NON-OSSEOUS UPTAKES OF TC-99M PHOSPHONATE DURING THREE PHASES BONE SCANNING

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ABSTRACT

Objective : The purpose of this was to visualize non-osseous uptakes of bone scanning agent.

Methods : Amongst 51 patients (Male 21, Female 30) of age range 8-80 years having three phase bone scans at NMC, Rangpur during January 2002, we looked for non-osseous uptakes. All of these patients were encouraged to drink enough water prior to bone scans.

Results : Twenty four patients had non-osseous uptakes of 99 metastable technetium methylenediphosphonate (99m Tc MDP). Renal, pulmonary and mammary uptakes of this series are not always due to malignant process, however, one patient had cisplatin nephrotoxicity.

Conclusion : Non-osseous uptake of bone-seeking radiopharmaceutical is quite common (24/51 i.e. about 48% in this series), however, most of these may be non-malignant. (Abstract Presented in 7th National Conference of Society of Nuclear Medicine, Bangladesh on 9 March, 2002).

Key words : Bone scan, Non-osseous Uptake.

INTRODUCTION

Staging of tumours is important both for the selection of appropriate treatment and to provide information about prognosis. Inadequate or inaccurate staging may lead to under or over treatment, resulting in failure to cure or unnecessary toxicity respectively. The increased sensitivity of bone scanning provides a 6 to 18 months before X-rays in demonstrating metastatic disease.[1] Breast uptake of bone scanning agents is non-specific, it has been reported in the normal breast as well as in benign or malignant diseases of the breast.[2,3] Holmes et al. showed that 95% of benign lesions including fibroadenomas, mammary dysplasia and cystic mastitis had bilateral uptake, while 25% of malignant lesions showed a similar pattern.[4] The appearance of a dilated renal pelvis and ureter with increased tracer accumulation is the most common soft tissue anomaly on bone scanning.[5]

METHODS

Three phase bone scans were performed using 5-20 milli Curies (mCi) of 99m Tc phosphonate under a computerized gamma camera (Siemens Microdelta). Amongst 51 patients (M21, F30) of age range 8-80 years having three phase bone scans at NMC, Rangpur

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during January 2000 to January 2002, we looked for non-osseous uptakes in all phases i.e. during post-injection flow, blood pool and late static views.

RESULTS

Twenty four patients had non-osseous uptakes of 99 metastable technetium methylene-diphosphonate (99m Tc MDP), 19 in kidneys (14 in right, 4 in left kidneys, one patient showing hold-up in both kidneys), 3 in breasts (2 in left, 1 in right breast), and two patients had lung uptakes. Renal, pulmonary and mammary uptakes of this series are not always due to malignant process, however, one patient had cisplatin nephrotoxicity.

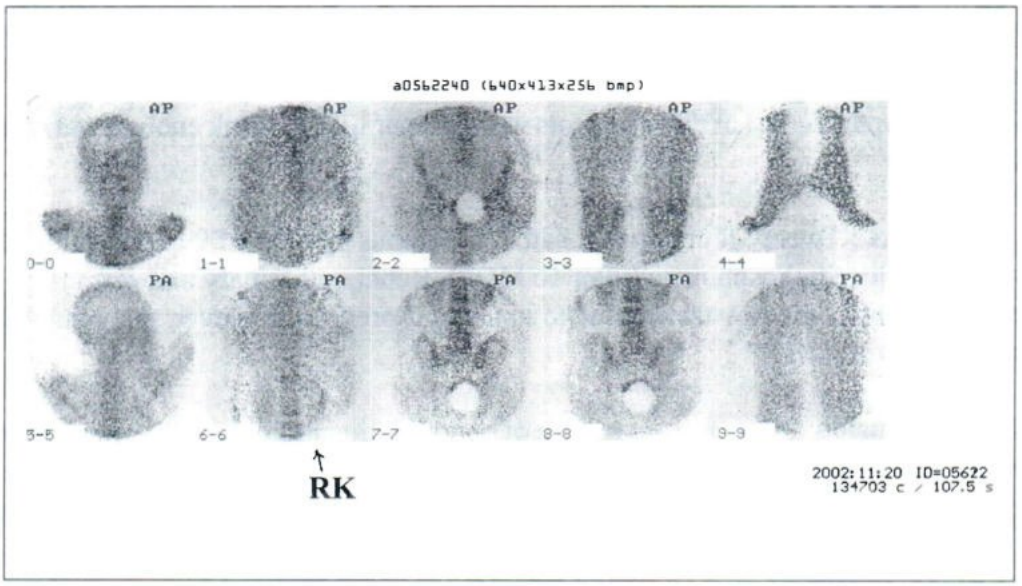

Fig. 1 Increases concentration of 99mTc MDP in Right kidney.

