Clinical trials look set to shed new light on preoperative breast MRI

What are the most common MRI biomarkers for breast cancer? Is breast MRI really diagnosing more false positives than mammography? What changes for preoperative breast MRI can be expected after the latest clinical trials? These are among the important unanswered questions in breast MRI, and they will be discussed at today’s master class.

MRI is the most sensitive and accurate test for ipsilateral staging of breast cancer and for screening of synchronous contralateral cancer, according to Prof. Francesco Sardanelli from the Department of Biomedical Sciences for Health at the University of Milan and Director of Radiology at the Research Hospital Policlinico San Donato in Milan.

“Importantly, several studies showed that those lesions detected with preoperative breast MRI are relevant (invasive, sometimes larger than the index lesion, biologically aggressive, etc.),” he said. “However, its use has not so far been associated with a better patient outcome, reducing recurrence or improving survival. Conversely, in many observational studies, preoperative breast MRI was associated with an increased rate of mastectomies.”

Of four recent randomised controlled trials, two were in favour of preoperative breast MRI because there was a reduced re-operation rate and two were against because there was no reduction in the re-operation rate. In this context, the mantra was ‘preoperative breast MRI increases mastectomy but does not improve patient outcome,’ explained Sardanelli, who is Past President of the European Society of Breast Imaging (EUSOBI).

He thinks the Multicenter International Prospective meta Analysis (MITA) trial will shed more light on the matter: Initial results of about 2,500 patients (with a target of 7,000) from 28 centres worldwide show 50% of patients had an MRI examination before surgery. Radiologists requested preoperative breast MRI the most, but surgeons were involved (alone or with another professional) in 40% of the cases. Also, the patients for whom a preoperative breast MRI is requested have a mastectomy already planned before MRI in about 20% of cases and the increase in mastectomies after MRI is only 1%.

“Of those patients who have breast-conserving surgery, about 14% have more extensive surgery due to MRI but 12–13% have less extensive surgery,” Sardanelli noted. “The re-operation rate is lower in those patients who had an MRI, but this has to be read in the light of the higher rate of mastectomies.”

Sardanelli sees the MITA trial as a way to combat the mantra against preoperative breast MRI and show the tool allows for a tailored breast conservative surgical treatment, i.e., precision breast cancer surgery.

“Clinical practice evolves not only based on guidelines, which frequently change very slowly, but also based on practice and experience,” he said. “The condition for the use of preoperative breast MRI is a high-level cooperation between radiologists and surgeons.”

Meanwhile, Prof. Dr. Christiane Kuhl, a professor of radiology and the director of the Department of Diagnostic and Interventional Radiology at the University of Aachen in Germany urges ECR 2017 attendees to understand that not all false-positive diagnoses should be treated the same.

In breast imaging, a false-positive diagnosis is one where malignancy is suspected but neither ductal carcinoma in situ or invasive cancer is found. However, a more useful definition would be to distinguish between ‘actionable’ and ‘non-actionable’ disease, she said.

continued on page 3
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Breast tissue produces non-proliferative changes, proliferative changes without atypia, and proliferative changes with atypia. Non-proliferative changes are associated with a 0.7- to 1.1-fold risk of breast cancer, while proliferative changes without atypia are associated with a 1.7- to 3.1-fold risk, and changes with atypia are associated with a 3.7- to 5.2-fold risk.

"Not all false positives are equal," she said. "The most important reason for mammography false positives is calcifications caused by regressive changes. It has nothing to do with cancer progression. As opposed to MRI with contrast enhancement, in cases with cell proliferation and atypia, this is the first step of carcinogenesis. This is something else. It has another connotation and implication for the patient. Calling it a 'false positive' is not appropriate."

In particular, certain kinds of lesions are associated with an increased risk of breast cancer. Atypical ductal hyperplasia is associated with a 40% increased risk of breast cancer and lobular intraepithelial neoplasia and flat epithelial atypia are both associated with a 21% increased risk. These lesions are treated with intensified surveillance and possibly tamoxifen, so while they may be called false positives on MRI, they are not completely harmless, even though they are still categorized as benign, added Kuhl, who is a keen advocate of abbreviated breast MRI studies (see Figure). MRI depicts a biologic continuum and many false positives are caused by the fact the continuum is divided into lesions that require treatment and lesions that do not, but MRI false positives are much closer to finding something that could lead to cancer than a false positive found on mammography, she continued.

"Cancer is not a black and white thing. There are shades of grey," Kuhl stated. "There is an entire process of breast cancer development and with MRI we depict this process. We are able to see changes that have many features of cancer, and that may develop into cancer." With an increased understanding of the prognostic importance of tissue changes, benign is too simple a phrase, she pointed out. "Benign" could mean potential to progress to invasive cancer.

"It’s time to rethink the nomenclature," she concluded.
HOT SHOTS
FROM DAY 4

Photography: S. Kreuzberger, F. Hübl
Sidra Medical and Research Center in Qatar is recruiting Sonographers and Radiographers

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From infectious diseases to imaging mummies: Peru set to amaze ECR delegates

Peruvian radiologists will reveal the secrets of pre-Incan civilisation and offer up-to-date knowledge of tuberculosis imaging during the ‘ESR meets Peru’ session. Immediate Past President of the Peruvian Society of Radiology Prof. Jorge Luis Guerrero Gil from Lima, Peru, gave a preview of the programme in an exclusive interview with ECR Today.

**ECR Today: Infectious diseases are a highlight of the programme for this session. What can Peruvian radiologists teach Europeans in that area?**

Prof. Jorge Luis Guerrero Gil: As in any other developing country, infectious diseases continue to be very common in Peru. Tuberculosis (TB) in particular is a population, healthcare and economic problem, and a major cause of morbidity among young adults. Medical imaging is of tremendous help in differential diagnosis of TB, and MRI has been shown to surpass CT in evaluating patients with suspected meningitis and its associated complications—hydrocephalus, vasculitis, cranial nerve involvement, and associated multiple tuberculomas.

In tuberculous spondylodiscitis, MRI is currently the modality of choice as it can be used to detect soft tissue and bone marrow changes better than any other imaging tool. MR spectroscopy, diffusion imaging and MR angiography can indicate that the patient is infected. X-ray images help in differentiating conditions that mimic tuberculosis.

In the diagnosis of infectious diseases, radiology helps identify the extension of disease and evaluate diseases, radiology helps identify the tissue and bone marrow changes associated with the disease. They also practiced cranial trepanation, one of the oldest surgical procedures for which there is archaeological evidence. Computed tomography and x-ray studies confirmed that some of the people who underwent the procedure survived the treatment, as both modalities showed signs of cicatrization such as new growth and trepanation closure in skull bones.

In the second interlude, we will also show what mummification consists of and how it can be carried out either in the artificial way as on Egyptian mummmies or mummmification that occurs naturally depending on climatic conditions. In desert areas organs dehydrate and dry up, and at high altitudes such as in the Andes Mountains, organs freeze with low temperatures. Extreme cold does not dry up organs though, but it creates fat saponification, a process that leaves the organs almost intact.

**JLGG: What other issues will the delegation tackle during the ‘ESR meets Peru’ session?**

Peru is a Latin American country and it has its own peculiarities, multiple geographical conditions and irregular demography distribution. We are about 35 million people and our cities have different conditions of life. A few modern cities, especially on the coast, have a good level of healthcare and education facilities, whereas many other areas in the mountains and jungle do not have such good access to care.

Peru has an insufficient centralised political environment and we will show how it affects radiology practice: centralism causes irregular distribution of hospitals, and educational and population resources in the country. So unfortunately access to radiology is far from homogeneous.

**ECRT: What are the current challenges faced by the specialty in your country?**

JLGG: Every radiology modality is available in Lima and in large cities, especially on the coast. There are only two FERCT scanners in the whole country both in the capital, Lima. Radiologists are distributed unequally across the country; there are about 400 in Lima and half of us work in Lima. About half are not yet members of the Peruvian Society of Radiology.

The best hospitals, clinics and universities are in the main cities. There are 25 universities in Peru, 15 of which have medical schools. There is only one national programme of residency and a three-year training in radiology is included. Approximately ten universities in different hospitals and clinics are able to train to 40 radiologists a year, most of which are in Lima. Unfortunately we do not have any subspecialisation programmes; therefore most of our radiologists need to do fellowships abroad or acquire the experience at work. The Peruvian Society of Radiology is dealing with the Peruvian Medical College to obtain supervision of radiologists’ training and profession. We hope we can achieve this goal, as this would give more power to our society and help the specialty to develop more.

**ECRT: How does the situation compare to neighbouring countries?**

JLGG: Economically we are lagging behind our neighbours in Brazil, Chile and Argentina are way ahead of us. However I think our professional quality is excellent and perhaps superior to that of any radiologist in Europe, in the United States or Latin America. Let me tell you why: in the United States a neuro-radiologist works in neuroradiology but they do not know that much about ultrasound, mammography and head and neck or abdominal imaging. For instance: On the other hand, a Peruvian radiologist has complete knowledge of radiology and can perform examinations with x-rays, mammography, ultrasound, computed tomography and magnetic resonance imaging in the chest or abdomen, etc.

**ECRT: What benefits do you expect to come from your participation at the ECR?**

JLGG: I would like it very much if this could open up possibilities for Peruvian radiologists to come to Europe and train in interventional, paediatric and MSK radiology as the opportunities to do so in Peru are very rare, if not almost impossible. But sustaining programmes in Latin America from Europe would cost a lot and Peru has very limited economic resources.

So it would be fantastic if the ESR had resources to invest in Peruvian radiologists’ training, for instance by paying a Spanish radiologist a sabbatical year to come to Peru and by funding an interventional radiology programme at one of our hospitals, so that they can train further interventional, paediatric or oncological radiologists in the future.

**ESR meets Session**

Sunday, March 5, 10:30–12:00, Room B

**ESR meets Peru**

**ESR meets Peru**

<table>
<thead>
<tr>
<th><strong>Presentation</strong></th>
<th><strong>Country/University</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction: Peruvian radiology: how is it going?</strong></td>
<td>P. Tapia Puente Arnao; Lima/PE</td>
</tr>
<tr>
<td><strong>MRI findings in CNS tuberculosis</strong></td>
<td>R. Marquina Diaz; Lima/PE</td>
</tr>
<tr>
<td><strong>Interlude: From Peruvian mummies to bones: use of x-rays in Peruvian archaeology (part 1)</strong></td>
<td>P. Tapia Puente Arnao; Lima/PE</td>
</tr>
<tr>
<td><strong>Interlude: From Peruvian mummies to bones: use of x-rays in Peruvian archaeology (part 2)</strong></td>
<td>P. Tapia Puente Arnao; Lima/PE</td>
</tr>
<tr>
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<td>P. Tapia Puente Arnao; Lima/PE</td>
</tr>
<tr>
<td><strong>Non-diagnosed spondylarthritises in MRI of the spine for lower back pain</strong></td>
<td>J. Carpio; Lima/PE</td>
</tr>
<tr>
<td><strong>Panel discussion: Is MRI the gold standard in CNS infection disease?</strong></td>
<td>P. Tapia Puente Arnao; Lima/PE</td>
</tr>
</tbody>
</table>

**By Mélisande Rouger**

![X-ray of a mummy of a young girl wrapped with many blankets in the fetal position.](image1)

![Note the typical deformation of the dorsal spine caused by Post’s disease.](image2)

![Note the trephine hole with irregular growing edges, indicating that the patient survived and the wound healed.](image3)

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For more information, please visit www.cirse.org/esir2017
By Frances Rylands-Monk

On the frontline: taking good care of logistics can reduce errors in emergency radiology

Errors in medicine have become headline news in recent years, and legal action against physicians for alleged malpractice in every specialty is an increasing problem in all industrialised countries. Radiology is not exempt from this phenomenon. Emergency radiologists must therefore learn how best to safeguard their practice against human error and champion processes that will prevent systematic flaws.

