CIRCUMSCRIBED MYOSITIS OSSIFICANS REPORT OF NINE CASES WITHOUT HISTORY OF INJURY

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The clinical features of 9 patients with circumscribed myositis ossificans (CMO) are described and the effects of treatment with surgical removal of ectopic bone are assessed. The average age of these patients was 24.4 years, and the average follow-up period was 7.4 years. Early correct diagnosis remains unusual, mainly because myositis may be mistaken for bruising, sarcoma or mumps. Once histological diagnosis was established by biopsy, surgical resection of the mass was performed in all patients ; no evidence of recurrence was found in this series. Although spontaneous regression of the clinical findings has been reported, we consider surgery to be necessary in CMO in order to establish the diagnosis ; furthermore, when the clinical and radiological diagnosis is uncertain or when the lesion causes pain or mechanical blocking of a joint, the removal of the mass is mandatory.

Keywords : myositis ossificans ; injury.
Mots-clés : myosite ossifiante ; traumatisme.

INTRODUCTION

Nonneoplastic heterotopic bone formation may result from a single major episode of trauma or repetitive minor trauma. There is also a certain number of patients with this lesion from whom no history of trauma can be elicited. The purpose of this article is to present nine cases unassociated with any known direct trauma. The correct radiographic diagnosis is especially significant since these patients present clinically with a tender soft tissue mass, and biopsies may be mistakenly interpreted as a malignant lesion (1, 2, 3, 4). Nine cases of "pseudomalignant osseous tumour of soft tissue" are presented here, with emphasis on the x ray signs which differentiate this lesion from a soft tissue or parosteal sarcoma.

MATERIALS AND METHODS

Nine cases diagnosed by the authors as circumscribed myositis ossificans (CMO) were reviewed. They spanned more than 14 years, from January 1975 to December 1988. In all cases available clinical information was obtained from the authors at the time of consultation. Relevant plain radiographs and xeroradiographs were studied in all patients ; computerized tomograms (CT) were performed in the last 5 cases. Follow-up films were obtained ; all available microscopic slides stained with hematoxylin and eosin were reviewed.

The average age of these patients was 24.4 years (range, 8 to 82), and the average follow-up period was 7.4 years (range, 3 to 14). There were 4 cases found in the upper extremity of which 3 were in the hands (fig. 1). The lower extremity was the site of 3 lesions (fig. 2). Particularly unusual sites included the thoracic wall (fig. 3) and the posterior neck muscles (5).

The radiographic features of this condition are helpful in assessing the maturity of the process. In traumatic cases, in the absence of repeated trauma, myositis is usually visible radiographically within 3 to 4 weeks after the initial injury. By 6 to 8 weeks, a lacey pattern of new bone is sharply circumscribed by cortex around the periphery, similar to the phenomena observed histologically. By 4 to 6 months the lesion usually has ceased to expand in size, and the bone appears lamellar. However, complete maturation of the nucleus may not occur for another 6 to 12 months when this resorption of the bony mass usually begins. This previously described pattern allows us to differentiate CMO from a soft tissue or parosteal sarcoma.

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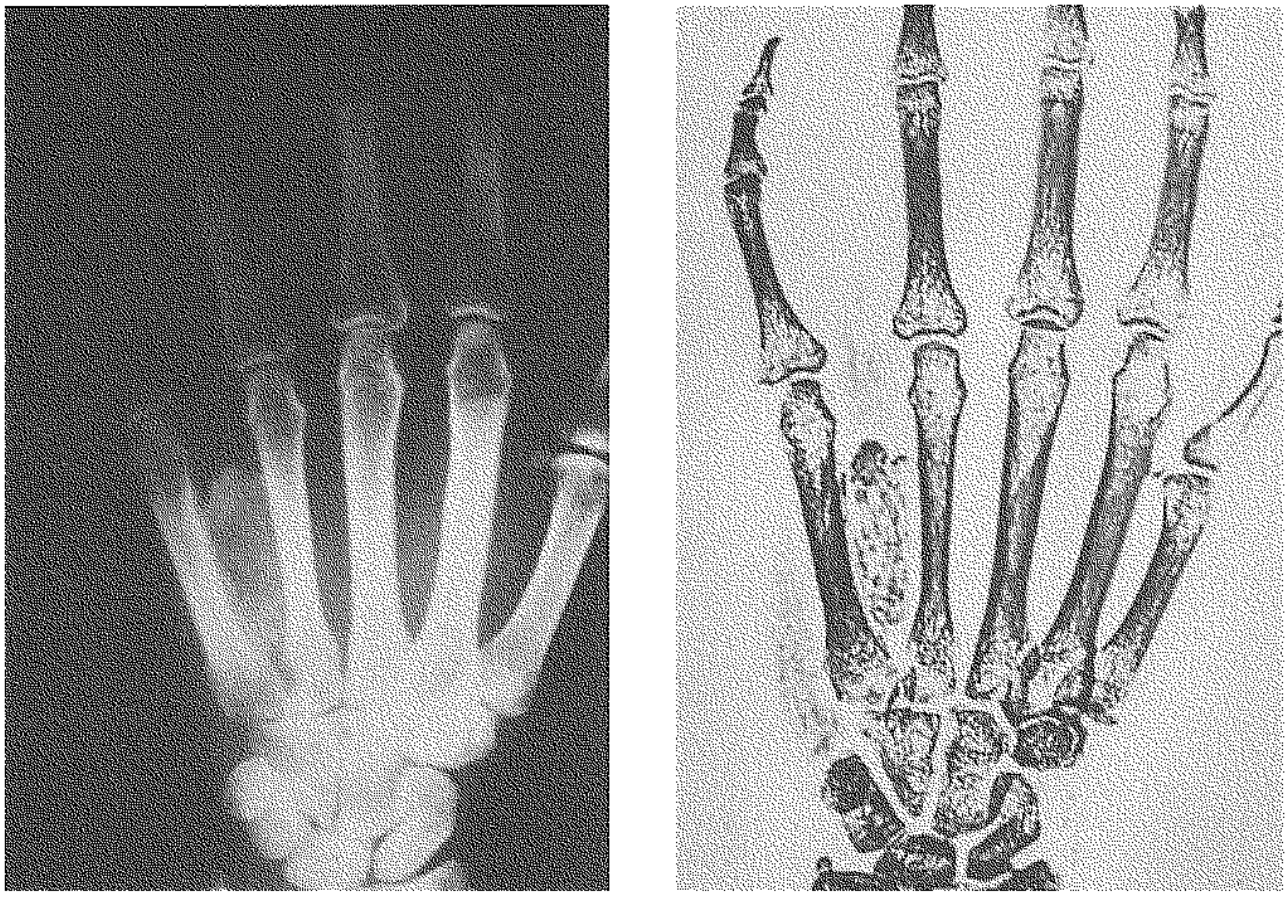

