



**Satellite Symposia
(D)**

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Thursday, March 7

10:30 - 11:30

Studio 2013

organised by Siemens Healthcare

SY 1

Advanced multimodality breast image reading

Moderator:

T. Hartley; Erlangen/DE

Place of digital breast tomosynthesis in diagnostic investigation of breast lesions: old and new paradigms

C. Van Ongeval, A. Van Steen, S. Postema, J. Soens; Leuven/BE

Digital mammography (DM) has proven to be equal or better than film-screen mammography (FSM), in a diagnostic and screening environment. The introduction of DM had no impact on the diagnostic work-up of breast lesions but improved the digital exchange of information. Digital data can be used for new techniques. One of these techniques is digital breast tomography (DBT). In DBT an acquisition sequence of 10 to 25 projection images is obtained from a limited range of angulations of the X-ray tube with the breast in a constant position. DBT overcomes one of the main limitations of 2D in which lesions were miss-diagnosed due to overlapping tissue. Recent studies report not only a better detection of stellate lesions but also a better characterisation of breast masses. Most studies were performed in a diagnostic environment. Studies on the role of DBT in screening are ongoing. DBT will have an impact on the workflow: for BIRADS 3 lesions DBT can result in a better classification of the abnormality, in some cases additional ultrasound can thus be avoided. For BIRADS 5 lesions, a better definition of the tumour and multifocality of the disease can be realized. It is unclear whether in the standard investigation of dense breast and patients with positive family history DBT (one/two-view) in addition to 2D is necessary. The relation between DBT and magnetic resonance imaging is also unclear. More research on the place of DBT in all steps of the diagnosis is essential for this promising new technique.

Learning Objectives:

1. To appreciate the advantages and disadvantages of the different imaging methods in breast cancer diagnosis.
2. To learn about strengths and weaknesses of digital breast tomosynthesis in the diagnosis of breast lesions.
3. To understand the impact of digital breast tomosynthesis on the diagnostic work out of breast lesions.

Place of breast MRI in diagnostic investigation of breast lesions

E. Wenkel; Erlangen/DE

The classical and most wide-spread breast imaging modalities comprise mammography and sonography. MRI as a high sensitive tool for cancer detection is often not so easily available for women due to different reasons like reimbursements from health insurances or lack of scanners. More recent developments like tomosynthesis claim to replace conventional mammography. Hence each modality is not suitable for every patient or maybe not every patient needs all available imaging modalities. On the basis of clinical examples we want to discuss the different imaging methods dependent on the patient's clinical history, breast density and histology.

Learning Objectives:

1. To discuss different approaches to detect breast cancer.
2. To learn criteria to distinguish between benign and malignant breast lesions.
3. To discuss the different imaging modalities for different patients.

Panel discussion

12:30 - 13:30

Room G/H

organised by SuperSonic Imagine

SY 2

The benefits UltraFast™ imaging brings to ultrasound

Moderator:

J. Souquet; Aix-en-Provence/FR

Advantages and limitations of ShearWave™ elastography for imaging prostate cancer and guiding biopsy

P.S. Zoumpoulis; Athens/GR

Benefits of UltraFast™ Doppler in the clinical workflow

G. Ivanac; Zagreb/HR

Experiences with the Aixplorer and ShearWave™ elastography for the staging of liver fibroses

V. Vilgrain; Clichy/FR

Advances in breast imaging with ShearWave™ elastography

F.K.W. Schäfer; Kiel/DE

12:30 - 13:30

Room I/K

organised by Bayer HealthCare

SY 3

New insight in breast cancer imaging

Moderator:

J. Camps Herrero; Valencia/ES

Breast MRI for screening breast cancer, why, who and when?

L. Umutlu; Essen/DE

Overtreatment due to breast MRI - a threat, a myth, or both?

C.K. Kuhl; Aachen/DE

MIPA study: study design, goals and rollout

F. Sardanelli; Milan/IT

12:00 - 13:30

Studio 2013

organised by Siemens Healthcare

SY 4

Challenges in breast imaging

Moderator:

J. Barkhausen; Lübeck/DE

3D automated breast ultrasound: accuracy and diagnostic potentials

M.J.C.M. Rutten; 's-Hertogenbosch/NL

Automated 3D breast ultrasound is a new technique, which scans the breast automatically and almost entirely. Data sets can be stored and are available for 3D cross correlating review. This new technique eliminates the subjectivity of conventional ultrasound, and disconnects the acquisition and assessment of US data. It facilitates the possibility of double reading, the presurgical workup planning, review of follow-up studies and the application of computer aided detection. Diagnostic yield, sensitivity, specificity, positive and negative predictive values will be presented, as well as the interobserver agreement. 3D US appears to be a reliable imaging technique for the detection and classification of benign and malignant breast tumours. Patient experiences less discomfort in comparison with MRI and mammography. Automated 3D ultrasound can be implemented in the clinical radiological setting and possibly in a personalised screening program for breast cancer.

Learning Objectives:

1. To become familiar with the 3D breast ultrasound technique and scanning protocols.
2. To comprehend the indications and limitations of 3D breast ultrasound.
3. To become familiar with the diagnostic accuracy of 3D breast ultrasound and to appreciate the potential added value for breast cancer screening.

