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Extraskeletal Osteochondroma of the Buttock

Osteochondromas are common and typically arise from the metaphyseal ends of long bones. An osteochondral neoplasm of the soft tissue, which is a lesion of uncertain pathogenesis, is uncommon and usually arises from the synovial tissue in joints and tendon sheaths. Rarely, extraskeletal osteochondromas also arise outside of synovial compartments. Most of the reported cases were presented in the hands and feet, especially in the fingers. Here we describe a 44-yr-old female patient who presented with a pain in the left buttock. A well-defined osseous mass was detected in the buttock. It consisted of sharply demarcated, mature hyaline cartilage that was covered with a fibrous capsule, which changed gradually into cancellous bone, more pronouncedly at the center. The diagnosis of an extraskeletal osteochondroma should be considered when a discrete, ossified mass is localized in the soft tissues. A case of pathologically proven extraskeletal osteochondroma of the buttock is presented with a literature review, magnetic resonance imaging, and radiological findings.

Key Words: *Osteochondroma; Soft Tissue Neoplasms; Buttocks; Histology*

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INTRODUCTION

Osteochondromas typically arise from the metaphyseal ends of long bones. However, osteochondral neoplasms of soft tissues occur infrequently and usually arise from synovial tissue. Therefore, the lesions in almost all cases have been reported in the hands and feet, and presented as a small discrete calcified mass, rarely exceeding 2 cm in its greatest dimension (1, 2). A case of a well-formed ball-like extraskeletal osteochondroma of the buttock that measured 6 cm in diameter is described in this report along with a review of the literature, and the clinical and roentgenographic findings.

CASE REPORT

A 44-yr-old female patient was admitted to our hospital because of a pain in her left buttock. Her symptom had been noted approximately 10 months prior to her admission and aggravated with a fall on her buttocks during the preceding two days, causing tenderness when she was in a sitting position.

Physical findings were normal except for a palpable, firm, fixed, intramuscular mass that showed tenderness. The overlying skin was normal. All laboratory data were normal. Motor and sensory functions were intact.

Plain pelvic radiography revealed an egg-sized calcified mass in the soft tissues of the medial aspect of the left proximal thigh (Fig. 1). Magnetic resonance imaging (MRI) revealed a relatively well-circumscribed, ovoid mass about 6 cm in size just beneath the inferior ramus of left ischium without an associated cortical change in the adjacent bone. The mass showed irregularities in the superior portion with heterogenous peripheral enhancement and extended inferiorly between adductor and semitendinous muscles (Fig. 2). Surgery revealed a thin encapsulated 6×3 cm-sized ovoid hard mass that did not have a feeding vessel. The mass was attached to the inferior aspect of inferior ischial ramus by a small capsular stalk. The mass was totally removed. No clear association with the joint capsule or tendon sheath was demonstrated (Fig. 3).

Microscopic examination revealed well-developed, partly lobulated mature hyaline cartilage surrounding the peripheral portion of the mass that was covered with a thin fibrous capsule, which gradually changed into mature trabecular bone especially at the center (Fig. 4). The thickness of the cartilaginous rim which represented high signal intensity on T2 weighted MRI image was variable and ranged 0.2-0.8 cm. The trabecular bone showed some osteoblastic activity especially subjacent to the cartilaginous rim, however, more mature bony trabeculae formed in the inner portion. There was no chondroblastic or chondrogenic differentiation at the inner portion of the mass. The zonal pattern that might be observed in myositis ossificans was not identified. The bone marrow inside the cancellous bone was devoid of hematopoietic cells.

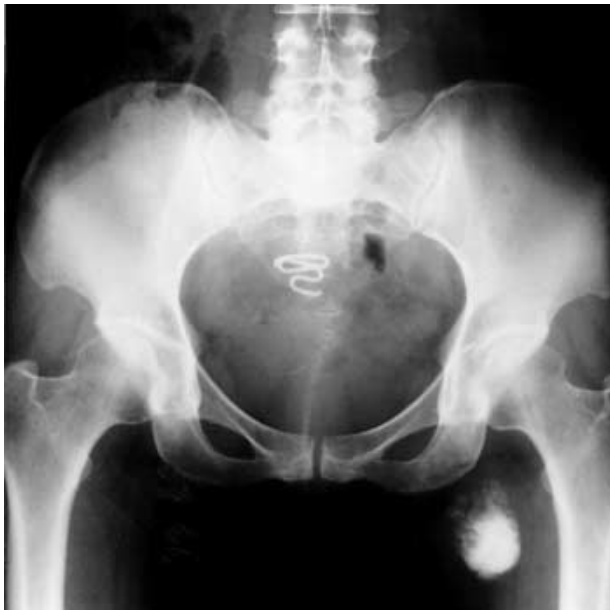

Fig. 1. Pelvis AP view shows an egg-sized calcified mass in the soft tissue of the medial aspect of the left proximal thigh.

