Case Report

TC-99m MDP ACCUMULATION IN A LIVER HEMANGIOMA

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Following their introduction in 1971 by Subramanian and McAfee, phosphate compounds of Tc-99m have been widely used in bone scintigraphy (10). However, researchers have also pointed out that Tc-99m phosphates could accumulate in soft tissue lesions and in the presence benign or malignant diseases of the liver (8). Previously, accumulation of technetium-99m methylene diphosphonate (Tc-99m MDP) in a patient with liver hemangioma was reported by Burkhalter *et al.* This in the second manuscript on the accumulation of Tc-99m MDP for liver hemangioma, we decided to publish this interesting observation.

Case Reports

The patient was a 46 year old male with no previous complaints. He, seven years ago, had total thyroidectomy because of thyroid papillary carcinoma. During routine examination blood biochemistry revealed no abnormality. A bone scan was performed using 20 mCi (740MBq) of Tc-99m MDP, uncovered no evidence of bony abnormality but did show a large round mass with significant uptake at the right upper quadrant of the abdomen (Figure I A,B). A solid mass of 12 cm diameter on the lower part of right lobe of the liver was seen on the ultrasonographic examination. The mass had regular boundaries, homogeneous ecogenic structure and did not involve any calcific or necrotic areas. Liver scintigraphy with Tc-99m sulphur colloid showed, on the right lobe, a hypoactive area with regular boundaries. Delayed blood pool imanging with Tc-99m RBC demonstrated sharply increased activity relative to the surrounding liver parenchyma. Subsequent computed tomography of the abdomen (Figure 1C) revealed a homogeneous, hypodense solid mass on the right lobe of the liver, which had no indications of calcification or necrosis and of hemangioma. A selective hepatic arteriography was performed and a mass with the characteristics of hemangioma was seen. A second bone scintigraphy with Tc-99m MDP, a month later, again showed radiopharmaceutical uptake in the liver, at the location of the hemangioma.

Comments

It was previously pointed out by various researchers that accumulation of Tc-99m phosphate compounds in the liver could occur in the cases of metastases from oat cell carcinoma of lung (8), metastases from malignant melanoma (8), metastases from colon carcinoma (4), metastases from osteosarcoma (12), cholangiocarcinoma (5), amyloidosis (11), postarteriography (3), aluminum excess (8) and liver necrosis (7). It is rather interesting to observe that there is also accumulation of Tc-99m MDP in the liver hemangioma, even though the details of the uptake mechanism are unknown. However, some possible mechanisms of extraosseous uptake of Tc-99m phosphate compounds have been postulated. Lyons *et al.* (7) described a case of Tc-99m pyrophosphate localization in a liver due to massive necrosis. Silberstein *et al.* (9) had proposed that accumulation of Tc-99m diphosphonates in extraosseous tissues could be related to the increased calcium content of the tissue. As an alternative explanation for radionuclide uptake in soft tissue, Chaudhuri suggested the possibility of high concentration of phosphatase enzyme sytems in certain tumors (2). On the other hand, Lowenthal *et al.* (6) reported the ion exchange between intra-cellular calcium phosphates and the bone agents containing phosphates as the reason for increased uptake.

We are of the opinion that more experimental and clinical studies are required to shed light on the mechanism and clinical importance of extraosseous localization of bone agents.

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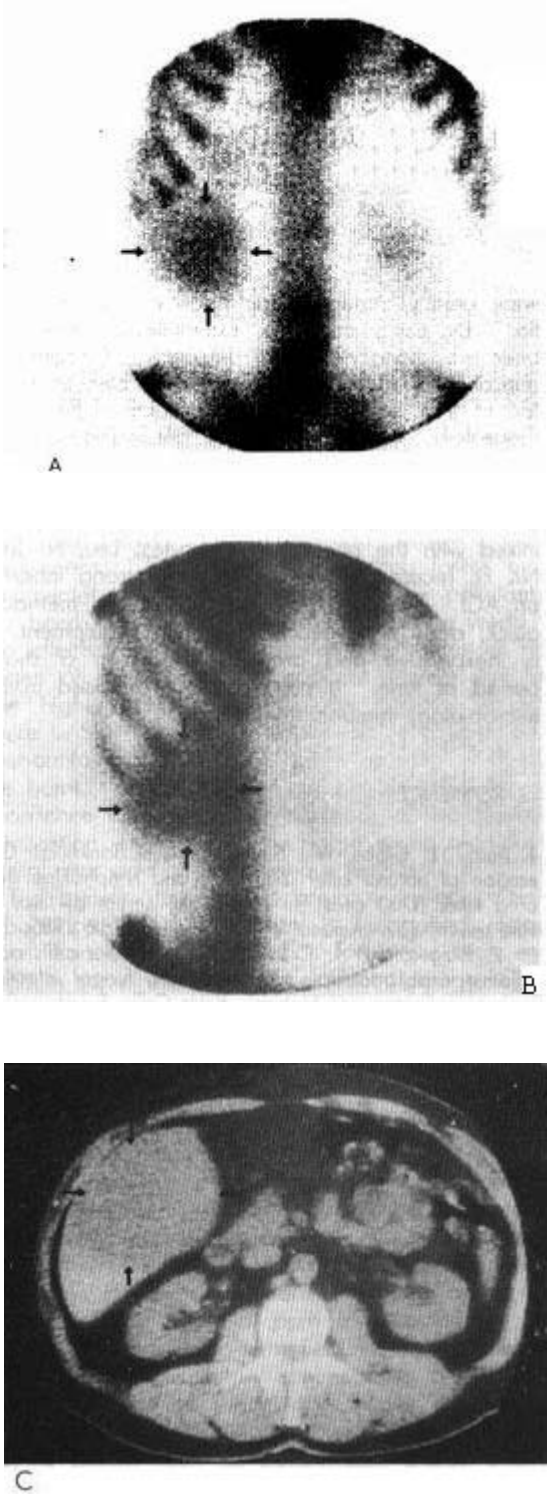

Figure 1: Initial anteiror (A), and right anterior oblique (B) bone scan demonstrating uptake of Tc-99m MDP by liver hemangioma. Subsequent CT scan (C) confirms a large homogeneous, hypodence, well-circumscribed, noncalcified liver hemangioma.

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