Osteopoikilosis. *A case report with a family screening*

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Osteopoikilosis is a rare benign sclerosing bone dysplasia with an estimated incidence of 1/50,000.[1] The disease is generally inherited in an autosomal dominant trait, its chromosomal locus has been newly identified with a loss-of-function mutation in gene LEMD3 (LEM domain-containing-3) on 12q14 genomic location, encoding an inner nuclear membrane protein.[2] The International Working Group on Constitutional Disease of Bone, subdivided the nomenclature and classification of the osteochondrodysplasias into 3 families. According to this revision, osteopoikilosis is classified in the first group, such as, increased bone density without modification of the bone shape.[3] Clinically, osteopoikilosis is an asymptomatic disease and often diagnosed incidentally by radiological features, although 20% may have mild articular pain and effusion.[1] The disease must be distinguished from severe condensing bone diseases such as, tuberous sclerosis, mastocytosis, and most importantly osteoblastic metastatic disorders. Normal findings of the bone scan in osteopoikilosis may be used as a marker in differentiation from osteoblastic bone metastases. The disease is often seen in association with dermatological lesions (Buschke-Ollendorf syndrome) or soft tissue involvement (melorheostosis).[4] Radiographically, osteopoikilosis manifests itself as multiple symmetric sclerotic foci throughout the axial and appendicular skeleton. The lesions vary in size (2-10 mm) and shape (round, oval, lenticular) without association of cortical disruption and periosteal reaction.[5] Here, we present a case of osteopoikilosis with a family survey and discuss the disease in light of the literature.

A 26-year-old man was admitted to our outpatient clinic with a complaint of low back pain. The pain had been present during the last 10 days and was mechanic in character. There was no special feature in his history or on systemic questionnaire. On physical examination, range of motion (ROM) in lumbar spine at sagittal and frontal plane was restricted approximately 30% due to pain. The palpation of lumbar muscles was painless. There was paravertebral spasm on his lumbar region. Lordosis of lumbar spine was decreased. Examination of ROM in sacroiliac joints was normal. Sacroiliac compression tests and straight leg raise tests were bilaterally negative. Neurologic examination in the lower extremities was normal. The result of his routine blood and urine analysis was all normal, and no significant pathology was observed on systemic physical examination. Two-sided lumbosacral radiography was planned and revealed multiple, small, well-circumscribed round areas of increased bone density on pelvis region (**Figure 1**). The shoulder and hand radiographs showed similar findings. On the bone scan, no increased uptake of technetium by the lesions was demonstrated. Due to the typical radiographic features, and the absence of biochemical or bone scan findings for metastasis, the diagnosis was discussed as osteopoikilosis. The other members of the family were invited to our outpatient clinic for family screening. His father died 5 years before in a traffic accident. The mother (48-year-old) and the youngest brother (6-year-old) had no clinical or radiological signs of osteopoikilosis. His sister (22-year-old) was diagnosed with osteopoikilosis after a routine radiographic examination and she had no complaint. All the family members were informed regarding osteopoikilosis. In light of these findings, lumbar strain was suspected in this patient. Medical treatment and physiotherapy were applied for 2 weeks. His complaints were diminished and the restriction of joint movement in the lumbar region disappeared after these therapies.

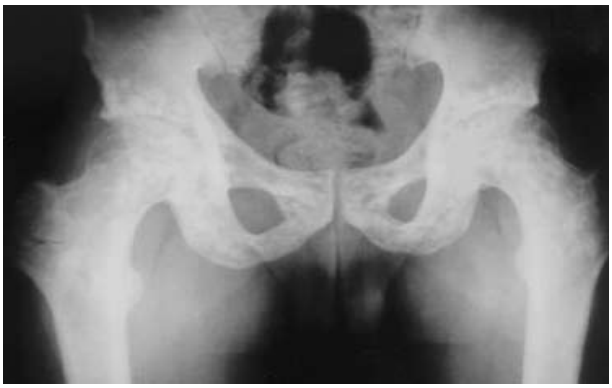

Figure 1 - Anteroposterior radiograph of the pelvis demonstrating the typical symmetric, small, well-circumscribed osteodense foci of osteopoikilosis.

Osteopoikilosis is a rare benign congenital bone disorder. As the disease has an autosomal dominant form of inheritance, incomplete penetrance, and spontaneous mutation have also been reported.[1,5] In the present study, we were unable to describe the transmission of the disease either as autosomal

dominant form or spontaneous mutation due to the death of the patient's father. In osteopoikilosis cases, patients are typically asymptomatic, however, articular pain and effusion may accompany with slight clinical symptoms.[1] Therefore, as patients admit to the hospital with different complaints, the diagnosis is made by a chance finding at radiographic examination, as in our case. Soft tissue involvement can accompany osteopoikilosis, referred to as melorheostosis. The bony sclerosis affects the diaphyses of the long bones, the carpal and tarsal bones, and the pelvis. Radiologically, irregular asymmetrical bands of sclerosis are observed in the long bones, and this typical radiological appearance is often described as molten wax flowing down to the side of a candle. Debeer et al[6] reported a 3 generation family with clinical and radiological findings of osteopoikilosis in 5, and melorheostosis in one individual. Our patient and the other individuals of the family had no sign of melorheostosis according to clinical and radiological features.

Osteopoikilosis has specific radiographic features, characterized by the development of multiple symmetric bone islands scattered throughout the axial and appendicular skeleton typically clustered around the larger joints.[5] In our cases, there were multiple, symmetric, well-circumscribed radiodense lesions between 2-10 mm on the side of the disease. The lesions are noticed commonly in the epiphysis and metaphysis of long tubular bones especially around the knee and shoulder, along with the pelvis, and in the small bones of hands and feet. We established typical localizations of the disease in the pelvis, shoulder, and hand joints. The differential diagnosis of osteopoikilosis includes severe bone diseases such as, tuberous sclerosis, mastocytosis, and osteoblastic metastases. Radiographically, the characteristic symmetric distribution in uniform size without modification of the bone shape, cortical disruption and periosteal reaction suggest the diagnosis of osteopoikilosis. There is no increased uptake of radiopharmaceutical substance on bone scan in osteopoikilosis. In contrast, the bone scan appearance of osteoblastic bone metastases shows increased activity.[4] We performed technetium bone scan for definite diagnosis and obtained normal findings in our patient.

We conclude that as osteopoikilosis is a rare benign disease, family screening must be carried out and appropriate information given to the other members of the family to avoid unnecessary investigation. However, it should be kept in mind to avoid misdiagnosis or delayed diagnosis of severe bone diseases, especially for osteoblastic metastases.

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