

CONSERVATIVE SURGERY FOR CHONDROSARCOMA OF THE FIRST METACARPAL BONE

R. J. WIRBEL, K. REMBERGER*

A rare case of a chondrosarcoma of the first metacarpal bone is presented. The lesion was radiographically interpreted initially as an enchondroma and treated conventionally by curettage and cancellous autologous bone grafting. After final histology, a low-grade chondrosarcoma was reported. A resection of the entire first metacarpal bone was performed, followed by reconstruction using an autologous corticocancellous bone graft and plate fixation, creating arthrodeses of the adjacent joints.

Although isolated enchondromas are considered to have no malignant potential, histological examination is essential to rule out malignancy. A preoperative biopsy should be recommended in lesions suspected to be chondromas.

Chondrosarcomas are rarely located in bones of the hand, where they are usually treated by amputation. With the case presented we wish to advocate that cases of low-grade, intraosseous chondrosarcoma (stage IA) can be treated by conservative surgery, especially when it is located in the thumb.

Keywords: chondrosarcoma; hand; conservative surgery.

Mots-clés: chondrosarcome; main; chirurgie conservative.

INTRODUCTION

Cartilaginous tumors involving bones of the hands are not uncommon (1-4). They are usually benign tumors, such as enchondromas or chondroblastomas. Chondrosarcomas are very rarely located in bones of the hand (1-4). Because limited surgical procedures like curettage tend to lead to a high rate of recurrences, radical excision is recommended, even in low-grade chondrosarco-

mas of the hand (1). Amputation of the affected finger or metacarpal ray is the procedure usually performed (1, 2, 4).

Very few cases of conservative surgical procedures with preservation of function have been reported (3). We report an additional case of a low-grade chondrosarcoma of the first metacarpal ray successfully treated with conservative surgical management.

CASE REPORT

A 29-year-old male body builder presented to our hospital in February, 1997 with pain in his right thumb after being struck one week earlier.

The initial x ray (fig. 1) revealed an intraosseous lytic lesion with a pathologic dorsoradial fissure of the first metacarpal bone, which was interpreted as an enchondroma.

One week later the patient was operated on with curettage of the lesion, filling of the defect with autologous cancellous bone graft and stabilization with an AO-miniplate.

Histopathological examination revealed myxoid tissue and hyaline cartilage in the medullary cavity with little lamellar bone encasement, a fibrosing band, and invasion of the marrow fat. The chondrocytes showed atypical and hyperchromatic nu-

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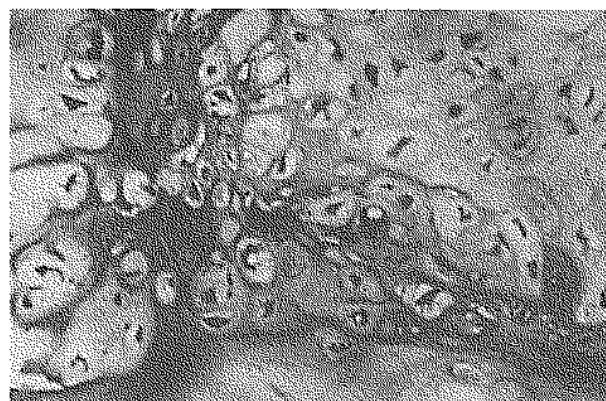


Fig. 1. --- Initial x ray of the right thumb (AP and lateral view). The large intraosseous lytic lesion in the shaft of the first metacarpal bone with a dorsoradial fissure was diagnosed as an enchondroma.

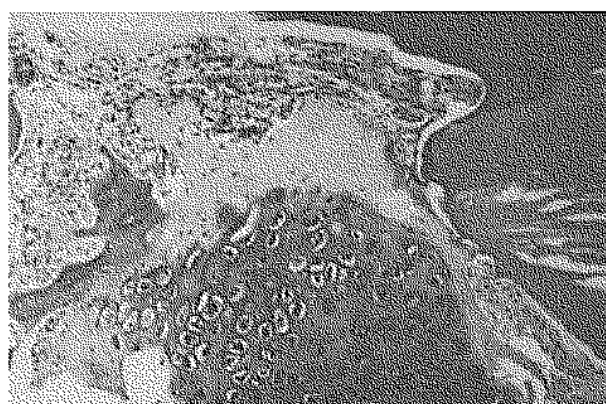
clei and numerous double-nucleated cells. These findings were compatible with a low-grade (grade 1) chondrosarcoma (fig. 2).

