

First sternocostal degenerative arthritis with intrarticular fluid collection.



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A case report

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First sternocostal degenerative arthritis with intraarticular fluid collection. A case report

A rare case with clinical condition of first sternocostal degenerative arthritis with intra-articular fluid collection that developed after long-lasting intense exercise (weight-lifting) for twenty years is reported. Imaging findings and differential diagnoses of the case are presented.

KEY WORDS: Degenerative arthritis, First sternocostal joint, Weight lifting.

Introduction

First sternocostal degenerative arthritis can be a result of the transformation of this particular structure in a movable articulation joint because of abnormal usage, or can be the result of distant trauma. We report a case of first sternocostal degenerative arthritis with intra-articular fluid collection that developed after as long-term weight-lifting exercise.

Case Report

A 43-year-old man was admitted to our Hospital on April 2003 with pain at the left upper area of the chest wall for one month. There was no history of surgery, trauma, drug ingestion, pulmonary or mediastinal infection. The patient did not have cough or any other pathological chest symptoms. He reported also that that he had stopped long-lasting intense exercise (weight-lifting) one year ago. Physical examination revealed swelling and tenderness over the left first sternocostal joint. The patient had full range of shoulder and cervical spine movements. No other sites of joint or bone involvement were present. No previous treatment was recommended.

Laboratory tests including WBC, CRP, ESR alkaline phosphatase, were negative for pathological findings. A chest x-ray scan was then requested. The x-ray revealed only several discoid lines above the right hemi diaphragm (Fig. 1). Computed Tomography scan was then performed, before and after intravenous administration of iodinated contrast medium, that demonstrated a not well demarcated mildly inhomogeneous soft tissue mass with extension into the left anterior chest wall and displacement of the left pectoralis major muscle anteriorly. Inside the lesion calcifications were visible. After intravenous admi-



Fig. 1 (P-A chest x-ray): Slight right rotation. Several discoid lines are seen above the right hemi diaphragm.

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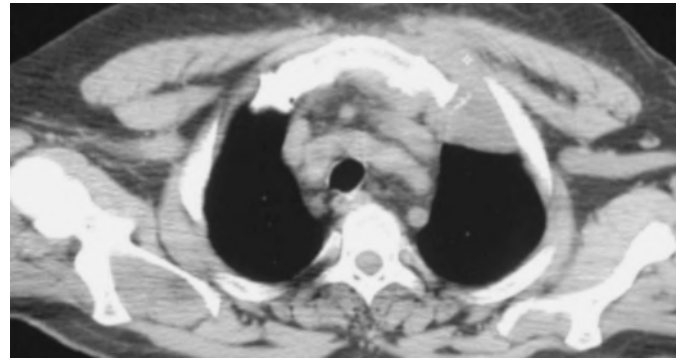
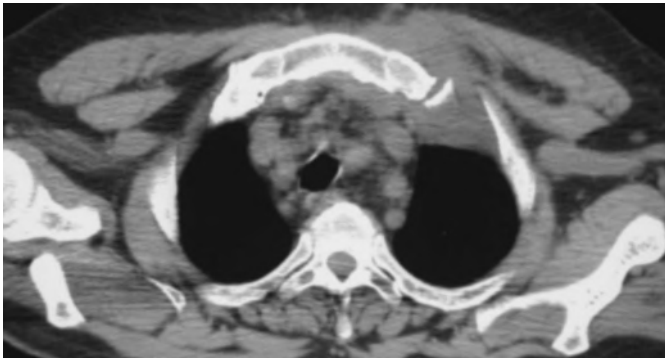


Fig. 2a, 2b (axial CT scan, at the level of the lung apex): A not well demarcated mildly inhomogeneous soft tissue mass with extension into the left anterior chest wall and displacement of the left pectoralis major muscle anteriorly, is present. Inside the lesion calcifications are visible. After intravenous administration of iodinated contrast medium the lesion enhances homogeneously. Note that sternum is thickened.

