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QUANTITATIVE ASSESSMENT OF METABOLIC BONE DISEASE IN IMMATURE RAT MODELS BY DUAL TRACER METHOD: 24-HOUR WHOLE-BODY RETENTION RATIO AND COMPARISON WITH CONVENTIONAL RADIOGRAPHY. H.Seto, F.Ihara, R.Futatsuya, T.Kamei, T.Soya, K.Taki and M.Kakishita. Toyama Med. & Pharm. Univ., Toyama.

We have performed to measure the uptake ratios of two radiopharmaceuticals (Tc-99mMDP, Ca-47) as a method for distinguishing states of abnormal bone metabolism. Nutritional osteoporosis (P), osteomalacia (M) and steroid-induced Osteoporosis (S) were produced in immature male rats, which were housed in a dark room throughout the study for 6 weeks.

24-hour whole-body retention (WBR) ratios of Ca-47 were significantly higher in the M and S groups and were lower in the P group as compared to the control group from the second week. The WBR ratios of Tc-99mMDP were significantly higher in the M group and were lower in the S group from the second week. The ratios were gradually increased in the P group. Conventional radiography revealed a significant osteopenia in the M, S and P groups from the second week, which was gradually worsened. The 24-hour WBR ratios of Ca-47 were correlated well with femoral uptake.

In conclusion 24-hour WBR ratios of Ca-47 and Tc-99mMDP at 2 weeks revealed significant differences among these four groups, suggesting the possiblity of early detection and differentiation of metabolic bone disease in immature rat models.

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A FOLLOW-UP BONE SCINTIGRAPHY IN RENAL OSTEODYSTROPHY. N. Otsuka, M. Fukunaga, S. Ono, K. Nagai, M. Mitsumori, S. Yanagimoto, T. Tomomitsu, A. Muranaka and R. Morita. Kawasaki Medical School, Kurashiki.

Bone scintigraphy was performed in 97 patients with chronic renal failure on maintenance hemodialysis, and the results of bone scintigraphy were quantitatively analysed, and were compared with those of biochemical's data.

Based on the first bone scintigraphy, bone scintigrams were classified into five types: normal type, secondary hyperparathyroidism type, osteomalasia type, rib fracture type and ectopic calcification type. Some patients showing normal type on first bone scintigram changed into other type after 6 month repeated scan.

Skeletal uptake of radiotracer, expressed as bone (skull and L_3) to soft tissue ratio, was significantly higher in the group which changed to secondary hyperparathyroidism than in other group.

These findings show that bone scintigraphy is a sensitive method to detect skeletal changes and, to evaluate the renal osteodystrophy, it is necessary to repeat periodically bone scintigraphy.

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DETECTION OF METASTATIC CALCIFICATION IN PATIENTS WITH MALIGNANT DISEASE AND DIALYSIS PATIENTS BY BONE SCINTIGRAPHY. T.Okamura, Y.Koizumi, A.Sazaki, T.Fukuda, H.Ochi, Y.Onoyama, Y.Shimonishi, M.Ohmura, H.Ikeda, K.Hamada, H.Morii*, S.Rin** and T.Nakai***. Department of Radiology, and *Second Department of Internal Medicine, Osaka City University Medical School. **Department of Radiology, Itami City Hospital. ***Department of Radiology, Nissei Hospital.

Extraosseous accumulation of Tc-99m MDP in three patients with malignant disease and eleven dialysis patients was reported. Diffuse radionucleid accumulation of the lung, stomach, and myocardium was shown in two patients with malignant lymphoma and a patient with transitional cell carcinoma of the renal pelvis, who had hypercalcemia and high level of CaxP product. Four dialysis patients had radionucleid accumulation of the lung and kidney, seven had that of soft tissue, particulary periarticular regions with hyperphosphatemia and high level of CaxP product.

Bone scintigraphy could detect visceral calcification, while other radiographic methods failed. The soft tissue calcifications were detected by both bone scintigraphy and conventional radiography, but bone scan was more sensitive for detection of changes in calcification after treatment

We suggest bone scintigraphy is useful for the detection and observation of metastatic calcification.

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EVALUATION OF SURVIVAL OF GRAFTED JOINT WITH BONE SCINTIGRAPHY , EXPERIMENTAL STUDIES USING RAT MODELS : 2ND REPOTRT VASCULARIZED ALLOGENIC GRAFT. K.Fujimori, T.Sakuma, M.Furudate, A.Minami and T.Ogino. Department of Nuclear Medicine and Department of Orthopedics, School of medicne, Hokkaido Univ.,Sapporo.

To evaluate survival of grafted joint, bone scintigraphy with Tc-99m-MDP was performed in vascularized allogenic rats. These rats were grouped to four according to different bone implantation, vascularized autogenic grafts (Group-I), non-vascularized autogenic grafts (Group-II),and non-vascularized allogenic grafts (Group-III) and vascularized allogenic grafts (Group-IV).
Bone scintigraphy in Group-IV showed immediate low uptake throughout the grafted joint at 2 weeks after transplantation. At same time, knee grafts were necrotic and osteocyte and chondrocyte of metaphysis of knee joint were also necrotic. Major anastomosed vessels; femoral artery and vein were not obstructed, but capillary vessel were obstructed. It seemed that rejection of transplanted joint started at capillary vessels and bone scintigraphy showed this phenomena correctly.
Bone scintigraphy is useful to evaluation of survival of grafted joint.