High image quality with lower dose mammography

D. Uhlenbrock; Dortmund/DE

The talk deals with a study to investigate dose saving and image quality of digital mammography acquired without anti-scatter grid in combination with a novel software-based scatter correction (SBSC). The SBSC for grid-less acquisition was initially validated by numerical simulations and physical phantom studies. Patient dose may be reduced by grid-less acquisition (no grid attenuation of primary radiation) and optimised breast-thickness-(BT)-dependent dose reduction factors (DRF) were determined from these measurements. For clinical evaluation, a feature analysis study with 75 patients having known mammographic findings was conducted. Each patient underwent two mammography exams during one compression phase: 1. with grid; 2. without grid, with SBSC. The tube current-time product of the second acquisition was reduced according to the DRF, all other imaging parameters were fixed. For each case, comparison of both mammograms with respect to general image quality was performed by 5 blinded readers using a 7-point Likert scale. Dose saving is highest for smaller breasts. The DRF in the clinical study ranged from 33% to 15%. Weighted with the BT-distribution of a typical screening population, the average dose reduction is 23%. The average of the general mammographic image quality comparing the two acquisitions was less than 0.3 points on the Likert-scale with a 95% confidence level. Based on these results, the grid-less acquisition with SBSC was rated to be of equivalent image quality as the acquisition with grid. Conclusion: Grid removal in combination with SBSC may reduce patient dose in digital mammography while maintaining image quality.

Breast imaging from a pathologist's perspective

A. Hartmann; Erlangen/DE

The interdisciplinary tumour conference, where breast surgical oncologists, medical oncologists and pathologists discuss the diagnosis and treatment of breast cancer patients is crucial in modern breast cancer centers. Especially a close collaboration between the diagnosing radiologist and the pathologist is very important. 1. The exact description of the radiologic findings (preferable with electronic images) has to be provided to the pathologist who is diagnosing breast cancers in needle biopsies. The grade of suspicion for malignancy will guide the pathologist in the workup of these biopsies. Specific tumour types (e.g. hereditary breast cancer in patients with BRCA-1-Mutations) have both specific radiologic and pathologic features. 2. In the workup of surgical specimens with microcalcifications the exact location and amount of the microcalcification has to be provided to the pathologist. In crucial cases the paraffin blocks can be investigated for the presence of minute areas of microcalcification to correlate the pathological to the radiological findings. 3. Fine needle aspiration cytology can be regarded as a very useful method to investigate suspicious lymph nodes, for instance in patients who would be candidates for neoadjuvant therapy. Histological typing of breast cancer and investigation of the hormone receptor and Her2 expression is possible in these specimens using the cytoblock technology.

MR breast in clinical routine

W.A. Kaiser; Jena/DE

MR-mammography or breast MRI is in clinical use since 30 years. Despite the long childhood it is still considered as "sophisticated", "complicated", "unspecific" etc. The mantra "MRI has as high sensitivity but a low specificity" is obviously living forever. On the other hand it is a wonderful technique if all factors come together. A lot of technical details have to be considered. Information from patient's history is extremely important and a lot of very helpful morphological and kinetic signs have to be used in order to find a high sensitivity and specificity as well. This can be performed nowadays. The lecture will describe the specific features to reach this goal.

Panel discussion

14:00 - 15:30

Studio 2013

organised by Siemens Healthcare

SY 5

Chances with digital breast tomosynthesis (DBT)

Moderator:

T.H. Helbich; Vienna/AT

Physical challenges with digital breast tomosynthesis

H. Bosmans; Leuven/BE

Introduction: Digital breast tomosynthesis (DBT) is a new modality that aims for 3D visualisation of the breast tissue. The technique can be realised following different choices of geometry, exposure settings and image reconstruction algorithms. The same mammography system may provide a combined 2D or 2D like image along with tomosynthesis. The clinical potential of this new modality is substantial and topic of several on-going clinical trials. In this presentation, we will address the technical parameters with potential impact on clinical performance. **Methods:** The technical performance of DBT will be explained from investigations performed on the Siemens Mammomat Inspiration system with tomosynthesis functionality. This system uses a 50° angle and 25 projections. We will focus in particular on the 3D aspects of DBT, such as spatial resolution in all 3 directions and the efficiency of suppressing the background structure in the reconstructed planes. Several new phantoms have been explored for this purpose. Selected test methods allow performance comparison between 2D mammography and DBT. **Conclusion:** When using test objects that mimic a mammographic background, comparative technical evaluations of 2D mammography and DBT confirm the better performance of DBT. In practice, both technical and practical considerations may guide the implementation of DBT as standalone or complementary modality to 2D mammography.

Learning Objectives:

1. To compare technical aspects of 2D digital mammography to DBT.
2. To explore test methods for the 3D aspects of DBT.
3. To discuss the combined use of 2D and DBT in terms of data volume and reading.

Experiences with digital breast tomosynthesis in screening

S. Zackrisson; Malmö/SE

Mammography is not the ultimate method for screening - between 15 and 30% of all cancers are missed at mammography screening and detection is particularly difficult in dense breasts. There are several reasons for the non-detection of tumours; the normal anatomy being the major one. Digital breast tomosynthesis, DBT is a three-dimensional radiographic technique which, to a great extent, may overcome the problem with overlapping tissues in breast cancer detection. The presentation will focus on our initial experiences of DBT within the Malmö Breast Tomosynthesis Screening Trial.

