Usefulness of 201Tl and 99mTc MIBI scintigraphy in a case of oncogenic osteomalacia

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A 45-year-old male was admitted with difficulty in walking due to leg pain. At the time of the first visit, a reduced serum phosphorus concentration and an increased serum alkaline phosphatase concentration of unknown etiology were observed. Either a whole body bone scintigraphy or CT of the neck, chest and abdominal region did not reveal any underlying disease. However both the whole body 201Tl scintigraphy and 99mTc MIBI SPECT showed accumulation in the right knee region, and a small tumor was detected by MRI examination. After a diagnosis of oncogenic osteomalacia due to this tumor was determined the tumor was surgically removed, and turned out to be a hemangiopericytoma. By removal of the tumor, either the symptoms or the laboratory data were improved significantly. In this case, both 201Tl scintigraphy and 99mTc scintigraphy MIBI were useful in identifying the location of the tumor which caused oncogenic osteomalacia.

Key words: oncogenic osteomalacia, 201Tl scintigraphy, 99mTc MIBI scintigraphy

INTRODUCTION

ONCOGENIC OSTEOMALACIA is a relatively rare disease accompanied with hypophosphatemic vitamin D-resistant osteomalacia (or rickets in the case of children) due to some kind of humoral factor produced by a tumor, and it can be completely cured by removal of the tumor. Based on the characteristics of the disease, rapid identification of the location of tumor and its removal is important. However, the tumor is sometimes very small and its location varies widely, making identification of the location highly difficult in some cases. In this report, we describe a case effectively identified its location with thallium-201 (201Tl) and technetium-99m-hexakis-2-methoxy-isobutyl-isonitrile (99mTc MIBI) scintigraphy.

CASE REPORT

A 45-year-old male was admitted to our hospital with a main complaint of gait difficulty due to leg pain in September 2000. He had also attended another clinic for left chest pain and lower back pain since around July 1999, but the cause had not been identified and symptomatic treatment had been given. Laboratory evaluation revealed white blood cell count 5.0 x 10³/μl (normal range 4.0 x 10³-8.0 x 10³/μl), red blood cell count 4.08 x 10⁶/μl (normal range 4.10-5.30 x 10⁶/μl), hemoglobin 12.9 g/dl (normal range 14.0-18.0 g/dl), platelet count 215 x 10⁴/μl (normal range 150-400 x 10⁴/μl), total protein 6.9 g/dl (normal range 6.5-8.5 g/dl), albumin 4.6 g/dl (normal range 3.5-5.3 g/dl), creatinine 0.7 mg/dl (normal range 0.6-1.1 mg/dl), sodium 143 mM/l (normal range 135-145 mM/l), chlorine 106 mM/l (normal range 99-110 mM/l), potassium 4.2 mM/l (normal range 3.5-5.0 mM/l), calcium 8.2 mM/l (normal range 7.9-9.8 mM/l), phosphorus 1.4 mg/ml (normal range 2.0-4.5 mg/ml), alkaline phosphatase 1033 IU/l (normal range 115-359 IU/l) and CRP 0.3 or less (normal range 0.3 or less). These results show abnormal low value of serum phosphorus and abnormal high value of ALP. Whole body bone scintigraphy (obtained three hours after intravenous administration of 740 MBq technetium-99m-hydroxy-methylenediphosphonate, 99mTc HMDP) showed abnormal accumulations in the both ribs, knees, and ankles and left hip joint (Fig. 1). The possibility of systemic bone...
metastasis or hyperparathyroidism could not be excluded, but computed tomography (CT) of the neck, chest or abdomen revealed neither suspicious tumors nor parathyroidoma. Then, whole body $^{201}$Tl scintigraphy (obtained fifteen minutes after intravenous administra-

A small tumor was found on the dorsal side of right patella by magnetic resonance imaging (MRI) examination (Fig. 4). Oncogenic osteomalacia due to this tumor was suspected and tumorectomy was carried out. The tumor with about two centimeters size located in the articular capsule at dorsal side of patella was an elastic and soft burned amber soft tissue tumor. No infiltration in the surrounding tissue was observed. The tumor was spindle or cylindrical shape medium size and covered with thin filamentous capsule filled with proliferated nearly ho-