Because emergency radiology is the sharp end of diagnostic imaging, establishing systems and human factors will make a palpable difference to outcomes in real-time, according to Dr. Paul McCoubrie, human factors adviser at the U.K. Royal College of Radiologists (RCR) and consultant radiologist at Southmead Hospital National Health Service (NHS) Trust, Bristol, U.K. Even so, many radiologists are set up to fail without their knowledge, and they must be vigilant about how the department is organised.

“Some environments are relati-\nvely medieval in terms of physical layout. Hospitals are happy to pay salaries and for medical equipment, but may not automatically pay for a comfortable chair or an ergonomic desk, and nor might they consider lighting or temperature as priority spending areas,” he told ECR Today.

It’s necessary to address these basic conditions for safe practice with management, and keeping quiet is tacit compliance, according to McCoubrie. Radiologists must also crusade for a satisfactory workflow by assessing how well the department is organised with regard to layout and what roles are assigned to staff members. Consulta-\ntions and reporting spaces are usually randomly allocated around a department, and this means that time is wasted when clinical colleagues come looking for the duty consultant. In addition, inter-\nruptions can trigger errors.

The radiology department of the three-year-old Southmead Hospi-\ntal was designed with a separate emergency zone so that clinicians can always find the duty radiolo-\gist without interrupting other staff. In this way the duty radio-\nlogist keeps ‘traffic’ away from the main department. Furthermore, the hospital also employs a coor-\ndinator as the point of contact for non-radiology personnel. The coor-\ndinator uses a telesales-type script to get calls through to the correct staff member. The creation of this role has reduced telephone inter-\nruptions by 75% for emergency queries about inpatients.

Some staff know who everybody is and where they can be found. When these seniors retire the department in question gets swamped with phone calls and visits,” he said. “Two years ago, we studied the number of interruptions to the duty radiologist and the average was a call or visit every 6 minutes in a 24 hour period. Radiologists couldn’t get anything done, especially during the daytime when interventions peaked. The coordinator and the script were necessary.”

The post of coordinator is fund-\ned during office hours Monday to Friday and the service is now 24/7 more productive in terms of reporting, McCoubrie noted.

He believes that improving effi-\nciency by changing workflow and small modifications such as provi-\nsing comfortable desks, chairs and work spaces, could go a long way towards solving staff shortages. He cited a cross-sectional survey sent by email several years ago which revealed poor ergonomic practice and occupational injury were widespread in the U.K.

“Good radiologists in bad environ-\nments will suffer from burn out. Happy radiologists in good environ-\nments will be highly productive, efficient, and ensure patient safety,” McCoubrie said. “It only takes one radiologist to speak out, for others to realise there is an issue.”

It is crucial to encourage a cul-\nture of safety within radiology departments, where in the event of a diagnostic error, medical staff can discuss it together, noted Dr. Antonio Pinto, PhD, emergency radiologist at the Cardarelli Hos-\npitale, Naples and President of the Ethics and Forensic Radiology Sec-\n\ntion of the Italian Society of Medi-\ncal Imaging (ISIRM).

“Diagnostic radiology must aim for the complete detection – and accurate diagnosis – of all abnor-\malties. This depends entirely on perception and identification of specific image characteristics,” he said.

While radiologists fear missing a diagnosis, this should be seen as a learning opportunity both individually and corporately, and this requires a critical appraisal of practice through error meetings and the implementation of change, he added. Only by uncovering and highlighting error traps can repetition of the same mistakes be avoided, and there is a need for accredited residency programmes to actively organise such meetings, which should be viewed as integral to continuing medical education.

His talk on errors in non-trau-\matic abdominal emergency will reveal a range of potential mistakes from the less severe to the more life-threatening, and provide tips on how to avoid the most common errors when diagnosing severity of disease and associated complica-\\ntions that could affect management and clinical outcome.

“Diagnostic radiology must aim for the complete detection – and accurate diagnosis – of all abnormalities. This depends entirely on perception and identification of specific image characteristics,” he said.

Cross-table lateral radiograph of the abdomen. Evidence of a translucent image was not correctly interpreted as pneumoperitoneum. (Provided by Dr. Antonio Pinto)

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Special Focus Session
Sunday, March 5, 08:30-10:00, Room F1
SF 17b Errors in emergency radiology
• Chairman’s introduction: Why do radiological errors occur?
  A. Brady, Cork
  • Imaging in multiple trauma
    U. Linzenmaier; Munich/DK
  • Non-traumatic abdominal emergencies
    A. Pinto, Naples/IT
  • How not to fail in emergency radiology
    P. McCoubrie; Bristol/UK
  • Panel discussion: Errors in radiology: inevitable or preventable?
Radiographers have central role in paediatric imaging to avoid misconceptions of risk

As public attention on the dangers of radiation exposure increases, never before has communication between radiographer and patient been more important. Pressure is growing for radiographers to implement strategies that both reassure paediatric patients and facilitate cooperation, while maximising use of new technology to improve image quality.

This topic should be of major interest to all radiographers, especially those who don’t work in a dedicated paediatric department, as their experience will not be as vast, according to Prof. Graçiano Paulo, PhD, vice president of Coimbra Health School (Escola de Saúde de Coimbra) and chair of the scientific board of the Medical Imaging & Radiotherapy Course.

Speaking to ECR Today ahead of today’s session, he underlined how radiographers must harness new technological features for delivering the most adequate diagnostic images with lowest radiation exposure.

“New equipment won’t necessarily reduce dose. These needs to be a bridge between new technology and learning how to use it,” Paulo noted. “Dose reduction should be a permanent topic on the radiographer agenda because these professionals are often the only contact point between patient, parents and technology.”

First, a deep commitment to dose reduction is required from the head of the imaging department and the chief radiographer. These leaders must motivate and empower imaging teams to change the paradigm.

“There is high heterogeneity in the way each team member works – something that I define as the ‘T’ problem,” he noted, pointing to the need to create a team to lead the optimisation programme and then audit current practice and implement corrections if needed.

To adhere to the ALARA (as low as reasonably achievable) principle in daily paediatric practice, radiographers should know how to use all the technological features of the equipment and call the vendor if they don’t understand something, according to Paulo. In addition, they should use the anti-scatter grid only when necessary and clinically recommended, correctly use the additional filtration, adapt the exposure parameters to the patient size, establish local diagnostic reference levels (DLRs) and implement regular clinical audits.

Coimbra Health School runs dedicated tailored courses in radiation protection, which can be a stepping stone to developing a master’s degree in patient safety and dose optimisation. Furthermore, in cooperation with the Portuguese Society of Interventional Cardiology, the Medical Imaging Department has committed to delivering lifelong learning aimed at all health professionals involved in fluoroscopy-guided procedures.

“Nerobas is advancing fast and health professionals are not getting the information they need to catch up. The courses are meant to respond to the exponential growth of medical imaging, especially in CT and interventional radiology,” be said. “However, education and training must be supported by a departmental commitment to improving radiation safety culture.”

Safety culture involves regular departmental meetings to review and adopt protocols. Furthermore, the core team of medical physicists, radiologists and radiographers must audit and assess their work to implement dose optimisation in daily practice. For effective assessment, data regarding dose exposure, parameters, protocol, and patient characteristics must also be collected.

“By comparing this data, we can determine whether we can optimise dose further without compromising diagnostic purpose. If images must be retaken because quality was not good enough first time around, then the patient receives even more dose,” he concluded.

Informed consent

Radiographers must also take time to engage in a benefit-risk dialogue with children and their parents or guardians. This empowers children and their families by making them part of the decision-making process, which will reduce any anxiety. According to Paulo, “never assume the risk is obvious and that the patient or family has to ensure that an appropriately indicated examination may be considered ‘adequate’, while being mindful not to cause undue worry and staff must take the time to listen to any concerns the patient or family may have to ensure that an appropriately indicated examination is not refused on the basis of a misconception of the risks involved, he said.”

Never assume that information has already been provided and understood, and be aware the perception of risk may differ from the reality of risk,” Portelli concluded.

Special Focus Session

Sunday, March 5, 08:30–10:00, Room K
SF 1rc: How do radiographers enhance paediatric imaging?
• Chairmen’s introduction: The role of the radiographer when imaging a paediatric patient
  E. Sorantin, Graz/AT
  J. Portelli, Msida/MT
  E. Sorantin, Graz/AT
• Informed consent: is this possible in paediatric imaging?
  J. Portelli, Msida/MT
• Dose reduction in paediatric imaging
  G. Paulo, Coimbra/PT
• Personality traits: a way of maximising cooperation during paediatric imaging
  S.J. Mackay, Liverpool/UK
• Panel discussion: Challenges and opportunities when imaging paediatric patients

This session is part of the EuroSafe Imaging campaign.
Imaging and reporting of traumatic brain injury

Neuroimaging plays a critical role in the evaluation of patients with traumatic brain injury (TBI). In today’s ECR Master Class on Imaging of traumatic brain injury, researchers will debate hot topics such as new MRI techniques and computer-aided diagnosis software, illustrating that TBI imaging is a rapidly evolving field, which not only helps to improve patient management, but also the prediction of the functional outcome.

TBI is a common and potentially devastating clinical problem and remains an important cause of death and disability. Early diagnosis and proper management, especially within the first 6 hours of the injury, can significantly alter the clinical course. Therefore, neuroimaging techniques have become a cornerstone of the clinical management of head injury patients.

Light and magnetic resonance imaging (MRI) are the imaging modalities of choice in TBI. MRI is superior to computed tomography (CT) in detecting subtle injuries, such as diffuse axonal injury (DAI), and in the assessment of long-term sequelae.

In the acute setting, imaging studies can determine the presence and extent of the injuries, as well as guide minimally invasive interventions and surgical planning. By providing important anatomic localization and navigation information, determining extracranial landmarks to help to plan the surgical approach, and by guiding the placement of burr holes. At a later stage, neuroimaging plays an important role in identifying chronic sequelae, guiding rehabilitation, and determining prognosis.

In today’s session, experts will provide an update on imaging of TBI and new imaging techniques. The session begins with Dr. Damien Galanaud, from the Department of Neuroradiology at Pitàs Salpêtrière Hospital in Paris, who will present an overview of new MRI techniques in the diagnosis of TBI.

Over the years, MRI has emerged as the leading method in evaluating the extent of brain damage. Advanced sequences such as susceptibility weighted imaging (SWI), MR spectroscopy, functional imaging, and especially diffusion tensor imaging (DTI) hold great promise. DTI is currently the most promising sequence for TBI evaluation, as it allows a precise and direct evaluation of the extent of white matter damage, one of the leading mechanisms in TBI.

However, there are still some drawbacks and limitations to overcome, as Galanaud will illustrate. The main limitation of DTI is its sensitivity to movement artefacts, which can make it difficult to obtain meaningful results.

Large scale studies are currently being conducted to standardize acquisition procedures and to determine the best approach to performing a reliable assessment of TBI severity based on MRI data. Also in this session, Mr. Thijs Vande Vyvere, a PhD student from Radboud University Medical Center, will discuss how to report traumatic brain injury lesions. “A detailed analysis of the images is crucial and best performed by using computer-aided diagnosis software,” he said.

According to Vande Vyvere, a structured radiology report in TBI can be split up into three main sections. “The first section focuses on primary intra-axial injuries such as cerebral contusions, intracerebral haematomas, and axonal, penetrating, and cervico-medullary injury, and the second section deals with secondary injuries. A crucial aspect of the report is whether extra- or intra-axial injuries are causing any mass effect such as midline shift, herniation, or ventricular compression,” he explained, adding that for all sections it is of great importance to mention basic descriptive and, if possible, advanced information and that the same interpretation criteria can be used for follow-up or postoperative scans.