Because of the low-grade malignancy and the intracompartmental extension of the tumor which corresponded to stage IA of Enneking's classification of the Musculoskeletal Tumor Society (MSTS), and because the lesion affected the thumb, we decided to perform a second conservative surgical procedure.

Thus, 10 days after the first surgical procedure the entire first metacarpal bone was resected completely including the previous scar. The reconstruction was performed with carpometacarpal and metacarpophalangeal arthrodeses using a corticocancellous bone graft from the right iliac crest and fixation with an AO radial buttress plate (fig. 3). Histologic study showed local incipient



a



b

Fig. 2. — Histopathological result :

a : irregular hyaline chondroid tissue with nuclear atypia and double nuclei in the biopsy specimen, compatible with low-grade chondrosarcoma (PAS, Alcian, x 360) ;

b : local aggressive atypical hyaline chondroid tissue with incipient invasion of the cortex in the resected specimen (HE, x 180).

invasion of the cortex by remnants of the atypical chondroid tumor, consistent with a lowgrade chondrosarcoma (fig. 2).

Twenty-two months postoperatively neither distant metastasis nor local recurrence had occurred. The patient reports satisfactory function of his right hand. Opposition of the right thumb with all of the long fingers and grasp of the hand as well as writing with his right hand are intact.

DISCUSSION

Osseous chondrosarcoma is a common tumor which presents between the fourth and sixth decade of life. It can be found in any part of the

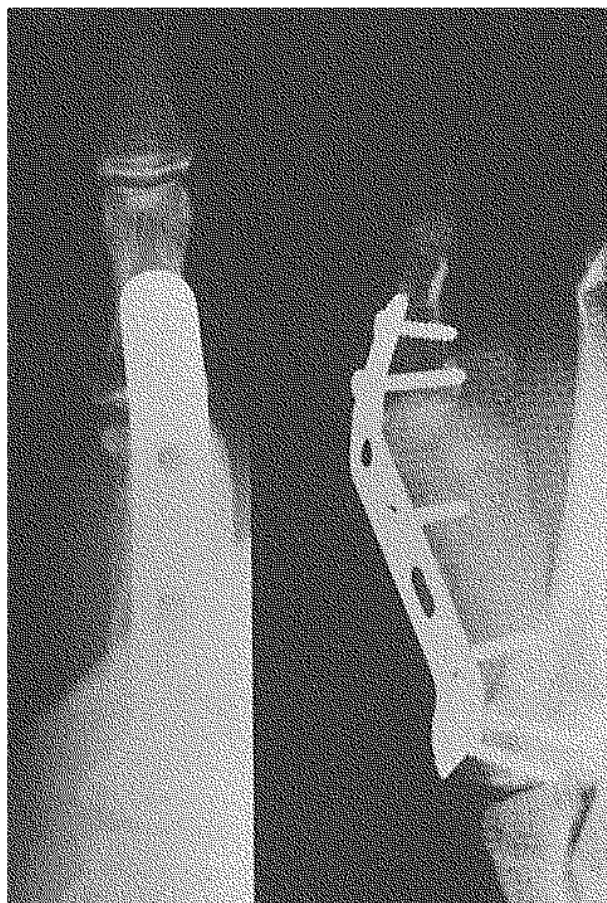


Fig. 3. — Resection of the first metacarpal bone and reconstruction with a corticocancellous bone graft and fixation to the adjacent bones using an AO radial buttress plate. X ray of the right thumb (AP and lateral view).

skeletal system, particularly in the proximal parts of the long bones. It has been found less frequently in smaller bones. The hand is affected in less than 0.5% of all chondrosarcomas (1-4). Phalangeal bones are affected in about 60% of these cases, the metacarpal bones in about 40% (1-3).

Chondrosarcoma may occur primarily or secondarily to preexisting osseous lesions (4, 5). It can develop from multiple enchondromas (Ollier's disease), hereditary multiple exostosis, chondromyxoid fibromas, osseous infarction, osseous cysts, fibrous dysplasia, Paget's disease and very rarely in osteopoikilosis and solitary enchondroma (1, 4, 5).

The malignant potential of multiple enchondromatosis (Ollier's disease) is well known with a

reported risk factor between 22 and 50% (5). However, very few cases of chondrosarcoma arising from a solitary enchondroma have been reported (4).