Learning Objectives:

1. To understand the potential impact of DBT on sensitivity and specificity of breast cancer detection in screening.
2. To appreciate the limitations of DBT in screening.
3. To understand the impact of DBT on image interpretation time and work-flow in screening.

Value of tomosynthesis for the assessment of screen-detected abnormalities

S.H. Heywang-Köbrunner¹, T. Mertelmeier², S. Sedlacek¹, S. Wulz-Horber¹;
¹Munich/DE, ²Erlangen/DE

Purpose: A study had been performed to countercheck whether tomosynthesis (TS) performed in one projection can replace all or part of the additional views (AV) that are used to assess mammographically detected lesions. The hypothesis is that tomosynthesis is at least equivalent to conventional assessment by AV.

Methods and Materials: Inclusion criteria: any assessment requiring at least one additional mammographic view and assessments that require further histopathological assessment are consecutively invited to obtain an additional tomosynthesis. In all cases TS is always performed in addition to the indicated AVs. The study is approved by the local Ethics Committee and by the Bureau of Radiation Protection. All invited screenees sign informed consent. Equipment: Siemens Inspiration **Results:** The study, for which 300 women have been included, has just been concluded. Evaluation is still ongoing. The results of all included patients will be presented. Our last evaluation was based evaluation of 262 lesions in 246 patients. Results have been verified by histology or 6-24 months follow-up. So far sensitivity was slightly better for TS+AVs than for TS than for AVs (trend), while specificity was significantly better for TS than for TS+AV than AV. Advantages of TS were seen any breast density, mostly in breast density ACR2 and 3. >92% of AVs were retrospectively considered unnecessary.

Discussion: TS is appears to be a valuable additional method for assessing indeterminate lesions.

Clinical experiences with digital breast tomosynthesis in follow up diagnostics

F. Taşkın; Aydın/TR

We use digital breast tomosynthesis (DBT) in our department during last 18 months. In our clinical practice, we perform MLO position DBT after two standard positions (CC and MLO) digital mammography (DM) in women with dense breast.

After mammography, we perform whole breast sonography. We performed 3024 DM and DBT examinations (1707 patients were referred for diagnostic, remaining 1317 were screening purposes). Seven-hundred sixteen lesions were categorised as BI-RADS 3, 391 were categorised as BI-RADS 4, and 228 were categorised as BI-RADS 5. On DM, 14% of malignant lesions were not visible, whereas visible on DBT. Thirty-five percent of malignant lesions were better visible with DBT than DM. In 43% of lesions, DM and DBT were equal for lesion detection and description. Twenty-seven lesions (8%) were not visible both in DM and DBT. Comparing the DM to DBT for BI-RADS categorisation; final decision was changed with DBT in 21% of all malignant cases. Histopathologically proven 41 benign and 57 malignant microcalcifications were visible on DM and DBT. In 97% of cases both DM and DBT were equal for visibility of microcalcifications. DBT seems less efficient than DM for evaluation of scattered microcalcifications with relatively low density. DBT is also helpful for determine spatial distribution of microcalcifications. Diagnostic imaging centers like our department can use DBT together with DM as a supplementary technique. In our limited clinical experience, using DM and DBT together improves the mammographic performance.

Learning Objectives:

1. To share our clinical experiences about using digital breast tomosynthesis.
2. To explain benefits and limitations of using digital breast tomosynthesis as a supplementary examination.

The future of breast tomosynthesis

T.H. [Helbich](#); *Vienna/AT*

Breast cancer remains a major cause of cancer death among women world wide. Mammography is an accepted screening modality. However, accuracy of mammography is reduced by several factors. Among those breast density seems to play a major role. Thus up to 15-30% of carcinomas are not depicted by mammography due to superposition and poor contrast. The elimination of superposition of cancer by tomosynthesis as well as the improvement of contrast by contrast enhanced tomosynthesis seems to have a major impact in the future development of mammography systems. These systems will offer tomosynthesis as well as contrast enhanced techniques. In this talk we will present the first results of a prototype which allows contrast enhanced tomosynthesis in the detection and characterisation of breast tumours.

Panel discussion

Friday, March 8

12:30 - 13:30

Room D1

organised by Bayer HealthCare

SY 6

Programme to be announced

12:30 - 13:30

Room G/H

organised by Bracco

SY 7

Programme not available by date of print

12:30 - 13:30

Room I/K

organised by GE Healthcare

SY 8

Evidence of avant-garde MR

Moderator:

D. Pickuth; Saarbrücken/DE

Sharing GE MR vision and future

R. Hausmann; Waukesha, WI/US

Getting closer to metallic implants

M. Padrón; Madrid/ES

Streamlining workflow through integrated reviewing and post-processing

C. Dromain; Villejuif/FR

12:30 - 13:30

Room L/M

organised by Siemens Healthcare

SY 9

Pioneering futures in ultrasound

Moderator:

P.S. Sidhu; London/UK

Strain imaging in the breast - with a focus on the new VTIQ technology

C.S. Balleyguier; Villejuif/FR

Breast elasticity imaging is a complementary functional imaging tool in breast ultrasound. Breast elasticity can help to characterise benign and malignant breast lesions, especially for non typically benign or malignant breast lesions, such as BIRADS 3 or 4a. New developments are focused on shear wave elasticity imaging, less dependent on individual sonographer technique. Attendees of this symposium will gain greater understanding of new developments such as eSie Touch elasticity and Virtual Tissue Imaging & Quantification (VTIQ, Siemens), both of which will be presented in this session.

