Increased Tc-99m MDP Uptake of Soft Tissue Lesions with Calcification in Bone Scintigraphy

Kalsifikasyon Gösteren Yumuşak Doku Lezyonlarında Kemik Sintigrasinsinde Yoğun Artmış Tc-99m MDP Tutumunu

ABSTRACT A 54-year-old female patient who had gone through left nephrectomy because of dedifferantiated liposarcoma was referred for back pain. In bone scan, increased accumulation of Tc-99m MDP was observed in posterior parts of the left 6th, 8th and 10th ribs. In addition to these lesions, increased bone agent uptake was also observed in right 7th to 9th and left 11th to 12th intercostal spaces with the same intensity of the bone lesions. Computed tomographic correlation revealed 2 soft tissue lesions with calcification, one of which in the lower lobe of the right lung and the other one located retroperitoneally beneath the left 11th rib. Extrasosseous uptake of bone agent was attributed to these calcified lesions.

Key Words: Bone scan, Tc-99m MDP, soft tissue, calcification


Anahtar Kelimeler: Kemik sintigrasisi, Tc-99m MDP, yumuşak doku, kalsifikasyon


A 54-year-old woman suffering from back pain was referred to our department for Tc-99m methylene diphosphonate (MDP) bone scintigraphy. From her history it was learnt that left nephrectomy was performed 3 months ago and pathology report was consistent with de-differentiated liposarcoma. After surgery, chemotherapy including Adriamycine, Ifosfamide and Mesna was given. In bone scan, increased radiopharmaceutical uptake was observed in posterior parts of the left 6th, 8th. and 10th ribs (Figure 1, white arrows) which were attributed to metastatic disease. Apart from these regions, increased uptake of bone agent was also seen in right 7th to 9th and left 11th to 12th intercostal spaces with the same intensity of the bone lesions (Figure 1, black arrows). Computed tomography (CT) of the thorax and abdomen depicted two lesions with dif-
fuse calcification, one of which in the lower lobe of the right lung (Figure 2a) and the other one located beneath the left 11th rib (Figure 2b).

Although the pathogenesis of uptake of bone seeking agents in soft tissue is multifactorial, primary underlying factor for abnormal localization is excess tissue calcium. Uptake of bone scan agents in soft tissue is secondary to chemisorption on the surface of calcium salts. Injury or death of cells leads loss of intracellular calcium and phosphate to the extracellular area and calcium phosphate salts precipitates in this compartment.

Extraosseous uptake of bone scanning agents is observed in primary and secondary neoplasms including osteosarcoma, neuroblastoma, liposarcoma, carcinoma of colon, breast and lung, fibrosarcoma, rhabdomyosarcoma, lymphoma, malignant fibrous histiocytoma, malignant peripheral nerve sheath tumor and metastatic malignant melanoma. Inflammation, injury and necrosis, amyloid, degenerative and granulomatous processes and metabolic conditions are the other causes described to concentrate bone seeking agents. Soft tissue calcification and formation of hydroxyapatite crystals are seen in both in dystrophic and metastatic calcification. However, uptake of radionuclide may be seen in metastatic lesions of patients with no evidence of calcification in radiographs. In these kind of patients, diphosphonates may bind to acid phosphatase which is an enzyme found highly in bone, lactating breast and breast carcinoma.

Osteogenic sarcoma and neuroblastoma are the most common tumors in which diphosphonate uptake is observed. Accumulation of bone seeking agents in neuroblastoma is seen in 80% patients. In osteosarcoma, distant metastatic focuses also show diphosphonate uptake. Although liposarcomas have been reported to accumulate bone seeking agents our patient was operated and primary tumor was resected. However, intraabdominal lesion showing dense calcification was located in the operation site. We thought that, dystrophic calcification in the lesions shown in CT that caused binding of Tc-99m MDP, may be seen in residuel tumor tissue and in lung metastases of the primary tumor. Calcifications in the site of previous trauma

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**FIGURE 1:** Increased uptake of bone scan agent was observed in right 7th to 9th and left 11th to 12th intercostal spaces (black arrows).

**FIGURE 2:** Soft tissue lesions with dense calcification was seen in lower lobe of the right lung (a, arrow) and just beneath the left 11th rib (b, arrows).
and in chronic inflammation must also be considered in the differential diagnosis.

Our patient shows that, intensity of the extraosseous uptake of bone agents may be observed as intense as the uptake in bone lesions. Differentiation of soft tissue lesions from bone can be performed by correlative anatomical imaging and dense calcifications in soft tissues must be kept in mind.

REFERENCES