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CASE STUDY

Myositis ossificans of the chest wall

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Myositis ossificans of the chest wall. J-F. Nisolle, L. Delaunois, J.P. Trigaux. ©ERS Journals Ltd 1996.

ABSTRACT: We report the unusual case of a young man with progressive pain in the thoracic wall. The radionuclide bone scan revealed an increased uptake, and the bone roentgenogram, a calcified soft-tissue mass. Based on computed tomography findings, biopsy was avoided, and evolution was favourable for myositis ossificans.

Although rare, myositis ossificans is one of the potential causes of thoracic pain, not to be mistaken for a malignant or infectious lesion.

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Myositis ossificans is a benign heterotopic ossification of a soft tissue mass. Without history of trauma, it may be misdiagnosed as a tumour or infection [1–3]. Indeed, a malignancy can be erroneously suspected radiographically, and even histologically if a biopsy is obtained at an early stage or only from the centre of the lesion [1–9].

Myositis ossificans of the chest wall is extremely rare; less than 10 cases have been described in the literature [3, 9]. We present the case of a young adult male admitted to the Department of Pneumology with progressive chest pain, who was found to have myositis ossificans.

Case report

A 26 year old man presented with progressive pain and tenderness in the right thoracic wall after a football game. He did not remember any trauma, and initial radiographs were normal. One week later, as the pain persisted, a radionuclide bone scan was performed and revealed an increased uptake in the area of the 5th and 6th right ribs. Usual laboratory findings were normal; parathormone level was not available. Plain radiographs performed 1 month later showed a calcified soft tissue mass located in the 5th intercostal space, with periosteal new bone formation of the 5th and 6th right ribs (fig. 1a). Calcifications, as demonstrated by computed tomography (CT) performed the same day, were obviously peripheral (fig. 1b).

The patient was referred to the Department of Pneumology of our institution for diagnosis and biopsy. Differential diagnosis was discussed between infection (because of a previous history of pulmonary tuberculosis), tumour and myositis ossificans. Due to the peripheral location of the calcifications, the diagnosis of myositis ossificans was proposed, and biopsy was delayed. On CT, performed 2, 5 and 7 months after the onset of the symptoms, the evolution was favourable for myositis ossificans,

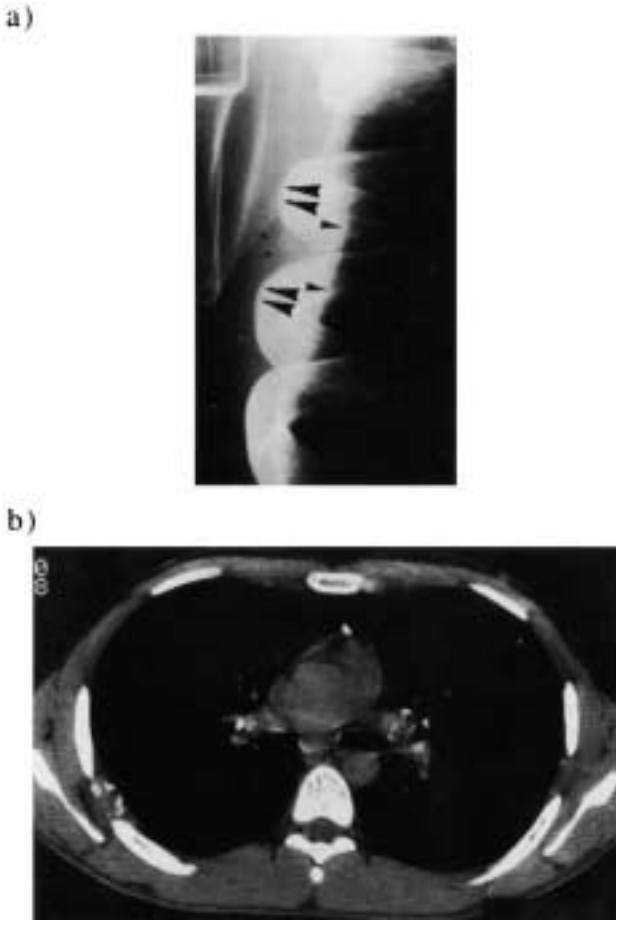

Fig. 1. – a) Plain radiographs performed 6 weeks after the onset of the symptoms. Central calcifications (arrows) appear to arise in the centre of a tissue mass (medium arrowheads) located in the fifth intercostal space. Periosteal new bone formation of the 5th and 6th right ribs is associated (large arrowheads). b) Computed tomography, without intravenous contrast, performed on the same day as the radiograph demonstrates the peripheral (and not central) topography of the small foci of ossification; thus, suggesting the diagnosis of myositis ossificans.