Fig. 1a *Fig. 1b*

Fig. 1. — Radiographic study of patient I : a) Anteroposterior radiograph at the onset of symptoms showing periosteal new bone formation ; b) Xeroradiograph of the hand showing a calcified mass at the onset of symptoms.

RESULTS

There was no sex predilection in the 9 patients studied, as opposed to the general male predominance reported in the literature. A history of trauma was specifically absent in all cases. The most common radiographic differential diagnostic alternative in this survey was a surface osteosarcoma or a soft tissue sarcoma. The lesions were recognized radiologically as CMO ; nevertheless, the authors still felt that the possibility of an extraskeletal osteosarcoma warranted resection of the mass.

Histology revealed the classic reactive bone formation and zonal organization of myositis ossificans, the "zone phenomenon" described by Ackerman (1). It consists of a tumoral structuring in three areas that reflects different degrees of cellular maturation : the central zone is composed of undifferentiated mesenchyme with high-grade mitotic activity ; the intermediate zone in which there is a variable amount of osteoid intermingled with fibroblasts and osteoblasts ; and the peripheral zone, in which the osteoid undergoes calcification and evolves into mature lamellar bone (5). No evidence of recurrence was encountered in this series after removal of bone from the affected areas. Table I summarizes the main data and results of the 9 patients.

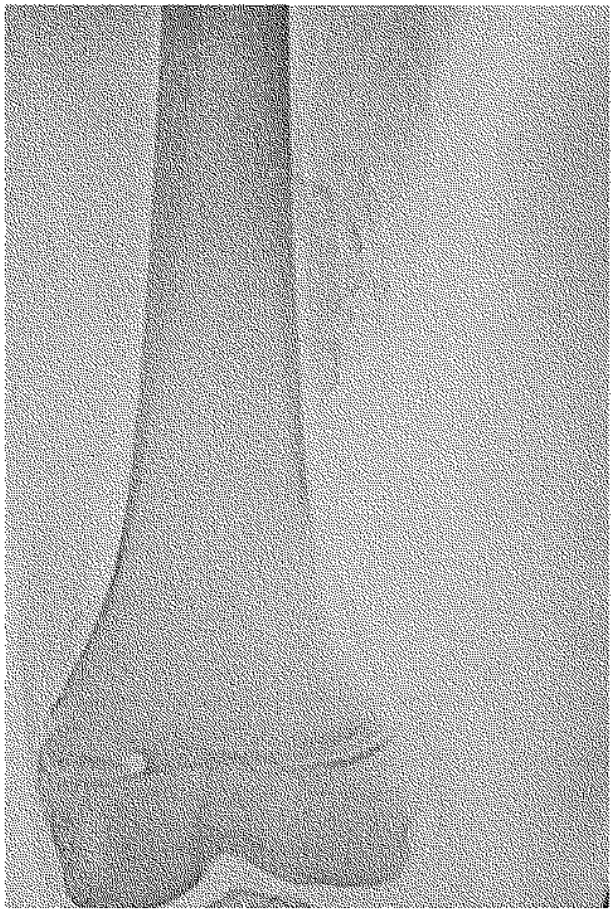

Fig. 2. — Anteroposterior xeroradiograph of the thigh showing early calcification two weeks after the onset of symptoms (Patient 7).