“Usually, radiologists subjectively read the images and report the findings using specific narrative language, free-text sentences and ad hoc formats. Even though radiologists are human experts in pattern recognition, this way of evaluation and reporting is error-prone and highly variable over time. Standardizing information and reporting processes help to minimize observer variability. In order to ensure that no information is missed and that reports are consistent and clear, always reporting radiological findings in the same way is extremely important,” he concluded.

Galanaud and Vande Vyvere will be joined by Dr. Rashida Manniesing from the Department of Radiology and Nuclear Medicine at the Radboud University Medical Center Nijmegen, Netherlands, who plans to go over the use of medical computing systems in TBI reports by point by point and to demonstrate the potential of computer-aided diagnosis software.

Figure 1: Axial susceptibility weighted image with mIP reformat shows bilateral diffusion axonal injury (DAI) in a patient with severe TBI. Images provided by Mr. Thijs Vande Vyvere.

Figure 2: Longitudinal whole-brain diffusion tensor tractography in a TBI patient with good outcome (top) and a TBI patient with worse outcome (bottom) illustrates pronounced progressive deterioration of white matter in the patient with worse outcome.

ECR TODAY | SUNDAY, MARCH 5, 2017

CLINICAL CORNER

INTEGRATING IMAGING INTO THE CLINICAL MANAGEMENT OF TRAUMATIC BRAIN INJURY

BY KATHARINA MIEDZINSKA

ECR 2017
Don’t miss Sunday afternoon’s sessions on systemic disease! Be assured, the Case-Based Diagnostic Training will challenge you. You have the chance to listen to eleven experts in their subspecialty fields and should be rewarded with the benefit of 30 interesting cases punctuated by our famous interlude lecture. In the two main blocks, you have the opportunity to solve patients’ cases like in your daily routine environment. Based on clinical information, a couple of characteristic images and multiple choice questions, you will have the chance to test yourself. At times, the answer will be straightforward and easy, where most of the audience get it right. Sometimes, the answers will be more evenly spread amongst the potential options. While this is more misleading, these are also the cases, where we learn most. The presenting specialists will explain typical pitfalls and clues for differential diagnostic entities. Afterwards, we should feel fortified to tackle our own patients’ problems at a higher level.

It is our honour that Prof. Klaus Bohndorf has agreed to prepare and give the interlude presentation. Our Case-Based Diagnostic Training veterans already know this format. Let me explain for all newcomers that this lecture is brought to life by the involvement of the global radiological community. We have appealed to all of you to submit your own cases of musculoskeletal manifestations of systemic disease. The best and most characteristic images will be shown and explained to help sharpen our focus. Who will win this year’s award for the most interesting submitted case?

Systemic disease: how does it work on the musculoskeletal system?

BY EVGENIA AVIZOV-KHODAK

Finding correlation between melanoma genotype and metastasis imaging features

It is not your responsibility to finish the work of perfecting the world, but you are not free to desert from it either. Ethics of our fathers 2:21, Rabbi Tarfon (70 CE - 135 CE)

Metastatic melanoma is a deadly skin cancer and its incidence grows every year, especially in Israel, where sun exposure and the percentage of the Caucasian population are relatively high. In our work, we evaluated the correlation between imaging features and genome specifically for melanoma in the hope that metastatic tumour phenotype on CT can be used as surrogates for signatures of gene expression and serve as response prediction to specific therapeutic and optimisation of the treatment form and duration. It is now known that melanoma treatment should be personalised, fast and achievable because individual patients with different genomes of melanoma respond differently to therapy. Radiogenomics is considered a promising topic in science and medicine (approximately 200 publications in the last five years and 60 during the last year alone). However, so far only a few studies have analysed the association between features of metastatic melanoma and specific genetic mutations. We took 14 patients suffering from metastatic melanoma stage III and IV that were previously genotyped for treatment and research purposes, and evaluated the correlation between phenotype and distribution of metastases and genome of melanoma (BRAF positive and wild type).

We checked CT follow-up studies that were performed before initiating any treatment for reducing the results affecting external factors. After initial analysis, we got a list of 14 features that showed a difference in their distribution between groups that were statistically significant. These features were combined in 6 clusters for practical purposes. Despite the limitations of this study, after accurate evaluation we can say that the pattern of metastatic spread in malignant melanoma varies with BRAF genotype. BRAF positive patients tend to present with adrenal, lymph node and soft tissue metastases, whereas BRAF WT patients tend to present with liver metastases. CT features and the pattern of metastatic spread of malignant melanoma could therefore be considered biomarkers and serve for linking specific imaging features with specific-gea expression patterns, thereby allowing more accurate diagnosis and prognosis and decreasing the need for expensive and sometimes long genetic tests. Further evaluation is needed for investigating the reaction to treatment through changes in the imaging features of metastasis after different types of therapy in different genotype groups.

Evgenia Avizov-Khodak, MD finished her residency at the Department of radiology at Hadassah Hebrew University Medical Center and now works at Maccabi Healthcare Services.

Case-Based Diagnostic Training

Sunday, March 5, 13:00–14:00, Room E1
CBDT I Case-Based Diagnostic Training – Part I
Moderator: K.M. Friedrich; Vienna/AT
S. Robinson; Vienna/AT

Sunday, March 5, 14:00–14:30, Room E1
Case-Based Diagnostic Training – Interlude: Musculoskeletal manifestations of systemic disease
K. Bohndorf; Vienna/AT

Sunday, March 5, 15:30–16:00, Room E1
CBDT II Case-Based Diagnostic Training – Part II
Moderator: K.M. Friedrich; Vienna/AT
S. Robinson; Vienna/AT

Scientific Session

Sunday, March 5, 10:30–12:00, Studio 2017
SS 1169 Improving imaging of malignant disease: what’s new?
Moderator: R.S.H. Swart-Zoon, Amsterdam/ NL
K. D. Pieper-Lovren/BE
+ Radiogenomics: evaluation of CT imaging features of melanoma metastases compared with genomic expression
E. Khodak, M. Lotem, J. DiPoe, S. Goldberg, J. Sosna, Jerusalem/IL
Paediatric parenchymal lung disease: which modality and when?

Because the information provided by chest x-ray is often limited, High Resolution Computed Tomography (HRCT), which can be used to visualise the parenchymal structure to the level of the secondary pulmonary lobules, is often the key chest imaging tool for diagnosis.

Dr. Paolo Tomà, Director of the Department of Radiology at Sophia Children’s Hospital, Rotterdam, Netherlands, will discuss the role of CT in paediatric parenchymal lung diseases.

"CT imaging has multiple roles, such as diagnosing disease, monitoring disease progression, assessing response to therapy and detecting complications of therapy and disease recurrence. It provides detailed anatomic information from multiple organ systems simultaneously and allows a high precision evaluation of parenchymal disease, in a short time. CT is the gold standard imaging technique to choose," said Ciet.

"Rapid isotropic CT imaging allows exquisite details of the lungs, the tracheobronchial tree and vascular structures. State-of-the-art CT scanners enable high-speed scanning in neonates and young children without the need for sedation or anaesthesia," he added, noting that in order to perform a good diagnostic CT with a dose as low as reasonably achievable, different factors need to be considered, including preparing the patient for the procedure, CT protocol adaptation according to the patient’s size, and the use of intravenous contrast.

"The patient’s age also plays an important role in developing an individualised imaging plan for each CT imaging examination. Children older than six years, who can follow commands, should undergo careful preprocedure before the CT scan, conducted either by the radiologist or by a medical staff member who is familiar with the protocol to improve image acquisition," said Ciet.

However, radiation exposure to children from CT exams is the highest of any imaging modality and remains a major concern. According to Ciet, it is therefore crucial that CT is only used when the benefit of the information provided outweighs the potential long-term risk of radiat exposure.

"Moreover, the stochastic effect of radiation is a random probabilistic effect due to genomic damage. The patient’s age is also an important modifier of radiation-induced cancer risks; the younger the patient, the higher the risk. However, risks are often overestimated or overweighted when the hazard is sensationalised, small, uncertain, delayed in effect, and not under the control of the exposed, all of which are operative in the setting of medical radiation. Finally, new CT techniques such as iterative reconstruction have lowered the dose to a point that it is feasible to perform a chest CT with the same radiation exposure of a chest x-ray," he said.

Tomà and Ciet will be joined by Prof. Savas Deftereos, from the Department of Radiology at Democritus University of Thrace in Alexandroupolis, Greece, who will discuss the potential role of MRI in paediatric lung diseases.

"Lung ultrasound (LUS) is a simple and dynamic method that can be used in all acute disorders needing immediate care. However, the resulting images from LUS do not present a clear image of the organ," noted Deftereos, adding that LUS is mainly based on artefacts.

"These artefacts need to be combined with disease-specific profiles assuming that prevalent disease patterns correlate with the amount of fluid in the lung," he said.

According to Deftereos, LUS unfortunately has a lot of limitations, including the inability to obtain an overview of the entire thorax, its strong operator-dependence and the fact that acoustic phenomena do not always correspond satisfactorily to the predominant pathology.

"The idea of replacing chest x-ray with LUS is unfeasible of course, LUS has no ground to replace conventional chest x-ray. However, when obtaining a chest x-ray thin-gauge aspiration is suggestive of an interstitial viral infection, which was suggested as the first differential diagnosis for this patient. Broncho-alveolar lavage turned positive for Epstein-Barr virus. Pathology specimen obtained through biopsy showed chronic interstitial pneumonia with lymphocytic infiltration and foci of organising pneumonia," (Provided by Dr. Pierluigi Ciet).

In a Special Focus session today, ECR delegates will get an opportunity to learn about the advantages and drawbacks of chest x-ray, ultrasound, CT and MRI in the diagnosis of paediatric parenchymal lung disease. International experts will discuss the optimal use of these imaging modalities, followed by a question-and-answer session.

Diffuse lung disease, traditionally known as interstitial lung disease (ILD), in infants and children, comprise a large and heterogeneous group of respiratory disorders, which are characterised by inflammatory and fibrotic changes affecting alveolar walls. Associated disease processes may affect not only the interstitium, but also the alveoli, blood vessels, airways, lymphatic channels and pleural spaces. Typical features of ILD include diffuse infiltrates, restrictive functional defects and disordered gas exchange. Common symptoms include dyspnoea, tachypnoea, chest wall retractions, exercise intolerance and frequent respiratory infections.

The relative frequencies of these disorders are considerably different in children compared with adults. More importantly, certain diseases are unique to infants and very young children, and have not been reported in adults, so when it comes to the management of parenchymal lung disease, children cannot simply be treated as small adults.

The aphorism that children are not little adults especially applies to the imaging of parenchymal lung disease. Acquiring motion-free images of fine pulmonary structures at desired lung volumes is easier in adults than in children. Therefore, painstaking attention to imaging technique and specialised knowledge are required to properly perform and interpret diagnostic images obtained for the evaluation of childhood ILD.

In his presentation about chest x-ray, Dr. Paolo Tomà, Director of the Department of Imaging at Ospedale Pediatrico Bambini Gesù in Rome, Italy, will address the aetiologies of paediatric parenchymal lung disease and the optimal use of different imaging modalities.

Plain radiographs are usually performed in a child suspected of ILD at first presentation, as they have a favourable profile in terms of low radiation dose, ease of performance, low cost and ready availability. However, some hurdles remain, including limited low-con- trast resolution and unspecific results.

For instance, the sensitivity and specificity are such that pneumonia on the chest x-ray is not a reliable test to discriminate between viral and bacterial tract infections, the main causes of pneumonia in infants and children up to five years and children between five and 18 years, in the general practice setting.

Special Focus Session

Sunday, March 5, 08:30–10:00, Room O

SF 17a Paediatric parenchymal lung disease: what imaging technique to choose?