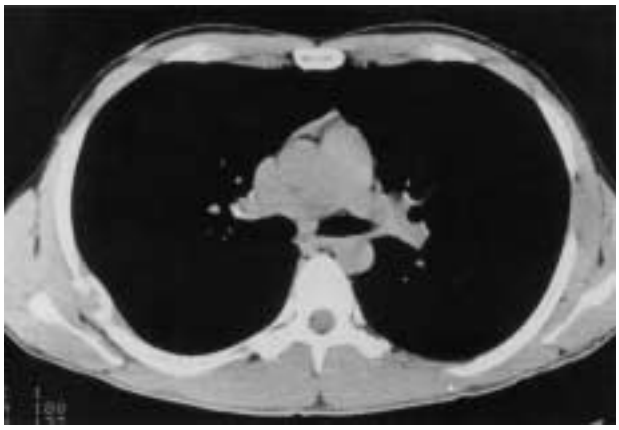

Fig. 2. – Computed tomography, without intravenous contrast, performed 5 months after the onset of the symptoms shows an organized lamellar peripheral shell of mature bone around a more lucent area.

with progressive diminution of the size of the lesion and with organized lamellar peripheral shell of mature calcified bone (fig. 2).

Discussion

Myositis ossificans can be considered as a callus of soft tissues. But, if callus is a normal response to a bone fracture, myositis ossificans is a rare aberrant response to soft tissue trauma. Osteoblasts may originate from pluripotent cells already present in the connective tissue or from damaged periosteum, since association or adherence to the periosteum can be noted in approximately one half of the lesions [1–3].

Only 40–60% of patients give such a history of a recent, acute trauma. The appearance of a soft tissue mass without a clear history of trauma can suggest a diagnosis of sarcoma, especially since a biopsy of the central portion of an area of myositis ossificans can yield immature, undifferentiated tissue resembling a sarcoma [1–9].

Pathological criteria that are helpful in the differentiation of myositis ossificans from sarcoma are a zone phenomenon, the lack of invasion of adjacent tissues, and the inclusion of viable muscle fibres. Histologically, the characteristic zone-phenomenon consists of three distinct zones: a central undifferentiated zone that merges into areas with osteoid formation and well-formed mature bone at the periphery [1–3].

Osteogenesis begins in the periphery of the mass from 11 days to 6 weeks after the onset of the symptoms [1–3]. Therefore, in the early phase before obvious ossification, plain radiographs and other diagnostic techniques, such as ultrasonography [4], CT [5, 6] and magnetic resonance imaging [7–9], are not specific. When calcifications appear, their peripheral topography can be difficult to assess on plain radiographs. In these circum-stances, CT is necessary for diagnosis with recognition of a peripheral rim of ossification [5, 6]. Echography may aid in the evaluation of this condition [4], but some areas, as in this case, are not accessible.

In chronic stages, radiological findings (roentgenogram and CT) reflect the histological zoning of myositis ossificans, with recognition of a peripheral rim of calcification and ossification surrounding a more lucent area. This pattern is also recognized by magnetic resonance, with a border of low signal intensity and a central area containing fat or occasionally revealing regions of high signal intensity on T2-weighted images [7–9].

On reviewing 208 reported cases of traumatic and "non-traumatic" myositis ossificans, the ages of the patients ranged 4–95 yrs with an average age of 32 yrs [1, 2]. Eighty percent of cases arise in the large muscles of the extremities (thigh and upper arm) [1–3]. Location in the chest area is unusual; it has been described in the intercostal spaces, near the sternum, in the pectoralis major, beside the scapula and in the erector spinae muscle [1, 3, 9]. In our case, no biopsy was performed but the mass was followed by serial radiographs and computed tomographs. Treatment was conservative.

In conclusion, myositis ossificans deserves notice in the differential diagnosis of sudden intercostal pain and of a calcified soft tissue mass of the chest wall. Biopsy is not always necessary if a radiologically typical pattern of ossification is present [2]. If not, a short-term follow-up of the lesion can be helpful as osteogenesis begins 11 days to 6 weeks after the onset of the symptoms.

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