Conclusion: The technical modifications of the BAT-software have lead to the achievement of accurate and reliable results. This qualifies the use of BAT in prospective and retrospective trials on breast cosmesis.

604   Poster

The additional value of whole-breast ultrasonography in the evaluation of women with mammography-negative dense breast

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Background: Mammography is the standard method of breast cancer screening but increased breast density reduces the sensitivity of both diagnostic and screening mammography. In the present study, the clinical utility of bilateral whole-breast ultrasonography as an adjunct examination to mammography in asymptomatic women with dense (Breast Imaging Reporting and Data System [BI-RADS] density category 2−4) breast tissue was examined.

Materials and Methods: Between January 2006 and January 2008, 592 asymptomatic women with normal mammography and physical examination and dense breasts (density grade 2−4) on mammography were evaluated with breast ultrasonography by three expert radiologists in a referral breast center. The findings of ultrasound were recorded by the radiologist in a separate sheet. According to ultrasound findings; the patients were offered routine follow up, repeat ultrasound in 6 months or biopsy.

Results: The mean age of the study population was 42.3±5.7. Positive family history for breast cancer was found in 16.6% of the patients. Ultrasound was normal in 57.5% of patients. Simple cyst or duct ectasia were diagnosed in 12.6% of patients and no further intervention was performed in this group. In 11 patients ultrasound found a suspicious or indeterminate lesion. Biopsy was performed for this group of patients according to ultrasound finding but no malignancy found on pathology report of the lesions. In 29.9% of patients complex cyst or benign appearing mass lesions were diagnosed on ultrasound. In repeat sonography, the lesions were either disappeared or not changed. No cancer was detected in the study population.

Conclusions: The findings of the present study do not support the routine use of ultrasonography in women with normal physical examination and mammography-negative dense breast. More studies in special high risk subgroups are recommended.

605   Poster

Thin slice multidetector-row computed tomography for the preoperative evaluation of axillary nodal status in patients with breast cancer

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Background: Sentinel lymph node biopsy (SLNB) is now widely accepted in breast cancer treatment, and being spared from complete axillary lymph node dissection (ALND). The role of a non-invasive imaging modality to assist in the preoperative diagnosis of axillary lymph nodal status (ALNS) has become very important. Multidetector-row Computed Tomography (MDCT) is one of the most useful methods of evaluating the clinical state of patients with breast cancer, and its high spatial resolution can offer an accurate diagnosis of distal metastasis. We retrospectively evaluated the effectiveness of thin slice MDCT for detecting ALNS in patients with breast cancer.

Material and Methods: Between November 2007 and October 2009, 246 patients with breast cancer enrolled in this study. We obtained CT images with a slice thickness of both 5 mm and 2 mm, by using helical CT scanning. A metastatic lymph node on MDCT was defined as more than 5 mm on the short axis and extinguishing fatty infiltration in hilum of lymph node. We estimated ALNS by both 5 mm-thick MDCT and 2 mm-thick MDCT, and performed either SLNB or ALND as part of the surgical treatment. The diagnostic accuracy for ALNS was evaluated based on the histological findings of either SLNB or ALND as a reference standard.

Results: The mean age of the patients was 57 years and all were female. Among the 246 patients examined, 72 (29%) patients were diagnosed pathologically as node-positive, and 174 (71%) were as node-negative. For establishing the ALNS, 5 mm-thick MDCT shows a sensitivity of 35%,

a specificity of 93%, a positive predict value of 68%, a negative predict value of 78% and an accuracy of 76%. On the other hand, 2 mm-thick MDCT shows a sensitivity of 35%, a specificity of 97%, a positive predict value of 81%, a negative predict value of 78% and an accuracy of 78%. By using 2 mm-thick MDCT, the specificity, positive predict value and accuracy of detecting ALNS in patients with breast cancer improved.

Conclusion: In patients with breast cancers, 2 mm-thick MDCT is more effective than 5 mm-thick for detecting ALNS. For current evaluation of ALNS, sufficient thin slice MDCT is required.

606   Poster

Mammographic and ultrasonographic findings after oncoplastic techniques and breast reconstruction for breast cancer

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Background: To describe the mammographic and ultrasonographic findings in patients treated for breast cancer with oncoplastic techniques in conservative surgery and with breast reconstruction techniques in mastectomy.

We review normal and pathologic findings and signs of recurrence.

Materials and Methods: Oncoplastic techniques after breast-conserving therapy and breast reconstruction techniques after mastectomy are a treatment choice for women with breast cancer, being an alternative treatment to conventional surgery in specialized centers.

Conservative treatment with oncoplastic techniques include tumorectomy with remodelling, tumorectomy with reduction mammoplasty, and partial reconstruction using prosthesis or autologous tissue.

After mastectomy, immediate breast reconstruction is the elected technique at our institution, and it includes the use of tissue expanders, prosthesis and autlogous myocutaneous flaps.