» Chairmen’s introduction
  » H. Ducrué le Poune; Paris/FR
  » M.O. Wielpütz; Heidelberg/DE

» Chest x-ray
  » P. Tomà; Rome/IT
  » US
  » S.P. Deftereos; Alexandroupolis/GR
  » C. Car; Paris/FR

» MRI
  » M.O. Wielpütz; Heidelberg/DE

» Panel discussion: What imaging modality to choose and when?
Percutaneous imaging-guided benign bone tumour ablation

Not only osteoid osteoma can benefit from this non-aggressive treatment

Thermal percutaneous tumour ablation methods, including radiofrequency, microwave or cryoablation techniques have attained widespread use. In the musculoskeletal field, they are mostly used as the definitive curative treatment of osteoid osteoma. Our experience shows that other benign tumours can also be treated with these techniques.

In the last few years, we have successfully performed percutaneous ablation in the treatment of 35 benign bone tumours other than osteoid osteoma. According to our data, benign bone tumours suitable for percutaneous ablation include chondroblastoma, osteoblastoma, aneurysmal bone cyst, mesenchymal tumours, haemangioma and fibrous dysplasia. Even giant-cell tumours can benefit from this percutaneous approach as a treatment or as an adjuvant therapy. Lesions were at different locations, including mostly the femur and pelvic ring, but also at the tibia, foot, spine, humerus and hand.

Image guidance is critical to the success of this therapy, and CT is preferred over other imaging techniques to treat bone tumours because it provides faster imaging acquisition and a better anatomic resolution of the bone tissue. Biopsy was performed in each case to confirm diagnosis.

Percutaneous radiofrequency thermal ablation (RFTA) was used in most of the patients (30 cases), while microwave was the selected technique in three and cryoablation in two patients. In five cases, the treatment was combined with cementoplasty. For larger lesions, cooler electrodes and longer ablation times may be needed. All patients completed a follow-up period of 24 to 36 months.

Chondroblastoma surgical curettage is often difficult, and radiofrequency tumour ablation (RFTA) has been previously reported as an alternative curative therapy.

Osteoblastoma is benign in nature, but may exhibit aggressive behaviour and become larger than an osteoid osteoma (≥2 cm). Recurrences are not uncommon after conventional treatment by surgical excision or curettage. RFTA is a less invasive alternative that is performed in the same way as in osteoid osteoma, using electrodes with a long active tip or a larger number of ablation sessions.

Surgery and percutaneous Ethibloc injection are traditional therapeutic options in aneurysmal bone cysts. RFTA can be an alternative in some cases, as the definitive treatment or an adjuvant to surgery.

Surgery is the gold standard in treating giant-cell tumour. We also consider that RFTA should be included among adjuvant therapies for giant-cell tumours. In some cases, combined with cementoplasty, it can be used as a curative treatment.

In any bone lesion in which surgery is indicated, it is always necessary to consider the possibility of percutaneous treatment.

Dr. José Martel Villagrán is professor of radiology and head of the department of diagnostic imaging at the Hospital Universitario Fundación Alcorcón in Madrid, Spain.

Figure 1: Osteoblastoma is detected in the left lamina of L2.

Figure 2: Cryoablation needle in the centre of the lesion.

Figure 3: Fine needle in the epidural space to protect the spinal cord.

Scientific Session

Sunday, March 5, 10:30-12:00, Room D

SS 1810a Musculoskeletal interventions

Moderators: J.M. Cambronero Gomez, Girona/ES; N.N.

- Benign bone tumours other than osteoid osteoma percutaneous ablation
  J. Martel, F. Ruiz-Santiago, A. Bueno, L. Guzmán; Alcorcón/ES, Granada/ES

Visit us at the Bayer booth, X5/13
Treatment of acute ischaemic stroke – a paradigm shift from ‘intravenous, what else?’ to ‘endovascular first’

By Klaus Hausegger and Christian Loewe

Until recently systemic thrombolysis was the only proven effective treatment for a selected group of patients suffering from acute ischaemic cerebral stroke. Although mechanical thrombectomy for large intracranial arteries is performed in clinical practice in a considerable number of specialised centres with good clinical success, this kind of treatment has not been introduced into the clinical treatment pathway due to a lack of scientific evidence. Three prospective randomised trials published in 2013 did not reveal a clinical benefit for patients with acute ischaemic stroke, due to the occlusion of a large intracranial artery treated with mechanical thrombectomy compared, to patients treated with systemic thrombolysis3,4,5.

Introduction

A good clinical outcome, defined by a mRS of 4 or 3 months after treatment, is observed in 60–70% of cases at most. Patient selection is based on the clinical history and presentation, including the time elapsed from onset of symptoms (time window) and the severity of the stroke based on the NIHSS Scale, the pre-event condition of the patient and last but not least, on imaging findings. The first item that has to be clarified is the differentiation between a haemorrhagic and ischaemic infarct – typically answered by non-enhanced CT. With the introduction of MTE, imaging of the large intracranial arteries has become essential. Therefore, CT angiography or MR angiography has become an integral part of stroke imaging protocols.

In addition, multimodal imaging has been introduced in many centres. CT perfusion studies and MR diffusion/perfusion imaging aim to define the infarct core – brain tissue which is irreversibly dead – from hypo-perfused but still salvageable brain tissue, which is called the penumbra area. It seems to be logical that patients with a significant mismatch between the infarct core and the penumbra area will benefit most from recanalisation by MTE, in contrast to patients with a large infarct core and a small surrounding penumbra. However, although this concept has been proven in clinical practice in several studies, there is no evidence that multimodal imaging should play an integral role in patient selection. In other words, currently there is no evidence that patients should be excluded from MTE solely based on the results of multimodal imaging.

Therefore, patient selection for MTE is currently based on three pillars, the first of which is the clinical situation, second is the time window, and third are the findings in non-enhanced CT, CT angiography or MR angiography.

In the Hermes analysis, representing a meta-analysis of the above-mentioned five positive randomised trials, it is clearly shown that an age above 80 years is an exclusion criterion for MTE. Furthermore, it is clearly shown that the concept ‘time is brain’ is of paramount importance. A 30-minute delay in recanalisation decreases the chance for a good clinical outcome by at least 75%.

The concept ‘time is brain’ is of utmost importance in every single treatment phase of patients with acute ischaemic stroke. Thus, imaging must be concise and even straight forward. The paradigm shift from ‘intravenous, what else?’ to ‘endovascular first’ has changed the role of radiologists in the management and treatment of ischaemic strokes dramatically. It is in terms of stroke imaging or in terms of endovascular treatment, where the interventionalists, who are typically neurointerventionalists or neuro-trained general interventionalists, have become the primary treating physicians.

Results

The concept ‘time is brain’ is of utmost importance in every single treatment phase of patients with acute ischaemic stroke. Thus, imaging must be concise and even straight forward. The paradigm shift from ‘intravenous, what else?’ to ‘endovascular first’ has changed the role of radiologists in the management and treatment of ischaemic strokes dramatically.

The results of the MR CLEAN trial were published6. Like in the previous studies, the treatment concept for mechanical thrombectomy in patients with acute ischaemic stroke due to large vessel occlusion in the anterior cerebral perfusion was compared with intravenous thrombolysis. This time, the study protocol was more precise, especially with regard to imaging work-up, and more advanced recanalisation technique was used. Moreover, indeed, the MR CLEAN study revealed significantly better results for mechanical thrombectomy (MTE) in terms of vessel recanalisation rate and, even more importantly, in terms of clinical outcome compared to IV thrombolysis: This study was followed by five additional randomised trials all confirming the results of the MR CLEAN trial7-10.

Based on these results, the treatment concept for patients with acute ischaemic stroke has changed dramatically and the treatment paradigm has shifted from intravenous, what else? to ‘endovascular first’. To obtain similar results as reported in the above-mentioned studies, careful patient selection is needed, since not every patient will benefit from MTE.

A paradigm shift from ‘intravenous, what else?’ to ‘endovascular first’ is of utmost importance in every single treatment phase of patients with acute ischaemic stroke. Thus, imaging must be concise and even straight forward.

Reference

The European Society of Neuroradiology (ESNR) is one of the largest, oldest and most active radiological societies in Europe. As president of the ESNR, I am more than satisfied with the success of our organisation, which is the result of the excellent work of my predecessors, the creative input and energy of the members of our Executive Committee, and most importantly, the active participation of our members in the educational and scientific activities organised by the Society.

Based on recently published phase III clinical trials, endovascular treatment programmes in both diagnostic and interventional neuroradiology are performed by neurosurgeons, vascular surgeons, or cardiologists. Neuroradiologists, should be wise and act quickly enough to provide training structures, quality standards and continuous medical education guidelines in interventional neuroradiology to ensure our leadership in education, training, and research in this field. This is critical, because only radiologists and neuroradiologists are in a position to offer a service that ensures optimised outcome on a large scale, while balancing patient needs and available resources. Ensuring the unity of all aspects of neuroradiology is the only way to achieve this goal.

Prof. Alex Rovira-Cañellas is head of the NRRI Unit and the department of neuroradiology at Hospital Universitari Vall d’Hebron in Barcelona, Spain, and President of the European Society of Neuroradiology.
X-ray vendors put renewed emphasis on dose reduction, flexibility and cost-effectiveness

Aside from their neverending quest to lower radiation dose, manufacturers of x-ray systems constantly strive for product innovations to increase flexibility, enhance workflow, and reduce cost. Technical advances continue to be made within this modality and attendees at ECR 2017 can witness them first hand in the technical exhibition.

Parametric imaging assists with the visualisation of haemodynamic properties in interventional procedures. Time-density curve parameters are calculated for each pixel of a 2D-digital subtraction angiography image and each pixel is colour-coded, based on the respective calculated values. (Provided by Toshiba)

Toshiba Medical is highlighting UltimaXi at this week’s congress. The multipurpose flat panel detector system is designed to enhance clinical versatility by facilitating routine gastrointestinal, urology, orthopaedic, and angiography examinations. The company is also introducing the Intrinsix Sky system, which reportedly delivers 3D imaging with 20% of anatomical coverage on both sides of the patient and a high-speed 3D rotation of 80° per second. The device also incorporates an extensive set of automated and user-selectable DoseRite dose management tools designed to minimise exposure to patients and clinicians.

"Offering interventional radiology an imaging system that provides clinicians flexibility to perform a wide array of procedures, the ceiling mounted system features a unique double-sliding C-arm that allows it to be positioned faster, and in more ways, to help clinicians increase their coverage, speed and patient access," said Beré Degues, senior manager of the x-ray business unit at Toshiba Medical.

Carusstream is showcasing the development of its DRX-Revolution Nano Mobile x-ray system at ECR 2017. Although not yet available for commercial sale, the product has fully integrated digital radiography workflow in a compact, lightweight design with low cost of ownership and features Carbon Nanotube technology that contributes to its smaller size and weight, according to the vendor.

Also on display is the second-generation Carestream DRX-Evolution Plus platform that can be configured with one or more wireless DRX Plus detectors. The platform reportedly features an innovative wall stand, an extended tube column for greater flexibility in high-ceiling rooms, a new high performance generator, and an optional table for larger patients.

Samsung is demonstrating the D404 premium mobile digital radiography system, which is said to have exceptional mobility and enhanced user convenience and high image quality. The unit has a narrow width of 950mm and a weight of 35kg, allowing easy access around tight spaces, while a collapsible column gives users clear visibility when moving the system and broadens access to smaller spaces, plus an adaptive soft-driving control and front-bumper sensor also helps make navigation safer, the company pointed out.

MX7, the newest version of the MobileDaRt Evolution series, is being showcased by Shimadzu at ECR 2017. The digital mobile x-ray system, equipped with a flat panel detector is especially suitable to examine patients during hospital rounds and for medical applications requiring a high level of urgency, such as emergency rooms and neonatal intensive care units, according to the vendor. The MX7 series offers a wide range of flat panel detector types to match individual clinical requirements such as physical size, sensitivity and data transmission, particularly the 28x35kg, is a 17-inch device (SL-DR max75), it adds.

