ARCHIVES OF HELLENIC MEDICINE: ISSN 11-05-3992

CONTINUING MEDICAL EDUCATION
ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

ARCHIVES OF HELLENIC MEDICINE 2019, 36(6):847–848
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2019, 36(6):847–848

Medical Imaging Quiz – Case 58

E. Botsa,
I. Thanou,
E. Barmpouti,
K. Antoniadi,
L. Thanos

Department of Interventional Radiology and Diagnostic Imaging, "Sotiria" General Hospital of Chest Diseases, Athens, Greece

A 21 year old man was admitted to the emergency department after a motorbike accident due to leg trauma. A femur x-ray was performed and revealed an abnormal finding in the left femur (Fig. 1).

Comments

Enchondromas constitute 5% of all bone tumours (range 3–10%), 17.5% of benign bone tumours (range 12–24%) and the most common primary benign bone tumour of hand/wrist. They are intramedullary cartilage neoplasms with benign imaging features that share histologic features with low-grade chondrosarcoma, and are sometimes classified under the umbrella term low grade chondral series tumours. Enchondromas are most frequently diagnosed incidentally, in childhood to early adulthood with a peak incidence of 10–30 years. As a rule, enchondromas should be asymptomatic; however, lesions of the hands/feet may present with pain from pathological fracture or impending fracture. Malignant transformation into a low-grade chondrosarcoma is rare, and may present with pain. The most important point is that they shouldn't be confused with more aggressive lesions.

Enchondromas comprise lobules of mature hyaline cartilage which are partially or completely encased by surrounding normal bone. The cartilaginous lobules may undergo endochondral ossification, often resulting in the characteristic 'rings and arcs' pattern of mineralization. They arise from rests of growth plate cartilage/chondrocytes which become isolated within mature bone. Hence, they may be seen in any bone formed from cartilage.

By definition, they show no histologic evidence of local invasion. However, it is important to be aware that enchondroma cannot be reliably distinguished from chondrosarcoma by histology, and diagnosis depends on correlation of clinical, imaging, and pathology findings. Grossly, lesions are usually <3 cm, translucent, nodular, and are grossly grey-blue. Ollier disease and Maffucci syndrome are associated with multiple enchondromas. They are typically located in a central or eccentric position within the medullary cavity of tubular bones: small tubular bones of the hands and feet (~50%), large tubular bones (femur, tibia, humerus) and rarely pelvis, ribs and scapula

Enchondromas have a somewhat variable appearance by imaging, although characterization by excluding suspicious features is key. Since most are asymptomatic incidental findings, lesions in a characteristic location and appearance are not usually further investigated. Imaging is generally less helpful in corroborating be-