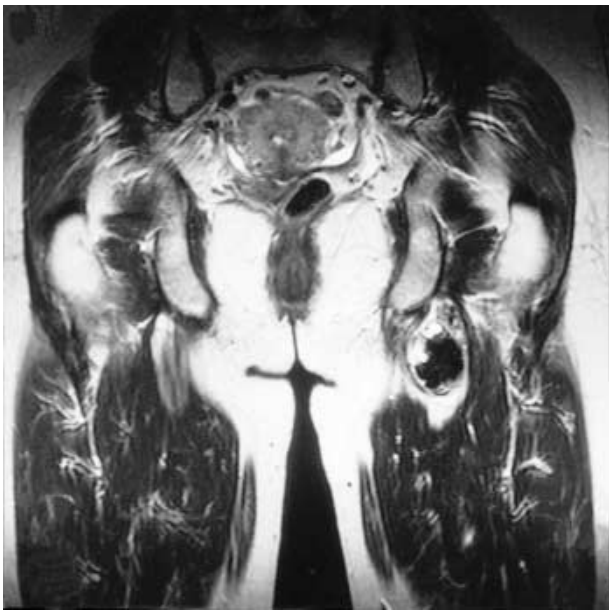

Fig. 2. T2-weighted coronal magnetic resonance imaging (MRI) shows an ovoid mass with low signal intensity in the soft tissue beneath the left inferior ischial ramus. The mass was attached to the left inferior ischial ramus with no visible cortical or marrow extension.

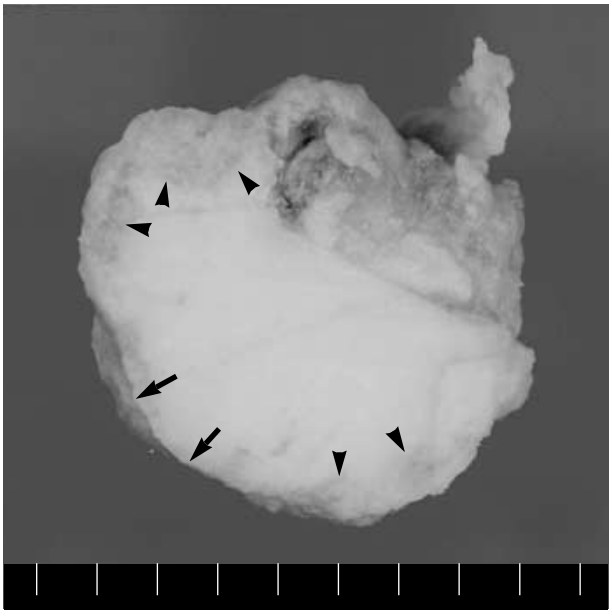

Fig. 3. Grossly a well-encapsulated ovoid bony mass is covered with a lobulated cartilage cap (arrowheads) and thin fibrous capsule (arrows).

No synovial tissue was identified histologically. These findings were compatible with an osteochondroma.

DISCUSSION

Osteochondroma is a common benign neoplasm that arises most commonly in the metaphysis of long tubular bones and demonstrates a mature bone that has a cartilaginous cap and a continuation of the medullary cavity with that of the long bone. The occurrence of an osteochondroma in soft tissue is, however, rare. The pathogenesis of extraskeletal osteochondromas is unknown. They may be firmly attached to tendons or be associated with the tendon sheath, joint capsule, or periosteum. A synovial origin has been suggested (1). A multipotential synovioblast was postulated to be the origin of the tumor cell (3). However, many authors have shown or suggested that the metaplasia of tendon sheaths in the hand and wrist is the origin of the cartilaginous soft tissue lesions in these sites (1, 4-7). These are supported by the predilection sites of the lesions. Almost all the lesions occur in the extremities. Approximately 82-84% of them have occurred in the hands and feet (1-8). However, osteochondral neoplasms can occur in soft tissues apart from bone or synovial structures. In animal studies, mesenchymal cells can give rise to a chondrogenic or an osteogenic cell line, including chondroblasts, chondrocytes, osteoblasts, and osteocytes (9). This capability suggests that an extraskeletal osteochondroma can arise from fibroblasts in the connective tissue apart from bones or joints due to unknown stimuli. Though some patients with extraskeletal osteochondromas had a history of trauma before the development of the tumor, typically no history of antecedent trauma has been documented (10). Extraskeletal chondromas or osteochondromas may occur in patients at any age, although they are most common in patients aged 30-60 yr. Patients usually present with a slowly growing soft-tissue mass, occa-