The scatter correction software used in the product reportedly enables more efficient work due to the elimination of grid malalignments, resulting in an image with reduced scatter and increased contrast, while the Smart secure integrated power management function allows users to select the best system for their clinical needs.

Another vendor with major announcements in the field is Philips, which is developing an augmented reality surgical navigation technology that is designed to help with image-guided open and minimally invasive spine surgery. The visualization technology allows for accurate and precise placement of implantable devices for procedures such as lumbar fusion and minimally invasive lumbar discectomy.

continued on page 18
Real-time volume navigation 3D roadmap with the Infinite i system links movements of the C-arm and table position with the 3D fused volume and fluoroscopic display. Regardless of change in the table position, the source-image-distance, field-of-view, and C-arm angulation, the 3D overlay remains consistently aligned with the fluoroscopic image provided, according to Toshiba.

Digital, flat panel detector (FPD) radiography x-ray is today so dominant for new key themes in digital x-ray to keep an eye out for. EC R exhibition floor. However, with a vast array of apparently similar systems on offer, installations in European hospitals that it is challenging to find film-based x-ray on the systems focusing on value, combining are releasing a variety of new systems releasing FPD pricing and a large instal- evedent. Add to this steadily decli- efficiency and radiographer time are investment for providers in terms of DR x-ray systems is predicted to con- traditionally dose calculation grids can result in improved cont- with chest radiography in order to improve image quality. Using grids can result in improved con- detail by reducing the amount of scatter radiation reaching the detector. This is particularly true for medium to large-sized patients.”

 Meanwhile, GE Healthcare is con- tinuing to develop its digital mobile x-ray system, the Optima XA80an with FlashPad HD digital detection. The product offers x-ray imaging support for carefully controlled neo- natal environments like the Giraffe Carestation, according to a statement from the vendor. "With the advent of mobile digi- tal radiography systems, combined with an aging population, there has been a continual increase in the percentage of bedside (portable) chest radiographs carried out in hospitals. In some cases, up to 50% of in-hospital digital radiography procedures are now bedside chest exams," it noted. "Anti-scatter grids are normally recommended for use with chest radiography in order to improve image quality. Using grids can result in improved con- trol detail by reducing the amount of scatter radiation reaching the detector. This is particularly true for medium to large-sized patients.”

Looking forward, as volumes of FPD installs steadily increase, price erosion will continue with intensified competition between the growing number of suppliers. OEM supply chains for major modality suppliers will also evolve with new market entrants and changes to upstream supply such as the recent Varian Imaging division spin off to form Varx Imaging. Comparables and market activity of LG Electronics. However, with FPD well established for DR, healthcare providers will be keenly scrutinising image quality and cost to ensure new DR systems are pas- sing on the benefits of FPD market expansion.

BY STEPHEN HOLLOWAY

Where next for digital x-ray?

Digital, flat panel detector (FPD) radiography x-ray is today so dominant for new installations in European hospitals that it is challenging to find film-based x-ray on the ECR exhibition floor. However, with a vast array of apparently similar systems on offer, it has also become harder to detect where the market is headed. Here’s my view on the key themes in digital x-ray to keep an eye out for.

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<thead>
<tr>
<th>Mobile FPD DR</th>
<th>Interventional X-ray</th>
<th>Flat Panel Detector DR</th>
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<tbody>
<tr>
<td>Growing portfolio of value systems; large addressable market of legacy analogue systems.</td>
<td>Replacement market; driven by dose safety and increase in minimally invasive procedures</td>
<td>Intensifying competition and declining panel pricing; still sizeable European installed base of analogue and CR for replacement</td>
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**Source:** Signify Research 2017

Mobile DR pushes into value segment

The rapid penetration of mobile DR x-ray systems is predicted to con- tinue. Mobile DR has seen significant growth as the benefits and return on investment for providers in terms of efficiency and radiographer time are evident. Add to this steadily decli- ning FPD pricing and a large install- led base across Europe of ageing ana- logue mobile x-ray systems creates a strong driver for growth.

To capitalise on this, vendors are releasing a variety of new sys- tems focusing on value, combining previously high-end features such as touchscreens or untethered wireless panels, with lower-priced gadolinium oxide (GdOx) FPD set- ting smaller, more mobile packages. These systems are then priced to compete against digital retrofit kits that can convert analogue systems to DR, and a number allow optional upgrade to more expens- ive Cadmium Iodide (CsI) FPDs at a later stage.

**Outlook 2017-2020**

(+++) Mobile FPD DR

(**) Interventional X-ray

(++++) Flat Panel Detector DR

**Comparison of main growth drivers for key DR x-ray markets in Europe.**

From the outset, it is evident that the mobile x-ray market will be defined by the continued streamlining of FPD technology. This technology can boost the capabili- ties of the firm’s low-dose x-ray sys- tem, using high-resolution optical cameras mounted on the flat panel x-ray detector to image the surface of the patient. It then combines the external camera view and the inter- nal 3D view of the patient acquired by the x-ray system to construct a 3D augmented-reality view of the patient’s external and internal ana- tomy. Results from the first pre-clin- ical study have been promising.

On the Axa booth, visitors can learn about Musical Fractional Multiscale Processing technology for difficult bedside chest exams. Delivering acceptable image quality from bedside imaging can often be challenging for a technologist due to equipment and exposure limitations as well as patient pathology. Accor- ding to a statement from the vendor, “With the advent of mobile digi- tal radiography systems, combined with an aging population, there has been a continual increase in the percentage of bedside (portable) chest radiographs carried out in hospitals. In some cases, up to 50% of in-hospital digital radiography procedures are now bedside chest exams,” it noted. “Anti-scatter grids are normally recommended for use with chest radiography in order to improve image quality. Using grids can result in improved con- trol detail by reducing the amount of scatter radiation reaching the detector. This is particularly true for medium to large-sized patients.”

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Stephen Holloway is principal analyst and company director at Signify Research (www.signifresearch.net), a health tech, market-intelligence firm based in Cranfield, and an ESRI board member.
EIBIR supports diagnostic imaging clinical studies SPECIFIC and MIPA

The European Institute for Biomedical Imaging Research (EIBIR) currently provides support to two industry-funded multicentre clinical studies investigating diagnostic imaging methods in myocardial perfusion imaging and breast cancer imaging.

Cardiac CT provides accurate assessment of the coronary arteries and detects significant coronary artery disease with high diagnostic accuracy. This information is highly relevant, but ignores the haemodynamic relevance of non-obstructive lesions, which is essential for clinical decision-making. The recent developments of third-generation dual-source CT allow for assessment of myocardial perfusion, and may determine the haemodynamic relevance of coronary lesions.

The SPECIFIC study is designed to determine the diagnostic accuracy of CT myocardial perfusion imaging for the detection of haemodynamically relevant coronary disease as determined by invasive fractional flow reserve as a reference standard, in patients with suspected angiographic coronary artery disease who have been clinically referred for invasive angiography.

SPECIFIC will investigate the feasibility of this approach in a global multicentre study with recruitment in the Netherlands, Germany, Switzerland, Japan and the United States. A small number of patients who have already been examined in the Netherlands and Germany and patient recruitment at other sites will follow over the course of 2017.

Within SPECIFIC, EIBIR provides management and administrative support, handles financial matters between the study and participating sites, and dissemination of the study results through well-established channels. All multicentre studies were already planned using mammography or ultrasound, and that preoperative MRI was used mainly as a confirmation tool. This selection has also contributed to determining a lower re-operation rate in women undergoing MRI.

MIPA study is funded by Bayer and is led by EIBIR and Prof. Francesco Sardanelli (University of Milan, Italy, past-president of EUSOBI).

The study conducts a systematic evaluation of pre-operative breast MRI, examining individual patient data in a multicentre setting with the aim of clarifying matters regarding the ongoing uncertainty in the application of pre-operative MRI in breast cancer patients.

MIPA collects data on recent first-time breast cancer diagnoses and compares surgical outcomes for women who undergo pre-operative MRI with those who do not. Data is being collected from 34 centres from Europe and beyond.

The results will be vital for a better understanding of the effect pre-operative breast MRI has on clinical decision-making.

In 2016, MIPA recruited more than 1,500 patients, which amounts to 78% of the target sample size of 1,900 patients. For more than 2,500 patients, data has already been analysed. Preliminary results show that most of the women were already planned using mammography or ultrasound, and that preoperative MRI was used mainly as a confirmation tool. This selection has also contributed to determining a lower re-operation rate in women undergoing MRI.

MIPA acts as the contracting partner for all sites participating in the MIPA study, and provides management and administrative support, in addition to handling all finances and leading dissemination efforts.

Prof. Sardanelli will present MIPAs preliminary results today at 10:30 in Room E3 during an ECR Master Class. E3 1726b Taking clinical breast MRI to the next level. His lecture is titled Preoperative MRI: which changes to expect after the MIPA trial? Please read also the article on page 1.

European Society of Breast Imaging: focus on education and cooperation

The European Society of Breast Imaging (EUSOBI), further increased its activities in 2016, with successful meetings, several teaching courses, the publication of a position paper on screening, women’s information papers and growing presence in the social media, with the contribution of the EUSOBI Young Club.

The European Society of Breast Imaging is a rapidly growing society. In 2016, the number of members reached 190 and it continues to increase. Participation at the Annual Meeting, which has been held in Paris in 2016, was higher than before with 750 participants, among them 190 local French radiologists.

The Paris Meeting was a great success, attended filled up the parallel sessions and workshops. The main subjects were diffusion breast MRI, breast lesions management, management of axilla and cutting-edge science. The round table discussion about the best ways to screen, the interactive MDT session, the image interpretation quiz and Bi-RADS workshop were also very popular.

A press release was issued containing a statement in favour of mammography screening.

EUSOBI’s traditional teaching courses have undergone some changes:

• The much demanded Breast MRI Course has served to bring lectures and workshops, inspired by well-known opinion leaders in the field of breast imaging, to diverse European and non-European cities in an effort to educate and harmonise first-hand knowledge.

• The new Breast Ultrasound Course was launched in Vienna, preceding the ECR, with a large proportion of practical workshops to allow hands-on-experience of automated 3D-ultrasound, ultrasound-guided biopsy/localisation and minimally invasive therapy of breast lesions. Besides this, the Course provides up-to-date reviews on the use of breast ultrasound to detect, differentiate and stage benign and malignant breast lesions. Presentations showed that most breast lesions present the basic principles of interpreting and reporting breast ultrasound examinations, even very challenging cases, delivers interactive case-based US-BI-RADS workshops and presents recent hot topics and emerging applications.

• EUSOBI will again offer the Mammography Screening Special Course.

• The planning of some new courses is currently underway.

EUSOBI contributed greatly to the ESR Book for the 2016 International Day of Radiology (IDoR). The concept of the book was developed by EUSOBI, together with the European Society of Radiology. Several chapters were written by leading EUSOBI radiologists, together with professionals from the American Society of Breast Imaging and Europa Donna, a patient advocacy group that represents women in many countries.

EUSOBI’s aim to create a European network for breast radiology continued on page 20.
EuroSafe Imaging Stars: University Hospital of Pisa

EuroSafe Imaging Stars is EuroSafe Imaging's latest initiative to promote quality and safety in medical imaging. By recruiting a network of imaging departments committed to best practice in radiation protection, the Stars initiative will give radiation protection efforts greater visibility, have a direct impact on clinical practice and enable the European Society of Radiology to collect data for analysis and benchmarking.

One of the EuroSafe Imaging Stars institutions is the University Hospital of Pisa, Italy which is a large tertiary care centre attracting patients in need of highly specialised surgical and oncologic treatments. The imaging services are ensured by three radiological units, by a neuroradiology unit and by a nuclear medicine unit. Interventional radiology is available for managing whole body as well neuro cases.

Please read below an interview with Prof. Davide Caramella, chairman of radiology (Radiodiagnostica) and director of the residency programme in radiology of the University of Pisa, which is a five-star facility.

