

# Clavicular Osteomyelitis. A Complication Of Septic Sternoclavicular Arthritis In Childhood. A Case Report And Review Of Literature

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## Citation

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## Abstract

Clavicular osteomyelitis is a rare complication of septic sternoclavicular arthritis in childhood. This form of septic arthritis is more common in adults with risk factors such as intravenous drug abuse, distant site infection, diabetes mellitus. CT scan is used to find out bone and periarticular tissues injuries. A puncture of joint is used to have a diagnosis. Surgical debridement together with a correct and prolonged antibiotic strategy is a good attitude to achieve good outcomes.

## INTRODUCTION

The incidence of childhood septic sternoclavicular arthritis (SSA) is very low. A case of a five year old with SSA who did not improve after surgical debridement is reported. MR images showed osteomyelitis in the medial 1/3 of the clavicle. Good results were obtained after more aggressive surgical debridement together with adequate antibiotic treatment. Presently the child shows complete articular balance without any other symptomatology.

## CASE REPORT

We report the case of a five year old child with Toxic Shock Staphylococcus Syndrome (TSSS) diagnosis. One week after being hospitalized for TSSS, he felt pain in his left shoulder and a swelling was appreciated in sternoclavicular joint (Fig. 1a). In fact, he had complained of having pain since the beginning of his hospitalization. A puncture of the sternoclavicular joint was performed and its content was positive for *Staphylococcus aureus*.

The blood test showed  $13,50 \times 10^9$  /L leucocytes, hematocrit 33,1%,  $647 \times 10^9$  /L platelets 16,5 mg /L C-Reactive Protein and 90 mm/1st h Erythrocyte Sedimentation Rate. The sternoclavicular joint echography revealed an unstructured and hypervascularized area. CT images were compatible with sternoclavicular arthritis and periarticular involvement (Fig 1b).

Surgical debridement was performed in view of the lack of successful improvement with antibiotic treatment alone

during three days. Purulent exudation was not appreciated in surgery. Postsurgical course, was unsatisfactory, because ESR was maintained at 70 mm and the pain radiated towards the clavicle. A MRI was requested and the presence of sternoclavicular arthritis with osteomyelitis and periostitis in the medial 1/3 of clavicle was reported. Two weeks later, a second surgical debridement was done due to wound serous exudation collection, and a clavicular osteomyelitis was suspected. As a result, a third surgery debridement was needed in the ensuing two weeks to extract a fragment of free cortical clavicle and a periostium denudation of the medial 1/3 of affected clavicle was performed.

Intravenous administration of different antibiotics were carried out during hospitalization. At the beginning was given cefazoline during 5 weeks, then with clindamicin and cloxacilin for 2 weeks, and finally oral cefadroxil was administrated during 3 more weeks.

At present, 18 months after hospitalization the child presents a complete articular balance and the X rays show a clavicular fracture callus.

**Figure 1**

Figure 1a. Left sternoclavicular swelling.  
Figure 1b. CT scan with Osteolytic pattern at medial third of left clavicle, after second debridement.



**DISCUSSION**

Septic affection of sternoclavicular joint is an uncommon disease. It is still more unfrequent to find a septic sternoclavicular arthritis in a healthy child. The major incidence is in males and the most frequent symptoms are chest (78%) and shoulder pain (24%).

This kind of septic arthritis can develop in adults with risk factors such as intravenous drug use (21%), a distant site infection (15%), diabetes mellitus (13%), trauma, subclavian venous catheterization, rheumatoid diseases.<sup>1,2,3</sup> Nevertheless, no risk factor has been found in 23% of the cases reported in the literature.<sup>1</sup>

Differential diagnosis includes Rheumatoid Arthritis, Chronic Multifocal Periosteitis, Chronic Recurrent Multifocal Osteomyelitis, and neoplasia.<sup>4,5</sup>

Staphylococcus aureus is the most commonly identified organism (50%) followed by enterobacterias.<sup>1,2,6</sup> Arthritis by Pseudomona affecting sternoclavicular joint has observed in 20% of cases.<sup>7</sup>

CT scan is used to find out bone and periarticular tissues injuries. Reaction to treatment and complications like retrosternal abscess or mediastinitis can be controlled by this technique.<sup>8,9</sup> MRI does not provide additional information and it is a complicated exploration for a child.<sup>10</sup> Moreover, CT scan minimizes motion artifact and has the advantage of demonstrating a rapid-contrast bolus which enables to distinguish the adjacent vasculature.

