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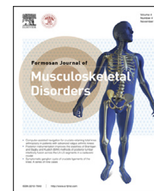

Case Report

Acute shoulder infection following acupuncture—A report of three cases

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ABSTRACT

Worldwide, acupuncture is a popular alternative medicine for releasing pain, treating diseases, or promoting health. Although it is generally considered safe, a few complications have been reported. These complications ranged from minor side effects, such as pain, local hematoma formation, or the aggravation of symptoms, to serious complications including mechanical injuries, such as pneumothorax and severe infection requiring surgical treatment. In orthopedic clinics, reports of complications caused by acupuncture are rare. We present three cases who developed severe infection following acupuncture, leading to irreversible osteoarthritic changes in their glenohumeral joints. All of them mentioned a history of acupuncture therapy before their shoulder became swollen and hot and no other infection source could be detected. Possible explanations included: (1) breakdown of the sterile technique; (2) no consensus of acupoint or how deep the needle should be inserted; (3) patient's comorbidities, such as diabetes mellitus or previous shoulder pathology, were not considered. Although these three patients underwent debridement and proper management with antibiotics according to the culture data, eventually, they still progressed to severe glenohumeral joint destruction. Strict infection control guidelines should be established to lower this type of life-threatening complication.
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1. Introduction

Shoulder pain is a common problem that generally leads to musculoskeletal morbidity,[1] and acupuncture is one of the common treatments used in Asia to relieve the associated discomfort. Acupuncture involves procedures inserting thin, metallic needles into specific areas, known as the acupoints, which are located in different parts of the body. Some authors attribute their effects to beta-endorphin release in the lumbar spine and increased 5-hydroxytryptophan levels in the cerebrum, while other authors suggest that acupuncture may override the pain signal transmission process in the central nervous system,[2] or that it may free the energy (Qi) that was blocked, promoting its circulation.[3]

Acupuncture is generally thought to be a safe procedure when performed by well-trained practitioners.[4] Recent reviews reported adverse events, ranging from needle site pain and local hematoma formation,[5] to more severe mechanical injuries, such as pneumothorax,[6] transmission of blood-borne infectious diseases, and deep soft tissue infections. The relationship between acupuncture and subsequent infectious complications raises significant concerns. A few articles reported a single case of septic arthritis[7,8] caused by acupuncture. In this article, we describe the first case series of acute shoulder infection complicating acupuncture, and advocate specific methods for infection control. Table 1 lists the treatment courses of the patients in our case series.

2. Case reports

2.1. Case 1

A 55-year-old woman with a long history of right shoulder pain had received one session of acupuncture for symptom relief. One week later, right shoulder swelling and erythematous changes had developed. She looked for help at several local clinics first, but in vain. She visited our outpatient clinic 45 days after her acupuncture therapy. Under the suspicion of inflammatory arthropathy, we arranged a series of examinations. Plain radiography revealed soft tissue swelling with inferior glenohumeral joint subluxation (Fig. 1A). Laboratory tests showed an initial white blood cell (WBC)

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Table 1
Demographic data and treatment courses of the three patients.

	Case 1	Case 2	Case 3
Age (y)	55	79	58
Sex	F	M	F
Underlying disease	Nil	DM	Nil
Acupuncture number	1	1	3
Interval (d)	7	8	8
Initial WBC (/μL)	16,180	16,040	9770
Initial CRP (mg/dL)	9.95	4.61	3.83
Debridement number	3	1	1
Pathogen	MRSA	MSSA	*H. parainfluenzae*
Antibiotic	Teicoplanin	Oxacillin	Unasyn
Final status	Hemi-shoulder arthroplasty	Being followed-up	Being followed-up
DASH score			
Before surgery	60	70	75
Currently	60 (31 mo)	60 (8 mo)	80 (7 mo)

DASH = disabilities of the arm, shoulder and hand; DM = diabetes mellitus; *H. parainfluenzae* = *Haemophilus parainfluenzae*; MRSA = methicillin-resistant *Staphylococcus aureus*; MSSA = methicillin-sensitive *Staphylococcus aureus.*

count of 16,180/μL with predominant neutrophils. The C-reactive protein (CRP) level was 9.95 mg/dL. Magnetic resonance imaging (MRI) studies found prominent abscess formation around the right shoulder joint (Fig. 1B and C). We performed open arthrotomy and debridement. Bacterial cultures obtained during the surgery yielded methicillin-resistant *Staphylococcus aureus* (MRSA). Intravenous teicoplanin (400 mg, once daily) was started according to the drug sensitivity tests. Due to persistent purulent discharge from the surgical wound, we performed repeated open debridements (three times). Her wound condition improved and no more swelling was noticed. Lab examination reported a normal WBC count and CRP level. We completed 4 weeks of intravenous teicoplanin and another 2 weeks of oral antibiotic therapy with rifampicin (300 mg daily) and fusidic acid (250 mg, 3 times daily). Although we did not find further swelling or local heat over her right shoulder during follow-up, a decreased range of motions developed. Right shoulder osteoarthritic changes with joint surface destruction were noted on plain X-rays (Fig. 1E). Due to the progressive degenerative changes in her shoulder which influenced her daily activities, and no signs of active infection clinically, we performed hemi-shoulder arthroplasty 16 months after her first shoulder operation (Fig. 1F). Her shoulder Disabilities of the Arm, Shoulder and Hand (DASH) score was 60 at her last 2-year follow up and no signs of infection were noticed.