ECHR: Your radiology department joined the EuroSafe Imaging Stars network. Why did you apply and what are your thoughts on this initiative?

DC: The University of Pisa is at the forefront of undergraduate, as well as postgraduate, teaching for radiographers and medical doctors. Those who choose to study in Pisa have to show the quality standards that we teach in our courses, in terms of radiation protection of patients, in our daily practice. That’s why we were among the first five European hospitals to obtain the five Stars from the EuroSafe Imaging Stars initiative.

ECHR: Would you recommend the EuroSafe Imaging Stars network to other facilities to become EuroSafe Imaging Stars? If so, what arguments would you use to convince them?

DC: A welcome extension would be a campaign of information targeted at all stakeholders (patient associations, scientists, radiology governments, etc) stating the importance of increasing awareness in the field of radiation protection of patients. In this media campaign, the EuroSafe Imaging Stars network could be mentioned as a group of radiological centres that are already championing the issue of dose optimisation in a transparent and cooperative manner.

ECHR: How do you see the future cooperation and activities within the network of Stars?

DC: Starting with CT. EuroSafe Imaging Stars network participants should be encouraged to publish their optimised disease-specific protocols for all CT equipment and versions on a dedicated website. Peer review of the protocols should be ensured by the EuroSafe Imaging Stars network participants themselves.

ECR TODAY | SUNDAY, MARCH 5, 2017
Radiation protection: ESR turns focus on transposition of Euratom directive

The European Commission-funded project European Diagnostic Reference Levels for Paediatric Imaging (PiDRL) was aimed at developing European DRLs for paediatric examinations and to promote their use so as to advance the optimisation of radiation protection of paediatric patients. Led by the European Society of Radiology (ESR), the project focused on CT, interventional procedures using fluoroscopy and digital radiographic imaging. Running from December 2013 and finished in January 2016, PiDRL concluded with the submission of the final European Guidelines on diagnostic reference levels for paediatric imaging to the European Commission.

With the ongoing implementation of the Basic Safety Standards (BSS) Directive (2013/59/Euratom) until the May 2018 deadline, a European Commission-funded project on the BSS transposition in the medical sector started in May 2016. The project’s objective is to evaluate Member States’ activities for the transposition and implementation of the BSS directive in the field of medicine. For this purpose, a survey was issued to all Member States and two EFTA Countries to collect information on their transposition process, and a workshop that included the presentation of the survey was held in Brussels in January 2017. Participants are expected to compare and contrast their own findings with those of other Member States and EFTA Countries and identify good practices as well as difficulties encountered in the transposition of the BSS Directive in the medical sector.

Data Protection Regulation

The General Data Protection Regulation (GDPR) was formally adopted on April 27, 2016, with the GDPR’s new data protection rules becoming applicable from May 25, 2018. This new regulation represents a major overhaul of data protection legislation in Europe, replacing a directive dating from 1995. The GDPR unifies data protection throughout the EU as it does not require any enabling legislation to be passed by member states.

The regulation significantly expands the scope of EU privacy legislation, and also applies to organisations from outside the EU who process EU residents’ data. It also strengthens consent requirements for collecting and processing data, complemented by a ‘right to erasure’. Non-compliance with the regulations can result in heavy fines of up to four per cent of annual turnover of the organisation found to be in breach.

The European Commission also views the GDPR as central to furthering the digital single market and hopes it will boost digital innovation. Research, a key issue for the ESR and the healthcare community at large, was afforded certain exemptions within the regulation, which has adopted a relatively broad definition of research. For example, in certain circumstances researchers may use personal data without explicit consent, and some processing restrictions do not apply to scientific or health research.

Following the adoption of the GDPR, the ESRs eHealth and Informatics Subcommittee has been working on a position statement on data protection, including an analysis of the regulation’s impact on radiology. This paper is slated for publication in Insights into Imaging in 2017.

Medical devices legislation

Following a lengthy legislative process, the EU Council and the European Parliament agreed on a new regulation for medical devices in May 2017. Designed to enhance the safety of medical devices while allowing patients to benefit from harmonised rules for timely and innovative healthcare solutions, the regulations on medical devices and in vitro medical devices will significantly change the landscape for manufacturers in Europe.

The regulation introduces new requirements for the traceability of devices and stricter rules for notified bodies that assess medical devices, such as ensuring they have qualified personnel available to conduct factory inspections. Manufacturers will be held responsible for continuous follow-up on the quality and safety of devices placed on the market.

The trilogue agreement still needs to be formally adopted in order to conclude the legislative process, which is expected in early 2017.

eHealth

The ESR has been a member of the European Commission’s eHealth stakeholder group (eHSG) since 2012, with the aim of contributing to the development of legislation or policy related to eHealth. This membership was renewed for a new three-year term in 2016. The ESRs main aim is to obtain recognition for teleradiology as a medical act in its own right. Although the European Commission welcomes the ESRs endeavours in the field of teleradiology and eHealth, this recognition has not yet been achieved.

The ESR is also active in the area of interoperability, aiming to facilitate the inclusion of imaging data into biobanks through adequate communication standards and updating standard terminologies with radiology terms. The eHSGs work on interoperability and standards also includes mobile devices, where the ESR advocates the certification of medical applications.
Patient safety and the role of the radiology department in Riga Children’s Clinical University Hospital

“A culture in which people are willing to learn from their mistakes is one of the most successful basic elements in business,” Shell Nederland (2004)

The staff in charge of the Patient Safety System at the radiology department of Children’s Clinical University Hospital in Riga, Latvia: Ilze Apine, head of the radiology department, and Evija Palceja, head of the Patient Safety System.

To err is human. However, errors in medicine can cost lives. Unfortunately, the assumption that mistakes can be avoided by working diligently and carefully is delusional since human nature cannot be changed. It is estimated that in the European Union 8–12% of hospital inpatients suffer from care-related accidents, such as healthcare-associated infections, treatment errors, device failures, diagnostic errors or withholding of help after receiving test results.

Radiology is one of the key services where patient safety issues might occur, and the involvement of staff to highlight the problematic ‘stumbling blocks’ which interfere with patient safety is of major importance.

To reduce the number of incidents, a blame-free reporting programme is needed to collect and analyse safety information. In 2013, the Children’s Clinical University Hospital of Riga was the first medical institution in Latvia to establish a punishment-free incident reporting system. Since criticism often causes alienation that interferes with rational analysis, instead of blaming the ‘guilty person’ our aim is to find out why the incident occurred and why our safeguards did not work in order to learn from our own mistakes and prevent such cases from happening again in the future.

Like all medical personnel at the Children’s Clinical University Hospital, the staff of the radiology department is encouraged to report incidents via the reporting system on the hospital website, responding to such questions as:

1. What happened to the patient?
2. Why did it happen?
3. To your mind, how often does this happen?
4. In your opinion, what harm could the incident do to the patient?
5. How could we avoid this situation in the future?
6. Use checklists wherever possible
7. Improve the availability of information
8. Reduce the passing of the information as much as possible
9. Strengthen the ‘Feedback’ between causes and solutions
10. Implement physical solutions rather than procedural changes

We have to be aware that medicine is never 100% safe. Human nature cannot be changed, but as patient safety is a common goal for all of us, we should change the factors that affect patients in order to ensure the best possible outcomes.

Prof. Ilze Apine is head of the radiology department at the Children’s Clinical University Hospital in Riga, Latvia.

Prof. Evija Palceja is head of the Patient Safety System at the Children’s Clinical University Hospital in Riga, Latvia.

References:
Patient safety issue ‘Staffepauke’ by Children’s Clinical University Hospital of Riga.

Download

Visit the Arts & Culture booth in the entrance hall
The radiology workforce crisis in the UK is the most serious issue facing The Royal College of Radiologists (RCR) and its Members and Fellows. This workforce shortfall is well recognised and documented due to the comprehensive census the RCR has conducted yearly for the last 7 years, successfully gathering robust data from 100% hospitals in the UK. On average, approximately 9% of British radiologist posts are unfilled, with 41% of those having been vacant for over a year.

The irony of the workforce shortage is that many overseas radiologists notice the appeal of working in the UK is that radiologists many learning opportunities and frequent peer feedback learning are available on a face-to-face basis by their ward-based clinical colleagues informally to discuss challenging cases. A large and diverse patient population. The British radiologists’ work is preparing for, and presenting the imaging at, multidisciplinary team meetings (MDTMs) which occur on a weekly basis in medical specialties. This prioritises imaging in the healthcare pathway and keeps radiologists abreast of the latest clinical developments in their areas of specialist interest. The rapidly growing specialty of interventional oncology is another area where radiologists in Britain are now more and more involved in the clinical treatment and management of patients as part of the cancer pathway team. Cancer patients are living longer and are increasingly having their chemotherapy and radiotherapy regimes tailored to their particular tumour types. Again radiologists are responsible for acquiring repeated biopsies on these patients, and for reporting on their follow-up cross-sectional imaging and PET-CT scans which will guide their tailored further treatment. The yearly appraisal, which is essential for all British doctors to undergo, means that radiologists have to be acted upon together and immediately to address the problem alone.

Benefits of working as a UK radiologist

Radiology in the UK is already flooded with international work- over 30% of the consultant radiology workforce is provided by international medical graduates (IMGs) from 65 different countries, and 31% of those gained their primary degree from a European country medical school. Despite the workforce deficits described above, UK radiology offers overseas radiologists many learning opportunities and valued experiences of a different way of working.

One of the most striking things many overseas radiologists notice about working in the UK is that radiologists are first and foremost clinical doctors who provide an essential role in the ‘front line’ in their local hospitals. They are not ‘remote battery hens’ providing a distant reporting service; they are closely involved with running the day-to-day healthcare service for patients. British radiologists are frequently consulted on a face-to-face basis by their ward-based clinical colleagues informally to discuss challenging cases. A large and diverse patient population. The British radiologists’ work is preparing for, and presenting the imaging at, multidisciplinary team meetings (MDTMs) which occur on a weekly basis in medical specialties. This prioritises imaging in the healthcare pathway and keeps radiologists abreast of the latest clinical developments in their areas of specialist interest. The rapidly growing specialty of interventional oncology is another area where radiologists in Britain are now more and more involved in the clinical treatment and management of patients as part of the cancer pathway team. Cancer patients are living longer and are increasingly having their chemotherapy and radiotherapy regimes tailored to their particular tumour types. Again radiologists are responsible for acquiring repeated biopsies on these patients, and for reporting on their follow-up cross-sectional imaging and PET-CT scans which will guide their tailored further treatment. The yearly appraisal, which is essential for all British doctors to undergo, means that radiologists have to be acted upon together and immediately to address the problem alone.

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ECR: uniting radiologists to show diversity of discipline

An exclusive interview with the incoming ESR President

BCR Today spoke with the incoming ESR President, Prof. Bernd Hamm, from Berlin, Germany, to learn about his ideas for next year’s congress.

ECRT: What do you think the most important role of ECR is?

BH: Radiology is such a diverse specialty, ranging from more and more refined diagnostic options to imaging for minimally invasive treatment options. Our specialty has something to offer for all of us and also for future generations of physicians, radiographers and students. However, like in a mosaic, it is the combination of all the pieces that create the big picture. By using this mosaic, the ECR can express all my sincere wish and hope that, despite these different and interesting facets and sub-specialties, radiologists should see themselves as a community and join forces to strengthen our specialty in the best interest of our patients.

During 2015 I also had a motto – ‘Radiology without borders’. In the beginning of 2015, none of us would have expected to see new forces being erected in Europe and borders becoming important once again. In view of these tendencies, it is even more important for our scientific community to promote radiology without borders and to advance our specialty through free academic discussions and by benefitting from a diversity of ideas.

ECRT: As president of ECR 2015, you introduced quite a few changes, such as the restructuring of the session categories according to the European Training Curriculum for Radiology. Was that the reaction?

