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CASE REPORT

Metachronous Multifocal Osteosarcoma After 5-month Therapy: Metastasis or Other Primary Lesion?

Metachronous Multifocal Osteosarcoma Setelah 5 bulan terapi: Metastasis atau Lesi Primer Lain?

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ABSTRACT

Multifocal osteosarcoma is a rare form osteosarcoma. It is diagnosed by having two or more lesions without any visceral damage. Osteosarcoma is characterized by having concurrent numerous lesions; the synchronous type, and metachronous type are characterized by non-concurrent multiple lesions form. This case reports a boy 4 years old with a left femur osteosarcoma; histopathologically confirmed as chondroblastic osteosarcoma. After 5 months of chemotherapy, a new lesion was found at the left side of the cruris and pedis bones that were multiple, destructive, permeative, and exhibiting periosteal reaction. No visceral damage was found. In this case, the patient had a primary lesion and new non-concurrently lesions and no visceral damage, as conclusion was diagnosed as metachronous multifocal osteosarcoma that had never been reported in Indonesia.

Keywords: Osteosarcoma, multifocal, metachronous

ABSTRAK

Multifokal osteosarkoma adalah bentuk osteosarkoma yang jarang terjadi. Diagnosis multifokal osteosarkoma, yakni adanya dua atau lebih lesi tanpa kerusakan organ visceral lainnya. Tipe sinkron multifokal osteosarcoma ditandai dengan diawali adanya lesi primer kemudian diikuti lesi lainnya secara bersamaan. Tipe metachronous apabila lesi baru, tumbuh pada waktu yang berbeda setelah lesi primernya. Kami melaporkan kasus seorang anak laki-laki berusia 4 tahun dengan osteosarkoma femur kiri, terbukti secara histopatologi sebagai osteosarkoma kondroblastik. Setelah 5 bulan kemoterapi ditemukan lesi lain pada kruris dan pedis kiri yang multipel, destruktif dan permeatif dengan reaksi periosteal. Tidak ditemukan kerusakan organ viseral pada pasien ini. Dalam kasus ini, pasien mempunyai lesi primer dan lesi baru yang ditemukan dalam waktu berbeda, dan tidak terdapat kerusakan organ viseral. Kami menyimpulkan ini adalah multifokal osteosarcoma tipe metachronous yang belum pernah dilaporkan di Indonesia sebelumnya.

Keywords : Metachronous, multifokal, osteosarkoma, metastasis

INTRODUCTION

Multifocal osteosarcoma is a very rare form of osteosarcoma. Osteosarcoma is the most prevalent form of bone malignancy among children and young adults, however, only 1-2% of all osteosarcomas are of the multifocal variety.[1,2] In 1936, Silverman[1] first described multifocal osteosarcoma as multiple tumors appearing synchronous or metachronously at more than one site without lung lesions. When multiple lesions manifest simultaneously, it is referred to as synchronous lesions. Metachronous lesions manifest over time, typically after the dominant lesion has been treated, but only when there are no lung metastases. Only 1.5% of all osteosarcomas in the study by Corradi et al. were multifocal osteosarcoma (0.6% synchronous and 0.9% metachronous).[1,3-6] The lower femur and upper tibia are where the conspicuous lesion is most frequently found. The outlook is still quite bad even with combined chemotherapy and surgery.[1,3]

CASE REPORT

A 4-year-old boy was admitted with swelling of the left thigh with pain following an injury during the last month (Fig. 1). Laboratory examination was within normal limits. Plain radiography of the left femur showed a sclerotic lesion accompanied by sunburst periosteal reaction and infiltration of the surrounding soft tissue (Fig. 2a). Five months post-diagnosis and after the 4th chemotherapy session, the swelling worsened, and radiography of the left cruris and pedis showed multiple lytic, destructive, and permeative lesions with periosteal reaction (Figure 2b). A biopsy specimen obtained from the distal left femur showed chondroblastic osteosarcoma. The patient was given chemotherapy. From this examination, the different diagnoses considered were between metabolic and metastatic bone disease. To ensure that this was not metabolic, an X-ray was taken on the opposite leg and the results were normal (Fig. 3). Chest X-ray did not show lung metastases (Fig. 4). Biopsy from the proximal tibia specimen showed conventional osteosarcoma that consists of a tumor mass composed of hyperplastic, densely packed, round to oval-shaped cells with pleomorphic, hyperchromatic nuclei, and mitosis was found. A neoplastic osteoid matrix is observed. The connective tissue stroma contains lymphocyte cells along with blood vessel dilatation and hemorrhage (Fig.5). Since all the lesions occurred within 5 months and the radiography of the opposite side was within normal limits, the diagnostic conclusion as metachronous multifocal osteosarcoma.

