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Diagnostic performance of SPECT/CT versus diffusion-weighted MRI in characterization of equivocal osseous lesions detected by bone scan

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Abstract:

OBJECTIVES: To evaluate the diagnostic performance of ^{99m}Tc-MDP bone scintigraphy using SPECT/CT in comparison to diffusion-weighted (DW) MRI in the characterization of solitary osseous lesions detected on planar bone scintigraphy.

METHODS: This ongoing prospective study recruited 29 cancer patients referred for bone scintigraphy (staging/restaging/follow-up) with their planar whole body scan showing solitary equivocal osseous lesion. Every patient further underwent SPECT/CT & DW-MRI within two weeks. Studies were read independently by one experienced nuclear medicine physician and one experienced radiologist on a 5-point score: (score 1 = benign, score 2 = likely benign, score 3 = equivocal, score 4 = likely malignant and score 5 = malignant). The final diagnosis of disease status was made on the basis of subsequent clinical/imaging follow-up for at least 6 months.

RESULTS: Of the 29 patients evaluated, only 9 (31%) proved to have osseous metastases and 20 (69%) were disease free.

SPECT/CT & DW-MRI had sensitivity, specificity, negative predictive value, positive predictive value, and accuracy of 67% vs 67%, 90% vs 75%, 86% vs 83%, 75% vs 55% and 83% vs 72%; respectively. Both modalities were true positive in 4, true negative in 14, false positive in 1 and false negative in 1 patient(s). No statistically significant difference noted in sensitivity, specificity or accuracy

CONCLUSION: bone scintigraphy using SPECT/CT is not superior to DW-MRI in characterization of solitary osseous lesions detected on planar scans. Further work is ongoing to identify the exact role of each modality in this setting.