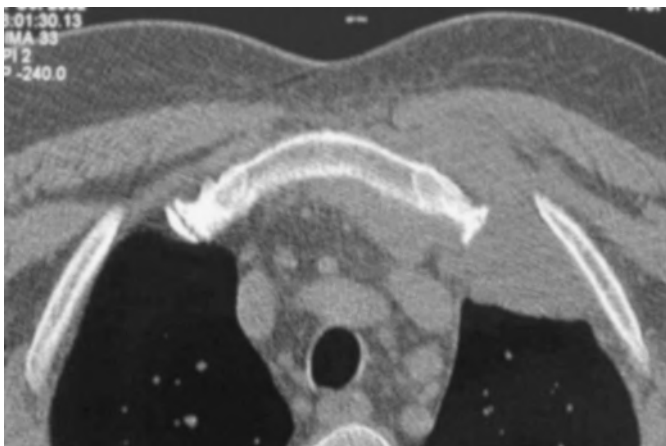


Fig. 3 (CT scan bone window): Dilation of the first sternocostal junction due the presence of a soft mass with intrathoracic extension, and a slight destruction of the left sternal edge is observed.

nistration of iodinated contrast medium the lesion was enhanced homogeneously. Sternum was thickened, with a slight destruction of the left sternal edge. A dilation of the first sternocostal junction was also present (Fig. 2a and b, 3). Magnetic Resonance Imaging demonstrated an abnormal and heterogeneous lesion that was located at the left first sternocostal joint (high signal intensity in T2 weighted images) with radical extension of the high signal into the left pectoralis major muscle probably due to the presence of fluid collection and surrounding edema (Fig. 4a, b). After intravenous administration of Gadolinium (in T1 weighted images) there was marked enhancement of the lesion located at the left first sternocostal joint (Fig. 5a, b).

In order to make a definitive diagnosis, an ultrasound-guided Fine Needle Aspiration was then performed. All the fluid was aspirated (Fig. 6). The culture for organi-

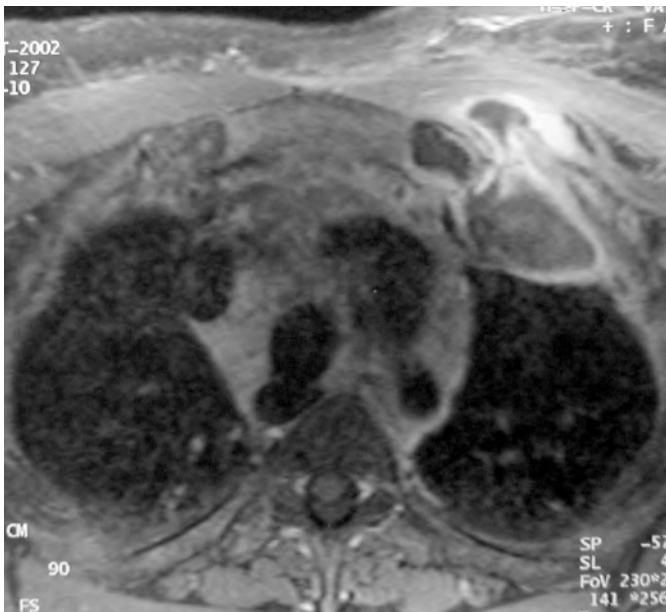


Fig. 4a (MR Coronal T2 weighted image): A high signal intensity heterogeneous lesion is located at the left first sternocostal joint with radical extension of the high signal into the left pectoralis major muscle probably due to the presence of fluid collection and surrounding edema.

