Clinical Features of Septic Arthritis of Sternoclavicular Joint

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Abstract

We studied 21 patients with septic arthritis of the sternoclavicular joint at Chulalongkorn University Hospital between January 1987 and January 1997. There were 15 males (71.4%) and 6 females (28.6%). The mean age was 47.4 years with a range of 16 to 69. More than half of the patients (57.1%) were aged more than 50 years and most had associated diseases including diabetes mellitus and cirrhosis. Almost all of the younger age group had a history of intravenous drug abuse. All of the patients had fever and sternoclavicular joint pain. Most of the patients (66.7%) had monoarticular arthritis, whereas, the others had oligoarticular arthritis. *Staphylococcus aureus* was the most commonly or identified organism in the patients. Retrosternal abscess was seen by computerized tomography in 6 patients (28.6%). All patients received parenteral antibiotics, and 5 patients (23.8%) required surgical drainage of a retrosternal abscess. Eighteen patients recovered but there were 3 (14.3%) deaths. All of these had retrosternal abscesses. The major cause of death was septic shock. Septic arthritis of the sternoclavicular joint is an uncommon disease in Thai clinical practice. Although uncommon, retrosternal abscess is a life threatening complication.

Key word : Septic Arthritis, Sternoclavicular Joint, Retrosternal Abscess

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Steptic arthritis is a frequent problem in clinical practice. It can manifest as monoarthritis and as oligo- or polyarthritis. The commonly involved joints are large joints such as knees, hips, and ankle joints. It may rarely affect unusual anatomic sites, such as the sacroiliac and sternoclavi-

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cular joints. In a previous report of septic arthritis, the sternoclavicular joint was involved in as many as 9 per cent of patients[1]. There has been no report of septic sternoclavicular arthritis in Thailand before.

The purpose of this study was to present clinical manifestations of septic sternoclavicular arthritis observed during a 10-year period at the Department of Medicine of Chulalongkorn University Hospital, Bangkok, Thailand.

MATERIAL AND METHOD

Chulalongkorn University Hospital is a 1,400-bed tertiary care center in Bangkok. Adult patients admitted at the Department of Medicine between January 1987 and January 1997 were included if they met the following criteria.

1. A clinical picture consistent with sternoclavicular arthritis.

2. One or more of the following.

2.1 The organism was found by gram stain from synovial fluid.

2.2 There was a positive culture from synovial fluid, blood or other fluid.

The medical records of the patients who met these diagnostic criteria were reviewed and abstracted.

RESULTS

A total of 21 patients met the criteria of septic sternoclavicular arthritis. Fifteen patients (71.4%) were male, and 6 patients (28.6%) were female. The ratio of male to female was 2.5 : 1. The mean age of the patients was 47.4 years with a range of 16 to 69. Patients aged 50 or more accounted for 57.1 per cent of cases as shown in Table 1.

Table 1. Age distribution of 21 patients.

Age group (years)	Number of cases		Total	%
	IVDU	Non-IVDU		
< 20	1	0	1	4.8
20-29	2	0	2	9.5
30-39	1	1	2	9.5
40-49	2	2	4	19.1
50-59	0	10	10	47.6
> 60	0	2	2	9.5
	6	15	21	100

Underlying joint diseases

Underlying joint diseases were found in 5 patients (23.8%). The most common were osteoarthritis of the knee (3 patients or 14.3%). Two patients (9.5%) had a history of previous septic arthritis and both were intravenous drug users (IVDU). None of the patients had a history of rheumatoid arthritis, seronegative spondyloarthropathy or crystal induced arthritis. No prior history of sternoclavicular arthritis was noted in the patients.

Associated diseases

Six patients (28.6%) were IVDU. No other associated diseases were found in the IVDU group. Fifteen patients (71.4%) were non-IVDU. Associated diseases were found in this group in 11 patients (73.3%). The most common were diabetes mellitus and liver cirrhosis (6 patients each). Others were systemic lupus erythematosus (SLE) and polycystic kidney (1 patient each). Two patients had both diabetes mellitus and cirrhosis, and one patient had both diabetes mellitus and SLE.