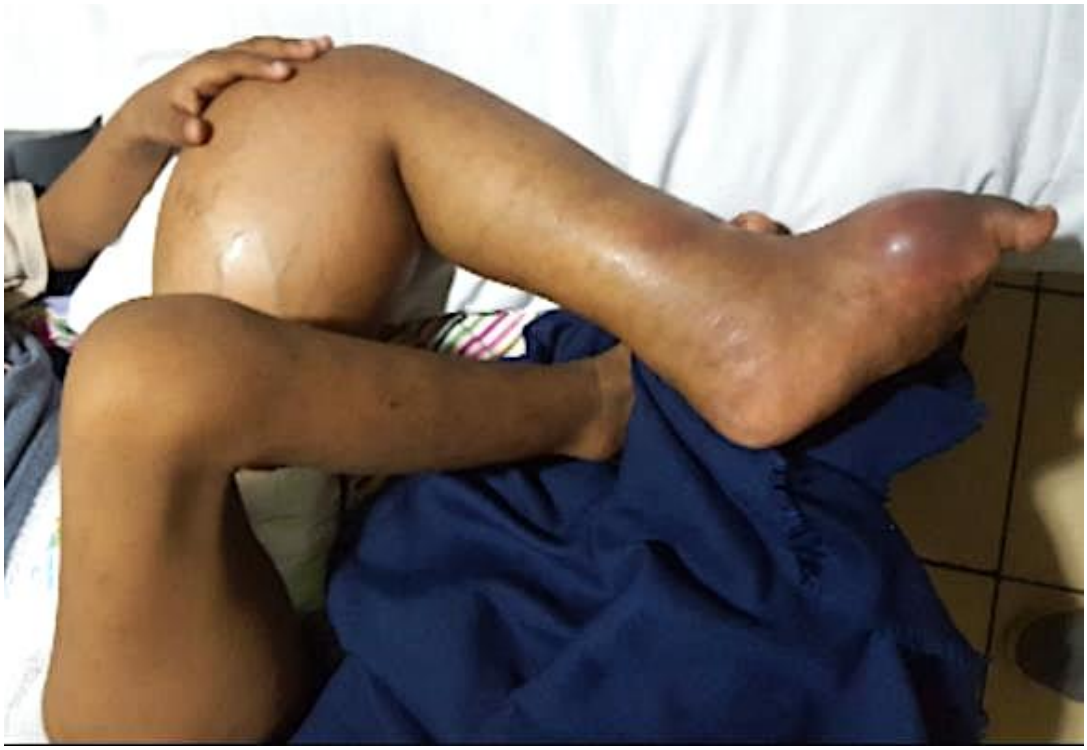

Figure 1. The patient presented with swelling of the left thigh with pain within the past month

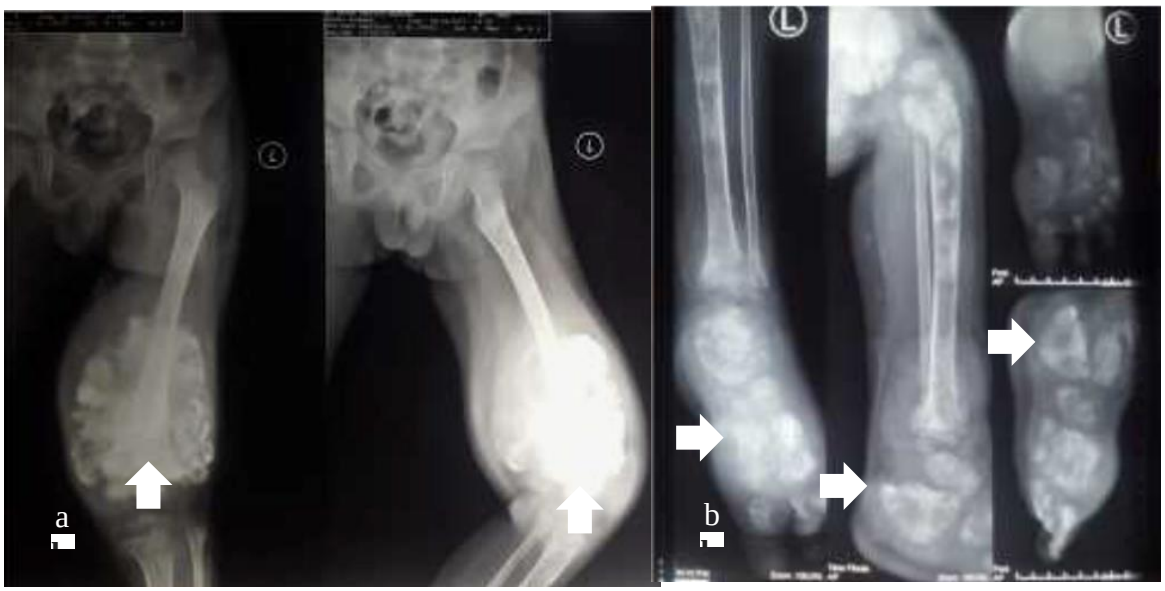

Figure 2. Femur, cruris and Pedis X-rays; a: Sclerotic lesion accompanied by sunburst periosteal reaction and infiltration of the surrounding soft tissue of left femur.(white arrow), b: The left cruris and pedis showed multiple lytic, destructive, and permeative lesions with periosteal reaction. (white arrow)