BH: The restructuring of the session categories certainly was helpful in making the programme structure clearer and more transparent and thus helping participants to choose lectures, courses and workshops that best suit their needs. The feedback was overwhelmingly positive, and I am happy that Katrinne Rälik and Paul Pietal maintained and further refined this new structure as the presidents of ECR 2016 and ECR 2017 respectively.

Specifically popular were the ECR Academies and the European Diploma Prep Sessions. The ECR Academies consist of a series of sessions relevant to a particular area of radiology and may appeal to general radiologists and subspecialist radiologists alike. The content of the ECR Academies mostly corresponds to Level III of the European Training Curriculum. The European Diploma Prep Sessions aim to help future candidates prepare for the European Diploma in Radiology (EDR). The content of the programme reflects Levels I and II of the European Training Curriculum. These courses are held in close cooperation with the European Board of Radiology (EBR) and are great for getting an overview of the European Diploma in Radiology (EDR).

ECRT: Are there any innovations already in the pipeline for ECR 2018?

BH: The ECR has a worldwide reputation for tackling new challenges and always being open to innovations. However, its attractiveness partly rests on the quality of the presentations and its sound organisation.

We are aware that not all radiologists can come to Vienna to attend the ECR and those who do attend can only participate in one interesting session at a time. As a result, already almost 6,000 ESR members attended the congress remotely in 2017, following ECR presentations via ECR Live. Via this service all ECR presentations are available to members for twelve months. Digital ECR attendance is on the rise and meets the expectations of our members.

For 2018, we are planning to use ECR Live to offer a special service to our colleagues in China as it is intended to select around 500 presentations to be translated into Mandarin Chinese for the radiological community in China. I am very eager to see how we can realise this and what the feedback will be. This is important for getting more colleagues interested in our society and promoting international cooperation. At the same time, it makes the ECR more visible around the world.

ECRT: What other special focuses will there be at ECR 2018 and are there any further innovations especially designed to cater to the needs of radiographers?

BH: Daily clinical radiology is teamwork. That also primarily includes radiographers. We are planning to pay more attention to the needs and interests of radiographers at the ECR in the future. To this end, we are in contact with the European Federation of Radiographer Societies (EFRS) and the national radiographic societies to tailor special programme sections to their specific interests. As many radiographers see language as a major obstacle to attending the ECR, we are planning to offer sessions for radiographers in different languages to overcome language barriers. Similar considerations have led us to a change in the ‘The Voice of EPOS’ format, where the authors of posters are now offered the opportunity to present summaries of their posters in their native tongues.

First introduced as a pilot project, the ‘Clinical Trials in Radiology’ session format is becoming more and more important. These sessions are a platform for presenting the most recent prospective studies and results of multicentre trials. This is a true asset in the era of evidence-based medicine in radiology.

ECRT: Can you already reveal any highlights we can look forward to at ECR 2018?

BH: Other than the topics already announced, the following are some highlights that will be another focus at ECR 2018:

- ‘Radiology without borders’. This new combined ESR/ECR congress focuses on bringing ESR President, Prof. Bernd Hamm is professor of radiology and chairman of all three merged departments of radiology at the Charité – Humboldt-Universität zu Berlin and Freie Universität (Campus Mitte, Campus Virchow-Klinikum, and Campus Benjamin Franklin). He is also clinical director of four outpatient service facilities in nuclear medicine, radiology and radiology at the Charité, as well as scientific and clinical chairman of three imaging centres within the ESR.

Continued on page 26
Meet Prof. Ioana Lupescu, incoming Editor-in-Chief of EPOS™

ECR Today spoke to Prof. Ioana Lupescu from Romania, who will become EPOS Editor-in-Chief as of ECR 2017. Prof. Lupescu has served as assistant EPOS Editor for the past year and shared with us her take on that experience, the achievements of the platform and the new initiative The Voice of EPOS™.

ECR Today: You have been assistant editor to Prof. Maria Argyropoulou for the past year. Did you find this a useful preparation for your impending editorship?

Ioana Lupescu: I am convinced that the initial experience as part of the EPOS reviewer team in the abdominal imaging field and then as assistant editor to Prof. Maria Argyropoulou will help me in this new position and challenging task.

ECRT: Why do you think an educational platform such as EPOS™ is so important these days?

IL: I believe that the EPOS platform, through its educational and scientific content, represents an excellent source for European radiological education, through the richness of images and theoretical concepts, and new imaging developments. Access to the EPOS platform is open to everyone and available all the time. I consider the EPOS platform extremely useful and necessary in training or for upgrading knowledge accumulated by any resident or radiology specialist, regardless of age.

ECRT: How has the platform developed during the past years; are there any features you would like to highlight?

IL: Over the years I have seen a diversification of the approaches, a significant increase in the number of abstracts initially submitted and included in the EPOS platform after review. Of course the diversity in terms of scientific and educational content between topics that cover the same pathological area or the same anatomical region has raised the profile of the platform.

ECRT: You have witnessed the birth of the new programme, The Voice of EPOS, now in its second year. Are you a fan?

IL: Of course I am a fan. The Voice of EPOS represents a new way to highlight the essence and the teaching points of the poster in front of colleagues. It is amazing that this can also be done in the native language of the author. At ECR 2017 authors from 19 countries are participating, including some from Romania.

ECRT: What do you think lies in store for EPOS™?

IL: I am convinced that in the coming years, EPOS will remain one of the most important educational platforms of the ESR, a bridge between countries and radiologists.
ESR announces Luis Martí-Bonmatí as incoming Editor-in-Chief of Insights into Imaging

The European Society of Radiology (ESR) is pleased to announce that Luis Martí-Bonmatí has been appointed as the new Editor-in-Chief of Insights into Imaging. From January 2018, he will take over from Robert Hermans, who has served as Editor-in-Chief since 2010. The transition will commence this autumn.

Robert Hermans, professor of head and neck radiology at UZ Leuven, Belgium, has successfully led the journal since its inception. After eight years at the head of Insights into Imaging, Hermans’ extended term will end, as he will step down to focus on his work at UZ Leuven.

“I am very happy to pass on the editorship to someone with such high standing and experience in radiological science and education,” Hermans said of his successor.

Under Hermans’ guidance, the journal saw a successful launch in 2010 and its transition into a fully open access journal as of 2012. An increasing number of full text downloads over the past years, reaching over 300,000 article downloads in 2016 alone, prove that the journal is appreciated by a growing number of readers all over the world. Additionally, insights into Imaging has been submitted to the Institute of Scientific Information (ISI) to receive an Impact Factor, and it is currently under evaluation.

Luis Martí-Bonmatí is director of the medical imaging department at La Fe University and Polytechnic University Hospital, as well as chief of radiology at Quirónsalud Hospital in Valencia, Spain. He is also director of the Biomedical Imaging Research Group (GIBI230) at La Fe Health Research Institute. In addition, he is a long-time member of the European Society of Radiology and served as chairperson of the ESR Research Committee from 2010-2013. He is currently a member of the Scientific Advisory Board of the European Institute for Biomedical Imaging Research (EIBIR), an ESR-led initiative. Martí-Bonmatí has authored over 450 publications and 57 book chapters, and has been the editor of ten books. Most of his publications focus on magnetic resonance, clinical radiology, the development of imaging biomarkers and engineering-supported biomedical research. “I look forward to this new challenge, and hope that I can develop the scientific influence of Insights into Imaging to engage our audience even further,” said Prof. Martí-Bonmatí.

Insights into Imaging is the ESR’s gold open access journal dedicated to educational articles, such as review articles, pictorial reviews and original articles on professional issues like management and audit, as well as guidelines and statements from leading European radiological societies.
The imaging consultant in the Netherlands: strategic vision for 2020

Early in 2016, the board of the Radiological Society of the Netherlands started an initiative to develop a strategic vision for the future role of Dutch radiologists. Together with our society members and subspecialty sections we developed a ‘compass’ to prepare for and guide us through the many challenges that are facing radiology in general.

Prof. Hildo J. Lamb is professor of radiology at Leiden University Medical Center and board member of the Radiological Society of the Netherlands (science and European affairs).

The main challenge for the radiologist is to maintain a high level of quality while managing an ever-increasing workload. To guarantee high-quality radiological exams and reports, subspecialization is essential, as well as an emphasis on efficient communication with our clinical partners. We have to shift our attention from production to consultation.

The added value of a radiologist is clinical and technical expertise on medical imaging. The involvement of the future-proof radiologist covers the full spectrum from basic technique development, clinical validation, request approval, protocol selection, medical and technical guidance of clinical exams, reading of exams and reporting and communication with clinical partners. In addition, more emphasis could be on communication with patients before, during and after imaging, thereby avoiding the situation where the radiologist becomes a commodity like a ‘digital doctor’.

The added value of a radiologist is clinical and technical expertise on medical imaging. The involvement of the future-proof radiologist covers the full spectrum from basic technique development, clinical validation, request approval, protocol selection, medical and technical guidance of clinical exams, reading of exams and reporting and communication with clinical partners. In addition, more emphasis could be on communication with patients before, during and after imaging, thereby avoiding the situation where the radiologist becomes a commodity like a ‘digital doctor’.

The value-based and patient-centered healthcare approach requires multidisciplinary organization.

To be able to cover the entire clinical imaging spectrum, close collaboration between radiologists, scientists, engineers, imaging technicians and patients is important. We have to shift our role from report generator to imaging consultant as part of a diagnostic treatment team. This way, our efforts will be more visible to referring clinical partners and patients.

The current challenge is to find a way to realize these goals in routine clinical healthcare. The Dutch Radiological Society has defined a roadmap to reach these goals (see frame).

Information technology

We must play a major role in future radiology. Regional, national and European collaboration through an expert network can help to guarantee top-quality radiological exams on a 24/7 basis and allow further subspecialization to increase expert level on rare diseases.

Interradical collaboration raises several basic privacy and related ICT issues that we have to solve ourselves, so that we do not become fully dependent on external ICT partners and companies. We have to define our own ICT future for radiology. The ICT revolution has already started and we have to be actively involved in order to determine our future role in the imaging process.

What will be the effect of ICT-based automatic image reading and report generation? We believe that these ICT developments will help us to deal with the ever-increasing workload. If we can generate radiology reports with ICT technology, radiologists can focus on expert reading and communication as imaging consultant with doctors and patients. Since the ICT revolution is already happening and forms the core of our future work, we have to be involved today.

The same holds for basic imaging technique developments. We have to take the lead in technique development, clinical validation and application by incorporating other fields of expertise into our radiology department. For example, engineering, hardware and software development. These activities can be initiated in academic centres in close collaboration with general hospitals for fast dissemination of new techniques and innovative healthcare approaches.

To determine clinically relevant research topics we are developing a Dutch scientific agenda for radiology. Based on existing healthcare guidelines and input from our society members and other stakeholders, such as patient organizations, healthcare insurance companies, healthcare providers and governmental institutes, we will define a 10-point list with top-priority research that will change clinical practise in the next five years. This programme is supported by the Dutch National Initiative for Healthcare Evaluation.

In addition to the general issues mentioned so far, we have to focus more specifically on radiology by non-radiologists. A new type of imaging professional is emerging, based on recently initiated bachelor and master programmes such as ‘medical technology’ or ‘technical medicine’ at technical universities.

These new medical technologists can help us to cope with the exponentially increasing demand for radiological exams, while respecting quality and healthcare sustainability. We have to redefine our role as clinical radiologists together with these ‘new kids on the block’.

Special attention is needed on collaboration with other medical doctors that are interested in performing radiological exams. Ultrasound exams by general practitioners, obstetricians, gynaecologists, dermatologists and CT/MRI exams by orthopaedic surgeons, neurologists, CT/MRI examiners by obstetricians can be initiated in academic centres and further developed by radiological examiners. These new medical technologists can help us to cope with the exponentially increasing demand for radiological exams, while respecting quality and healthcare sustainability.