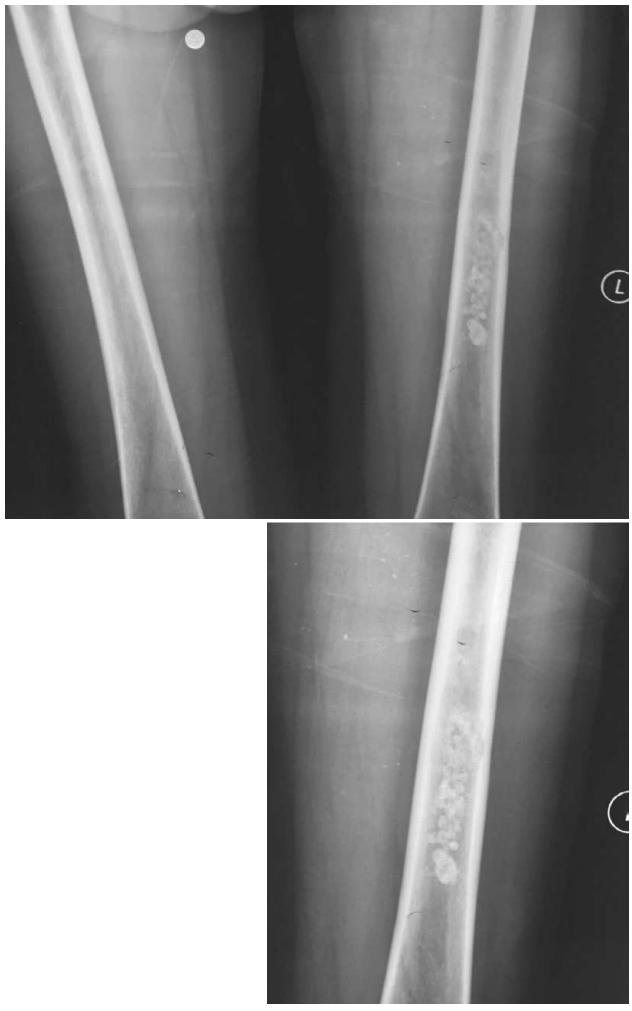

Figure 1. Small <5 cm lytic lesions with non-aggressive features, narrow zone of transition, sharply defined margins, chondroid calcification of the left femur.

nignity of lesions in the hands/feet, as well as in enchondromatosis or skeletally immature patients.

Enchondromas have a variable appearance, although typical they are small <5 cm lytic lesions with non-aggressive features: narrow zone of transition, sharply defined margins, chondroid calcification (rings and arcs calcification). They don't appear growth through cortex, gross bone destruction, periosteal reaction or soft tissue mass.

The majority of enchondromas more frequently arise in the metaphyseal region, owing presumably to their origin from the growth plate, although they are frequently seen in the diaphysis. They are rarely seen in the epiphysis, and a cartilaginous lesion in an epiphysis is more likely to be a chondrosarcoma.

MRI is useful in evaluating for soft tissue extension and for confirming the diagnosis. Enchondromas appear as well circumscribed somewhat lobulated masses replacing marrow. Bone scan reveals increased uptake.

The majority of enchondromas remain asymptomatic and require no treatment. Pathologic fractures are commonly treated by curettage and bone grafting, with follow-up x-rays to monitor for healing and recurrence. An incisional biopsy is obtained intraoperatively. Recurrence is reported in 2–15% and suggests malignancy. If malignant transformation is suspected, which occurs in less than 5% of cases, then treatment is more aggressive. Complications of enchondromas consists of pathological fracture and malignant transformation into chondrosarcoma.

The differential diagnosis is significantly affected by the modality in question, and most entities such as bone infarct, intraosseous ganglion, other benign or metastatic lytic bone lesions, granulomatous disease can be excluded with MRI. The exception is chondrosarcoma.

References

1. REITH JD. Chapter 40 - Bone and Joints. In: Goldblum JR, Lamps LW, McKenney J, Myers JL (eds). *Rosai and Ackerman's Surgical Pathology,* 11th ed., Elsevieer, Amstredam, 2017
2. DOUIS H, SAIFUDDIN A. The imaging of cartilaginous bone tumours. I. Benign lesions. *Skeletal Radiol* 2012, 41:1195–1212
3. AN YY, KIM JY, AHN MI, KANG YK, CHOI HJ. Enchondroma protuberans of the hand. *AJR Am J Roentgenol* 2008, 190:40–44
4. SKINNER HB. *Current diagnosis & treatment in orthopedics*. McGraw-Hill Medical, London, 2003
5. FERRER-SANTACREU EM, ORTIZ-CRUZ EJ, GONZÁLEZ-LÓPEZ JM, PÉREZ FERNÁNDEZ E. Enchondroma versus low-grade chondrosarcoma in appendicular skeleton: clinical and radiological criteria. *J Oncol* 2012, 2012:437958
6. LIFCHEZ SD, KELAMIS J. Surgery of the Hand and Wrist. In: Brunicardi F, Hunter JG, Billiar T, Andersen D, Matthews J, Dunn D, Pollock RE (eds). *Schwartz's Principles of Surgery,* 10th ed., Medicine & Health Science Books, 2014

Corresponding author:

L. Thanos, Department of Computed Tomography, "Sotiria" General Hospital of Chest Diseases, 152 Mesogeion Ave., 115 27 Athens, Greece
e-mail: loutharad@yahoo.com