7th Breast Care Day

Abstracts to the presentations

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Siemens Healthineers and Bayer Healthcare welcomed you to the 7th Breast Care Day.

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SIEMENS Healthineers

Breast MRI: Current challenges and new trends

Wednesday, March 1, 2017, 10:30 am – 12:00 pm, Room "Studio 2017"

Chair: Jörg Barkhausen; Lübeck/Germany

Preoperative breast MRI: first results from the MIPA study

Francesco Sardanelli; Milan/Italy

MIPA is an ongoing prospective observational multicenter study sponsored by Bayer, endorsed by EUSOBI and run by EIBIR/EuroAIM. Study was designed as an individual data analysis of two concurrent groups of women with a newly diagnosed first breast cancer, not candidate to neoadjuvant therapy, receiving or not receiving MRI before surgery. In 2012, after an web-based call, 96 centres applied and 34 (19 academic) were selected from 14 countries; 28 started the enrolment. Up to July 2016, 4,944 patients were enrolled, 2,425 with complete eCRF: 1,201 (49.5%) without and 1,224 (50.5%) with MRI. Gadobutrol (0.1 mmol/kg) was used in 70% patients; 84% had also DWI. A radiologist was involved in the MRI order in 68% of cases, a surgeon in 40%. Mastectomy rate planned after mammography/US was 185/1201 (15.4%) for non-MRI and 245/1224 (20.0%) for MRI-group (p<0.001). In MRI-group, 21 additional mastectomies (1.7%) were planned after MRI; bilateral surgery instead of bilateral was performed 13 (1.1%); of 1004 breasts conservatively treated after MRI, surgery was unchanged in 733 (73%), while a wider surgery or >1 excision wad done in 143 (12.5%) and a less extensive surgery was done in 128 (12.7%). Actual mastectomy rate was 192/1201 (16%) in non-MRI-group and 257/1224 (21%) in MRI-group (p<0.001; age/density-adjusted OR 1.4, 95% CI 1.3-1.6). Per-patient re-operation rate for close/positive margins was 135/1009 (13.4%) in non-MRI-group and 80/967 (8%) in MRI-group (p<0.001). These results show that already planned mastectomies prompt MRI, used as a confirmation tool, not vice versa and that MRI allows for tailoring conservative treatment.

First clinical experiences with a new 7ch breast imaging and biopsy coil

Evelyn Wenkel; Erlangen/Germany

A new coil for high-resolution imaging of the breast at 3T is presented. Whereas most breast coils have a high number of coil elements for diagnostic purposes but only a subset can be used during biopsy, the 7ch BI Breast Coil has a special design to facilitate imaging with the full number of elements in the biopsy scenario, thereby offering comparable image quality to the imaging scenario. Due to its open design, the coil is well suited for breast biopsy with lateral, medial and cranio-caudal access. Additional features like LED-lighting of the biopsy site simplify the workflow. During the presentation, first clinical cases and workflow experience with the new device are reported.

Gadolinium retention: impact on breast MRI?

Jörg Barkhausen; Lübeck/Germany

More than 30 years ago, contrast-enhanced MRI emerged as a new technique in clinical breast imaging and over the last three decades numerous clinical studies have shown excellent results for the detection and characterization of breast lesions. Despite the most recent improvement of high-resolution and diffusion-weighted MRI, dynamic contrast-enhanced sequences are still considered as key component of any breast MRI examination. The applied gadolinium-based contrast agents (GBCAs) were considered as very safe compounds until the association between nephrogenic systemic fibrosis and GBCAs was suspected in 2006. Additionally, in late 2013 Kanda and colleagues described increased signal intensity in the dentate nucleus on unenhanced T1-weighted MR images as a consequence of repetitive previous GBCA administrations. Although no clinically relevant adverse events have yet been associated with the detection of gadolinium in the brain, the results of these studies must be taken seriously. With respect to breast MRI, these issues are especially important for repe titive breast cancer screening in high-risk patients, for example, with BRCA mutations. In this lecture, the results of the most recent clinical trials addressing these topics will be presented in a comprehensive manner and the impact of these studies on daily clinical routine will be discussed.

Learning objectives:

- To gain knowledge on the pharmacokinetics of different MR contrast agents
- To discuss the potential risks of gadolinium based contrast agents
- To learn about the most recent recommendations and guidelines

Multimodality lunch symposium: Dense breast and how to overcome the radiologist's "problem child"

Wednesday, March 1, 2017, 12:15 pm – 1:45 pm, Room "Studio 2017"

Chair: Luis Javier Pina Insausti; Pamplona/Spain

Dense breast and how to overcome the radiologist's "problem child"

