From these results it is concluded that Overall HMDP image was suggested to be not significantly higher than that of with HMDP and 23 with MDP by scintimetry. In order to estimate the uptake of these agents, the ratio of normal bone to soft tissue was obtained in 22 cases with HMDP and 23 with MDP by scintimetry. This data suggested that HMDP bone to soft tissue ratios was significantly higher than that of MDP. Although this ratio of HMDP was not significantly higher than that of MDP before first 1 hour after administration, the former became gradually higher than the latter, and difference was significant 2 hour after administration. Overall, HMDP image was judged to be slightly better than MDP in qualitatively grading by three independent observers. From these results it is concluded that HMDP is a useful skeletal imaging agent.

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Measurement of 24-Hr Whole-Body Retention of Tc-99mMDP With a Thyroid-Uptake Probe and Its Clinical Significance. H. Seto, M. Kakishita, R. Futatsuyu, T. Kamei, M. Hada, Y. Ishizaki and N. Furumoto Department of Radiology, Toyama Medical and Pharm. University Hospital, Toyama.

A new method for measurement of 24-hr whole-body retention of Tc-99mMDP using a thyroid uptake probe was established and its clinical significance was evaluated in various bone diseases.

1) Reproducibility of 24 hr WBR in 9 patients was very good (r=0.997).
2) 24-hr WBR of normal adult males (n=5) was 35.0 ± 1.49%, which was significantly elevated compared to the result reported by Fogelman (WBR of Tc-99m HEDP: 19.2 ± 1.7%).
3) No significant differences were noted compared to the groups of benign disorders (n=5, WBR: 31.7 ± 3.9%) and malignant tumors without bone metastasis (n=13, WBR: 30.7 ± 3.6%). However whole-body retentions of the groups of chronic renal failure (n=4, WBR: 97.4 ± 2.4%), malignant tumors with bone metastases (n=6, WBR: 45.7 ± 2.8%) and hyperthyroidism (n=4, WBR: 40.7 ± 6.1%) were significantly elevated. WBR of steroid-induced osteoporotic goats was significantly decreased (n=5, WBR: 18.2 ± 6.8%).

Based on these results, this thyroid uptake probe method was simple, reproducible and accurate to measure 24-hr WBR of Tc-99m MDP. Quantification of WBR of Tc-99m MDP was of great clinical value to diagnose metabolic bone disease and to follow-up metabolic and metastatic bone diseases.

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In the conventional bone imaging (CBI), it is not always easy to detect and localize the disease especially in the portion composed of multiple complex bones. In this study ECTI was evaluated in the imaging of basal skull and facial bones, comparing CBI. The system was GCA-70AS, manufactured by Toshiba Corporation, composed of two opposed large-field-of-view gamma cameras. Four hours after i.v. injection of 15 mCi of Tc-99m MDP, ECT scan was performed by rotating the cameras 180° about the patient's longitudinal axis. The scanning time was 1-3 min. Transaxial, sagittal and coronal sections were reconstructed by convolution algorithms. As activity concentrated in various complex bones are separated in the ECTI, the petrous bone, clivus and sella, which could not be visualized in the CBI, were identified in ECTI. The sphenoid and ethmoid sinuses could also be identified separately in ECTI whereas these were seen only as the sphenethmoid complex in the CBI. Further advantage of ECTI was that a little difference of radioactivity could be appreciated because background activity and overwhelming bone activities are separated. We have experienced several patients with sinusitis in whom abnormal concentration and exact location of the disease could be detected only by ECTI.