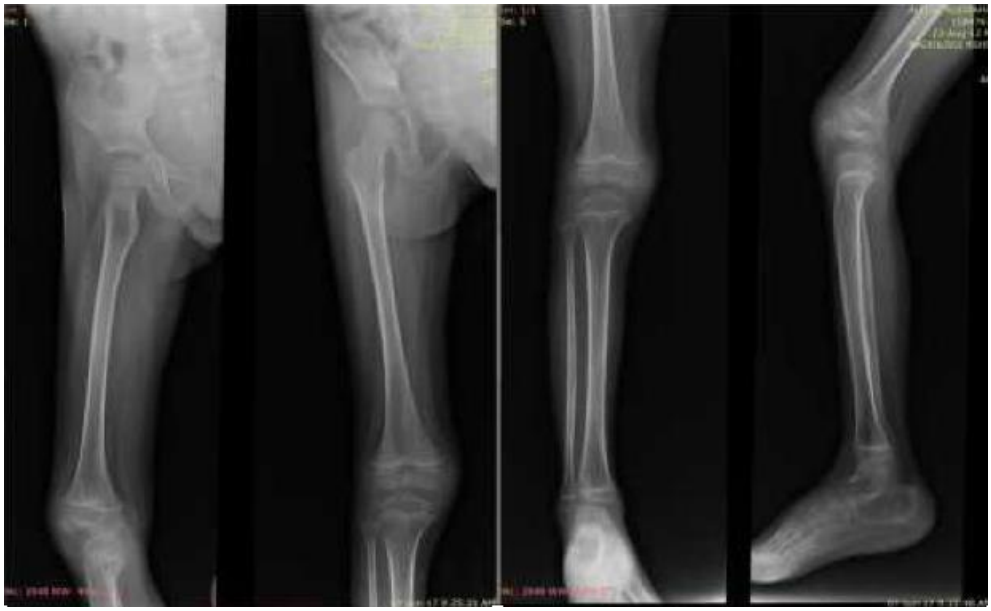

Fig. 3 Right cruris and pedis showed no lesion.

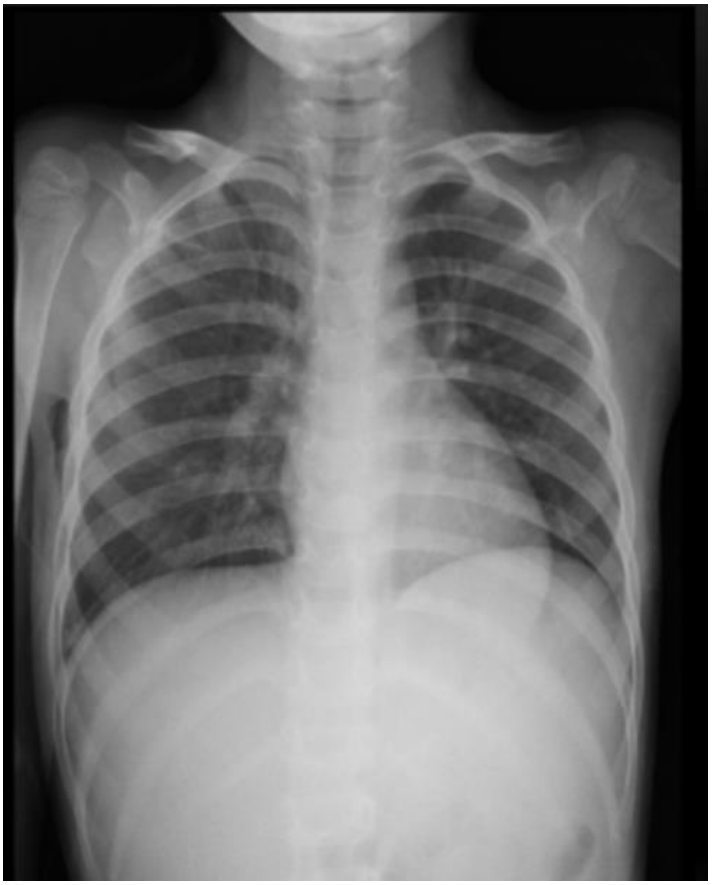

Figure 4. No lesion detected in patient.