Ultrasound study of the pancreas with CPS (CEUS) and ARFI (elastography): improving the diagnosis of pancreatic tumours

M. D'Onofrio; Verona/IT

Image fusion enables us to perform a direct, on-screen correlation between a current ultrasound study and a previously performed CT or MRI exam. Using this ability, the spatial resolution of the ultrasound image can be added to the superior overview of a CT or MRI providing additional clinical confidence, lesions first noted on CT or MRI may be more easily detected and characterised on ultrasound and interventions such as biopsies and tumour ablations may be guided by a combination of modalities. Participants in this symposium will become familiar with how image fusion adds another dimension both to diagnostic and interventional ultrasound.

Image fusion: is this something we need?

A. Nilsson; Uppsala/SE

Conventional ultrasonography is often the first diagnostic step in the evaluation of the pancreas. The introduction of contrast-enhanced ultrasonography (CEUS) has led to great developments in the diagnostic capabilities of ultrasound. The greater accuracy of CEUS compared to baseline US can immediately result in better diagnostic workup and treatment planning. The immediate use of CEUS in the work up of a pancreatic lesion detected by means of ultrasound may be therefore proposed to save time (faster diagnosis) and money (move directly to MRI for cystic tumours). Acoustic Radiation Force Impulse imaging (ARFI) is a new technique able to provide numerical measurements of the tissue stiffness, improving the tissue characterisation. Virtual Touch quantification is a quantitative implementation of ARFI technology, which provides numerical measurements (shear wave velocity values, measured in meters per second) of the tissue stiffness: the stiffer a tissue is, the greater the shear wave speed will be. Virtual Touch tissue quantification can be also applied in the analysis of fluids and is potentially able to differentiate more complex (mucinous) from simple (serous) content in studying pancreatic cystic lesions. Attendees of this symposium will learn how CEUS and ARFI Shear Wave imaging can help them better understand and differentiate pancreatic pathology.

Saturday, March 9

12:30 - 13:30

Room D1

jointly organised by Siemens Healthcare
and Bayer HealthCare

SY 10

Synergies in CT for better patient care: cutting edge CT and optimised contrast media application

Moderator:

J.E. Wildberger; Maastricht/NL

Clinical benefits of a new fully integrated CT detector

H. Alkadhi; Zurich/CH

Optimise your CT results from scan to contrast media application

J.E. Wildberger; Maastricht/NL

Protocol optimisation in cutting edge CT

A.H. Mahnken; Marburg/DE

12:30 - 13:30

Room E1

organised by Bracco

SY 11

Personalised CT imaging: a patient centric approach

Moderator:

M. Prokop; Nijmegen/NL

Tailoring CT exams: when and how?

C. Loewe; Vienna/AT

How to balance radiation dose and diagnostic yield?

H.-C. Becker; Munich/DE

What if the patient is at risk?

M.-F. Bellin; Le Kremlin-Bicêtre/FR

12:30 - 13:30

Room E2

organised by Siemens Healthcare

SY 12

Leading. With MAGNETOM.

Moderator:

T.J. Vogl; Frankfurt a. Main/DE

Leading. With MAGNETOM.

N. Bolle; Erlangen/DE

Novel imaging techniques in abdominal imaging

H.J. Michaely; Mannheim/DE

Sustainability in a complex health care environment

T.J. Vogl; Frankfurt a. Main/DE

12:30 - 13:30

Room F2

organised by GE Healthcare

SY 13

Developing innovative breast care solutions to improve clinical confidence

Moderator:

R.C. Sigal; Velizy/FR

Case clarification with digital breast tomosynthesis versus mammography special views

A. Stork; Düsseldorf/DE

Purpose: Compare case clarification capability of Digital Breast Tomosynthesis (DBT) and Mammography Special Views (MSV) in a population of women with biopsied breast lesions.

Methods and Materials: 234 consenting women recalled for diagnostic work-up after inconclusive screening mammography and with indication of MSV, were proposed an additional DBT examination of the suspicious breast(s). DBT was performed with 15 exposures over an angle of 40° around the MLO position and a total dose equal to that of a 2-view standard mammography. MSV and DBT were read and scored on-line by an experienced breast radiologist. Interpretations with BI-RADS scores $\geq 4a$ were considered positive. 59 of these women underwent biopsy of their suspicious lesions.

Results: Histology revealed 35 malignant and 24 benign cases. 64% and 71% of these cases were correctly classified by MSV and DBT, respectively. Amongst the malignant lesions, 3% and 26% were scored more accurately (equal or closer to BI-RADS 5) with MSV and DBT, respectively. In two patients, additional malignant lesions found with DBT were not detected on standard mammography and MSV.

Conclusions: Initial results show that DBT (MLO) may become a valuable replacement of MSV in the diagnostic set-up.

