

Osteomyelitis Resulting from Chronic Septic Olecranon Bursitis: Report of Two Cases

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We reported the two cases of olecranon osteomyelitis secondary to the iatrogenic chronic relapsing septic olecranon bursitis. Infection was well eradicated by excision of the infected bursa and curettage of the eroded olecranon under the coverage of antibiotic therapy. (Clin Shoulder Elbow 2016;19(4):252-255)

Key Words: Bursitis; Pyogenic arthritis; Iatrogenic disease; Olecranon process

Olecranon erosion, – or osteomyelitis secondary to septic olecranon bursitis, – has very rarely been reported to date.¹⁻⁴⁾ However, its incidence can be high in patients with frequently relapsing olecranon bursitis treated by repeated aspiration with or without intra-bursal drug injection, and/or repeated acupuncture. The two case reports herein are examples of such needle procedure-related septic bursitis complicating the contiguous olecranon erosion and/or osteomyelitis.

Case Report

Case 1

An 82-year-old female patient was examined at an our out-patient clinic for multi-joint pain including her left elbow joint. A diagnosis of epicondylitis was made for which a trigger point injection (TPI) was performed and non-steroidal anti-inflammatory drugs (NSAIDs) were prescribed. Several days later, TPI was done again at a pain management clinic under the diagnosis of medial epicondylitis. She also had two more TPIs for lateral epicondylitis. On plain radiographs of the left elbow taken 11 days after the first visit, there was no bone lesion. Ten days later, TPI was done at a pain management clinic once more.

After one month from her first visit, she was transferred to an orthopedic clinic for swollen and painful elbow, for which intra-

venous antibiotics were administered on an out-patient basis, and oral antibiotics along with NSAIDs were prescribed. However, there were no signs of improvement after an additional one month of conservative treatment. She was admitted for care because of worsening local symptoms. Plain radiographs taken two months after her first visit showed an eroded olecranon, which suggested a spread of infected bursitis to the contiguous olecranon (Fig. 1).

Enterobacter cloacae and Methicillin-resistant *Staphylococcus aureus* (MRSA) were discovered from the bursa aspirate culture, with a cell count of 5,147/mm³ (neutrophils, 84%) and *S. hominis* was discovered by blood culture.

For this condition, an excision of the infected bursa together with curettage of the eroded olecranon were performed under the coverage of antibiotics. Infection was well controlled. She was followed-up for 6 months after the surgery. On her last follow-up, there was no elbow joint pain and her lab result was all within normal range (erythrocyte sedimentation rate [ESR]=12 mm/hr; normal value=0–25 mm/hr and C-reactive protein [CRP]=0.2 mg/dl; normal value=0.3 mg/dl or below).

Case 2

An 83-year-old male patient visited an out-patient clinic for care of his painful swollen left elbow with general fever (38.6°C)

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Fig. 1. (A) Initial radiographs of elbow taken on June 11, 2015 show an intact olecranon. (B) Radiographs taken on August 6, 2015 show cortical destruction of olecranon.

that progressively worsened since its onset. He had a history of repeated acupuncture treatment for his swollen olecranon bursa, and he also had a history of warfarin therapy for his heart disease. His left elbow was swollen, particularly over the olecranon. The elbow was tender and reddened with painful motion. A laboratory examination revealed increased CRP (5.11 mg/dl), ESR (29 mm/hr), and leukocytosis (white blood cell, 10,400 cells/ μ l).

After the initial examination by a primary physician, the patient was treated under the impression of acute gouty arthritis and cellulitis, which were diagnosed by the clinical symptoms and lab result of high uric acid level (9.2 mg/dl; normal value 4.0–7.0 mg/dl).

On plain radiographs of his left elbow, a small cortical erosion

of the olecranon contiguous to septic bursa was observed (Fig. 2), which indicated a spread of infection to the bone.

MRSA was discovered from the bursa aspirate culture, with a cell count of 8,259/mm³ (neutrophils, 86%).

After an incisional drainage of the septic bursa, curettage of the eroded olecranon was performed while undergoing antibiotic therapy. The infection was successfully controlled. He was followed up for six months after the surgery. On his last follow-up, there was no elbow joint pain and his lab result was all within normal range (ESR=15 mm/hour and CRP=0.16 mg/dl).

Discussion

Septic olecranon bursitis regardless of its origin has been the



Fig. 2. Elbow radiograms of an 83-year-old patient with chronic low grade septic olecranon bursitis: A small eroded olecranon cortex is observed.

topic of several reports; however, to the best of our knowledge, the cases complicating the contiguous olecranon osteomyelitis have very rarely been reported.¹⁻⁴⁾ We have described two cases of relapsing low grade septic bursitis complicating the contiguous olecranon osteomyelitis.

It was reported that of those who developed septic olecranon bursa, about one-third gave a history of a previous non-infected olecranon bursitis. Our cases also showed the same past history, including repeated acupuncture, local anesthetic blocks and needle aspiration. Thus, the cause of septic bursitis in our cases is thought to be of the above listed needle procedure-related iatrogenic non-hematogenous origin.

It is an astonishing fact that about 20% of acute bursitis cases had a septic cause, though it was not clear whether those were due primarily to a hematogenous or non-hematogenous cause.²⁾

It seems essential to routinely have bursal aspirate culture and elbow radiographs at certain intervals to detect contiguous olecranon involvement in cases of relapsing bursitis with previous history of repeated needle procedures.²⁻⁴⁾

According to Ho and Tice,²⁾ distinguishing between a septic and aseptic inflammatory bursitis has been the subject of detailed study.

Septic bursitis is typically presented with fever alongside acute pain, diminished range of motion and tenderness to palpation at the olecranon bursa, erythema, parabursal cellulitis, warmth and swelling. Smith et al.⁴⁾ revealed that the skin over a septic bursa is almost 4°C warmer than over the non-septic contralateral extremity. However, these findings are not specific.

Non-infected bursal fluid typically reveals a low leukocyte count, usually $<1,000/\text{mm}^3$, with predominantly mononuclear cells. Bursal aspiration is crucial in the evaluation process of sepsis, and typically in the cases of sepsis, bacteria (Gram stain)

with a leukocyte count $>1,000/\text{mm}^3$ and 80% neutrophils is revealed.⁴⁾

Plain radiography is rarely useful in the evaluation of acute olecranon bursitis. However, in relapsing bursitis that lasts over three months, and in particular, as in our index cases above, the erosive bony change suggests the infectious etiology. Biopsy and cultures remain the gold standard for the identification of bacterial infection and therapeutic guideline.⁵⁾

It is plausible that this infection was introduced into the bursa in our patients via contaminated needles during bursal aspiration and pain blockage procedures. Development of olecranon osteomyelitis is thought to be extended from the initially unrecognized infected bursa.

It is concluded that septic olecranon bursitis can spread to the olecranon and induce osteomyelitis. Even under the most conservative management, in cases of painful, relapsing bursitis, the possibility of septic bursitis should be suspected as the first priority, and repeated cultures and radiographs should be obtained to rule out the septic nature of bursitis. It is thought that bursectomy and curettage of eroded olecranon are essential to eradicate the infected foci under the cover of antibiotics.

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