Scintiscanning with Strontium on Aseptic Necrosis of Femoral Head

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Twenty eight patients with 33 hips of aseptic necrosis of femoral head were studied by means of scintiscanning with aid of ^{85}Sr or ^{87m}Sr.

Clinical materials consisted of 11 idiopathic necrosis of femoral head with 16 hips, 15 hips of unilateral posttraumatic necrosis, and two unilateral cases caused by gout and roentgen irradiation.

^{85}Sr was given intra-venously 50 to 100 microcuries and scintiscanning was done 7 to 14 days following injection. ^{87}Sr m was given 0.8 to 2.0 milli-curies and scan was performed 2 to 3 hours after intravenous injection.

Results:

Sixteen hips of idiopathic necrosis were divided into 3 grades after d'Aubigne's description, and scintigrams to each grades were taken into account.

For moderately advanced lesions on radio gram, strontium was taken limited to femoral heads on scintigram, and for radiographically severely advanced cases scintigram showed accumulation of strontium not only to femoral heads but to acetabulin.

However, in early cases for which radiograph showed little information except cortical double shadow or cyst like figure at lateral superior part of the femoral heads, scintigram already revealed uptake of strontium in femoral heads.

The early diagnosis of necrosis is aided by tomogram, intravenous venogram or arteriogram besides roentgenogram, scintigram with strontium is quite useful as a new method for this purpose.

In post-traumatic cases, there were two types of lesions showing collaps and/or deformity, and sclerosis without deformity on radiogram. The pattern of strontium uptake to former type was similar to idiopathic one of moderate and severely advanced case. Strontium uptake to latter type was limited to femoral head from fracture line of femoral neck.

Radionuclei uptake to necrosis of femoral head in our series is thought to be related to osteoblastic activity in adjacent area of necrosis and also to creeping bone repairing process in the area of necrosis itself.

Scintigraphy of Malignant Bone Tumor

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The purpose of this study was to asses the reliability of bone scintigraphy with ^{85}Sr or ^{87m}Sr by comparing it with the roentgenologic survey and clinical symptomes.

The materials consisted of 46 patients with tumors on whom bone scintigraphy and ro-

entgenologic study had been performed for suspition of primary or metastatic bone tumors. The patient was given 80±100 μCi of ^{85}Sr or 1-2 mCi of ^{87m}Sr intravenously for the examination.

The cases consisted of 3 primary bone tumor, 17 mammary cancer, 5 eosophageal cancer, 4 thyroidal cancer, 3 pulmonary cancer and so on.

The scintigraphy was done for 141 areas.

51% areas of 72 areas in which a roentgenologic survey was positive showed positive in scintigraphy. Positive scintigraphy was found most frequently in the spinal column, pelvic bones, humerus and thigh bone, but bone scintigraphy was often negative in ribs or scalp bone inspite of their positive roentgenogram. Most of the pathologic fracture of ribs showed negative scintigram.

Positive scintigraphy was found more frequently in osteoplastic change than in osteolytic change.

Scintigraphy was positive in 9 areas of 69 areas in which roentgenologic examination showed negative, and scintigram was positive more frequently when there was pain or swelling.

Clinical Application and Its Study on Knee Joint Cavity Scintigram by Sequential Scanning Method for Diagnosis of Osteoarthrosis of the Knee

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Purpose: To investigate the shape of knee joint cavity and its absorption state as one of the methods for diagnosis of the condition of osteoarthrosis of the knee by using radioisotape.

Method: ^{131}I-HSA, ^{198}Au Colloid and ^{131}I-Na solution were use das radioisotope reagents and 25-70 μCi (0.5-1.0 ml) per knee was injected into knee joint cavity. Scanning was performed in course of time after injection. Absorption half time (t 1/2) determined by the external knee disappearance curve and, the shape of joint cavity was drawn by area scanning on both the frontal and the laleral view of joint of the knee.

Results: t 1/2 in normal or non-symptomatic knee estimated 1.4±0.2 hours (n=8) by ^{131}I-Na solution, 1.5±0.2 days (n=12) by ^{131}I-HSA and nearly 7.0 days (N=15) by ^{198}Au-Colloid, and its half time was prolonged further in the cases of symptomatic or pathologic stages, and had apparently reduced by the injection of steroids into joint cavity. Normal joint cavity scintiphoto by ^{131}I-HSA shows a triangular shape on the frontal view and a fishhook-shape on the lateral view.

This pattern consists of the suprapatellar bursa and articular capsule joining to articular cavity and absorption shadow distributing upward.

Various kinds of change can be observed on the diseased knee. For example, externally, expansion, contraction and deformity of contour, internally, areas of decreased density, and with the lapse of time a delay or a lack of appearance of absorption shadow or the existence of remained figure, etc.

Conclusion: After this method had been applied to the osteoarthrosis of the knee principally consisting of osteoarthrosis deformans, there were discovered the changes of the shape of joint cavity and the disturbance of absorption or distribution mechanism. The above information can never be obtained by X-rays examination and this, therefore, may become one of the useful methods for diagnosis of osteoarthrosis.