

Cystic Chondroblastoma of Talus-A Case Report with Ultrastructural Study

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ABSTRACT: A case of cystic chondroblastoma of talus was reported on the basis of rarity and unique ultrastructural feature but might simulate other cystic lesions especially bone cyst and tuberculosis. Histopathology was therefore important for definitive diagnosis of cystic lesion so that proper management could be given.

INTRODUCTION

Chondroblastoma was earlier described as a variant of giant cell tumor and was later delineated and named as a distinct entity in 1942 by Jaffe and Lichtenstein.^{1,3} Chondroblastomas are rare benign chondromatous tumors affecting patients around the second decade of lives, most of which occur in the epiphysis of long bones especially femur, tibia and humerus. We report a case of chondroblastoma occurring at the talus. To our knowledge, this location is quite unusual and there were only 23 cases in Dahlin's series, 13 cases in Schajowics' series and few other reports in English literature.⁴⁻⁷ In addition to rarity, the case has been reported on the basis of unique ultrastructural feature and cystic formation which may create difficulty in differentiating from other cystic lesions such as bone cysts and tuberculosis.

CASE REPORT

A 26-year-old female came to Ramathibodi Hospital on June, 1982 with the complaint of pain in the right ankle for two years. The pain aggravated when she walked. Physical examination revealed unremarkable finding but the Roentgen finding showed a lobulated, ovoid, osteolytic lesion at dome of talus with sharp border (Figure 1). Clinical impression was unicameral bone cyst. The curettage was therefore performed. The operative finding showed yellowish serous fluid as content

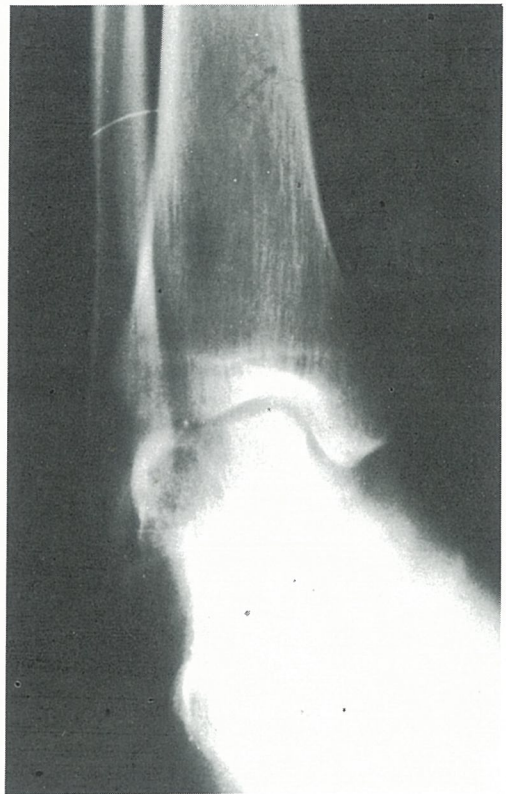


Fig. 1 Photograph of the X-rays of the ankle joint showing lobulated cyst with sclerotic border of the talus bone.

and pieces of whitish and yellow tissue as curettage from the cyst wall. The diagnosis was cystic chondroblastoma.

MATERIAL AND METHODS

For light microscopic study, the tissue was fixed in 10 per cent formalin solution, embedded in paraffin block, cut into 3 micron section, stained with hematoxylin-eosin (H & E).

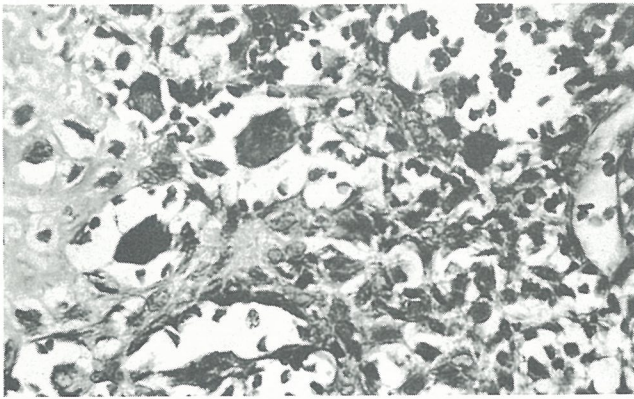


Fig. 2 (H & E; Magnification x 400)

Photomicrograph of the lesion showing cluster of chondroblasts in the right lower and an area of chondrification in the left upper quadrants of the picture. Few multinucleated giant cells were seen dispersing in the center.