Luis Javier Pina Insausti; Pamplona/Spain

In BI-RADS 2003, the composition was based on the overall density resulting in ACR category 1 (<25% fibroglandular tissue), category 2 (25-50%), category 3 (50-75%) and category 4 (>75%). In BI-RADS 2013, the use of percentages is discouraged, because in individual cases it is more important to take into account the chance that a mass can be obscured by fibroglandular tissue than the percentage of breast density as an indicator for breast cancer risk. Four groups are used: a,b, c and d. The patterns c and d are considered as "dense". Dense breasts reduce the sensitivity of mammography up to 50%. This is the main limitation of mammography. Fortunately, tomosynthesis can significantly increase the sensitivity of mammography, especially if wide angle is used (increment of detection rate up to +43%). Tomosynthesis is able to reduce the superimposition of tissue and the anatomic noise, allowing the detection of occult lesions. However, at least a small amount of fat surrounding the lesion is needed to be detected. Breast US is widely used as an adjunct to mammography and it improves the sensitivity in dense breasts. But US is a time-consuming, operator-dependent technique that detects too many benign lesions (false-positive results). This is why US cannot be used for population-based screening. MRI is not routinely used for the evaluation of dense breasts, although it can be very useful in some particular cases (preoperative planning, high-risk patients, etc.).

Learning objectives:

- To become familiar with the limitations of mammography in dense breasts
- To learn the role of Tomosynthesis to overcome the limitations of mammography in dense breasts
- To understand the role of breast US in dense breasts.

Volumetric breast density analysis in mammography and tomosynthesis: brief overview

Hanna Sartor; Malmö/Sweden

High breast density is associated with an increased risk of breast cancer. However, qualitative measurements of breast density by radiologists may vary and be subjective. Automated VBDA was developed to provide objective and reproducible measurements. To explore the possibilities and clinical use of VBDA, previous studies have described the agreement between different methods of measuring volumetric density (e.g. by software such as Volpara and Quantra) and radiologists' assessments in mammography (e.g. qualitative measurements such as BI-RADS and a visual analogue scale) with varying results. DBT is a promising technique and a potential screening modality and the possibility to measure breast density on DBT images is important. Our group has previously compared breast density that was measured by radiologists to measurements obtained from an automated VBDA tool from Siemens using the central projection image in DBT. The results suggested that VBDA could be used in DBT in addition to mammography. Taken together, the use of a robust VBDA is important and seems possible in both mammography and DBT, enabling it to be used in individualised screening programs and in breast cancer risk scores.

Learning objectives:

- To understand the clinical basics of volumetric breast density analysis (VBDA) based on previous studies
- To acknowledge the difference between radiologists' assessment of breast density and software measurements
- To discuss VBDA's potential use for mammography and digital breast tomosynthesis (DBT) in clinical practice

Multimodality lunch symposium: Dense breast and how to overcome the radiologist's "problem child"

Wednesday, March 1, 2017, 12:15 pm – 1:45 pm, Room "Studio 2017"

Chair: Luis Javier Pina Insausti; Pamplona/Spain

Current role of MRI in imaging of dense breast tissue

Carla van Gils; Utrecht/The Netherlands

MRI is the most sensitive breast cancer imaging technique currently available and recommended for screening women with high breast cancer risk. Women with dense breasts have a moderately increased breast cancer risk. In addition, their dense tissue limits the detection of a tumour with mammography and, therefore, additional screening with MRI could provide a solution for these women as well. However, MRI is not included in screening recommendations for women with dense breasts. The effects of MRI, and also those of other supplemental imaging methods, on breast cancer outcomes remain as yet unclear due to a lack of comparative studies with interval breast cancer rates, stage at diagnosis or breast cancer mortality as the outcome. In this presentation I will outline the present evidence for MRI screening in women with dense breasts, and indicate which type of evidence is still needed to proove its additional value. DENSE, a large randomised controlled trial, that we are currently conducting, has been designed to deliver this proof. It investigates the value of additional MRI compared to usual screening practice, in women with extremely dense breasts and a negative digital mammography. Women are included solely on the basis of their breast density. A fully automatic and validated method is used to estimate mammographic density. The primary outcome is a difference in interval cancer rates between the two arms, the best proxy for a difference in breast cancer mortality.

Learning objectives:

- To understand the current evidence for MRI screening in women with dense breasts
- To learn what type of studies are needed to fully appreciate and weigh the benefits and harms of supplemental MRI screening in women with dense breasts

The future of breast cancer screening: where can it help the dense breast?

Michael Golatta; Heidelberg/Germany

In most countries breast cancer screening is offered to women between (40)50 and 70(75). The organization of the screening programs differ from country to country, but in general every two or three years mammography is offered to the participating women. In the past years, several breast imaging techniques have been developed which have the potential to improve breast cancer screening. Digital breast tomosynthesis is one method that has been developed. Multiple low-dose images are obtained and digitally edited and reconstructed as a 3D-image of a breast. The reconstructed 3D-image overcomes the weakness of standard mammography and enables reduction in false-positive findings as results of overlapping tissue. On the other hand, it also enables reduction in the false-negative findings in women with dense breast tissue. Studies have shown that combining ultrasound with mammography in screening settings can significantly improve the rate of found lesions. By adding US to the screening work flow the sensitivity can be improved especially in the dense breast. But US is very time consuming and the specificity goes down (more biopsies are necessary). To overcome these two weaknesses, an "Automated breast volume scanner (ABVS)" and elastography can be used. Strain imaging ultrasound technology as Virtual Touch IQ (VTIQ) is a new method being used in breast ultrasound. Various studies have been able to show an increase of the diagnostic specificity without loss of sensitivity when combining the standard ultrasound BIRADS® classification with elastography. The improvement of the specificity will help to eliminate unnecessary breast biopsies in the future.