2.2. Case 2

A 79-year-old man with diabetes mellitus presented with right shoulder swelling pain. Before visiting our hospital, he had suffered from right shoulder discomfort for months and had undergone one session of acupuncture therapy to ease his symptoms. However, right shoulder swelling, high fever and erythematous changes developed 8 days later. Laboratory data showed a WBC count of 16,040/μL and a CRP level of 4.61 mg/dL. MRI revealed shoulder joint capsule bone marrow enhancement, and intramuscular mass surrounding the biceps muscle. Under the impression of septic arthritis and pyomyositis, we performed open arthrotomy and debridement, and intraoperative bacterial culture yielded methicillin-sensitive *Staphylococcus aureus* (MSSA). Intravenous

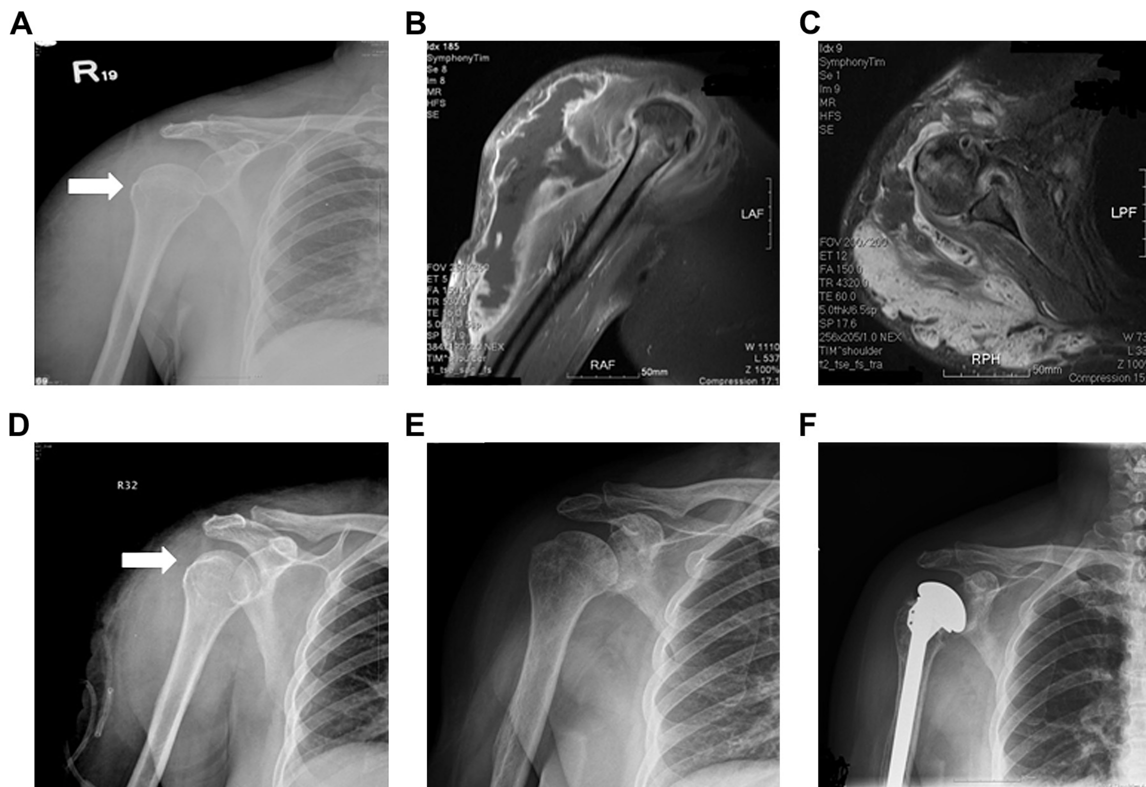

Fig. 1. Case 1. The 55-year-old female suffered from right shoulder septic arthritis following acupuncture. (A) Anteroposterior radiograph shows right shoulder subluxation (white arrow); (B) T1 coronal magnetic resonance imaging (MRI) view; (C) T2 cross MRI view shows huge soft tissue abscess formation; (D) postoperative anteroposterior radiography reveals spontaneous reduction of subluxation (white arrow); (E) anteroposterior radiograph taken 1 year after the episode. The glenohumeral joint shows sclerotic changes with subchondral cyst formation; and (F) anteroposterior radiograph of the right shoulder. The patient underwent shoulder hemi-arthroplasty 16 months later.

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