



## CHRONIC CHEST WALL ABSCESS IN A DRUG ADDICT: A CASE REPORT

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### ABSTRACT

Chronic chest wall abscess mimicking a soft tissue tumor has not been previously reported. A 36-year-old man with an 18-month-history of a left anterior chest wall mass is presented. He was an injection drug user and had no local signs or symptoms of infection. Imaging investigation included plain radiographs, magnetic resonance imaging and scintigraphy. The findings suggested a well defined chest wall lesion associated with increased radioactive uptake of the clavicle and the first rib indicative of osteomyelitis. Diagnosis was based on tissue culture that revealed the growth of *Pseudomonas aeruginosa*, as well as on the histopathological findings from a close biopsy that indicated an active inflammatory process. Properly targeted antibiotic therapy based on the susceptibility results for a 3-month period led to complete healing of both the soft tissue and bone lesions. No recurrence of the lesion or complications related to osteomyelitis and its treatment were detected after a 2-year follow-up.

**Key words:** Chronic abscess, Chest wall, Drug addict.

### INTRODUCTION

Skin and soft tissue abscesses are a common complication of injection drug use. Subcutaneous or intramuscular, instead of intravenous, injection is a major risk factor for infection, while several other potential risk factors have also been identified among injection drug users [1, 2]. Chest wall infections can be categorized as primary and secondary infections [3]. The former (primary chest wall abscess) may arise spontaneously, while the latter (secondary chest wall abscess) may occasionally be due to drug injection at the sternoclavicular joint area in drug users [4]. A 36-year-old man, who was an injection drug user, presented with an anterior upper chest wall mass that was finally diagnosed as a chronic chest wall abscess. This case was unusual because its insidious onset and indolent symptoms mimicked a bone tumor, it was associated with osteomyelitis of the clavicle and the first rib, and moreover because the administration of antibiotics resulted in a successful outcome, obviating the need for

any surgical intervention. The clinical, imaging and histological findings, as well as the appropriate terminology of the lesion are presented and discussed in this report.

### CASE REPORT

A 36-year-old patient presented with an 18-month history of a painful lump on the medial end of the left clavicle. The patient was a healthy appearing white male with normal vital signs, gait and posture. He was an injection drug user but denied any history of local trauma or infection. Physical examination revealed a diffuse tender hard swelling over the sternal end of the left clavicle with no redness or discoloration, which was not fluctuant. The skin did not show discharging sinuses. He reported a gradual increase of the lump's size as well as of pain intensity that was provoked with abduction of the shoulder over 100° and especially with overhead activities.

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No general signs or symptoms of infection (malaise, fever, etc) were present. There was no neurovascular deficit in the affected limb.

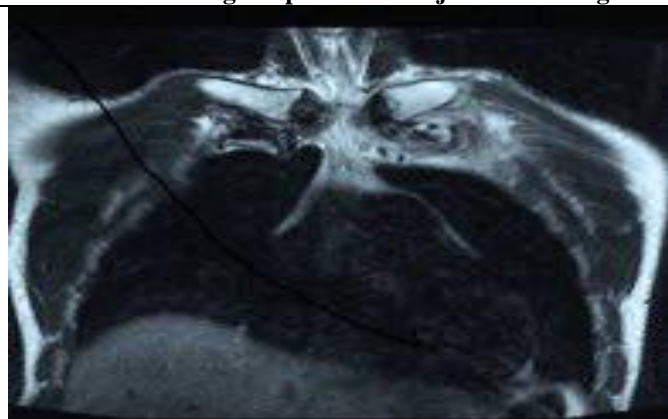
Blood examination revealed a raised erythrocyte sedimentation rate (ESR) of 55 mm/hr and an increased C-reactive protein (CRP) value of 8mg/dl (normal value < 0.5 mg/dl) with normal white blood count (WBC) and no other abnormal findings. Radiographic examination demonstrated an isolated sclerotic lesion measuring about 3x2cm beneath the medial part of the left clavicle (Fig.1). A magnetic resonance imaging (MRI) of the thorax showed a lesion in the anterior left costoclavicular area with oedema of the surrounding soft tissue affecting the origin of the pectoralis major muscle, without excluding the possibility of a neoplastic lesion (Fig 2). A conventional three-phase bone scintigraphy with Tc-99m MDP (methylene di-phosphonate) indicated increased uptake of the lesion as well as at the medial part of the clavicle and the first rib (Fig. 3). A close biopsy of the lesion under local anaesthesia was undertaken. A 3mm