Learning objectives:

- To become familiar with new breast imaging techniques
- Breast cancer screening could be improved by embedding new breast imaging techniques like Tomosynthesis, US, Elastography, ABVS

Breast tomosynthesis symposium: Is digital breast tomosynthesis ready for mammo screening?

Wednesday, March 1, 2017, 2:00 pm – 3:30 pm, Room “Studio 2017”

Chair: Sylvia H. Heywang-Köbrunner; Munich/Germany

Is digital breast tomosynthesis ready for mammo screening?

Sylvia H. Heywang-Köbrunner; Munich/Germany

For DBT, first systematic reviews of screening trials and of mostly retrospective data from the US confirm that DBT is clearly superior to mammography allowing significantly improved sensitivity. DBT leads to a slightly increased biopsy rate with comparable PPV compared to mammography screening with double reading. Unfortunately for a screening procedure, increased detection is not equivalent to mortality reduction, since increased detection could as well be caused by overdetection of “harmless“ malignancy (overdiagnosis). So far no data on overdetection or mortality reduction exist for DBT. Even though important, they are generally difficult to obtain and require long-term follow-up. First indicators of effectiveness could include a significant reduction of interval cancers or an improved stage distribution of cancers detected during the follow-up round(s). Initial data on interval carcinomas are being published. However, first analyses show that evaluation of follow-up rounds remains essential. Thus, to date DBT remains the most promising new modality for screening. Further data allowing estimates of effectiveness and potential overdiagnoses are needed and are gradually expected. Logistic problems (longer reading time, fatigue, optimised hanging protocols, comparison with DM or DBT priors, etc.) should be investigated as well as the potential of stratified DBT vs mammography screening.

Learning objectives:

- To understand true benefits and risks of screening procedures
- To understand present data on diagnostic accuracy and the gap concerning data on screening effectiveness and potential overdiagnosis
- To understand logistic demands associated with future DBT screening

Experiences from the Malmö Breast Tomosynthesis Screening Trial

Kristina Lang; Malmö/Sweden

The Malmö breast tomosynthesis screening trial is a prospective population-based single-arm study including randomly invited women 40-74 years old eligible for the screening programme in the city of Malmö, Sweden. Women underwent one-view BT and two-view DM. The images were read and scored separately in a blinded double-reading procedure. Interim results of 7,500 women showed a significant increase in cancer detection rate (6.3 to 8.9/1,000) and recall rate (2.6% to 3.8%). The additionally detected cancers were mainly invasive, with a tendency of downstaging (Lång 2015). Findings of stellate distortions simulating malignancy increased the false-positive rate with BT. The FP rate was reduced over time, suggesting a learning curve (Lång 2016). The BT images were acquired with reduced compression force which would be a great advantage for a new screening modality. Slabbing and reconstruction methods can be used to reduce the reading time and increase the image quality. The main challenge of implementing BT in screening is the reading time (x 2-4) (Bernardi 2012, Skaane 2013). CAD and AI could provide a solution. Hopefully, attempts to implement BT in screening could be a catalyst towards the development of individualised screening programmes.

Learning Objectives:

- To describe the Malmö Breast Tomosynthesis Screening Trial
- To illustrate technical aspects of BT as a screening tool
- To recognize the challenges of implementing BT in screening

Breast tomosynthesis symposium: Is digital breast tomosynthesis ready for mammo screening?

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Chair: Sylvia H. Heywang-Köbrunner; Munich/Germany

Clinical performance of a synthetic mammogram (Insight 2D) and its role for screening procedures

Maria Bernathova; Vienna/Austria

No abstract submitted

New tomo reconstruction algorithms: clinical experiences

Detlev Uhlenbrock; Dortmund/Germany

No abstract submitted

Practical challenges in screening with digital breast tomosynthesis

Chantal Van Ongeval, Julie Soens, Machteld Keupers, Cockmartin Lesley, Bosmans Hilde;
University Hospitals Leuven, Leuven/Belgium

Learning objectives:

- To evaluate the impact of the reading time on the use of digital breast tomosynthesis (DBT) in breast cancer screening
- To discuss the requirements of image transfer and data storage in breast cancer screening with DBT
- Evaluation of additional tools in improving accuracy in reading of DBT in screening.

Technical aspects of digital breast tomosynthesis

Wayne Lemish; Melbourne/Australia

There are a number of digital breast tomosynthesis (DBT) systems in the market that have applied differing technologies to acquire the data necessary for tomosynthesis image reconstruction. The various techniques all have advantages and some potential limitations. These differences could potentially produce different clinical outcomes and the lack of uniformity may make the comparisons between clinical trials difficult. We will review the principles of DBT and discuss the likely advantages and possible limitations of different methods available.

Learning Objectives:

- To review the physical principles of Digital Breast Tomosynthesis
- To become familiar with the strengths and limitations of different technologies used in Digital Breast Tomosynthesis.

The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

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