ARCHIVES OF HELLENIC MEDICINE: ISSN 11-05-3992

CONTINUING MEDICAL EDUCATION
ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Medical Imaging Quiz – Case 75

ARCHIVES OF HELLENIC MEDICINE 2023, 40(5):718–719
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2023, 40(5):718–719

E. Botsa,
I. Thanou,
M. Bompou,
C. Georgokosta,
L. Thanos

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

A 16-years-old boy with a past medical history of osteosarcoma of the left tibia visited the emergency department due to pain of the right hip. The exact duration of this symptom could not be determined. The patient was referred to the Department of Imaging and Interventional Radiology for imaging evaluation. Computed tomography (CT) was performed and diagnosis was confirmed with a core needle biopsy (fig. 1).

Comments

Osteosarcoma represents the most common non-haematopoietic primary malignant bone tumour, with an incidence of 3.1 per million (4.4 per million population <25 years). The incidence of osteosarcoma is slightly higher in males than in females. Osteosarcoma is very rare in young children. The incidence increases steadily with age, rising more dramatically in adolescence. Approximately 60% of patients with osteosarcoma are younger than 25 years old. A second peak of incidence exists in individuals older than 60 years. About 80% of those patients already present subclinical micrometastases at the time of primary tumour diagnosis. Therefore, pre- and postoperative chemotherapeutic treatment in addition to a wide resection, and in exceptional cases of inappropriate resectability also local radiotherapy, has been documented as a successful therapeutic approach. This interdisciplinary therapy concept contributed to an increase of the 5-year survival rate of osteosarcoma patients from 15% to 50–70%.

Nevertheless, some patients still experience recurrences, and of those, less than 25% become long-term survivors. The highest probability of tumour recurrence, independent of the localisation, has been reported during the first three years after initial osteosarcoma diagnosis. Generally, osteosarcoma is thought to spread on a haematogenous pathway primarily to the lungs, with the skeleton presenting the second most common organ of metastatic manifestation. In some rare cases, visceral or cerebral metastases were reported. Osteosarcomatous lesions, which occur distant from the primary site of osteosarcoma affection after initial treatment without pulmonary manifestation, are classified as metachronous osteosarcoma with reported incidence rates varying from less than 1–10%. Patients with late recurrences are reported to have a more favourable outcome if treated according to the principles of primary osteosarcoma.

The pathogeneses of metachronous osteosarcoma are still unclear. They are discussed either as metastases of the primary

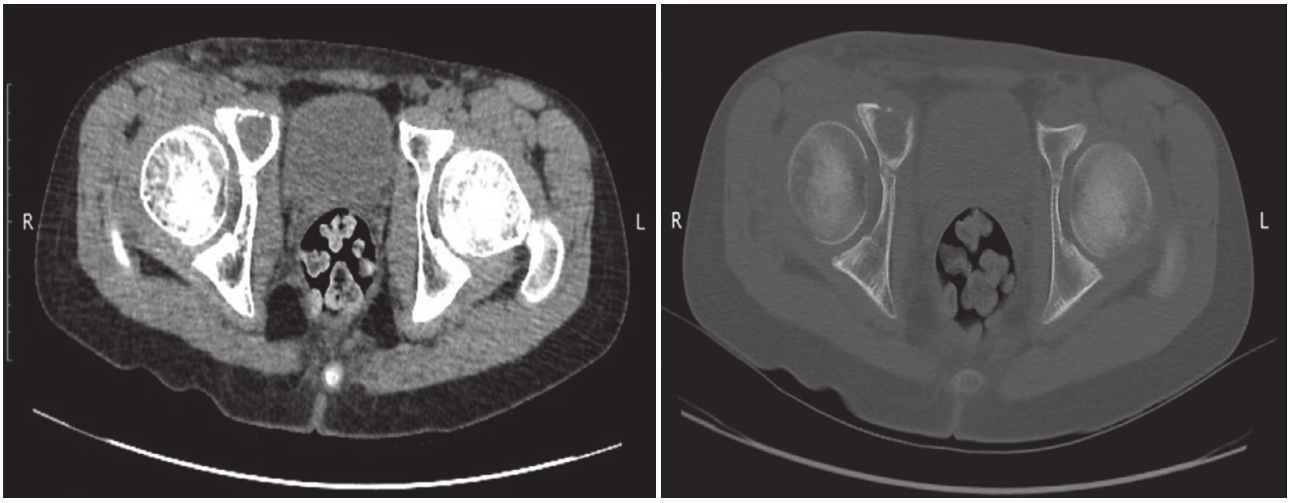

Figure 1. Computed tomography (CT) images reveal osteolytic lesion of the right cotyle.

tumour to the bone or second primary lesions. Histopathology does not offer sufficient methods of differentiation yet. Theories on its development, without involvement of the lungs, are focusing on a bone-to-bone-spread via venous plexus, intraosseous embolisation, or lymphatic spread. A predisposition to primary osteosarcoma development has been observed in patients presenting genetic abnormalities of the p53 tumour suppressor pathway or retinoblastoma gene germline mutations.

References

1. TARAN SJ, TARAN R, MALIPATIL NB. Pediatric osteosarcoma: An updated review. *Indian J Med Paediatr Oncol* 2017, 38:33–43
2. JEFFREE GM, PRICE CH, SISSONS HA. The metastatic patterns of osteosarcoma. *Br J Cancer* 1975, 32:87–107
3. BRANDAL P, BJERKEHAGEN B, BRULAND OS, SKJELDAL S, BOGSRUD TV, HALL KS. Synchronous and metachronous skeletal osteosarcomas: The Norwegian Radium Hospital experience. *Acta Oncol* 2009, 48:1165–1172
4. FRANKE M, HARDES J, HELMKE K, JUNDT G, JÜRGENS H, KEMPF-BIELACK B ET AL. Solitary skeletal osteosarcoma recurrence. Findings from the Cooperative Osteosarcoma Study Group. *Pediatr Blood Cancer* 2011, 56:771–776

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