Contrast enhanced spectral mammography versus breast MRI - clinical experience

E.M. Fallenberg; Berlin/DE

Early detection of breast cancer through x-ray mammography (MX) has been shown to reduce mortality; however, the method is limited by a decreased sensitivity and specificity particularly in young patients and women with radiographically dense breasts, due to a reduced contrast difference between breast tumours and surrounding breast tissue. Furthermore, treatment options in breast cancer are depending on size of the lesions and additional foci. Therefore, independently of correct detection, accurate size estimation is mandatory to provide the best treatment option for every individual patient. To overcome the limitations of MX in staging, detection and size estimation in compromised conditions, MRI is a useful technique. However, only in a very limited number of cases breast MRI is performed due to high costs and low availability. The introduction of full field digital mammography gave the possibility to develop further technical methods, which are less expensive and widely available. One of these is contrast enhanced spectral mammography (CESM). CESM is able to increase sensitivity without decreasing specificity due to higher contrast and better lesion delineation than mammography alone. In this talk will be presented the background of CESM, how it is performed, clinical performance results versus mammography and ultrasound, as well as data comparing bilateral CESM, digital mammography and MRI on histologically proven breast cancers to postoperative histology results as gold standard. Potential advantages and disadvantages of CESM and MRI will be indicated and a sample of clinical cases will be presented to illustrate how CESM contributes to the detection of lesions and how it can be used in daily clinical workflow.

New frontiers of advanced breast ultrasound

A. Munding; Osnabrück/DE

Advanced breast ultrasound (US) is going to expand its technological horizons that already include miniaturised and portable US systems, optimised 3- and 4-dimensional US, and hybrid systems combining different imaging modalities. The modern image presentation makes use of processing techniques known from MRI, helical CT and computerised image detection. The final aim of modern fusion and hybrid imaging is providing the image with the integrated quantitative information of distinct physical basic properties for every voxel within the three dimensional matrix of the breast volume to help the user improve tissue characterisation and detection of cancer. US reflection, interference, speed, attenuation, flow and elasticity coded imaging, X-ray attenuation and spectral information, magnetic diffusion and enhancement, receptor and metabolic activity and optical interfer-

ence are all candidates to make every voxel of the image more informative. The dream of tissue analysis goes on. Actual smaller steps in this direction have been implemented in updated high end US systems for better diagnosis using acoustic modelling based technology, elastography, fusion imaging of live US and MR volume data, or fusion of live US and plane mammography. Further options as 3D imaging for lesion pattern study, or packages for lesions borders tracing may help in a comprehensive diagnosis leading to a suitable care path, as well as an improved workflow. Treatment planning is being complemented by elastography and fusion for pre-surgical assessment of lesion size, GPS to mark a lesion before biopsy, and 3D for anatomical volume overview. Advanced treatment guidance may involve also virtual tracking solutions for challenging biopsies.

Role of MR DWI in breast cancer: correlation with histopathology

V. Martinez de Vega; Madrid/ES

12:30 - 13:30

Room G/H

organised by Guerbet

SY 14

Combining high tolerance with high diagnostic performance in contrast enhanced MRI

Moderator:

S.O. Schönberg; Mannheim/DE

Introduction

S.O. Schönberg; Mannheim/DE

Tolerance of MR contrast agent in at risk patients

G. Deray; Paris/FR

The tolerance gadolinium chelates in healthy subjects have been uniformly favourable with no cases of Contrast induced nephropathy (CIN) or nephrogenic systemic fibrosis (NSF) reported, to our knowledge. gadolinium chelates appear to be safe and non nephrotoxic as intravenous CM in patients with normal renal function, as well as in patients with pre-existing RI, when used in doses similar to those recommended for MR imaging. In 2000, Cowper published the first report about a new scleromyxoedema in renal dialysis patents. Grobner then suggested a link between the development of similar skin lesions exposure to gadodiamide during. The new condition was named nephrogenic systemic fibrosis (NFS), because it was associated with fibrotic changes in many organs. Since then, approximately 1,600 cases have been reported to the FDA. In 2007 the EMA stated that the use of gadodiamide and gadopentetate dimeglumine was contra-indicated in patients with GFR < 30 ml/min and in June 2007. Pro-FINEST prospectively determined the prevalence of NSF after a MRI examination, +/- GBCA, in dialysis patients. 571 patients have been included: 50.3% received GBCA, 88.9% Gadoterate. No case of NSF has been reported in our 571 dialysis patients among whom the majority received a GBCA. When good clinical practices regarding the use of GBCA in a group at risk of NSF are followed, the NSF frequency is nil. Within patients who underwent an injected MRI 2.1% patients received linear GBCA but 93.4% received a macrolytic GBCA and 88.9% received Gadoterate for which no unconfounded case of NSF has been observed yet worldwide.

