

Scintigraphic Visualization of the Liver with ^{99m}Tc -Phosphate Compounds

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Increased uptake by the liver incidental to bone scan is discussed. In our approximately 1,000 cases of bone scan with ^{99m}Tc -phosphate compounds the liver was visualized in 3 cases. Such liver uptake was seen in only one patient among several patients who got injections of same amount of the compound from same vial on same day. Preparation is thought to be done well. Intravenous injection in all of the above 3 cases was so difficult that the once withdrawn blood was mixed with the ^{99m}Tc -phosphate solution within the syringe and it took about 15 to 30 minutes to complete the administration. One month later, one of these patients had bone scan again with same compound as a followup study. This time the injection went on smoothly and the liver was not visualized. So we suspected that such abnormal liver accumulation of ^{99m}Tc -compounds could be due to colloid

formation by mixing with blood within the syringe.

As an experimental study, the blood of a rabbit and ^{99m}Tc -pyrophosphate or ^{99m}Tc -EHDP were mixed in a syringe for 20 minutes and then the mixture was injected intravenously to the same rabbit. On scintigram, high liver uptake was observed in all rabbits thus studied. The organ distribution pattern shows abnormally high activity in the liver, spleen and bone marrow compared to the control group. In the lung and kidney, no difference of activity was seen between 2 groups. Such high uptake in the reticuloendothelial system strongly suggests colloid formation from ^{99m}Tc -phosphate compounds.

In bone scan with ^{99m}Tc -phosphate compounds, appearance of the liver image may occur due to a technical error in intravenous injection.

Bilateral Femoral Heads Blood Flow Volume with the Radioisotopes

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Many dynamic function surveys with radio-nuclids are performed by computer and used in nuclear medicine. Many people have devised examination for diseases that occur due to decreased blood flow volume, for example Perthes's disease, aseptic necrosis, etc. Early diagnosis is required.

We devised an examination method to the disease with radionuclide medicine by computer, compared it with bilateral femoral heads blood flow volume and adapted it for clinical use.

Method: We got the bilateral femoral heads bone scanning 3 hours after injecting ^{99m}Tc -MDP. Next we recorded these data on magnetic tape for 60 seconds. In the same position, this patient was

injected with ^{99m}Tc -albumin and these data were recorded on magnetic tape for 600 seconds. From these data we made 256 frames each at a 2 second intervals and subtracted the bone scanning frame from these latter data, to obtain the blood flow volume data. We decided the femoral head ROI on the bone scanning, and transferred it to the blood flow images. The femoral heads blood flow time activity curves were obtained.

Result: We could get the decreased blood flow volume data on the femoral heads for Perthes disease by this method.

There are many technical problems left, but this method is useful for clinical early diagnosis of bone aseptic necrosis.