Clinical manifestations

Major symptoms were fever and pain limited to the area of the sternoclavicular joint. Two patients were admitted with other diseases, and sternoclavicular joint pain developed during hospitalization. All of the 21 patients had fever and sternoclavicular joint pain. Mean duration of sternoclavicular joint pain was 10 days prior to admission. Restricted and painful movement of the homolateral shoulder was found in 16 patients (76.2%).

The main physical findings were tenderness, swelling, and erythema over the affected sternoclavicular joint. Range of motion of the homolateral shoulder was reduced in all directions by 50 per cent to 75 per cent in each case.

Fourteen patients (66.7%) had monoarticular arthritis, whereas, the other 7 (33.3%) had oligoarticular arthritis. Knee, hip, elbow and shoulder joints were affected in the oligoarticular group. Bilateral sternoclavicular joints were involved in one case. The right sternoclavicular joint was affected more often than the left (16 and 6 respectively).

Synovial fluid study

Arthrocentesis was done in every patient and yielded synovial fluid in 15 patients (71.4%) ; in the remaining 6 (28.6%), no synovial fluid could be obtained despite multiple attempts.

Synovial fluid white cell counts ranged from 15,000 to 140,000/mm^3. The mean was 58,000/mm^3. Polymorphonuclear leukocytes predominated with a mean of 90 per cent (range 50 to 100%). There were 5 frank purulent synovial fluids and no bloody fluid samples.

Of the 15 successful needle aspirations, synovial fluid gram stains were positive in 8 (53.3%). Gram positive cocci in clusters were observed on smear in 5 specimens (62.5%), and gram negative bacilli were observed in 3 specimens (37.5%). Synovial fluid cultures were positive in 8 specimens (53.3%). *Staphylococcus aureus* were the most frequently found (4 specimens) while 2 grew *Escherichia coli. Pseudomonas aeruginosa* and *Burkholderia pseudomallei* were the responsible pathogens in one case each.

Other microbiologic study

Hemoculture was done in all 21 patients and the results were positive in 9 patients (42.9%). *Staphylococcus aureus, Escherichia coli,* and *Burkholderia pseudomallei* were the responsible pathogens in 6,2, and 1 patient respectively. Urine cultures were positive for *Escherichia coli* in 2 patients. Pus was sent for culture in 3 patients who had cellulitis in the extremities. *Staphylococcus aureus* was the etiologic pathogen in 2 patients, while *Streptococcus* group A was the responsible pathogen in 1 patient.

Computerized tomography (CT)

CT scan of the sternoclavicular joints was done in 13 patients. Erosion of the sternoclavicular joint was seen in all patients. Retrosternal abscess was seen in 6 patients.

Therapy and outcome

All patients received parenteral antibiotics once they were diagnosed. Five patients (23.8%) required surgical drainage of the retrosternal abscess. The duration of antibiotic therapy was 6 weeks. Eighteen patients improved after treatment. There were 3 (14.3%) deaths. All 3 patients had a retrosternal abscess and the major cause of death was septic shock.

DISCUSSION

The sternoclavicular joint consists of incongruous bony surfaces separated by a fibrocartilagenous disk which creates two articular cavities each lined by synovium. Tenderness and swelling of this joint have been described in patients with rheumatoid arthritis, ankylosing spondylitis, osteoarthritis, rheumatic fever, and primary and metastatic tumors. However, septic arthritis of this joint is an uncommon occurrence, representing only 9 per cent of all cases of septic arthritis in a reported series[1]. Our study showed a prevalence of septic sternoclavicular arthritis of 2 patients per year. The number of males was higher than females (ratio 2.5:1). More than half of the patients (57.1%) were aged 50 or more. None of our patients had a previous history of sternoclavicular arthritis. A history of IVDU was found in 28.6 per cent of our patients. This number was similar to a previous report which showed that 19 to 29 per cent of such patients were IVDU[2]. It has been suggested that the incidence of this disease is on the rise among IVDU[3-6]. All of our patients in the IVDU group were younger than 50 years. Among the non-IVDU group, 73.3 per cent had associated diseases including diabetes mellitus, cirrhosis, SLE and polycystic kidney. This finding is similar to previous reports, where IVDU and patients with chronic diseases such as alcoholism, diabetes mellitus, and kidney failure appeared to be at higher risk for sternoclavicular joint septic arthritis than the general population[7,8].