Optimal gadolinium concentration with high diagnostic accuracy

M. Lell; Erlangen/DE

Introduction: Peripheral arterial occlusive disease (PAOD) is a significant health problem in the western world. Non-invasive imaging is warranted to determine which patient profits from revascularisation. Contrast-enhanced MR angiography (CE-MRA) has evolved as the method of choice. To date, no large-scale prospective randomised trial comparing peripheral CE-MRA at 3T to the reference standard DSA has been performed. Therefore, the aim of this multicentre trial was to assess the diagnostic accuracy of CE- MRA at 3T compared to DSA and to demonstrate the clinical equivalence between the use of gadobutrol and Gd-DOTA. **Methods:** In this prospective, multi-country, multi-center, randomised, parallel group, double-blind, phase IV trial, 189 patients (66.4±10.7 years) with peripheral arterial disease (PAOD) (stages II-IV Leriche and Fontaine classification) were included. Patients randomly underwent MRA of the lower extremities during injection of 0.1mmol/kg Gd-based contrast agent (either Gd-DOTA (15.4±3.1mL) or gadobutrol (7.6±1.3mL)). A total of 21 vascular segments were assessed. Image assessment was performed on- and off-site. Agreement of CE- MRA with the reference standard DSA, using a non-inferiority analysis for the two different contrast agents, was evaluated in a blinded manner by on- and off- site reading. Sensitivity, specificity, positive, and

negative predictive values (PPV, NPV) were calculated. **Results:** No statistically significant differences were found for both types of contrast agent in the detection of stenosis (Gd-DOTA, 80.6%±16.1%; gadobutrol, 77.1%±19.6%). The sensitivity for detecting significant stenosis (>50%) was 72.3% with Gd-DOTA and 70.6% with gadobutrol, the specificity (92.6% vs 92.3%), PPV (75.8% versus 72.7%), NPV (91.3% vs 91.5%), and diagnostic confidence (87.0% vs 86.0%).

Conclusion: Peripheral CE-MRA at 3T is feasible with high diagnostic accuracy. This study suggests that both contrast agents provide similar clinical information.

MRI follow-up after kidney cancer cryoablation

E. de Kerviler; Paris/FR

The incidence of renal cell carcinoma (RCC) has been increasing in western countries in last 3 decades. More than two thirds of RCCs are found incidentally on a routine imaging workup. Also, more than 50% of patients are older than 65 at diagnosis, some of them having serious comorbidities including impaired renal function. This has prompted to develop nephron sparing ablative therapies to treat RCCs percutaneously. These recent techniques, namely radiofrequency ablation and cryoablation need careful patients' follow-up to assess successful procedure and to detect early recurrence. Whatever the imaging technique, the best indicator for relapse is contrast enhancement. When compared with ultrasound and CT, MRI has multiplanar capabilities, is reproducible and has an excellent safety profile when a macrocyclic Gadolinium-based contrast agent such as Dotarem is used. Our follow-up protocol includes 7 CE-MRIs during the 2 years following ablation. Dotarem is usable even in patients with GRF below 30 ml/min, making it valuable for assessing treatment efficacy while avoiding serious adverse events such as NSF.

Questions and conclusion

S.O. Schönberg; Mannheim/DE

12:30 - 13:30

Room I/K

organised by Philips Healthcare

SY 15

Programme not available by date of print

12:30 - 13:30

Room L/M

organised by Philips Healthcare

SY 16

News in mammography: spectral imaging in mammography screening

Moderator:

M. Danielsson; Solna/SE

Experiences of MicroDose in tailored breast cancer screening program including women between 40-49 years

P. Panizza, A. Del Maschio; Milan/IT

Latest development in mammography non-invasive single-shot spectral imaging

S. Suryanarayanan; Andover, MA/US

Spectral lesion evaluation: will it be possible to distinguish cysts from solid masses on the screening mammogram?

M.G. Wallis; Cambridge/UK

Questions

14:00 - 15:30

Room C

organised by Hologic

SY 17

Celebrating the evolution of breast tomosynthesis: from research to large-scale, population-based screening programs, to advanced applications

Moderator:

A. Smith; Bedford, MA/US

A review of the evolution of breast tomosynthesis

A. Smith; Bedford, MA/US

The Oslo clinical tomosynthesis screening experience

P. Skaane; Oslo/NO

Initial experience with tomosynthesis biopsy

D. Bernardi; Trento/IT

14:00 - 15:30

Room E1

organised by Toshiba

SY 18

Clinical advances in multimodality applications - new perspectives in perfusion and fusion imaging

Moderator:

B. Hamm; Berlin/DE

The impact of smart fusion on the diagnostic outcome

T. Fischer; Berlin/DE

In recent years, advanced techniques have revolutionised ultrasound (US). The new possibilities comprise techniques for optimising image quality such as differential tissue harmonic imaging (THI) and frequency compounding (FC), tools for post-processing US raw data (ASQ and Precision Imaging) such as strain imaging (elastography), and the use of US contrast agents with new techniques (FlyThru; Image Fusion). The presentation will focus on characteristic features of abdominal organs, malignant liver lesions and prostate cancer detection using these state-of-the-art US techniques. For the improvement of the TRUS in the study presented here, we used ultrasound contrast agent imaging and compared it to magnetic resonance imaging (MRI), Elastography, Image Fusion (ultrasound plus MRI) and histology after biopsy.

Learning Objectives:

1. Puncture and postoperative quality control using new US techniques.
2. Detection of focal liver lesions and monitoring of therapy for liver metastases using Image Fusion.
3. Presentation of examples to work out the benefits of Image Fusion in the field of prostate cancer detection and TRUS biopsy.

CEUS of the kidney: from new technology to patient management improvement

J.-M. Correas; Paris/FR

Contrast-Enhanced Ultrasound (CEUS) indications can be extended to renal diseases. New sequences have become available on several transducers including convex and linear probes and improve the sensitivity and resolution of the contrast modes. Together with Tissue Harmonic Imaging, the diagnostic performance of US has been improved particularly for the detection of small renal masses and the characterisation of peripheral vascular disorders and atypical cystic masses. The percutaneous conservative management of renal masses benefit from both image quality and fusion imaging for guiding electrode placement and evaluating therapeutic efficacy. Applications such as 4D CEUS and quantitative assessment of perfusion should leave the research teams and become part of the clinical applications.