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Ukrainian radiology society celebrates 25th anniversary

The Association of the Radiologists of Ukraine (ARU) is a public, non-profit professional organisation of radiologists, physicians and allied sciences professionals. The ARU’s mission is to increase the professional level of Ukrainian radiologists and further cooperation with the European Society of Radiology (ESR).

The ARU was founded in early 1992 and this year is celebrating its 25th anniversary. The ARU has been organising the National Congress of Radiologists of Ukraine with international participation since 2013. The 5th Annual Congress will be held in March 2017 with several key European speakers. The first plenary session will be opened by the ESR President, Prof. Bernd Hamm, who will describe ESR and ARU cooperation. The key feature of the 5th Congress will reflect the topic of the European School of Radiology section dedicated to oncologic imaging. Another highlight of the congress will be the special session ‘Ukraine meets radiologists from Charité’, which will include four lectures from famous German radiologists.

Three peer-reviewed radiological journals are published in Ukraine. Radiodiagnostic, Radiotherapy and Radiology Bulletin are the official journals of the ARU. Radiodiagnostic, Radiotherapy focuses on scientific publications and lectures from local and foreign authors in all subspecialties of radiology. Scientific papers are accepted for publication in three languages – Ukrainian, Russian and English. Radiology Bulletin mostly focuses on case studies, but also publishes information materials from conferences and the main achievements of Ukrainian and world radiology.

The Ukrainian Journal of Radiology is the third radiological periodical in Ukraine. It is published by the Gribenev Institute of Radiology, which is the National Academy of Medical Science of Ukraine in Kharkiv.

Top-ranking scientific radiological research in Ukraine is performed at several leading institutions: the Gribenev Institute for Medical Radiology in Kharkov; the Institute for Nuclear Medicine and Radiology in Kiev; the Scientific-Practical Children’s Cardiac Centre in Kiev; the Strahselsko Institute of Cardiology in Kiev and the specialised medical universities.

The research at Gribenev Institute for Medical Radiology encompasses several fields, including developing new techniques for radiodiagnosis and radiotherapy; methods of prevention, diagnosis and treatment of radiation lesions; improving dosimetry provision in radiotherapy; medical radiation load optimisation and metrology provision for the medical application of ionising radiation. The Institute serves as a clinical base for new radiopharmaceuticals and equipment. An important focus of the research work is developing and investigating the properties of anti-radiation drugs. The introduction of these drugs into clinical practice has significantly increased anti-tumour therapy efficacy in oncology patients.

Currently, congenital heart diseases are diagnosed with state-of-the-art cardiac MRI and CT in the paediatric radiology department of the Scientific-Practical Children’s Cardiac Centre. The centre-based critical congenital heart disease surgery and autologous umbilical cord blood treatment programme (CORD) first started in Ukraine in 2009. Leading cardiac surgeons from the Centre perform open cardiac surgery within the first hours of the CORD patient’s life.

Cardioangiologists of the National Institute of Cardiology continue to implement European standards in MSCT and MRI imaging within cardiology and cardiac surgery, such as CT and MR ventriculography and coronaryography. The discovery of MRI-based biomarkers is also one of the major goals of the research by young radiologists in Ukraine. Our researchers are of the opinion that the implementation of several functional, structural and metabolic techniques along with routine MRI protocols give more opportunities for differential diagnosis. Currently, they are performing multimodal functional MRI, MR spectroscopy and diffusion tensor imaging (DTI) research with a focus on clinical needs, particularly in brain tumours, stroke, epilepsy, prenatal brain injury, multiple sclerosis and Parkinson’s disease.

Researchers utilise the DTI data for fibre tracking in the brain and spinal cord, especially in demyelinating and dysmyelinating diseases. They are working on the delineation of the personalised pattern of MBT activation according to the most widespread paradigms for motor, visual and language cortex mapping.

Prof. Volodymyr Rogozhyn is President of the Association of the Radiologists of Ukraine (ARU).

ESOR ASKLEPIOS Courses 2017

The established ASKLEPIOS project is tailored toward serving professional development by addressing recognised needs in the context of continuous radiological education. Its programmes include multithematic: organ-oriented, multimodality and multidisciplinary advanced courses, aimed at senior residents, general radiologists, private practitioners in radiology, and allied specialists.

Challenges in Head and Neck Imaging March 30-31, Serock/Poland

Emergency Radiology May 4-5, Bucharest/Romania

Advanced Oncologic Imaging May 18-20, Eilat/Erez/Israel

Advanced Abdominal Imaging June 29-30, Yerevan/Armenia

Introduction to Hybrid Imaging in Oncology August 31-September 1, Vienna/Austria

Multimodality Course September 1-2, Split/Croatia

Cardiac and Abdominal Imaging October 18-20, Graz/Austria

Symposium on Imaging Hallmarks of Cancer October 27-28, Lisbon/Portugal

Multidisciplinary Approach to Cancer Imaging November 2-3, Roma/Italy

Women’s Imaging December 7-8, Bratislava/Slovakia

For further information on the detailed programmes and registration, please visit myESR.org/esor

myESR.org #ECR2017

COMMUNITY NEWS

ECR TODAY | SUNDAY, MARCH 5, 2017

BY VOLODYMYR ROGOZHYN
Lithuanian Radiologists’ Association: a historical glimpse

Following Wilhelm Conrad Röntgen’s discovery of x-rays in November 1895, a demonstration of x-ray equipment in Vilnius took place in April 1896, performed by M. Resner and A. Gershon. The first radiology units were opened in Vilnius in 1896 by F. Dembowski, in 1900 by L. Stembo and in 1903 by L. Ivanter. In 1914, the first Röntgen unit in Kaunas was opened by A. Lapin.

During the 1920 to the 1940s, the capital Vilnius was part of Poland, thus the history of Lithuanian radiology in that period was created mostly in the temporary capital Kaunas. In 1920 the first lectures on radiology were delivered by the surgeon J. Žemgulys in the higher courses of education in Kaunas.

In 1921, the first scientific publication on radiology in Lithuania was published by J. Žemgulys in Medicina journal No. 4 (Review of 25 Years of Roentgenology). In 1922, the first Lithuanian book on radiology Roentgen Rays, what is Possible to do With Them and What Is Not, was published by the physician and radiologist P. Kalvaityte. At that time there were six radiology units in Lithuania.

In 1925, the Department of Health adopted the specialty of physician radiologist. The first were the surgeon J. Žemgulys, physician-radiologist P. Kalvaityte, O. Kerpauskaite and E. Jaceviciute (Figure 1).

In 1939, a course on radiology was added to the curriculum of the Faculty of Medicine at the University of Vytautas Magnus, delivered together with general medical specialties. In 1941, a course on radiology was also added to the curriculum of the Faculty of Medicine at Vilnius University delivered together with internal diseases.

In 1954, the position of expert-consultant at the Ministry of Health of Lithuania was introduced. The aim of the new position was inspection of application of x-rays in the field of radiotherapy and radiodiagnosis. The first chair was V. Lapinskas and since 2009 the experts-consultants have been Prof. A. Basevičius and Prof. A.E. Tamulionis.

In 1963, the Republican Scientific Research Institute of Nuclear Medicine of Lithuania was established. In 1990 the Society was transformed into the Lithuanian Radiologists’ Association, the first President being Dr. K.R. Dobrovolskis. From 2001–2005 the President was Prof. J. Dementavicius, and from 2005 to present Prof. A. Basevičius.

At the moment the society is comprised of five regional associations (Vilnius, Kaunas, Klaipėda, Šiauliai, Panevėžys), the largest number of members being in Kaunas (around 140 members) and Vilnius (around 200 members) regional associations. The society members of the Association are: The Association of Radiology Assistants, Lithuanian Ultrasound Association; and the Association of Nuclear Medicine of Lithuania.

There are about 300 active physician radiologists in Lithuania at the moment.

On November 11, the anniversary conference ‘60 Years of Radiology and Roentgenology in Kaunas’ took place, which was combined with the International Day of Radiology. There were multiple speeches and talks delivered by administrative authorities, as well as representatives of neighbouring specialties and associations, veterans of Lithuanian radiology and guests. A big part of the organisational load was carried by our residents (Figure 2). There are 70 residents studying in Lithuania at the moment – 50 in Kaunas and 20 in Vilnius.

Prof. Algirdas Basevičius is chair of the department of radiology, Lithuanian University of Health Sciences in Kaunas, and President of the Lithuanian Radiologists’ Association.

Prof. Saulius Lukoševičius is head of the tomography unit at the department of radiology, Lithuanian University of Health Sciences in Kaunas, and chair of the Committee of Education and Foreign Relations, Lithuanian Radiologists’ Association.

Prior to 1950, there were six radiology units in Lithuania.

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Special Exhibition:
Alfons Schilling. Beyond photography

WESTLICHT FOTOMUSEUM
1070 Vienna, Westbahnstraße 40
www.westlicht.com
WHAT’S ON TODAY IN VIENNA?

SUNDAY, MARCH 5, 2017

THEATRE & DANCE

Die Wiedervereinigung der beiden Koreas
by Joël Pommerat
AKADEMIETHEATER | 19:00
1030 Vienna, Lisztstraße 1
Phone: +43 1 51444 4145
www.burgtheater.at

Antigone
by Sophokles
BURGTHEATER | 19:00
1010 Vienna, Universitätsring 2
Phone: +43 1 51444 4145
www.burgtheater.at

Die Kehrseite der Medaille
by Florian Zeller
KAMMERSPIELE DER JOSEFSTADT | 15:00 + 19:30
1010 Vienna, Rotenturmstraße 20
Phone: +43 1 42 700 300
www.josefstadt.org

Das Mädl aus der Vorstadt
by Johann N. Nestroy
THEATER IN DER JOSEFSTADT | 15:00 + 19:30
1080 Vienna, Josefstadter Straße 26
Phone: +43 1 42 700 300
www.josefstadt.org

Klein Zaches – Operation Zinnober
based on a story by E.T.A. Hoffmann
VOLKSTHEATER | 15:00
1070 Vienna, Neustiftgasse 1
Phone: +43 1 5211 400
www.volkstheater.at

CONCERTS & SOUNDS

Wiener Symphoniker
Conductor Philippe Jordan
J.S. Bach: Johannespassion (St. John Passion) BMV 245
KONZERTHAUS | 15:30
1030 Vienna, Lothringerstraße 20
www.konzerthaus.at

Concentus Musicus Wien
Maria Hinojosa Montenegro, soprano
U. van Wassenaer; A. Vivaldi; L. Boccherini
MUSIKVEREIN | 11:00
1010 Vienna, Bösendorferstraße 12
www.musikverein.at

Zhenya Strigalev’s Never Group with Federico Dannemann / Linley Marthe / Eric Harland
PORGY & BESS (JAZZ) | 20:30
1090 Vienna, Riemergasse 11
www.porgy.at

OPERA & MUSICAL

Wie man Karriere macht, ohne sich anzustrengen
Musical by Frank Loesser
VOLKSOPER | 16:30
1090 Vienna, Währingerstraße 78
www.volksoper.at

Don Giovanni
by Wolfgang Amadeus Mozart
Conducted by Adam Fischer
With Adam Plachetka, Albina Shagimuratova, Saimir Pirgu, Olga Bezsmertna, Jongmin Park
WIENER STAATSSOPER | 18:30
1010 Vienna, Opernring 2
www.wiener-staatsoper.at

Schikaneder
Musical by Stephen Schwartz & Christian Struppeck
RAIUMUNDTHEATER | 16:30
1060 Vienna, Wallgasse 18-20
www.musicalvienna.at

Don Camillo & Peppone
Musical by Michael Kunze & Dario Farina
RONACHER | 16:30
1010 Vienna, Sellerstatte 9
www.musicalvienna.at

Please note that all theatre performances are in German.