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Breast Imaging in Patients Aged 35−39 − Which Modality is Best?

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Background: In the last 12 months new best practice guidelines for the imaging of symptomatic breast problems in women aged 35−39 inclusive have been published.[1] These advocate that ultrasound scan (USS) should be adopted as the primary imaging modality in this age group and mammography (MMG) reserved for those with suspicious or atypical findings clinically and/or on imaging. This is a change in practice for many units including our own and we sought to investigate the adequacy of USS alone in our unit prior to introducing this change.

Materials and Methods: All new patients aged 35−39 years old attending breast clinic from January 2008 to December 2010 who had a radiological investigation were identified. Imaging results were cross referenced with histology to establish those diagnosed with cancer and to see how this was identified.

Results: 542 patients were identified. 15 (3%) were men and were excluded. 398 (73%) patients were investigated with MMG, 285 of these also had USS. 144 (27%) patients had USS only. 28 patients were diagnosed with breast cancer; all women with a mean age of 36.9 years.

17 cancers were investigated with both MMG and USS, but in all of these the USS was graded U3/4/5 using the breast imaging reporting and data system (BIRADS) classification. 1 cancer only had USS (U4/5) and 1 cancer was diagnosed on MMG only (although she had an informal unreported portable USS in clinic on which the cancer was seen).

There were no incidental findings of breast cancer on MMG. 2 patients had lesions graded benign by MMG but suspicious on USS: core biopsy of both lesions demonstrated malignancy.

In one patient a cancer was identified in the contralateral breast following prophylactic mastectomy which was not identified on MMG pre-operatively.

Conclusion: We found that USS in this group of patients was more sensitive for the identification of breast cancer than MMG. MMG alone here would have missed pathology in 3 patients. Thus MMG could be reserved for patients with uncertain or positive findings on USS and we have adjusted our guidelines accordingly.

References

[1] Willett AM, Michell MJ, Lee MJR. Best practice diagnostic guidelines for patients presenting with breast symptoms. Department Of Health; 2010.

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A Dedicated Breast PET-CT System for Metabolic Imaging of Breast Tumors

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Introduction: To demonstrate feasibility of a dedicated ^{18}FDG-PET-CT for metabolic imaging of breast lesions.

Material and Methods: 103 breast tumors in 93 patients classified by mammography or ultrasound as BIRADS 4 or 5 were included in this IRB approved prospective study. Patients fasted at least 6 h before injection of approximately 300–700 MBq 18F-FDG based on the patients weight. Scanning was started 45 min after injection. Blood glucose levels were <150 mg/dl (8.3 mmol/l). All patients were subjected to ^{18}FDG-PET-CT scanning using a combined PET-CT in-line system (Biograph, Siemens, Erlangen, Germany). PET data were acquired in the prone position similar to breast MRI to allow an optimal expansion of breast parenchyma. CT data was used for attenuation correction. PET scan was reconstructed applying a standard iterative algorithm [ordered-subset expectation maximization] into a 168×168 matrix. Dedicated breast ^{18}FDG-PET-CT was assessed for ^{18}FDG-avidity as well nodal status. Tumors within tissues of mild metabolic activity were classified as positive when 18F-FDG uptake > blood-pool activity. Tumors within tissues demonstrating moderate or high physiologic activity were considered positive if the activity was greater than the adjacent physiologic activity. All tumors were histopathologically verified.

Results: There were 33 benign and 70 malignant lesions. Mean histopathological tumor size was 28.8 mm (range 3−90 mm). ^{18}FDG-PET-CT demonstrated a sensitivity of 94%, a specificity of 82% and a diagnostic accuracy of 90%. PPV was 0.92 (CI: 0.83–0.96) and NPV was 0.87 (CI: 0.71–0.95). The 6 false positive tumors were juvenile fibroadenomas and one chronic abscess. The 4 false negative tumors were all smaller than 1cm associated with very high physiologic activity of the breast parenchyma.