Learning Objectives:

1. To become familiar with new CEUS applications and settings.
2. To understand the classification of peripheral vascular disorders and atypical cystic renal masses.
3. To apply new US technology to percutaneous conservative management of renal tumours.

Liver and pancreatic perfusion using Aquilion ONE vision

J. Hermans; Nijmegen/NL

Only few studies have been published about CT perfusion of the pancreas, partly due to the small volume of coverage with previous scanners. With the Aquilion ONE Vision (a rotation time of 0.275s) a volume with a coverage of 16 cm can be scanned, which makes it possible to scan the entire pancreas and a major part of the liver. During free breathing of the patient multiple sequential time points are acquired to obtain a tissue concentration curve. The time interval between acquisitions is small in the arterial phase (ca. 2s), is larger in the parenchymal phase (ca. 5s) and increases to 1 min in the late venous phase. However, until now there is no scan protocol that has been optimised for pancreas perfusion. This includes the volume and rate of contrast agent administration, kV and mAs, and the number of necessary time points. The number of time points should be minimised as with perfusion CT the radiation dose is substantial. Because of movement of the pancreas in the z-axis during the acquisitions, the obtained high resolution perfusion images are registered in a non-rigid way, using one volume with maximal enhancement as a reference scan. Subsequently, perfusion maps can be calculated based on different models. Quantitative analysis of tissue microcirculation can possibly be used for biological characterisation of solid pancreatic tumours and for evaluation of response to chemotherapeutic agents and/or radiotherapy. In the future perfusion parameters might be used to predict tumour aggressiveness and to design an individually tailored therapeutic approach.

Learning Objectives:

1. To learn how to perform abdomen perfusion with volume CT, in particular liver and pancreas.
2. To learn how to optimize dose without compromising image quality in CT perfusion.
3. To understand the quantitative analysis of tissue microcirculation for evaluation of chemotherapeutic agents.

14:00 - 15:30

Room F2

organised by Toshiba

SY 19

Multimodal imaging for neuro applications

Moderator:

P.A. Brouwer; Leiden/NL

Neuro applications using Aquilion ONE

P.A. Brouwer; Leiden/NL

The use of 320 row detector CT scanners in Neuroradiology opens a range of new possibilities. The 16 cm volume acquisition allows whole brain perfusion imaging in stroke patients, and the combination with subsecond temporal resolution enables 4D- or time resolved CTA. The application of these techniques prove to be helpful in describing and understanding pathological processes but also in detection of specific neurovascular diseases. In this presentation the audience will become familiar with the properties of the CTA protocols used, and will learn about the neurovascular pathology, that can be depicted with these new techniques, through exemplary clinical cases.

Learning Objectives:

1. To learn the clinical impact of CT with 16 cm coverage on neuro applications.
2. To understand pathological processes of neurovascular diseases.
3. To learn the properties of the CTA clinical protocols using 320-row CT.

Advanced neuroimaging at 3T with a 32ch head coil

T. Okada; Kyoto/JP

High density array coils with 3T imaging improve dramatically the available signal-to-noise ratio (SNR), making a substantial reduction in scan time possible using parallel imaging to increase the spatial resolution of 2D and 3D acquisitions, allowing sub-millimeter voxel sizes within clinically acceptable acquisition times. A wide range of brain imaging MR applications can be improved using a high SNR 32 channel coil at 3T; with an in-plane resolution of 0.4 mm excellent details of the cortical and the deep gray matter structures can be captured. Using flow sensitive black blood (FSBB) imaging with an in plane resolution of 0.3mm, microvasculature of the brain such as lenticulostriate arteries can be clearly visualised. With a parallel imaging factor of 4 a brain infarction protocol including a T2 weighted, a time-of-flight, a diffusion weighted and a perfusion weighted image could be scanned in 6 minutes or less.

Learning Objectives:

1. To understand the added value of high density array coils at 3T.

2. To learn how to take advantage of the increased SNR at 3T to improve spatial and temporal resolution in advance brain imaging.
3. To apply new scanning parameters in fast routine brain imaging .

Neurological interventions using Toshiba Infinix

H. [Fransen](#); *Gent/BE*

In recent years, advanced techniques have been introduced in angiography (XR). The new possibilities comprise techniques for optimising image quality during interventional procedures in neurology and the introduction of new imaging techniques like Volume Navigation - 3D Road Mapping, Needle Guidance, Low Contrast Imaging and Multimodality imaging. The presentation will focus on complex aneurysm interventions. The advanced angiography equipment we have at our department allows us to see the blood vessel, the aneurysm or AVM , and the microcatheter all together continuously from the front and the side. Together with the 3D roadmapping and the CT multimodality it gives you during the embolisation a higher sense of security and precision.

