

A comparative study of ^{201}Tl scintigraphy and three-phase bone scintigraphy following therapy in patients with bone and soft-tissue tumors

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Objective: The purpose of this study was to evaluate the usefulness of ^{201}Tl scintigraphy in comparison with three-phase bone scintigraphy in the differentiation of residual/recurrent tumors from post-therapeutic changes, in patients previously treated for bone and soft-tissue tumors.

Methods: Thirty-five ^{201}Tl and three-phase bone scintigraphy scans were obtained for 30 patients with a history of bone or soft-tissue tumor who had undergone chemotherapy, radiation therapy, tumor resection, or a combination of these treatments. The planar ^{201}Tl images were acquired 10 mins (early) and 2 hrs (delayed) after the intravenous injection of 111 MBq ^{201}Tl -chloride. Three-phase bone scintigraphy was performed using 740 MBq $^{99\text{m}}\text{Tc}$ -HMDP at the same lesion site as for ^{201}Tl imaging. The blood flow images were obtained every 10 sec for 2 mins and were immediately followed by the blood pool image after 5 mins. Three to 4 hrs later, bone images were obtained. ^{201}Tl and three-phase bone scintigraphies were correlated with the histopathologic findings and/or clinical follow-up of more than 3 months. **Results:** Of the 35 cases, 15 were free of disease and 20 had residual or recurrent tumors. Of the 20 residual or recurrent cases, all had true-positive ^{201}Tl early and delayed scans, while bone scintigraphy was true-positive on the blood flow, blood pool and bone images in 16, 18 and 12 cases, respectively. ^{201}Tl early and delayed images and $^{99\text{m}}\text{Tc}$ -HMDP blood flow and blood pool images were false-positive in one patient. The histology of this false-positive case showed the presence of lymph proliferative tissue. **Conclusions:** Although ^{201}Tl uptake after treatment does not always indicate recurrence, ^{201}Tl scintigraphy may still be more useful than three-phase bone scintigraphy in the follow-up of patients with bone and soft-tissue tumors following therapy.

Key words: bone and soft-tissue tumor, recurrence, ^{201}Tl , scintigraphy