Clinical manifestations included fever and sternoclavicular joint pain. All of our patients had fever and sternoclavicular joint pain during the course of their illness. Previous reports claimed that fever was variably present, occuring rarely in one series and 67 per cent of the time in another [6,9]. Fever was usually low grade and without chills. The patients usually complained only of anterior chest discomfort; while redness, warmth and swelling of that area were often absent in the early stage[7]. There often was pain with movement of the homolateral shoulder. Restricted and painful movement of the homolateral shoulder was noted in 76.2 per cent of our patients. The mean duration of joint pain was 10 days prior to admission. The duration ranged from 1 day to 2 months in a previous report[10]. Most (66.7%) of our patients had monoarticular arthritis, whereas,

the rest (33.3%) had oligoarticular arthritis. Bilateral sternoclavicular joints were involved in one case.This finding was similar to previous reports[1,4].

Definitive diagnosis was made by arthrocentesis of the sternoclavicular joint and was done in all of our patients. The success rate was 71.4 per cent. The mean synovial fluid white cell count was 58,000/mm^3, neutrophil accounted for 90 per cent. Gram stain of the fluid was positive in 53.3 per cent. Most (62.5%) of the specimens were gram positive cocci, and the rest (37.5%) were gram negative bacilli. Synovial fluid cultures were positive in 53.3 per cent. *Staphylococcus aureus* was the dominant organism, the others were *Escherichia coli*, *Pseudomonas aeruginosa*, and *Burkholderia pseudomallei* consecutively.

Hemoculture was done in all patients, The results were positive in 42.9 per cent. *Staphylococcus aureus*, *Escherichia coli* and *Burkholderia pseudomallei* were the responsible pathogens in 66.7, 22.2 and 11.1 per cent respectively. Urine cultures were positive for *Escherichia coli* in 2 patients. Pus cultures were positive in 3 patients who had cellulitis. *Staphylococcus aureus* and *Streptococcus* group A were the responsible pathogens in 2 and 1 patients respectively.

Previous reports claimed that *Staphylococcus aureus* was the most commonly identified organism in sternoclavicular arthritis[6,10,11]. However, there were reports where *Pseudomonas aeruginosa* was the most common organism in IVDUs[4,12]. The other organisms were *Streptococcus, Escherichia coli, Brucella, Hemophilus influenzae, Salmonella* Spp, *Serratia marcescens, Bacteroides* species, *Neisseria meningitidis*, and *Candida albicans*[1,2,8,13-16]. *Burkholderia pseudomallei* has been previously reported in septic sternoclavicular arthritis[17].

Previous reviews reported plain roentgenograms of this joint were generally of little value when looking for joint destruction unless the involvement was extensive. Standard tomography provided better definition of the articular surfaces but still lacked sensitivity in early joint involvement. CT scan or MRI were recommended as the best diagnostic modality because of their excellent delineation of both bony and soft tissue lesions[11,18]. CT scan was done in 13 patients and erosion of the sternoclavicular joint was seen in all. Retrosternal abscess was seen in 6 patients and accounted for 28.6 per cent. This finding was similar to a previous report in which 20 per cent of patients developed abscesses[10].