Puncture aspiration allows an ethiological diagnostic of the disease and it can be therapeutic in some cases.<sup>2,9</sup>

Radiologic changes are described as a sclerotic, lytic or mixed pattern. Also, a periosteal reaction, sequestrum formation may be demonstrated in later stages of the process, but are not frequent in children.<sup>3</sup>

Antibiotic treatment is the first line of therapy for this disease and has to cover Meticilin-Resistant Staphylococcus aureus (MRSA).

Retrosternal abscess or mediastinitis are potential complications, and radical debridement and myoplasty of the pectoralis major muscle may be needed in these cases.<sup>2</sup> Superior vena cava syndrome and septic shock are rare complications.<sup>3</sup> Clavicular osteomyelitis is another unusual complication that has been described in many few papers. Resection of sternoclavicular joint may be indicated in some cases and, although this joint contributes to shoulder stability, its total resection restricts motion minimally.<sup>1,11</sup> Conservative surgery does not ensure correct debridement of all affected tissues and the number of recurrences is high.<sup>2</sup> Septic arthritis of sternoclavicular joint is abscessificated in 20% of cases.<sup>12</sup> Capsular joint microperforations or minimal elongations in less resistant regions of capsular joint can lead to direct dissemination of infection and locoregional abscess development, according to Chen.<sup>13</sup>

**CONCLUSIONS**

Septic sternoclavicular arthritis is very infrequent in children. Puncture aspiration can be therapeutic in some cases and allows a definitive diagnoses in order to start correct antibiotic treatment. Precocious diagnose will increase possibility of successful results of medical treatment. When antibiotics are not enough to heal the process, however, a radical debridement needs to be performed to avoid complications and clavicular osteomyelitis.

Even though there are several therapeutic alternatives, we suggest that an aggressive debridement together with a correct and prolonged antibiotic strategy is the best way to achieve a good outcome.

**References**

- 1) Ross JJ, Shamsuddin H. Sternoclavicular septic arthritis: review of 180 cases. *Medicine (Baltimore)*. 2004. 83(3): 139 – 148.
- 2) González Muñoz JI, Córdoba Peláez M, Tébar Boti E, Téllez Cantero JC, Castedo Mejuto E, Varela de Ugarte A. Surgical treatment of sternoclavicular osteomyelitis. *Arch Bronconeumol*. 1996. 32(10): 541 – 543.
- 3) Wong LLS, Peh WCG. A 7-year-old boy with left sternoclavicular swelling. *Am J Orthop*. 2003. 32(1): 49 – 51.
- 4) Rodney KB, Donald DS. Nontraumatic disorders of the clavicle. *J Am Acad Orthop Surg*. 2006. 14: 205 – 214.
- 5) Duffy CM, Lam PY, Ditchfield M, Allen R, Graham HK. Chronic recurrent multifocal osteomyelitis: review of orthopaedic complications at maturity. *J Pediatr Orthop*. 2002. 22(4): 501 – 505.
- 6) Akkasilpa S, Osiri M, Ukritchon S, Junsirimongkol B, Deesomchok U. Clinical features of septic arthritis of sternoclavicular joint. *J Med Assoc Thai*. 2001. 84(1): 63 – 68.
- 7) Gifford D, Patzakis M, Ivler D, Swezey RL: Septic

arthritis due to pseudomonas in heroin addicts. *J Bone Joint Surg.* 1975. 57-A. 631 – 635.

8) Pollack M. Staphylococcal mediastinitis due to sternoclavicular pyarthrosis: CT appearance. *J Comput Assist Tomogr.* 1990. 924 – 927.

9) Bonneville N, Gaston A, Loustau O, Bonneville P, Mansat P. Anaerobic sternocostoclavicular septic arthritis: a case report. *Rev Chir Orthop Reparatrice Appar Mot.* 2007. 93(3): 277 – 282.

10) Shanley D, Vassallo C, Buckner A. Sternoclavicular pyarthrosis demonstrated on bone scan correlation with CT

and MRI. *Clin Nucl Med.* 1991. 16: 786 – 787.

11) Yasuda T, Tamura K, Fujiwara M Tuberculous arthritis of the sternoclavicular joint. *J Bone Joint Surg.* 1995: 77-A. 136 – 139.

12) Wolhgethan J, Newberg A, Reed J. The risk of abscess from septic arthritis. *J Rheumatol.* 1988. 15:1. 1302 – 1306.

13) Chen WS, Wan Y-L, Lui C-C, Leet T-Y, Wang K-C. Extrapleural abscess secondary to infection of the sternoclavicular joint. *J Bone Joint Surg.* 1993. 75-A. 1835 – 1839.

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