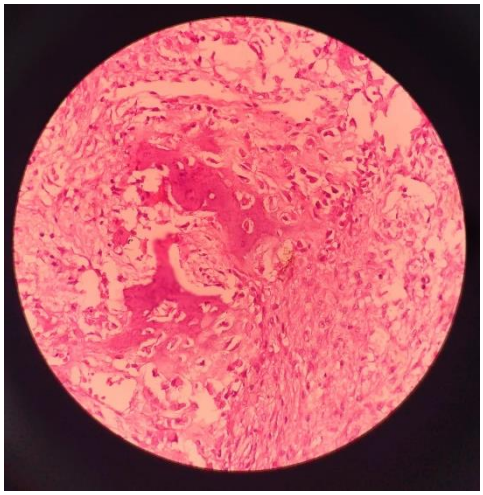

Figure 5. Biopsy of lesion specimen showed chondroblastic osteosarcoma.

DISCUSSION

Osteosarcoma is a rare form of bone tumor malignancy defined by an osteoid matrix formed by malignant cells. Osteosarcomas make up 3% of all child tumors and < 1% of all malignancies diagnosed annually in the United States.[7] The survival of individuals with osteosarcoma dramatically improved after systemic chemotherapy was added to multimodality therapy.[7,8]

The ages of osteosarcoma patients are distributed bimodally both at a young age as well as old age. The initial peak is between the ages of 10 and 14. This category includes the vast majority of primary osteosarcomas. When the next detectable peak occurs in those over 65 years, osteosarcoma is more likely to be a secondary malignancy caused mainly by malignant Paget disease and on sites of bone infarction. It has been found that the patient's age and survival are associated; older individuals have the lowest survival rates. The annual decline in osteosarcoma mortality rates is roughly 1.3%. The 5-year overall survival rate is around 68%, regardless of gender.[9] The lower long bones' metaphyses, particularly those of the lower femur and upper tibia, are the major locations most frequently afflicted in patients above 25 years showing a broader diversity of bony locations.[3]

Multifocal osteosarcoma predominantly affects the young and males.[1,3,10] During the initial assessment, with radiographic studies such as bone survey or bone scintigraphy, lesions other than the main site's pain and swelling are frequently found accidentally in similar patients. The dominant tumor is most frequently seen in the lower femur, followed by the upper tibia, together with other secondary bone lesions.[1,3] These lesions are found in the metaphysis or meta diaphysis of long bones, exhibiting imaging characteristics that are typical of primary osteosarcomas, such as an aggressive mixed lytic and sclerotic pattern of bone destruction with associated cortical destruction, soft-tissue extension, a wide zone of transition, and malignant periosteal new bone formation.[1,3]

Multifocal osteosarcoma has the same characteristics as osteosarcoma. Most cases show osteoblastic differentiation with neoplastic cells surrounding an eosinophilic osteoid. Metastatic disease was more common in the age group over 60 years. The frequency of metastatic disease varied depending on the tumor location, and it was more common in osteosarcoma of the pelvis than in other sites for both young and old cases.[11]

There is a lot of disagreement in the literature over whether multifocal osteosarcoma suggests a large number of primary tumors or metastatic disease. The majority of studies are in disagreement. Multifocal Osteosarcoma[1,12], which has one prominent lesion is primary osteosarcoma and the remainder are metastases, which makes it a broad-range metastatic osteosarcoma. Lesions typically exhibit a narrow transition zone, heavy mineralization, and no signs of soft tissue mass, cortical disintegration, or malignant periosteal new bone formation.[1] Thus, this patient has a primary lesion and a new lesion found non-concurrently after 5 months of chemotherapy, no pulmonary metastases, having a conventional osteosarcoma biopsy test. In conclusion, the diagnosis was this is a metachronous multifocal osteosarcoma.

There is much debate in the literature as to whether multifocal osteosarcoma represents multiple primary tumors or metastatic disease. Most studies tend to conclude that the dominant lesion is a primary lesion and the remaining lesion suggestive metastases.

CONCLUSIONS

Multifocal osteosarcoma is a very rare form of osteosarcoma. Both the doctor and the radiologist have difficulty in diagnosis because of its presentation and the absence of substantial clinical signs despite the broad bone damage. This is especially true when there is no dominant primary lesion. The diagnosis of this extremely malignant condition can only be confirmed histopathologically.

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AUTHORS CONTRIBUTION

All authors contributed to the preparation of this manuscript.

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CONFLICT OF INTEREST

There is no conflict of interest between the authors.

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