2011–2012. Stentrievers TREVO and TREVO PRO 4 were used. Stroke severity was evaluated by the NIHSS.

Results. The mean NIHSS score before and 2 h after i.v. thrombolysis was 12 and 13, respectively. Total recanalization was achieved in 3 patients and partly in 1 patient. After thrombectomy all patients improved, the mean NIHSS score 7 days later was 5.

Conclusions. Intravenous thrombolysis with subsequent intracranial thrombectomy in our first patients was successful. Controlled clinical trials are needed to prove the effectiveness of this method in acute stroke care.

MR IMAGING OF PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA IN INMUNOCOMPETENT PATIENTS

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Primary central nervous system lymphoma (PCNSL) is a rare form of non-Hodgkin lymphoma that is frequently misdiagnosed. PNSL is highly sensitive to both radiation therapy and chemotherapy. To avoid an unnecessary extensive surgery, the diagnosis should be suspected after MRI.CNS lymphoma can have variable imaging findings, but certain features are characteristic. Supratentorial brain is the most frequently involved site, but can also affect the spinal cord, leptomeninges and eyes. PCNSL typically involves the periventricular and superficial regions of the brain. In non-immunosuppressed patients PCNSL tends to involve solitary parenchymal lesions that enhance homogenously. Oedema in the surrounding white matter is another common finding.Radiological signs of patients with neurolymphoma, researched and treated in the hospital Santariskiu klinikos compared with data described in literature.

MR-SPECTROSCOPY AND VOXEL-BASED MORPHOMETRY IN COMPLEX MR-DIAGNOSTICS OF MULTIPLE SCLEROSIS

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Introduction: Conventional MRI does not give quantitative data about pathological changes of the brain, such as the level of brain atrophy and metabolic changes. Voxel-based morphometry (VBM) and MR-spectroscopy make MR diagnostics of multiple sclerosis (MS) more complex.

Methods: 32 patients with relapsing-remitting MS and 20 healthy volunteers underwent MR investigation, which included conventional MRI, MR-spectroscopy and MR morphometry. SPM8 software package was used for VBM.

Results: The investigation showed reduction of N-acetylaspartate and creatine concentrations, NAA/Cho and NAA/Cr ratios and increase of choline and lactate concentrations, Cho/Cr ratio in brain lesions. VBM showed atrophy of gray matter of both hemispheres in particular in cingulated gyrus, hippocampus, uncus, basal ganglia and increase of cerebrospinal fluid volume between baseline and 2 year point.

Conclusions: VBM and MR-spectroscopy give additional quantitative information of brain lesions in MS patients.

APPLICATION OF THE SEMIAUTOMATED PROGRAM IN GLIOMA VOLUME MEASUREMENT

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Due to infiltrating, asymmetric growth of gliomas it is difficult to apply standard measurement methods, semiautomated methods are more precise and accurate in measuring tumors.

Aim: To evaluate application of SA program in glioma volume measurements, detect factors affecting the measurements, advantages and pitfalls.

Methods: 2 radiologists measured gliomas with SA and 3D methods and calculated tumor volumes by using standard formulas.

Results: The SA data showed high interoperator agreement and reproducibility ($p<0,01$), lower variability in volumes. High procentual interoperator difference was noted between SA and 3D volume values $3,27>2,23$ ($p<0.008$), $4,74>2,13$ ($p<0.0003$). 3D volumes were higher, the biggest difference in volume values was detected for Grade II, the lowest for Grade III-IV.

Conclusion: Method is easy, reliable, time-consuming, applicable for measuring active parts of HGG, non-regular LGG, visualization and measurement of demyelinating lesions and brain atrophy.

THE ROLE OF TLPS IN ARTERIOVENOUS SHUNTING MALFORMATION ASSESSEMENT

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AIM:

The clinical assessment of arteriovenous malformations (AVMs), including treatment response has traditionally been done by arteriography, mainly by looking for residual lesions. Transarterial lung perfusion scintigraphy (TLPS) has a unique role in determining the degree of shunting that occurs with an extremity AVM lesion. Additionally, TLPS is able to detect an assess a micro-AV shunting lesion, which can by easily missed by arteriography.

MATHERIALS AND METHODS:

The shunting volume of radioisotope-tagged macro-aggregated albumin injected into the arterial system of the affected limb was counted by TLPS just after the conventional angiography procedure (angiographically detected AVMs was embolized) for quantitative measure of shunting status and treatment response. The findings obtained were compared with a matching arteriographic findings.

RESULTS:

22 TLPS tests were performed on 21 patient (8 men) with AVM in the extremity. 11(52%) patients underwent embotherapy with mean shunting volume 50,13%(7,20-97,70%). Non treated patients 1,86%(0,1- 4,0%). One patient was treated by surgical resection (88,6% vs. 82% after the surgery).

CONCLUSIONS:

TLPS provides hemodynamic information of AVMs in extremities semiquantitatively. The results of TLPS showed a high concordance rate with angiographic findings. TLPS is useful for the diagnosis, post-therapeutic evaluation of AVMs in extremities.

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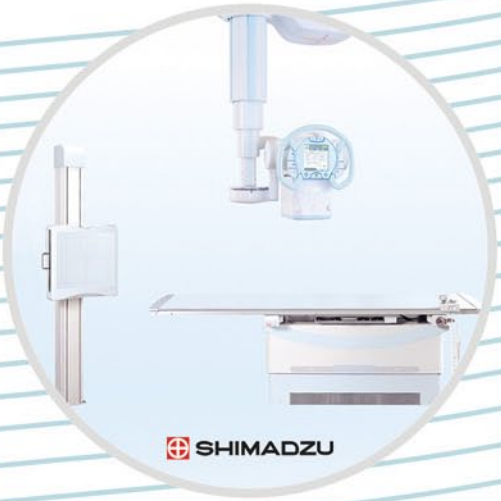

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