Follow-up mammographies are systematically carried out yearly according to our protocol, and sonographic exams are complementary to follow-up mammography.

We review exams performed to 355 patients treated between 2005 and 2008; 243 patients were treated with mastectomy and breast reconstruction, and 112 with conserving therapy (20 hemimastectomy).

Sixty one patients had bilateral reduction mammoplasty, 17 tumorectomy and remodeling, 196 reconstruction with myocutaneous flaps only, 51 autologous flap with implant, and 25 patients only implant.

Results: Implants are radiopaque, and autologous myocutaneous flaps are radiolucent, with variable density due to the muscle component.

Fat density surrounded by dense band and muscle fibers inside are normal findings of myocutaneous flaps. Implant wrinkles are seen with saline implants.

Parenchymal redistribution inferiorly, distortion and elevation of nipple are normal findings in reduction mammoplasty.

Unlike simple tumorectomy, postoperative scarring and fluid colleccions inside cavities are not visualized in remodelling techniques.

Abnormal findings in these techniques are fat necrosis, dystrophic calcifications, epidermal inclusion cysts and recurrent carcinoma.

Conclusions: Treatment of breast cancer with oncoplastic techniques has increased in popularity. Mammography and ultrasound provide excellent visualization of normal and pathologic findings in reconstructed breasts.

For a better follow-up of these patients, radiologists dedicated to breast pathology need to be familiarized with these radiologic findings.

607   Poster

USG scan of the axilla complemented with clinical examination can help predicting positive nodes and avoid unnecessary axillary node clearance in invasive breast cancer

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Introduction: Axillary node status remains the most important prognostic factor in invasive breast cancer recurrence. Axillary Node Clearance (ANC) remains the mainstay of treatment for all patients who have lymph node involvement with metastatic disease. The information obtained from the axillary clearance helps in planning further adjuvant therapy. Sentinel Lymph Node biopsy (SLNB) has become the standard method of staging the axilla. In order to avoid unnecessary ANC ultrasound (USG) of the axilla followed by either FNA or core biopsy of the abnormal gland is being undertaken. This however commands additional resources and training which is not freely available. As a compromise, we relied on USG and

clinical findings, and gave consideration to size of the tumour on predicting who is likely to be node positive and have ANC without SLNB.

Aims: The aim of this study was to look at the different criteria used for performing ANC in a District General Hospital and to study the sensitivity of each determinant criterion.

Methods: A retrospective study was performed on all patients who underwent ANC for any reason over a periodof 18 months. Demographic, radiological and histological data were collected from medical notes. The reason for doing ANC without SLNB was documented.

Results: 165 ANC were performed in that period and 40 were negative for metastatic disease, with an overall sensitivity of 80%. If we exclude SLNB, the combined sensitivity of all other predictor factors is 65%, which means we are sparing 2 out of 3 patients unnecessary ANC. On the other hand we are subjecting 1 out of 3 patients invasive and unnecessary ANC, It is interesting to note that clinical examination is as sensitive as US assessment (80%, and 75%), and when both are combined the sensitivity went up to 85%. It is noted that the intra-operative assessment is the least reliable.

Reason for axillary clearance	n	Positive ANC	Negative ANC	Sensitivity
Positive prediction on USG	32	24	8	75%
Size of tumour	18	10	8	55.5%
Recurrence of breast cancer	2	0	2	0
Patient request	2	0	2	0
MRI findings	1	0	1	0
Clinically suspicious nodes	40	32	8	80%
Concerns for fitness for surgery	7	4	3	57.1%
On-table decision (suspicious nodes)	11	1	10	9.0%
SLNB	52	52	0	100%

Conclusions: The combination of USG and clinical examination can correctly predict positive nodes in 85% of cases. To improve the sensitivity an additional assessment of abnormal lymph nodes with FNA or core biopsy is strongly recommended. Suspicious nodes noted intra-operatively should not be used as a criteria for performing ANC.

608   Poster
Visualisation of lymph nodes using optical projection tomography

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Background: Optical Projection Tomography (OPT) is a wholemount, *in vitro* imaging technique suitable for small biological specimens (1−15 mm in diameter) (Sharpe J. Science 2002;296:541−5). The aim of this study is to investigate whether human lymph nodes can be imaged using OPT and to compare the images with traditional H&E stained sections. The OPT scanner can be considered to be the optical equivalent of an X Ray CT scanner. It produces 3D images and virtual sections in 3 orthogonal planes through the whole of the specimen with a cellular level of resolution. Furthermore, since OPT is non-destructive, the tissue can subsequently be successfully processed for routine histology (either H&E or immunohistochemistry).