Conclusion: Metabolic imaging of breast lesions with ^{18}FDG-PET-CT using a prone patient geometry is possible and allows a detection and assessment of breast tumors with a good sensitivity and specificity. False negative results seem to be influenced by tumor size (<1cm) and high physiologic background activity. Radiologist should be aware that lesions with high cellular density or inflammatory changes can mimic malignancy and lead to false-positive results in breast PET-CT.

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Pain in Stereotactic Breast Biopsy for Non-palpable Mammographic Lesions − Comparison of Two Biopsy Methods

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Background: Pain has been recognized as an important factor in the context of breast biopsy that affects both quality of life and patient compliance. The present study examines and compares pain during stereotactic breast biopsy for suspicious non-palpable mammographic lesions with two different biopsy methods.

Materials and Methods: In this study 181 consecutive women were included with mean age 51.57±9.02 years. The patients underwent a stereotactic breast biopsy for suspicious (BIRADS⩾4) non-palpable mammographic lesions, such as microcalcifications, solid lesions and asymmetric breast density. Biopsies were performed in a Fischer's Mammotest® stereotactic table, by the same surgical-radiologist team, using the Mammotome® large-core vacuum-assisted breast biopsy system or the radiofrequency-assisted intact-specimen Breast Lesion Excision System® (BLES). All procedures were performed under local anaesthesia, using the relevant for each method anaesthesia protocol. For the quantification of pain experience, the visual analogue scale (VAS) was used (0−10 scale,0 indicates 'no pain',10 indicates 'worst possible pain'). Immediately after the procedure, the patients were asked to retrospectively indicate the experienced pain, defined as the VAS score.

Results: In order to excise suspicious non-palpable mammographic lesions for pathologic diagnosis, we used large-core vacuum-assisted breast biopsy in 83 cases(Group A,patient age 49,9±8,5 years) and radiofrequency-assisted intact-specimen breast biopsy in 98 cases(Group B,patient age 52,9±9,22 years). The pain VAS score was 4,41±2,22 for Group A patients and 4,02±2,42 for Group B. Statistical analysis between groups showed no significant difference in the VAS score(p = 0,31, Mann-Whitney U test). Within-group analysis showed that the pain experience was not associated with the type of the lesion excised in both groups.

Conclusion: There is a broad spectrum of methods and devices available for the excision of suspicious non-palpable mammographic lesions in order to establish an accurate pathologic diagnosis. Although stereotactic breast biopsy is a relatively painful procedure, it has been suggested to be less painful than other methods of breast biopsy. According to our experience,there is no significant difference in pain experience between stereotactic large-core vacuum-assisted breast biopsy with the use of Mammotome® and radiofrequency-assisted intact-specimen breast biopsy with the use of BLES®.

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The Characteristics of Primary Breast Cancers with Non Mass like Enhancements in a Breast MRI

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Background: Breast MRI has been a popular method for patients in planning to breast conserving operations. The MR breast imaging reporting and data system (BI-RADS) lexicon of the American College of Radiology(ACR) includes a new lesion category defined as non-mass like enhacement(NME). The purpose of this study is to identify the incidence of this new entity, the correlation with breast cancer, and the impact on surgical treatment in primary breast cancers.

Methods: A retrospective review was performed for 133 patients with primary breast cancer evaluated with gadolinium enhanced MRI before surgical treatment. Detection of NME is made on contrast enhanced subtracted images. We categorized the MR-breast finding with 5 groups, such as, (1) group 1; solitary lesion, (2) group 2; another suspicious Cat 4a lesion in an ipsilateral breast, (3) group3; non mass-like enhancement with primary breast cancer. Before operations, we checked a lesion marking by a second-look ultrasonography, we took a excision for another lesions and definite cancer operations. If frozen biopsy of another lesions were found as a malignancy during breast conserving operations, wider excisions were performed. We compared MR-breast findings with clinicopathologic findings, such as, patient's age, histologic features,