

EXPERIMENTAL STUDY ON THE RADIATION EFFECTS
TO THE BONE GROWTH

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The radiation effects on growing bone were studied using infant rabbits. Irradiation was done with telecobalt to the right knee joint and the effects of irradiation were ^Vby RI-scintigraphy and X-ray photography. ^{investigated}

The infant rabbits were divided into six groups according to the dose, such as 1,000, 2,000, 3,000, 4,000, 6,000 and 8,000rad respectively. Scintigraphy was performed with ^{99m}Tc-MDP. Scintigrams aided with data processor were analysed by the concentration ratio of RI in the both knee joints, one was the right as object, the other the left as control.

Measurement were made by means of X-ray photography for length of the tibia and radiation damage was evaluated in comparison with irradiated tibia and contra side one.

Scintigraphic evaluation was showed decreasing concentration ratio according to irradiated dose even so early phase. A tendency was observed as the lowest concentration ratio occurred about 40 days after the irradiation in groups of 6,000 rad or less, thereafter the ratio increasing a little.

While, 8,000 rad group was decreasing the ratio remarkably of elapsed time and didn't increase again. Longitudinal length of the tibia was measured on X-photogram and compared with contra side.

A growth inhibition was observed in length of irradiated tibia. It seems that RI concentration ratio correspond with growth rate of tibia. As the index of the effects of irradiation RI-concentration ratio was more delicate than the growth rate.

Accumulation of ^{99m}Tc-MDP in Experimental Osteoporosis

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Accumulation of ^{99m}Tc-phosphate is found in the site of osteoporosis clinically. We have reported that grade of the accumulation is comparable to that of osteoporosis. The purpose of this studies is observation of ^{99m}Tc-MDP accumulation and measurement of density of bone x-ray film in the experimental osteoporosis.

Adult male rabbits were fixed left leg by gyps at 4 weeks. Scintiphotos of the leg were carried out with ^{99m}Tc-MDP immediately, at 1,2 and 3 weeks after free from fixation of gypsum. At the same time, radiography and measurement of density of the x-ray film were also carried out.

As a result, the highest accumulation of ^{99m}Tc-MDP was observed after 2 weeks of free from gypsum. Change of the density of bone x-ray film was similar to that of ^{99m}Tc-MDP accumulation. Accumulation of ^{99m}Tc-MDP may be relate with calsium metabolism in the site of experimental osteoporosis.