Learning Objectives:

1. Visualisation of aneurysm or AVM.
2. Use of advanced techniques like Volume Navigation - 3D Road Mapping, Needle Guidance, Low Contrast Imaging and Multimodality imaging.
3. Presentation of examples to work out the benefits of new imaging techniques related to the interventional procedure in aneurysm or AVM treatment.

and derived determinants of myocardial perfusion. These are under the superior control of the neuro-vegetative system. The regulation of myocardial perfusion appears as a very complex process, where the neuro-vegetative system plays an important role as superior controlling mechanism. The goal of the presentation is 1) to review the essential anatomic structures of the brain and of the nervous connecting system which interfere with and control the individual cardiac function. 2) to describe neuro-humoral regulations which serve as protective mechanism to prevent or at least to reduce the extent of myocardial ischemia.

Russian radiology best practice - clinical experience sharing

A. [Lukianchenko](#); *Moscow/RU*

GE Healthcare innovative solutions for modern healthcare

V.I. [Grishchenko](#); *Moscow/RU*

14:00 - 15:30

Room L/M

organised by GE Healthcare Nycomed

SY 20

CT and MR diagnostic capabilities and safety: new tendency

Moderators:

V.N. [Kornienko](#); *Moscow/RU*

I.E. [Tyurin](#); *Moscow/RU*

Low-dose and low-iodine CT coronary angiography

V.E. [Sinitsyn](#); *Moscow/RU*

CTA has been widely used for coronary imaging. But still further decreases of radiation exposure and volume of contrast media (CM) are desirable. Results of latest studies have been shown that low-dose coronary CTA could be performed in combination with low iodine load. Total dose of iodine could be decreased up to about 25%. There is possibility to use CM with concentration 270-300 mgI/ml instead of 320-350 mgI/ml. Decrease in tube kV is associated with higher values of measured Hounsfield units and corresponding increase of image noise. Use of iterative reconstruction technique (ASiR) for coronary CTA results in low image noise. Prospective gating and low tube kV decrease radiation exposure to patient (<2-3 mSv). Low-dose, low-iodine coronary CTA performed with systems having options of high-definition imaging, prospective gating and interative image reconstruction may change current approach to diagnostic work-up of coronary patients.

MRI safety - actual issues

E.A. [Merzhina](#); *Moscow/RU*

Magnetic resonance imaging (MRI) has become an important tool for diagnosis and treatment control of many diseases. Patients with cardiac implantable electronic devices such as permanent pacemakers and implantable defibrillators are usually excluded from MRI examinations since the majority of implantable devices have a contraindication for MRI. The probability to have indications for MRI are doubled after age of 65 years, 17% of patients will need MRI in 1 year after permanent pacemaker implantation. As a result of patients' needs (and their physicians') different manufacturers recently released permanent implantable pacemaker systems which are designed with respect to the potential adverse effects of MR on permanent pacemakers. Main risks for patients with implanted pacemakers and different ways to change the construction of pacemakers to make them MRI-compatible will be discussed. The results of trials and our own results will be demonstrated.

Brain - heart - axis

R. [Rienmüller](#); *Graz/AT*

The continuous technologic improvement of cardiac CT and MR enables to measure myocardial perfusion in absolute numbers (ml/100g/min) on a daily routine basis. This important functional parameter of the heart, however is not only dependant on the state of the morphology of the coronary vessel wall but also on number of direct

Sunday, March 10

Clinical and cost effectiveness of CEUS for liver imaging: the NICE diagnostics guidance

T. Hoare; Newcastle Upon Tyne/UK

12:30 - 13:30

Room C

organised by GE Healthcare

SY 21

Patient care and image quality: at the forefront of CT innovations and contrast media

Moderator:

V.E. Sinitsyn; Moscow/RU

Iodinated contrast media in CT: defining the key properties

Optimising image quality and patient care in cardiac CT

D. Andreini; Milan/IT

Spectral imaging: clinical breakthrough in oncology

P. Ardies; Malle/BE

Many promising clinical applications have been reported for Spectral Imaging Computed Tomography (CT) in Oncology Imaging in the last years. Several studies have shown the unique capabilities Spectral Imaging CT provides for characterising hypervascular liver lesions by increasing the iodine conspicuity thanks to low keV monochromatic images reconstructions. Moreover, Spectral Imaging CT has also been shown to enable accurate iodine quantification, therefore allowing for a more precise kidney lesions characterisation. Virtual unenhanced images reconstructed from Spectral Imaging CT datasets can be useful for differentiating hemorrhagic cysts from enhancing lesions, potentially reducing the need for an unenhanced scanning phase. Although this acquisition mode had some limitations in the past, mainly linked to a significant increase in radiation dose, the latest advances in scanning protocols and radiation dose reduction technologies have enabled to use Spectral Imaging CT with no dose penalty for the patient. The aim of this presentation is to discuss about the unique clinical benefits that Spectral Imaging CT can provide in oncology imaging and highlight the most promising clinical applications in this field.

12:30 - 13:30

Room G/H

organised by Samsung

SY 22

Programme not available by date of print

12:30 - 13:30

Room L/M

organised by Philips Healthcare

SY 23

Programme not available by date of print

12:30 - 13:30

Room N/O

organised by Bracco

SY 24

Cost-effectiveness and improvement of patient management with contrast enhanced ultrasound (CEUS)

Moderator:

G.H. Mostbeck; Vienna/AT

Implementation of CEUS in the daily practice of the imaging center

M. Wüstner; Trier/DE

CEUS in interventional radiology: clinical outcomes and impact on patient management

E.M. Jung; Regensburg/DE