trephine needle under fluoroscopic guidance was used. The cultured material revealed Gram-negative and oxidase-positive rods. The results of culture suggested the presence of *Pseudomonas aeruginosa* and the susceptibility results indicated that the strain was sensitive to amikacin and ciprofloxacin. Bacterial identification and antimicrobial susceptibility testing were performed with Vitek 2 automated system (bioMérieux, France). Repeated staining for Acid Fast Bacilli was negative. Tuberculosis polymerase chain reaction-based analysis and staining for fungal elements were negative. Soft tissue samples indicated granulation tissue: oedematous stroma with extensive infiltration of inflammatory multinuclear cells and thin walled vessels (Fig. 4). Bone biopsy specimens were not obtained. The patient was treated with intramuscular amikacin 1g/once a day for 2 weeks combined with oral ciprofloxacin 500 mg three times daily for 3 months. A simple upper limb sling was applied for 2 weeks and active movements of the shoulder were immediately permitted as tolerated.

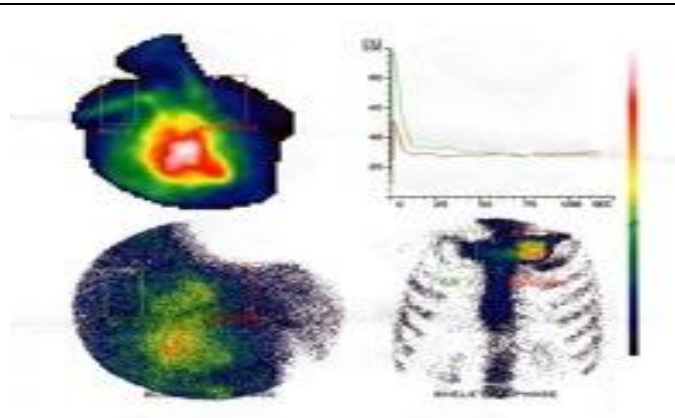
**Figure 1. Anteroposterior chest radiograph shows a sclerotic lesion in the left anterior costoclavicular area**



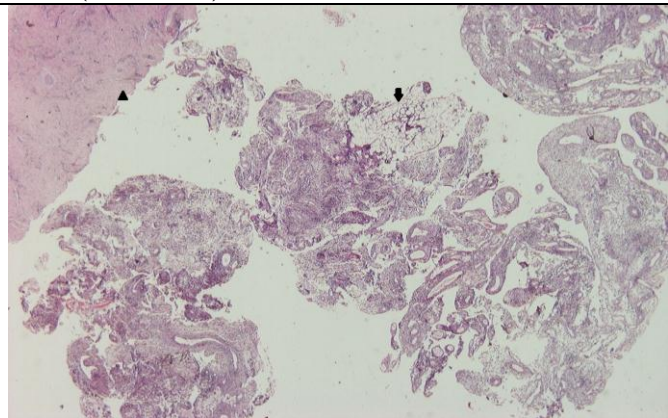
**Figure 2. T1-weighted frontal MRI demonstrates a lesion beneath the medial clavicle with edema of the surrounding soft tissues affecting the pectoralis major muscle origin**



**Figure 3. Bone scintigraphy reveals increased uptake in a localized area including the medial clavicle and the first rib**



**Figure 4. Low-power photomicrograph indicated granulation tissue, inflamed fat tissue (arrow) and fibrous tissue (arrowhead)**



At the 6-month follow-up the lesion had completely disappeared, while the diffuse pain in overhead activities still persisted in some extent. Radiographic examination displayed no evidence of the lesion. At the 12-month follow-up the patient reported to be pain free when performing overhead activities. A new scintigraphy indicated no soft tissue or bone abnormality. At the final follow-up visit, two years after initial diagnosis, the inflammation markers remain normal without any symptoms or signs of a possible infection recurrence.

## DISCUSSION

The patient presented in this report appeared with an 18-month history of a radiographically sclerotic chest wall mass having no associated erythema, heat, or tenderness. The laboratory findings were also nonspecific, although the ESR and CRP levels were mildly elevated. Imaging modalities including plain radiographs, MRI and technetium triphasic scintigraphy were indicative of infection but they were not sufficient to exclude a neoplastic lesion. Biopsy samples taken from the soft tissues for histological assessment, acid-fast bacilli staining, culture and antimicrobial susceptibility tests indicated the nature of the lesion and the pathogenic microorganism. Although the patient did not report a history of local trauma to the infected region, the lesion was considered to be most likely a secondary infection.