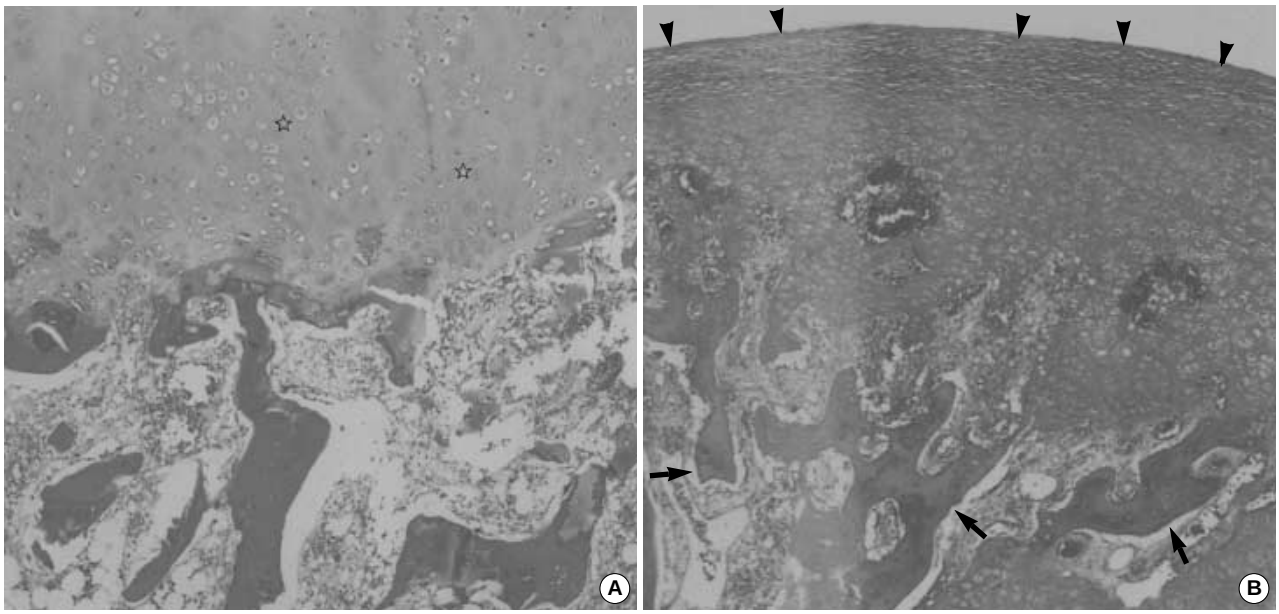

Fig. 4. Microscopic examination shows well-developed, partly lobulated, mature hyaline cartilage (asterisks) surrounding the peripheral portion of the mass that was covered with a thin fibrous capsule (arrowheads), and which gradually changed into mature trabecular bone (arrows) especially at the centers (H&E, ×100).

sionally accompanied by pain or tenderness (11). Lesions are typically well-demarcated and lobulated, and rarely exceed 2 cm in their greatest dimension (1). Extraskeletal osteochondromas are discrete lobulated masses that display at least focal areas of hyaline cartilage formation. Areas of calcification and ossification may be identified within the hyaline cartilage. Lesions appear to arise de novo without any apparent precursor (1). Cellular atypia may be seen histologically, but no malignant transformation or metastatic lesions have been demonstrated. The nodules are typically less than 5 cm in size (1, 10). They may scallop the underlying bone. The radiographic findings of extraskeletal osteochondromas typically consist of well-circumscribed, lobulated masses with dense, central calcifications or areas of ossification.