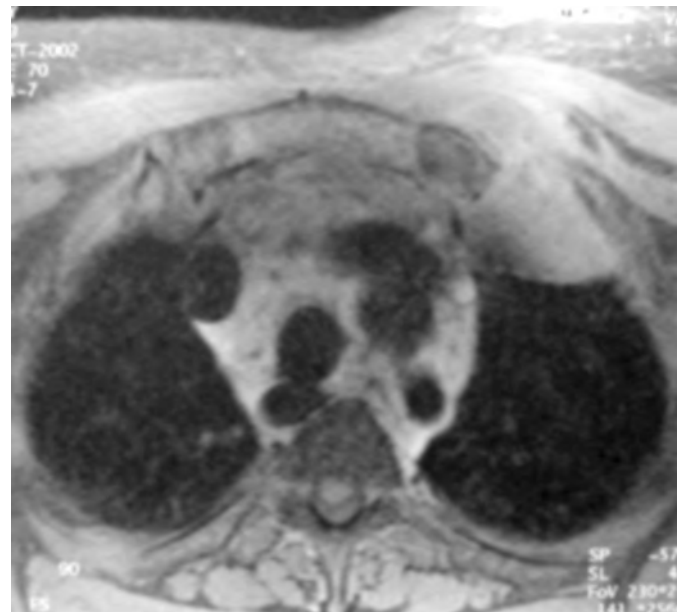


Fig. 4b (MR Coronal T2 weighted image with fat suppression technique-at the same level as previous image): The margins of the lesion and the presence of fluid collection with the surrounding edema are better observed.



Fig. 5a, 5b (MR Axial T1 weighted images before and after intravenous administration of Gadolinium): There is marked enhancement of the lesion, located at the left first sternocostal joint, accompanied with fluid collection and surrounding edema.

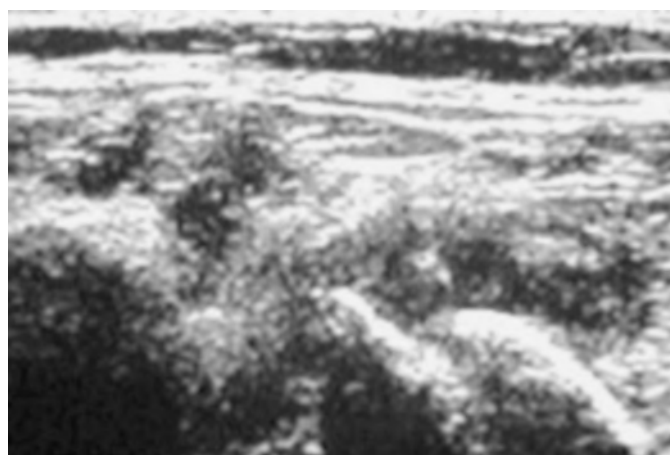


Fig 6 (US-guided FNA-biopsy): The needle crosses the acoustic beam and only portion of it is seen, because it is inserted in a quite steeply approach parallel to the short axis of the probe.

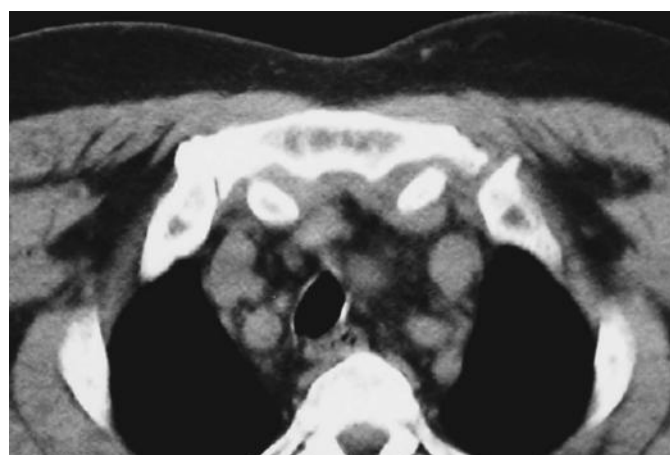


Fig. 7 (axial CT scan, twelve months later): Slight dilation of the first sternocostal junction due the presence of a very small soft mass.

sms was negative. A diagnosis of degenerative arthritis with intra-articular fluid collection was definitively made. The patient was treated conservatively with rest and NSAIDs. One month after treatment he had relief of the pain. Fourteen months later CT scan revealed a slight dilation of the first sternocostal junction due the presence of a very small soft mass (Fig. 7).

Discussion

First sternocostal degenerative arthritis is a very uncommon clinical condition and can be a result of the transformation of this particular structure in a movable articulation joint because of abnormal usage, such as long-term exercise (weight-lifting in our case), or can be a result of distant trauma.