Skin abscess (cutaneous or subcutaneous) may be called acute or chronic, depending on how rapidly it forms and how effectively the body defends itself. Acute abscesses are a frequent, morbid, and costly complication of injection drug use [1]. While an acute (hot) abscess is characterized by erythema, heat and tenderness, a chronic abscess, on the other hand, produces a low-grade inflammatory response and may be walled off by a fibrous sac. It develops slowly, and produces few or no local or systemic symptoms. It may or may not be associated with pus formation. Healing of an abscess can occur only after the suppurative exudates and necrotic debris have been removed either by rupture or surgical drainage. If abscess evacuation does not occur, healing may still take place after total proteolytic digestion of the accumulated tissue and cellular debris. This watery digestate may then be resorbed into the blood. Neglected abscesses may frequently accumulate calcium salts which then convert into calcium masses. The cold abscess is a form of chronic abscess that may be present in immunodeficiency disorders, deep mucosae, and other infectious diseases including tuberculosis [5, 6].

Osteoarticular infections occur also more commonly in injection drug users [7]. They may be localized in unusual locations and present with indolent symptoms; they are usually not associated with systemic signs and may be caused by a wide spectrum of microorganisms [8]. Various exceptional clinical

situations like the involvement of the sternoclavicular joint area have also been described in intravenous-drug users and patients with indwelling intravenous devices [9]. Osteomyelitis localized to the clavicle [10-13], the first rib [14-16] or the sternoclavicular joint [4, 17, 18] is very rare and is usually a secondary infection in adults, while its link with predisposing factors has been proved [13]. It may be associated with immunosuppression therapy, and can occur as a complication after surgery for head and neck cancer, tracheostomy, sternotomy, following subclavian vein catheterization, or may be idiopathic [11, 12, 19, 20]. Intravenous drug use has been recognized as a significant common risk factor [4]. It may present with nonspecific clinical symptoms and final diagnosis may depend on the results of biopsy and cultures [21, 22]. The causing organisms represent a wide spectrum [23]; therefore, empiric therapy is not recommended [8, 24].

On the other hand, osteoarticular infections caused by *Pseudomonas aeruginosa* usually include pelvic and vertebral infections. They are more common after a tooth extraction, in patients with immunodeficiency and in intravenous drug abusers [25-34]. Chronic osteomyelitis of the clavicle caused by *Pseudomonas aeruginosa* has been previously reported, only once, in an adult with IgA nephropathy [19].

Management of osteomyelitis of the costoclavicular region includes both medical and surgical strategies. Furthermore, osteomyelitis caused by Gram-negative bacilli infections constitutes an important therapeutic challenge, especially when associated with nonfermenting bacteria [35]. A high dose of parenteral antibiotics, determined by culture and susceptibility results, for 4-8 weeks is usually successful [36-38]. However, surgery will be considered in cases of antibiotic failure, for abscess drainage or in chronic osteomyelitis with necrotic bone and soft tissue [39, 40]. Treatment options in injection drug users are similar to therapy in other groups with osteomyelitis [7].

A rare occurrence of a chronic, well defined, subcutaneous inflammatory process of the anterior chest wall in an injection drug user is reported. Increased radioactive uptake of the lesion on scintigraphy was associated with increased uptake of the medial part of the clavicle and the first rib indicative of osteomyelitis. The lesion was defined as chronic since it appeared 18 months before admission, due to the radiographically evident calcium masses within the lesion, and due to the histologic appearance of a fibrous layer at the periphery of the lesion (Fig. 4). Description of the lesion as an abscess was based on the histological appearance of an active inflammation characterized by the presence of granulation tissue with abundant neutrophils in the biopsy specimen. In the reported case the confirmed diagnosis of infection caused by *Pseudomonas aeruginosa* optimized the initial selection of antimicrobial regimen from the

very beginning of treatment. The administration of the tested antibiotics alone induced digestion and resorption of the lesion as well as complete scintigraphic recovery of the bone lesions of the clavicle and the first rib, obviating the need for any surgical intervention.

## CONCLUSION

A chronic circumscribed subcutaneous chest wall abscess has not been previously reported. High level of suspicion is mandatory in patients presenting with a chest

wall mass without signs of acute infection, especially in injection drug users. Management may be challenging and prolonged proper antibiotic treatment based on biopsy sample cultures should be considered as a treatment option before any surgical intervention.

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## CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

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