The factors responsible for the high rate of abscess formation may be due to the anatomy of the joint. The sternoclavicular joint is divided by an intraarticular disk and surrounded by a dense ligamentous capsule. Examination and fluid aspiration are difficult, impeding recognition of infection and leading to delay in treatment. In addition, the joint capsule is unable to freely distend, creating high intraarticular pressure and favoring dissemination of infection, through the lymphatics and into the adjacent tissues.

Treatment of septic arthritis is appropriate antibiotic administration combined with drainage. This can be by closed needle aspiration or by surgical intervention. Medical therapy has largely replaced the traditional surgical approach to an infected joint at least for the initial management. Medical treatment along with closed needle aspiration is generally recommended for septic infection of all joints except the hip[19]. However, therapy for septic sternoclavicular arthritis is controversial. Some reports favor early surgical exploration to obtain specimens for culture and to effect adequate debridement. This is important when extensive osteomyelitis or retrosternal abscesses are present [9,10].

All of our patients received medical therapy once they were diagnosed. Surgical drainage for retrosternal abscess was done in 23.8 per cent of our patients. The duration of antibiotic therapy was 6 weeks. Most of our patients improved after treatment. However, 14.3 per cent of our patients died, and all of these had retrosternal abscess and septic shock.

In conclusion, septic sternoclavicular arthritis is an uncommon disease in clinical practice. However, it may cause life threatening complications.

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ลักษณะทางคลินิกของข้ออักเสบติดเชื้อที่ข้อสเตอร์โนคลาวิคูลาร์

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ได้ศึกษาผู้ป่วยข้ออักเสบติดเชื้อที่ข้อ sternoclavicular 21 ราย ที่รับการรักษาในโรงพยาบาลจุฬาลงกรณ์ ตั้งแต่เดือนมกราคม 2530 ถึงเดือนมกราคม 2540 เป็นเพศชาย 15 ราย (71.4%) เพศหญิง 6 ราย (28.6%) อายุเฉลี่ย 47.4 ปี (พิสัย 16-69 ปี) มากกว่าครึ่ง (57.1%) ของผู้ป่วยอายุมากกว่า 50 ปี และส่วนมากจะพบมีโรคประจำตัวอยู่ก่อนที่พบบ่อย คือ เบาหวานและตับแข็ง ส่วนกลุ่มอายุน้อยเกือบทุกรายมีประวัติของการฉีดยาเข้าเส้น เมื่อศึกษาถึงลักษณะอาการพบว่าทุกรายมีไข้และปวดที่บริเวณข้อ sternoclavicular โดย 14 ราย (66.7%) จะมีการอักเสบเพียงข้อเดียว ที่เหลือจะมีการอักเสบของข้ออื่น ๆ ร่วมด้วย การศึกษาถึงเชื้อที่เป็นสาเหตุพบ *Staphylococcus aureus* มากที่สุด และจากการตรวจวินิจฉัยเพิ่มเติมด้วยเอกซเรย์คอมพิวเตอร์พบ retrosternal abscess 6 ราย (28.6%) การรักษาโดยให้ยาปฏิชีวนะทุกราย โดยมี 5 ราย (23.8%) ที่ใช้การผ่าตัดร่วมด้วย ผลการรักษา พบว่าอาการดีขึ้น 18 ราย มีผู้ป่วยเสียชีวิต 3 ราย (14.3%) โดยพบว่าทั้ง 3 ราย มีภาวะ retrosternal abscess ร่วมด้วย สาเหตุการตายที่สำคัญ คือ ภาวะช็อคจากการติดเชื้อ

โดยสรุป ข้ออักเสบติดเชื้อที่ข้อ sternoclavicular เป็นโรคที่พบไม่บ่อยในเวชปฏิบัติ แต่อาจพบภาวะแทรกซ้อนที่สำคัญ คือ retrosternal abscess ซึ่งมีอันตรายถึงเสียชีวิตได้

คำสำคัญ : ข้ออักเสบติดเชื้อ, ข้อสเตอร์โนคลาวิคูลาร์, Retrosternal Abscess

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