Clinical features of sternocostal degenerative arthritis

include joint pain and stiffness, swelling, creptius, low-grade synovitis, and loss of mobility. Symptomatic patients are usually best managed nonoperatively with conservative measures.

Sternocostal joints and the chest wall are very difficult to be examined by physical examination ¹.

X-ray findings are also difficult to be valued because of the complex skeletal anatomy. Osteoarthritis is typically characterized by narrowing of the joint space and subchondral sclerosis with small subchondral cysts on both sides of the joint, as well as osteophytes. Secondary intrarticular fluid collection and ossification within the joint space may be present ².

CT and MR imaging are the advised imaging modalities to discover diseases of the chest wall that may include major pectoralis muscle, sternum, sternocostal and sternocostoclavicular joints. Intravenous contrast administration can help to identify possible hypervascularity of

mass lesions and enables to distinguish the adjacent vasculature. Both CT and MR can show the exact dimension of the disease possible infiltration of fat planes and the participation of the adjacent bones and joints. MR is more appropriate to demonstrate associated extra osseous soft tissue characteristics and CT to locate possible bone destruction or periosteal reaction and the presence of calcification or ossification.

CT can also rule out the presence of mimicking mass occupying lesion, or subtle marrow changes seen in lymphoid malignancies. In cases of bone and joint infection MR imaging demonstrates joint effusion, joint capsule distension, marrow edema and erosions³.

Nuclear medicine imaging can be very helpful, especially after surgery or trauma.

In those patients from whom pain is not a significant problem but the diagnosis is still unclear, a CT or US FNA-biopsy, can be considered first^{1,2,4}.

In our case radiological differential diagnosis must include septic arthritis, tuberculosis, bronchogenic carcinoma, SAPHO syndrome and sternocostal degenerative arthritis (with intra-articular fluid collection).

Symptomatic arthritic involvement of any joint can be a result of distant trauma, prior joint overuse, infection, hyperostosis, post-menopausal arthritis, metabolic disorders, endocrinopathies or secondary to an underlying arthropathy. Situations like surgery, trauma, pulmonary, pleural or mediastinal infections are very possible to lead to inflammation, cellulitis or abscesses of the chest wall. Risk is increasing with age, diabetes or in immunocompromised patients. Osteomyelitis is the most common cause for chest wall infections, as a result of extra osseous extension especially after surgical medial sternotomy¹.

Staphylococcus aureus, non-group A, beta-hemolytic streptococci and Streptococcus pneumoniae are the most commonly involved gram-positive aerobic organisms³. Gram-negative bacteria and anaerobes are increasingly frequent causes as a result of parenteral drug use and the rising number of immunocompromised hosts. Anaerobic infections are also more common in patients who have wounds of an extremity or gastrointestinal cancers⁶. Tuberculosis is possible to spread from thoracic skeleton on pleural space and should be considered in the differential diagnosis, especially in immunocompromised hosts and in patients whose joints have been injected frequently with corticosteroids⁷. Klebsiella, nocardia, blastomycosis, candida and herpes simplex virus may also infect the chest and junctions in this area¹.

Arthritis of the manubriosternal joint and upper sternocostal joints as part of ankylosing spondylitis, reactive arthritis, and arthritis associated with psoriasis and/or pustulosis palmoplantaris is very common in this group of patients².

Sternum may involved directly by primary tumors such as bronchogenic carcinoma, breast carcinoma or metastases from prostate, thyroid, breast, lung or renal carcinomas. Radiation therapy may result in localized osteoporosis, sclerosis or aseptic necrosis.

SAPHO syndrome stands for Synovitis, Acne, Pustulosis, Hyperostosis and Osteitis. The common site of skeletal lesions in this syndrome is the sternoclavicular area. Axial skeleton occasionally can be involved^{4,9}.

Riassunto

Gli Autori riportano il caso di una rara condizione clinica di artrite degenerante della prima giuntura sternocostale associata ad accumulo intraarticolare di liquido sviluppatasi nel paziente dopo intenso esercizio (sollevamento di pesi) per un periodo di tempo di circa venti anni.

Vengono discussi i reperti delle tecniche per immagini utilizzate per la diagnosi come anche le diagnosi differenziali.

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