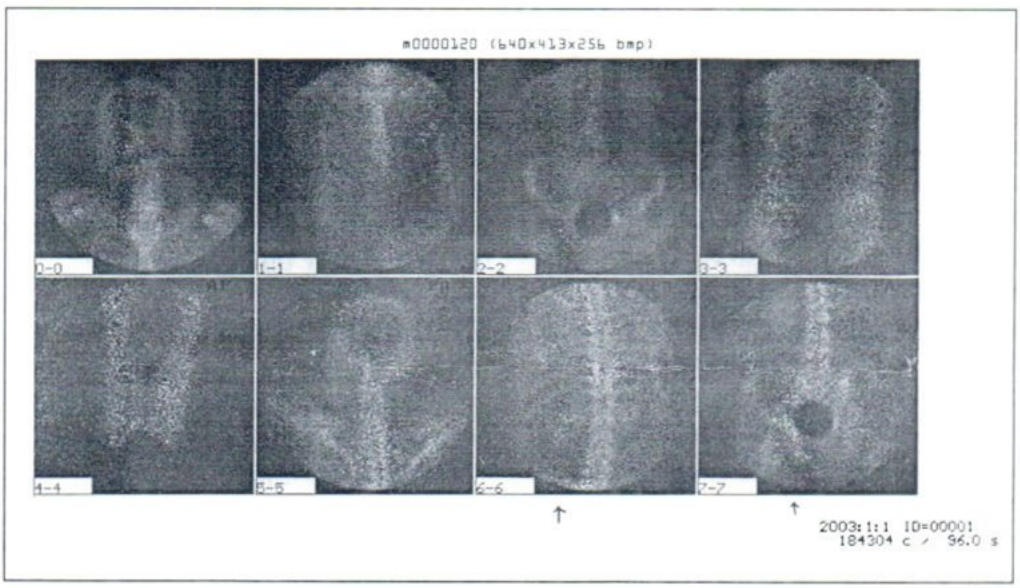

Fig. 2 Increases concentration of 99mTc MDP in Left kidney.

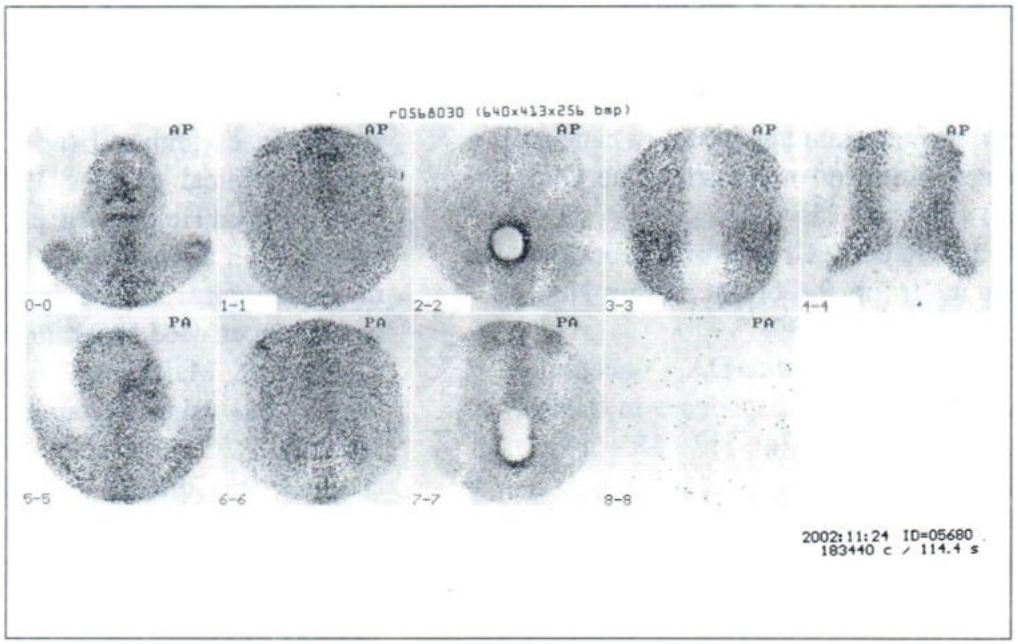

Fig. 3 Increased concentration of 99mTc MDP in Both kidneys.

DISCUSSION

Bone-seeking radiopharmaceuticals concentrate in the skeletal system as well as in many soft-tissue lesions for non-osseous pathology, sometimes serendipitious(incidental) and also purposeful detection e.g. scintimammography. However, the non-specific nature of the findings should be kept in mind. A negative mammogram should be ignored, if a suspicious breast lump remains palpable,[6] and Sestamibi scan is better than mammography.[7] Biello et al compared bone scan with IVP (intravenous pyelogram) and found that bone scan had a sensitivity of 73% with specificity of 100% for detection of uretero -pyelocaliectasis. They found that bilateral disease on bone scans were 100% concordant with IVP, while unilateral anomalies were found in 50% of cases with bilateral disease, bone scan detecting the most severely affected side. Increased accumulation in the renal pelvis alone was found to be an unreliable and insensitive(11%)indicator of true pelvi-ureteric junction (PUJ)obstruction. IVP is usually normal or reveals an extra renal pelvis or duplex calyceal system in such cases.[8] Intense renal uptake of bone agents was described 6-10 days after cytotoxic drugs, e.g. cyclophosphamide, doxorubicin, cyclosporin, vincristine and amphotericin B.[5] Uptake of bone radiopharmaceautical can result from a tumor of the chest wall, lung and pleural uptake in bronchogenic carcinoma, radiotherapy to chest and radiation pneumonitis. Metastatic disease in lung is readily identifiable by the more focal nature of the uptake.[5]

CONCLUSION

Non-osseous uptake of bone scanning agent is about 48% (24/51) in this series, however, most of these may be non-malignant and a result of cytotoxic drugs and/or radiotherapy.

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