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


*Department of Radiology, "Hippocrasion" General Hospital, Athens; **Department of Familiar Medicine, General State Hospital of Nikaia - Piraeus "Saint Panteleimon"; ***Sports Injuries Department, "KAT" Hospital, Athens; ****Department of Radiology, "Panarkadikon" Hospital, Tripolis; *****Department of Radiology, IASO General Hospital, Athens, all in Greece.

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 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 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 hemidiaphragm (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.
Administration of iodinated contrast medium the lesion was enhanced homogeneously. Sternum was thickened, with a slight destruction of the left sternic 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 Gadollinium (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-
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 to 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 into 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, crepitus, 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 sternocostaclavicular 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 suble marrow changes seen in lymphoid malignancies. In cases of bone and joint infection MR imaging demonstrates joint effusion, joint capsule distension, marrow edema and erosions. 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. 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 sternotomy. Staphylococcus aureus, non-group A, beta-hemolytic streptococci and Streptococcus pneumoniae are the most commonly involved gram-positive aerobic organisms. 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 cancers. Tuberculosis is possible to spread from thoracic skeleton on pleural space and should be considered in the differential diagnosis, especially in immunocompromised host and in patients whose joints have been injected frequently with corticosteroids. Klebsiella, nocardia, blastomycosis, candida and herpes simplex virus may also infect the chest and junctions in this area. Arthritis of the manubriosternal joint and upper sternocostal joints as part of ankylosing spondylitis, reactive arthritis, and arthritis associated with psoriasis and/or pustulosis palmoplantar is very common in this group of patients.

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.

**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.

**References**