

Case of the Quarter

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Case Histories

Case 1. SS1, a 68-year-old male with known carcinoma of the prostate, underwent surgery in 1974 and was admitted to this hospital on June 20, 1975, for severe headaches and severe pain in the back and lower extremities. On June 24, 1975, a bone scan demonstrated a high uptake of stannous-pyrophosphate in the liver (Fig. 1).

Case 2. SS2, a 40-year-old female with known metastatic ductal carcinoma of the breast underwent a right radical mastectomy in 1973. At the time, 20 of 28 lymph nodes were found to have carcinoma. Cobalt-60 radiation therapy to the axilla and chest wall followed. On June 24, 1975, the bone scan demonstrated a high uptake of stannous-pyrophosphate in the liver and spleen (Fig. 2).

The increased uptake in the liver and spleen might have been caused by:

1. The agent was diluted through multiple application of the single vial.
2. The vial was vented to the atmosphere to release pressure.

3. The pH of the stannous-pyrophosphate kits was too high.

4. The generator elutant pH was too low.

5. The patients were not hydrated.

Solution and Discussion

SS1 and SS2 were scanned on the same day with both doses drawn from the same vial of stannous-pyrophosphate, which was vented to ambient atmospheric pressure with a bleed needle to release pressure buildup. One could thus assume the correct answer to be 2. This was initially confirmed by the manufacturer's quality control division (1).

Through more investigation it was later confirmed that the pH for the stannous-pyrophosphate kits was not compatible with the pH of the FM generators. Therefore, the correct answers are 3 and 4. The pH of the early lots of stannous-pyrophosphate was between 7.0 and 7.1, whereas the pH of the elutant was between 5.0

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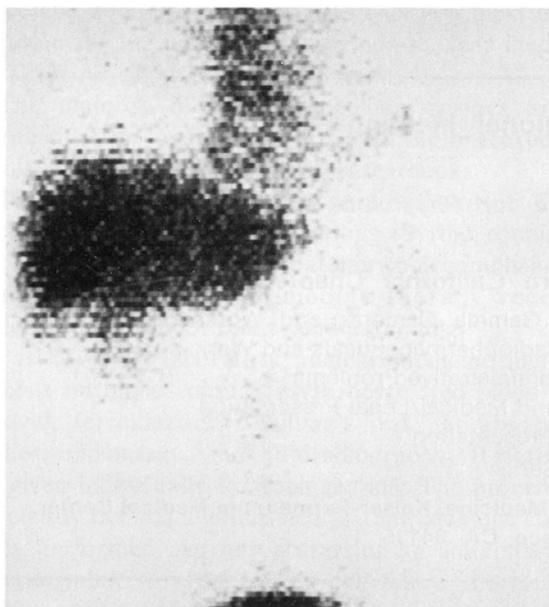


FIG. 1. Bone scan of case 1 demonstrating abnormal stannous-pyrophosphate in liver.

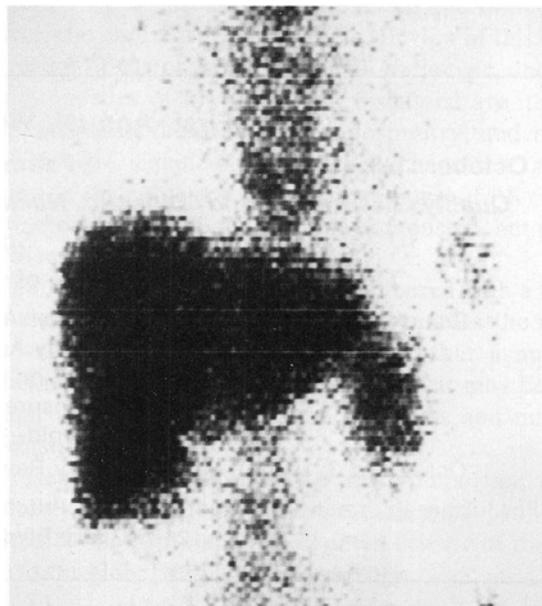


FIG. 2. Bone scan of case 2 demonstrating abnormal stannous-pyrophosphate in liver and spleen.

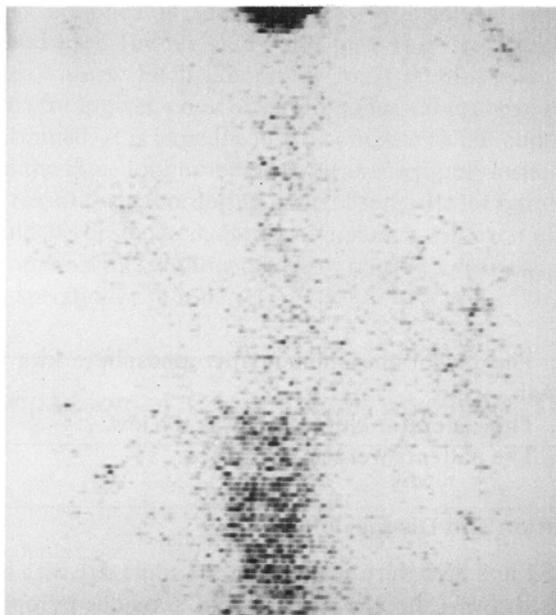


FIG. 3. Bone scan of case 2 demonstrating normal stannous-pyrophosphate uptake in bone.

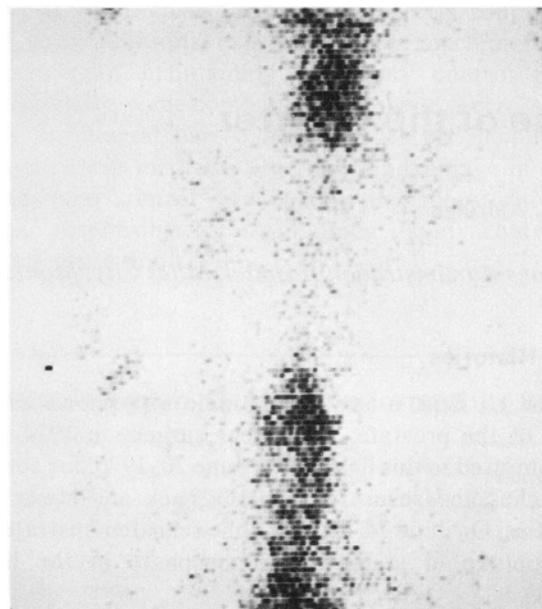


FIG. 4. Bone scan of case 1 demonstrating uptake of stannous-pyrophosphate in 11th rib.

and 5.5 (1). This imbalance was causing the abnormal uptake in soft tissues, such as the liver and spleen in this case.

Since the initial report was filed with the manufacturer, the pH in the stannous-pyrophosphate kits has been lowered to values of 5.0 to 5.1 to be more compatible with the FM generator elutant (1).

Liver scans were performed two days later on both patients and demonstrated normal livers and spleens. Followup bone scans performed one week later did not

demonstrate liver or spleen uptake (Fig. 3). However, uptake occurred in the 11th rib near the lateral margin, which had previously been masked by the liver in SS1 (Fig. 4). The stannous-pyrophosphate used in these followup scans were of a different lot, with a pH of 5.0.

References

1. Mallinckrodt/Nuclear Laboratories, St. Louis, MO. Private communication.