INTRODUCTION

Giant cell tumours (GCT) are uncommon benign osseous neoplasms with an obscure origin and rarely seen in children.\textsuperscript{1,2} They mostly occur in the epiphyses of long bones after skeletal maturity.\textsuperscript{3-5} It usually involves the appendicular skeleton and tends to occur in young adults between 20 - 40 years of age.\textsuperscript{6,7} Occurrence in skeletally immature children is rare,\textsuperscript{6,8} and the lesion is metaphyseal in children with open epiphysis. Radiologically, giant cell tumour appears as a lucent and eccentrically located lesion in the bone. Children treated for Hodgkin's disease (HD) are known to be at the greatest risk to develop a secondary neoplasm during their follow-up.\textsuperscript{7} This case reports a rare occurrence of a giant cell tumour (GCT) of humerus with successful outcome after surgical excision and regular follow-ups in a 10-year-old child after 4 years of treatment for HD.

CASE REPORT

A 10 years girl child was referred to the Orthopedics and Traumatology Outpatient Clinic because of a lytic lesion in her left humerus. The lesion was noticed on a posteroanterior chest X-ray during her routine control and reported as the presence of a lytic lesion in the left humerus that was most probably compatible with a bone cyst, and less possibly a mono-ostotic fibrous dysplasia or non-ossified fibroma. Her medical history revealed that she presented with cervical and supraclavicular lymph nodes 4 years ago. The imaging studies revealed multiple mediastinal, hilar, paraaortal lymph nodes and splenic lymphomatous involvement. She was diagnosed as HD, stage IIIS and the histopathologic findings of the cervical lymph node specimen were consistent with mixed cellular type HD. After receiving 6 cycles of COPP-ABVD chemotherapy, subdiaphragmatic radiotherapy and supradiaphragmatic radiotherapy involving the right axillary and left cervical region was administered. The treatment of HD was completed with complete response and disappearance of involvement at all sites. The patient was followed-up without any treatment after that time and was in a healthy condition until the lytic lesion in her left humerus was noticed.

Magnetic resonance imaging studies of the left humerus revealed a well-defined lesion without any cortical...
destruction or soft tissue involvement (Figure 1a). After intravenous contrast enhancement, the lesion displayed both cystic and solid components (Figure 1b,c). The patient was operated with a plan of curettage, biopsy and grafting. Macroscopic appearance of the tumour was a solid, yellow mass. Aggressive curettage was performed with allograft grafting and locking compression plate fixation. The histopathologic examination of the biopsy specimen revealed findings consistent with giant cell tumour of the bone (Figure 1d).

**DISCUSSION**

This is an atypical case of a giant cell tumour of the bone regarding its presentation, radiological appearance and occurrence following treatment of HD. It is not known whether it is a coincidental tumour or secondary to treatment/presence of HD. Children treated for Hodgkin's disease are known to have the highest risk of secondary neoplasm.7,10 The patient received radiotherapy to the left cervical region, which theoretically did not involve the left proximal humerus. However, not only those receiving radiotherapy, but also children who only receive chemotherapy for HD were reported to develop secondary neoplasm.10 To the best of authors’ knowledge, no report of giant cell tumour of the bone as a co-existent or secondary neoplasm to Hodgkin’s disease has been reported. However, it is emphasized that in a large series of children and young adults treated for solid cancers (involving those with Hodgkin’s disease), the types of subsequent bone cancers were not specified.7,10

Radiologically, well-defined borders, cystic and solid compartments associated with a heterogenous enhancement suggested the diagnosis of aneurysmal bone cyst with regard to the patient’s age. Complicated bone cyst, telangiectatic osteosarcoma, giant cell tumour might have been included in the differential diagnosis. GCT of bone is one of tumors that are frequently found invading the ends of long bones, such as chondroblastoma, intraosseous ganglia, and clear cell chondrosarcoma.9 On MRI, the mass appears dark on T1-weighted images, bright on T2-weighted images, and avid on gadolinium-enhanced images. On MRI, GCT of bone bears characteristics similar to those of any aggressive bone tumor, including malignant lesions such as osteosarcoma. Fluid-fluid levels can also be seen in GCT and aneurysmal bone cyst. Both of them have similar characteristics histologically and radiologically especially on MRI. Giant cell tumor was less likely since the lesion was not located in the epiphysis and the patient was a child. Complicated bone cyst was also less likely because of the relatively more solid parts and marked enhancement in the lesion. Telangiectatic osteosarcoma was excluded because no periosteal reaction or soft tissue lesion associated with disruption of cortex accompanied the lesion.

In conclusion, giant cell tumor of the bone is a rare disease of the skeletally immature patient and no cases of this tumor secondary to radiotherapy and chemotherapy for HD have been reported before. This case report is the first case of giant cell tumour of humerus in a long survivor of childhood Hodgkin’s disease. Among survivors HD of childhood, breast and thyroid cancer were reported. However, since the types of bone cancers in large series were not specified, we do not know if there are giant cell tumors of bone secondary to treatment for HD.

**REFERENCES**