Methods and Materials: We retrospectively examined 24 lymph nodes taken from 7 patients who had a histological diagnosis of breast or colon adenocarcinoma with known lymph node involvement, and whose treatment would not be altered by the outcome of this study. The fixed lymph nodes were first prepared for OPT scanning. They were embedded in agarose, dehydrated in methanol and cleared in benzyl alcohol benzyl benzoate (in a 1:2 ratio). The tissue was then mounted and scanned at high resolution on an OPT Scanner 3001, using a Cy3 filter. The reconstructed virtual sections were visualised in 3 orthogonal planes using DataViewer. Once the images were obtained, the nodes were re-hydrated, de-embedded from agarose using a sucrose solution and prepared for histology in the traditional way. The H&E stained sections and the corresponding OPT virtual sections were examined by the Consultant Histopathologist.

Results: Direct comparisons were made between traditional H&E sections and the virtual monochrome sections obtained from OPT. Anatomical structures characteristic of lymph nodes could be visualised using OPT. Furthermore, areas of tumour and small areas of metastases could also be clearly identified.

Conclusions: This study demonstrates that it is possible to identify areas of metastasis and make a presumptive diagnosis based on OPT images of lymph nodes. The actual scanning of tissue using OPT takes minutes, but the processing of tissue takes too long for it to be suitable for intraoperative diagnosis of metastatic spread. However it could potentially be used to direct subsequent histological sectioning or obtain a more accurate assessment of tumour size/extent of involvement within the lymph node. It may also have applications in other clinical scenarios.

609   Poster
A combined high temporal and high spatial resolution 3 Tesla MR imaging protocol for the assessment of breast lesions: initial results

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Purpose: To develop a 3.0 Tesla breast imaging protocol that combines high temporal and spatial resolution 3D MR sequences for quantitative time course and morphological analysis of breast lesions.

Materials and Methods: Thirty-four patients were included in the study (age range, 31−82; mean age, 54.3). The study protocol was approved by the Institutional Review Board and written, informed consent was obtained from all patients. The MRI protocol included: a coronal T1-weighted Volume-Interpolated-Breathhold-Examination sequence (VIBE), focused on high temporal resolution for optimal assessment of the contrast-enhancement behavior of lesions (SI 1.7 mm isotropic; TA 3.45 min for 17 measurements); a coronal T1-weighted turbo fast-low-angle-shot-3D sequence (FLASH), with water-excitation and fat-suppression, focused on high spatial resolution for morphologic analysis (SI 1 mm isotropic; TA 2 min); and a repeated coronal VIBE for detection of washout. Lesion size and morphology were assessed. ROIs for suspicious areas were manually drawn and evaluated for contrast-enhancement behavior by plotting intensity courses against time. Sensitivity and specificity with a 95% confidence interval and the negative predictive value (NPV) and positive predictive value (PPV) were calculated. Diagnostic accuracy was assessed. The histopathological diagnoses were used as a standard of reference.

Results: Fifty-five lesions were detected in 34 patients. All malignant breast lesions were identified correctly. There were five false-positive lesions. The sensitivity of contrast-enhanced MRI of the breast at 3Twas 100%, with a 95% confidence interval (CI) of 90.6–100%. The specificity was 72.2%, with a 95% CI of 49.1–87.5%. The PPV was 0.88 and the NPV was 1. Diagnostic accuracy was 91% with a 95% CI of 80.4–96.1%.

Conclusion: Our prospective study demonstrates that the presented 3 Tesla MR imaging protocol, comprising both high temporal and high spatial resolution, enables accurate detection and assessment of breast lesions.

610   Poster
Method of differential breast tumour diagnostics

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Background: *Oxidative stress* is a disturbance in the balance between the production of *reactive oxygen species* (ROS) and antioxidant defense. In patients with mammary gland tumors the processes of peroxide oxidation of lipids (POL) are increased and metabolism disturbed. *Glutathione-associated metabolism* is a major mechanism for cellular protection against agents which generate oxidative stress and peroxide oxidation of lipids. Glutathione, glutathione-dependent enzymes and glutathione S-conjugate efflux pumps function in an integrated fashion to allow cellular adaptation to oxidative stress. Co-ordination of this response is achieved, at least in part, through the antioxidant which is found in the promoters of many of the genes that are inducible by oxidative and chemical stress.

Purpose: A comparative investigation of the activity of antioxidative glutathione-dependent enzymes and glucose-6-phosphate dehydrogenase in the blood serum and saliva in the patients with breast dyshormonal hyperplasiae (BDH) and breast cancer (BC).

Material and Methods: Fifty-five patients aged 32−65 years (mean age 48.5±16.5 years) were studied before treatment and 30 healthy (a control group). In the blood serum and saliva the following enzyme activities were determined using SP "Humalyzer 2000": glutathione reductase (GR), glutathione-S-transferase (GST), gamma-glutamyltranspeptidase (GGT), glucose-6-phosphate dehydrogenase (G6PDH), and the content of the reduced glutathione (GSH).

Results: The results were calculated with the help of statistical Student method. Spearmen method was used for examination of interrelations