

The efficacy of ^{99m}Tc -MIBI scintimammography in the evaluation of breast lesions and axillary involvement

To the Editor: With interest we read the paper by Özülker et al (2010) [1]. For more than 15 years, scintimammography has been tested against mammography, ultrasound and MRI of the breast. Scintimammography has repeatedly shown high specificity for breast lesions. Although sensitivity rates are also favorable, scintimammography is less useful in non-palpable tumors [2].

The above study [1] included 46 patients, 43 of whom underwent biopsy or surgery, the gold standard for final evaluation of a breast tumor. Two thirds of patients had palpable tumors. Also, judging from the age of the patients, two thirds of their patients may have been premenopausal, although the exact menopausal status is not provided. These premenopausal two thirds of patients are of particular interest, because breast density is crucial for mammography, but not for scintimammography. Breast density is a mandatory factor to be given in any diagnostic breast test. The above study [1] does not provide any information on breast density. However, based on the results of mammography it may be assumed that breast density was a factor in mammography readings.

Scintimammography is favorable in premenopausal women, because the tumor-to-background ratio is independent of breast density. The limiting factor is lesion size, and only lesions of 10mm or more can be accurately imaged [2]. Therefore, consensus has been achieved to not use scintimammography in a routine evaluation. The above study [1] did not provide lesion size in the present study. Reviewing the literature, big tumors have been accurately imaged. Taking the favorable sensitivity rates, a rather large lesion size must be assumed.

Our study group has previously published a study enrolling 101 consecutive patients [3], also comparing different tracers for best imaging. While the best tracer was found to be sestamibi, we found a high specificity and a rather low sensitivity for the primary evaluation of breast lesions. Because the technique applied by Özülker et al (2010) is similar to that used in our study, results of a routine first line setting may also be expected to be similar. Therefore, it is not a study to evaluate any equivocal mammogram. Rather, they tested whether scintimammography would "replace" mammography. Because scintimammography is well known from previous studies, any additional study may not alter the widely accepted routine work-up of our female patients, using the same large field of view technique (LFOV). As a consequence, LFOV scintimammography should rather be used in a tertiary setting in patients with BIRADS III or IV, after routine diagnostic tests including sonography and mammography. In such patients, any test forgoing the need for invasive testing will be welcome by many colleagues.

The study by Özülker et al (2010) [1] is another report on a favorable specificity of scintimammography. Because lesion size is not provided, no conclusion can be drawn on sensitivity issues for other patients.

What do we need scintimammography for? Because mammography in American College of Radiology, classification I-IV, increasing with tissue density (ACR III or ACR IV) is rather difficult to read, scintimammography can be used in such patients to provide further information, i.e., to increase specificity. Many women are diagnosed as having Breast Imaging and Reporting Data System (BIRADS) III or even early IV. These women will ultimately undergo biopsy, and in some of them, biopsy will show cancer. However, there is often a long time lag until diagnosis is established, and scintimammography is therefore useful to provide evidence of active (= hot) tissue. From specificity, we know that a cold spot would allow a watch-and-wait strategy. However, a hot spot on scintimammography should be biopsied without delay.

In conclusion, in view of its specificity, the main benefit of scintimammography is that it may help obviate the need for invasive testing or surgery in a well defined sub-group of BIRADS III and IVa patients. Therefore, this subgroup should be given special attention in any future study in such patients.

Bibliography

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Author's reply: We appreciate the insights of Berghammer and Sinzinger into the role of scintimammography (SM) in the evaluation of breast masses. In the literature it has been reported that SM might be an accurate and clinically useful tool for evaluating patients with breast masses when

X-rays mammography (XRM) is negative and in the cases of indeterminate mammography [1]. In our study also, the overall sensitivity and negative predictive value (NPV) of SM in the detection of malignant breast masses was calculated as 93% and 96% respectively, which were higher than that of other modalities including XRM. Although, to us, this value seemed to be high enough to replace XRM when it gives equivocal results, of course this conclusion is not irrevocable, especially when we concern the previous assertions saying that a test must fulfill the prerequisite of having an NPV of more than 98% to dependably obviate breast biopsy and to be consistent with the standards set for mammography [2, 3]. The sensitivity and NPV further decreased to 75% and 90% in the patient group with non-palpable lesions. The influence of lesion size on the sensitivity of SM, as a low accuracy in lesions below 1cm, has been a well known fact. As Berghammer and Sinzinger pointed out, in our patient group, the mean tumor size for all tumors was large as 2.59cm with a range of 1.1-6.2cm and this value also makes contribution to the favourable sensitivity results that we have found. We hope that if we have made receiver operating characteristic curve (ROC) analysis, we might have shown the fall in the sensitivity as the lesion size decreases.

We did not mention about the breast density of our patients in our article, but it seems to have an effect on the sensitivity of XRM when the ages of the patients are concerned. XRM still remains the first imaging modality in the detection of

breast cancer we did not claim that it can be totally replaced by SM, but SM can be a useful supplement to equivocal XRM in certain situations like patients with dense breasts, breast implants and scar tissue in breasts. The main limitation that prevents SM being a first choice modality in the early identification of breast malignancies is its low sensitivity in small sized lesions and improvements in radiopharmaceuticals and development of new, dedicated instrumentation may alter this drawback.

Bibliography

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