Differential diagnosis for a discrete soft tissue mass containing mature ossification is limited and usually not difficult to make. It includes myositis ossificans, extraskeletal chondroma with enchondral ossification, synovial (osteo)chondromatosis, tumoral calcinosis, synovial sarcoma, and extraskeletal osteosarcoma. The most commonly occurring disorder is myositis ossificans, which has a zonal phenomenon of peripheral calcification and may increase or decrease in size within a few weeks (8-10). Myositis ossificans with massive metaplastic cartilaginous tissue was considered in differential diagnosis, however, the distinct cartilaginous cap with fibrous capsule, and mature trabecular bone without zonal phenomenon could rule out the condition. Extraskeletal chondroma with enchondral ossification could be ruled out by absence of chondrogenic or chondroblastic differentiation of the inner part of the mass and the distinct cartilage cap with fibrous capsule. Synovial chondromatosis (8, 9, 12), particularly when it is exta-articular, may pose a problem in differential diagnosis. Synovial chondromatosis usually has multiple cartilaginous and osteocartilaginous nodules of synovium and loose bodies within the joint. Therefore it is usually found within or near the joints. However, extraskeletal osteochondromas are usually solitary lesions that may occur away from the joint. Tumoral calcinosis usually appears as well-defined lobulated calcified masses with layering when imaged with a horizontal beam (8, 9, 13). Unlike extraskeletal osteochondromas, there are no osseous trabecular structures in the mass. As many as one third of synovial sarcomas demonstrate some internal calcification (less commonly, ossification), which often occurs at the periphery of the tumor (8, 14). A coexistent adjacent bone involvement is seen in some cases. This lesion is cytologically active and atypical, and thus it may be readily regarded as being sarcomatous. In osteosarcomas, the radiological findings include scattered amorphous calcification and ossification within the soft-tissue mass (8, 9, 15-17). The mass exhibits a disorganized arrangement of osteogenic elements in the center of the tumor and shows cellular atypism.

A diagnosis of extraskeletal osteochondroma should be considered when a well-defined osseous mass with a typical chondroid matrix is located in the soft tissues.

REFERENCES

1. Chung EB, Enzinger FM. *Chondroma of soft parts. Cancer 1978; 41: 1414-24.*

2. Dahlin DC, Salvador AH. *Cartilaginous tumors of the soft tissues of the hands and feet. Mayo Clin Proc 1974; 49: 721-6.*
3. Morton JJ. *Tumors of the tendon sheaths. Surg Gynecol Obstet 1934; 59: 441-52.*
4. Lynn MD, Lee J. *Periarticular tenosynovial chondrometaplasia: report of a case at the wrist. J Bone Joint Surg Am 1972; 54: 450-2.*
5. Milgram JW, Dunn EJ. *Para-articular chondromas and osteochondromas. Clin Orthop 1980; 148: 147-51.*
6. Rockey HC. *Trigger-finger due to tenosynovial osteochondroma. A case report. J Bone Joint Surg Am 1963; 45: 387-92.*
7. Someren A, Merritt WH. *Tenosynovial chondroma of the hand: a case report with a brief review of the literature. Hum Pathol 1978; 9: 476-9.*
8. Kransdorf MJ, Meis JM. *From the archives of the AFIP. Extraskeletal osseous and cartilaginous tumors of the extremities. Radiographics 1993; 13: 853-84.*
9. Li C, Arger PH, Dalinka MK. *Soft tissue osteochondroma. A report of three cases. Skeletal Radiol 1989; 18: 435-7.*
10. Gayle EL, Morrison WB, Carrino JA, Parsons TW, Liang CY, Stevenson A. *Extraskeletal osteochondroma of the foot. Skeletal Radiol 1999; 28: 594-8.*
11. Zlatkin MB, Lander PH, Begin LR, Hadjipavlou A. *Soft-tissue chondroma. Am J Roentgenol 1985; 144: 1263-7.*
12. Karlin CA, De Smet AA, Neff J, Lin F, Horton W, Wertzberger JJ. *The variable manifestations of extraarticular synovial chondromatosis. Am J Roentgenol 1981; 137: 731-5.*
13. Palmer PES. *Tumoral calcinosis. Br J Radiol 1966; 39: 518-23.*
14. Cadman NL, Soule EH, Kelley PJ. *Synovial sarcoma: an analysis of 134 tumors. Cancer 1965; 18: 613-27.*
15. Greenspan A, Steiner G, Norman A, Lewis MM, Matlen J. *Case report 436. Osteosarcoma of the soft tissues of the distal end of the thigh. Skeletal Radiol 1987; 16: 489-92.*
16. Hudson TM, Bertoni F, Enneking WF. *Computed tomography of a benign mesenchymoma of soft tissue. J Comput Assist Tomogr 1985; 9: 205-8.*
17. Martel W, Abell MR. *Radiologic evaluation of soft tissue tumors. A retrospective study. Cancer 1973; 32: 352-66.*