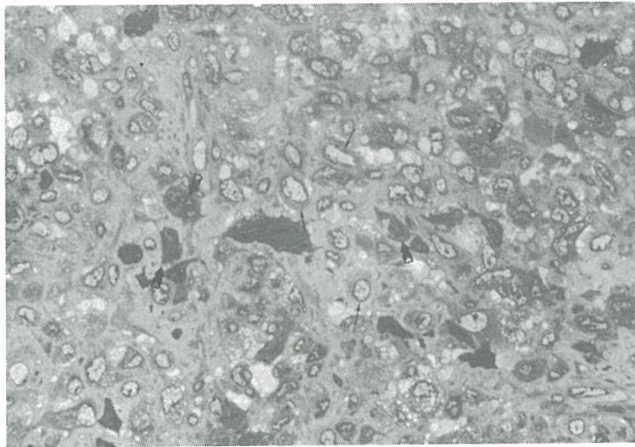


Fig. 3 (Thick-section stained with Toluene blue; Magnification x500)

Photomicrograph exhibiting basically two different types of cells; one with oval to indented euchromatic nuclei and pale cytoplasm (thin arrows); the other with markedly indented or multilobated nuclei and dark cytoplasm (thick arrows).

For electron microscopic study, fresh tissue of tumor was fixed in 2 per cent glutaraldehyde in 0.1 M phosphate buffer, pH 7.4 for 2 hours and post-fixed in 1 per cent Osmium tetroxide in 0.1 M phosphate buffer, pH 7.4, dehydrated in a graded series of ethanol and propylene oxide and embedded in Epon 812. One micron thick sections were stained with toluidine blue for histological orientation. Thin section were stained with uranyl acetate and lead citrate, and examined in a Hitachi-UV 12 electron microscope at 100 KV.

Pathologic findings:

Gross examination revealed several pieces of glistening greyish white soft rubbery tissue alternating with gritty yellowish material measuring totally 1 x 0.5 x 0.5 cm.

Microscopically, the tumor showed several lobules of chondroid matrix interspersing in the stroma which consisted of mainly uniformed closely packed polyhedral cells and occasional multinucleated giant cells. The mononuclear cells show irregular vesiculated nuclei and abundant eosinophilic cytoplasm. Mitosis is rare. The stroma showed telangiectatic vascular spaces. The findings are compatible with cystic chondroblastoma.

The thick sections for ultrastructural study reveal basically two different types of cells (Figure 3). One appeared ultrastructurally as mononuclear polygonal cells about 15 to 20 microns in sizes. The cytoplasmic borders showed short blunt microvillous processes; their cytoplasm contains moderate amount of mitochondria and lysosomes. The distinctive feature was the presence of band-like aggregate of microfilaments which partially subdivide cell-cytoplasm into an electron-dense endoplasmic portion rich in organelles and an electron-lucent ectoplasm largely devoid of organelles. The nuclei showed slightly irregular indentations and possessed peripheral heterochromatin and fibrous elastic lamina (Figure 4). The other type of cells, nuclei became more irregular and form multi-lobations of which individual lobes were connected to each other with narrow nuclear

