BONE IMAGING DEMONSTRATION OF OSSEOUS LESIONS AND HEPATIC UPTAKE: AMYLOID AND RENAL DIALYSIS EFFECT

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ABSTRACT

A 64 year old woman, with amyloid related kidney failure (on renal dialysis) had a bone scan because of pain in the right upper femur. The ^{99m}Tc-MDP images revealed marked hepatic uptake. In addition, there was right proximal femoral concentration of radiotracer which corresponded to a fracture site. As an added finding, the same femur demonstrated circumferential uptake at the lower pole. This region fractured on the next day. A biopsy of the fracture site revealed amyloid staining. The plasma aluminum level was elevated, consistent with long term dialysis. Hepatic uptake of bone imaging agent might be related to amyloid deposition or the elevated aluminum concentration.

A 64 year old woman had been followed because of amyloid related kidney failure. She was placed on dialysis and had undergone that periodic therapy for 3 years. The patient was referred, with a request for a bone scan, because of right upper femoral pain. A whole body bone scan was carried out, with a number of findings.

CASE REPORT

The patient was injected intravenously with ^{99m}Tc-MDP. Three hours later, whole body imaging was carried out (figure 1, posterior view on the left). There were 3 major findings:

1. There was diffuse uptake in the liver.
2. Concentration was apparent in the right proximal femur (later confirmed as a fracture by x-ray).
3. The right lower femur demonstrated circumferential uptake.

DISCUSSION

The hepatic uptake of bone imaging agent was not due to a problem with the radiopharmaceutical. Three other patients were injected with material from the same vial of ^{99m}Tc-MDP; no hepatic

activity was noted in these individuals. Hence. another cause must be sought, and we have to examine the underlying disease and its therapy.

The plasma measurement of aluminum revealed a value of 17 mcg/L. The normal range is 3 to 10, but can be as high as 40 in patients on chronic dialysis. It is known that aluminum (likely alumina) that elutes from the column of a molybdenum to technetium radionuclide generator, can interfere with radiopharmaceutical preparation (1). Aluminum residing in the liver could have resulted in deposition of ^{99m}Tc-MDP at that site. A second possible cause of the hepatic uptake of ^{99m}Tc-MDP also has to be explored. The day following our study, the patient fractured the right lower femur. A biopsy was taken at that time and revealed "...eosinophilic and congophilic material consistent with amyloid." Hence, hepatic uptake of the bone imaging agent, and the unusual circumferential pattern in the right lower femur, might both be related to the deposition of amyloid. Casey and associates have described"...amyloidosis of bone of beta 2-microglobulin origin in association with long-term hemodialysis"(2). Interest in the variants of amyloid has increased since certain disorders of the central nervous system have been shown to be associated with the deposition of amyloid-like materials. Some insights into this might be forthcoming, as radiolabeled amyloid components have been investigated.(3)

REFERENCES

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Figure 1. These are posterior (left) and anterior (right) whole body images in our patient.