Primary chondrosarcoma can usually be recognized by its typical appearance on a plain radiograph. The lesion usually arises in the metaphysis, although it can present in the diaphysis of a long bone. There is a typical combination of bone destruction, commonly with small intralesional calcifications, and a periosteal reaction. The cortex is rarely completely destroyed but is irregularly thinned with a circumferential periosteal reaction (2).

In secondary chondrosarcomas these radiographic findings are not as characteristic. In the present case, we interpreted the radiographic findings (fig. 1) as typical of an enchondroma, due to the typical central osteolytic lesion and its localization. Only biopsy and histological examination can confirm the exact diagnosis and should therefore be recommended in any lesion which resembles a chondroma.

This reported case was considered a secondary chondrosarcoma arising from a solitary enchondroma, although differentiation between primary and secondary types may be difficult from radiographic findings and even from histologic findings.

Secondary chondrosarcomas are usually of a lower malignant grade histologically with low metastatic potential (5). Surgical treatment can be curative in 65% to 85% of low-grade lesions. Although conservative surgery by curettage and instillation of phenol is an accepted treatment for low-grade chondrosarcoma, such limited surgical procedures tend to lead to a high rate of recurrences in chondrosarcomas of the hand (1).

Therefore, radical or at least wide resection is required to avoid local recurrence. In chondrosarcomas located in the bones of the hand, amputation of the affected finger or metacarpal ray is the usual radical treatment (1, 2, 4).

Conservative surgery and preservation of function are reported in very few cases (3).

Although long-term follow-up findings are not available (22 months follow-up in our case), this concept should be pursued in our opinion if the following conditions are fulfilled :

a. the tumor must be intracompartmental, i.e. intraosseous, without soft tissue infiltration ; b. the tumor must be of low-grade malignancy (grade I), corresponding to stage IA of Enneking's classification.

Furthermore, as demonstrated in our case, conservative surgery should be considered particularly in those cases where the thumb, the most important finger for the integrated functions of the hand, is involved.

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SAMENVATTING

R. J. WIRBEL, K. REMBERGER. Conservatieve chirurgie voor chondrosarcoma van de eerste metacarpaal.

De auteurs melden een zeldzaam geval van chondrosaroom van de eerste metacarpaal. Eerst werd het letsel als een enchondroom geïnterpreteerd en klassiek behandeld met curettage en autologe beengreffes. Het histologisch onderzoek heeft aangetoond dat het waarschijnlijk ging om een chondrosaroom met zwakke

maligniteit. Een tweede behandeling bestond uit resectie van de eerste metacarpaal gevolgd door reconstructie met een corticospongieuze autogrefte, gefixeerd met plaat en met een artrodese onder en boven de ent.

Chondrosarcomen aan de hand zijn zeer zeldzaam en werden meestal behandeld door amputatie. Aan de hand van dit geval kunnen we toch een conservatieve behandeling bij lage maligniteitsgraad van intra-osseuze chondrosarcomen voorstellen.

RÉSUMÉ

R. J. WIRBEL, K. REMBERGER. Traitement chirurgical conservateur d'un chondrosarcome du premier métacarpien.

Les auteurs rapportent le cas, rare, d'un chondrosarcome du premier métacarpien. La lésion a été interprétée au départ comme un enchondrome et a été traitée de façon classique par curetage et comblement par greffe autologue. L'examen histologique a montré qu'il s'agissait d'un chondrosarcome de faible malignité. Un second traitement chirurgical a été réalisé, avec résection complète du premier métacarpien, suivie de reconstruction au moyen d'une greffe cortico-spongieuse autologue, avec fixation par plaque, réalisant l'arthrodèse des articulations adjacentes.

Bien que les enchondromes isolés soient considérés comme dépourvus de potentiel malin, un examen histologique est indispensable pour écarter le diagnostic de tumeur maligne. Une biopsie préopératoire devrait être recommandée dans les lésions de type chondromateux.

Les chondrosarcomes se rencontrent rarement dans les os de la main ; ils y sont habituellement traités par amputation. A la lueur du cas présenté, nous suggérons que certains cas de chondrosarcome intra-osseux de faible malignité (grade IA) peuvent être traités par chirurgie conservatrice, en particulier s'ils sont localisés au niveau du pouce.