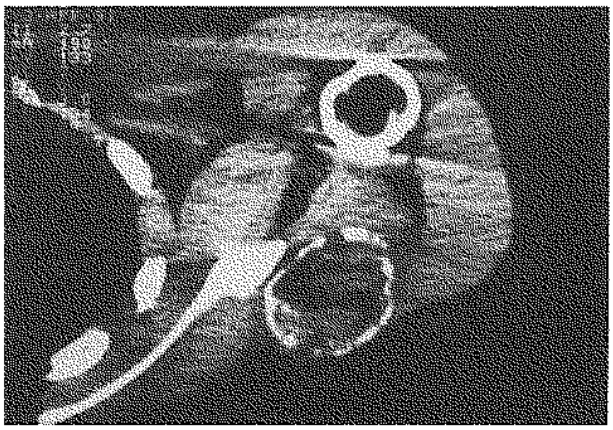

Fig. 3. — A CT scan of the thorax showing extensive extraskeletal ossification (Patient 4).

DISCUSSION

Circumscribed myositis ossificans (CMO) is a rare entity ; the terminology is misleading, since it is wellknown that the lesion is not inflammatory in nature (except for a brief period in the initial phases), and origin in a muscle is not a prerequisite. Although 80% of CMO arises in the large muscles, isolated lesions in unusual locations have been described in some series. Included in our review cases were lesions beside the scapula, chest area and posterior neck. The etiologic stimulus for CMO is not known. After considering a neoplastic process and origin from periosteum, we think that initial trauma to the area with a fibroblastic reaction and subsequent osseous and cartilaginous metaplasia plays a role to a certain degree.

The rarity of so-called malignant transformation of CMO, plus the tenuous verification under close scrutiny in some cases, emphasizes its isolated occurrence, if it exists at all. Therefore, the benign nature of this nonneoplastic process requiring a conservative approach cannot be overly stressed. In those clinical, radiologic and/or histologic presentations in which the diagnosis of CMO may be entertained but is questionable, a reasonable period of observation is mandatory. Furthermore, if the mass does not manifest zoning maturation and shrinkage as would be anticipated for CMO, other diagnoses should then be considered.

Because of the spontaneous regression of clinical findings and the self-limiting characteristics, some experts consider surgery to be unnecessary in CMO (6, 7, 8). However, when the clinical and radiological diagnosis is uncertain or when the lesion causes pain or mechanical block of a joint, the removal of the mass is usually undertaken.

It is important to emphasize that CT scan can be very useful and will lead to diagnosis if ossification along the edge of the mass can be detected as faint peripheral densities and confirmed later as bone formation progresses. Furthermore, if two successive CT scans and radiographs confirmed such peripheral ossification, surgery appears to be less imperative. However, the possibility of a soft tissue osteosarcoma must be kept in mind until a CMO is fully confirmed.

Table I. — Clinical details of the nine patients

C	S	Age and mode of onset of myositis	Type of operation	Histology	Effect of operation	Follow-up
1	M	34 years Swelling on right hand	Removal of bone from right hand	ZP	NEOR	14 years
2	F	25 years Swelling on right hand	Removal of bone from right hand	ZP	NEOR	11 years
3	F	82 years Lump on left hand	Removal of bone from left hand	ZP	NEOR	9 years
4	F	14 years Lump on thorax	Removal of ectopic bone over thoracic wall	ZP	NEOR	8 years
5	M	8 years Swelling on back of leg	Removal of bone around right leg	ZP	NEOR	7 years
6	F	15 years Lump on hip	Removal of bone from right hip	ZP	NEOR	6 years
7	M	15 years Swelling on back of thigh	Removal of bone around right thigh	ZP	NEOR	5 years
8	M	17 years Lump on back of scapula	Removal of bone over right scapula	ZP	NEOR	4 years
9*	F	10 years Swelling on back of neck	Removal of bone over the cervical area	ZP	NEOR	3 years

C = Case ; S = Sex (M, male ; F, female) ; Histology : ZP = zone phenomenon ; Effect of operation : NEOR = No evidence of recurrence ; 9* : this case has been previously published (reference number 5).

In summary, we emphasize that CT scanning can be of great value in establishing the diagnosis of CMO ; we consider surgery to be necessary in this condition in order to reach such a diagnosis.

Acknowledgements

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SAMENVATTING

E. C. R. MERCHAN, S. SANCHEZ-HERRERA, D. A. VALDAZO, J. M. GONZALEZ. Myositis ossificans circumscripta. Beschrijving van 9 gevallen, zonder voorafgaandelijk trauma.

De auteurs beschrijven 9 gevallen van niet neoplastische heterotopische ossificaties, waarbij er geen rechtstreeks trauma in de anamnese vermeld wordt.

RÉSUMÉ

E. C. R. MERCHAN, S. SANCHEZ-HERRERA, D. A. VALDAZO, J. M. GONZALEZ. Myosite ossifiante circonscrite. Présentation de 9 cas sans antécédent traumatique.

Les auteurs présentent 9 cas d'ossification hétérotopique non néoplasique dans l'anamnèse desquels on ne trouve aucun traumatisme direct.