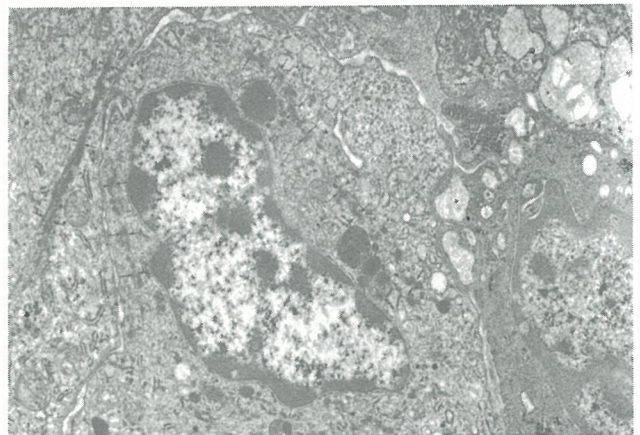


Fig. 4 (E.M.; Magnification x 10,000)

Ultrastructure of the cells labelled with thin arrows in Fig. 3 showing prominent interrupted dark bands (arrows) subdivide cell-cytoplasm into an electron-dense endoplasmic portion rich in organelles and an electron-lucent ectoplasm

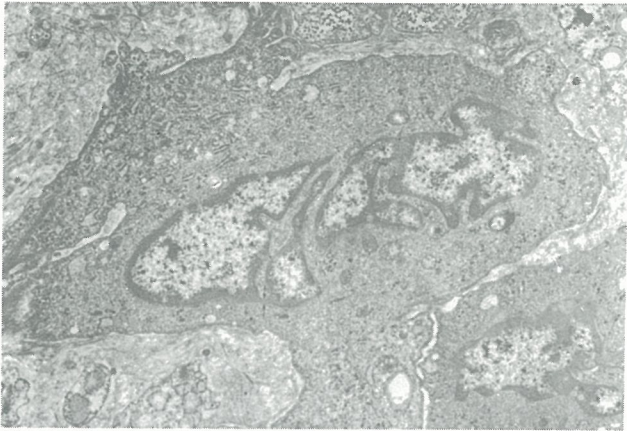


Fig. 5 (E.M.; magnification x 10,000)

Ultrastructure of the cells labelled with thick arrows in Fig. 3 showing markedly indented and multilobated nuclei. The lobules of nuclei are interconnected with nuclear bridges (arrows). The cytoplasm was rich of microfilaments and endoplasmic reticulum.

bridges. The cytoplasm showed increase in number of rough endoplasmic reticulum. The band-like aggregates of microfilaments were rare (Figure 5).

DISCUSSION

The differential diagnosis of cystic lesions in talus bone include chondroblastoma, unicameral bone cyst and infection.⁶⁻¹⁰ In radiologic view point, we usually encountered calcifications in

chondroblastoma but such finding was not present in the case and had created difficulty in differentiating from other lesions especially bone cyst. However, on morphological ground it fit very well with the diagnosis of chondroblastoma because of the presence of chondrifications of matrix and marked irregularity of nuclei of basic tumor cells; in addition they possessed interrupted dark bands and narrow bridges joining between lobules of nuclei ultrastructurally.¹¹⁻¹⁴ Cystic change in chondroblastoma has been observed by several authors.^{4,14-17} According to Dahlin, cyst formations usually comprised a small portion of the tumor; however in 6 out of his 125 cases cystic change was so extensive that the lesions resemble unicameral bone cysts.⁵ Some of his cystic chondroblastomas contain blood and was consistent with those have been designated as chondroblastoma with secondary aneurysmal bone cyst by other authors.^{14,17} As in our case the patient was erroneously diagnosed as bone cyst preoperatively. It is therefore important that biopsy be required for definitive diagnosis of cystic lesions otherwise the treatment may be inappropriate especially in this decade the diagnosis is more critical since steroid injection has been introduced for the treatment of unicameral bone cyst.^{8,18,19}

The cystic change of tumors in term of prognosis is still debatable. Huvos hinted that cystic chondroblastoma often gave recurrence more frequently after curettage than the noncystic type.¹⁴ However, Dahlin did not see any difference in term of prognosis.²⁰ Our case was consistent with that observed by Dahlin and no recurrence was found during 7 years of follow-up.

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