

## ***Staphylococcus aureus* SUBCUTANEOUS ABSCESS COMPLICATING ACUPUNCTURE: NEED FOR IMPLEMENTATION OF PROPER INFECTION CONTROL GUIDELINES**

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### SUMMARY

We report a case of *Staphylococcus aureus* subcutaneous abscess centered over the Jizhong acupuncture point (DU 6) which lies along the Du (Back midline) meridian after acupuncture at the corresponding acupuncture point for low back pain. The patient recovered after surgical debridement and drainage and 5 weeks of cloxacillin therapy. Among the 16 anecdotal case reports of pyogenic bacterial infections complicating acupuncture described in the English literature (MEDLINE Search 1996-2002), *S. aureus* was documented to be the causative agent in 9 (56%). Three patients had septic arthritis, 2 had chronic osteomyelitis, 2 had abscess formation, 1 had chondritis, and 1 had infective endocarditis. Five patients had *S. aureus* bacteremia. All patients who recovered required prolonged antibiotic treatment of 5-6 weeks, and 6 required drainage and/or debridement. Overall, 3 patients (30%) died. *S. aureus* causes significant morbidity and mortality in patients who receive acupuncture treatment. More resources should be spent on implementation of proper infection control guidelines, as the money lost due to prolonged hospitalization and medication would far exceed that used for implementation.

KEY WORDS: *Staphylococcus aureus*,  
acupuncture, infection control

## INTRODUCTION

Acupuncture has been gaining popularity as a form of alternative medicine in both Asian and Western countries for chronic pain, digestive disorders, allergic disorders, psychosomatic problems, menstrual disorders, and drug and alcohol rehabilitation. However, in most countries, the monitoring and control over the practice and its associated complications are far from adequate. Although infection control guidelines for acupuncture are available (Australian Acupuncture Association Limited, 1997), the implementation, especially in developing countries where acupuncture is very popular, is far from ideal. In the past, needles used for acupuncture were usually reused and often inadequately sterilized. Such inadequate disinfection has led to the transmission of infectious diseases from patient to patient. The best documented acupuncture transmitted microorganisms are the blood borne viruses, including human immunodeficiency virus, hepatitis B virus, and hepatitis C virus (Vittecoq *et al.*, 1989; Kent *et al.*, 1988; Wu *et al.*, 1993). Apart from blood borne infections due to patient-to-patient transmission, acupuncture can also be complicated by infections caused by pyogenic bacteria. Case reports of such bacterial infections as well as abscess formation without proven microbiological causes complicating acupuncture have been reported (Izatt and Fairman, 1977; Jones and Cross, 1980; Hadden and Swanson, 1982; Pierik, 1982; Lee and McIlwain, 1985; Gilbert, 1987; Spelman *et al.*, 1993; Garcia and Venkataramani, 1994; Kirschbaum and Rizzo, 1997; Chen *et al.*, 1997; Lau *et al.*, 1998; Matsumura *et al.*, 1998; Yazawa *et al.*, 1998; Ha *et al.*, 1999; Origuchi *et al.*, 2000). Recently, we described a novel clinical syndrome, acupuncture mycobacteriosis, in which the lesions caused by mycobacteria that are transmitted by acupuncture were meridian- and acupuncture point-specific (Woo *et al.*, 2001; Woo *et al.*, 2002).

In this article, we report a case of *Staphylococcus aureus* subcutaneous abscess transmitted by acupuncture. *S. aureus* infections complicating acupuncture are reviewed. Meridian- and acupuncture point-specificity of acupuncture

transmitted pyogenic bacterial infections and the need for implementation of proper infection control guidelines for acupuncture are discussed.

## CASE REPORT

A 73-year-old Chinese man was admitted in July 2001 because of back swelling for 3 months. He had had low back pain for 2 years, and had received over 10 sessions of acupuncture treatment for the pain for 2 months. Examination showed a 6 cm × 2 cm subcutaneous abscess at the back, with surrounding cellulitis, centered over the Jizhong acupuncture point (DU 6) which lies along the Du (Back midline) meridian (Figure 1A).

Plain radiographs of the thoracic spine showed osteoporotic collapse of T11. Hemoglobin was 12.0 g/dL, white cell count  $6.9 \times 10^9/L$ , and platelet count  $228 \times 10^9/L$ . The serum glucose and liver and renal function tests were within normal limits. Magnetic resonance imaging of the thoraco-lumbar spine showed collapsed T11, narrowing of the spinal canal, and a dumbbell-shaped subcutaneous abscess extending from T10 to T12 (Figure 1B and 1C). Surgical drainage and debridement of the abscess were performed.

Gram smear of the pus showed numerous white blood cells and Gram-positive cocci in clusters, which turned out to be methicillin sensitive *S. aureus*. The patient responded to a total of 21 days of intravenous cloxacillin followed by 14 days of oral cloxacillin, and was discharged after 26 days of hospitalization. He has remained asymptomatic up to the time of writing, 10 months after discharge.

## DISCUSSION

Acupuncture point- and meridian-specificity does not only occur in mycobacterial infections (Woo *et al.*, 2001; Woo *et al.*, 2002), but also in pyogenic bacterial infections, transmit-

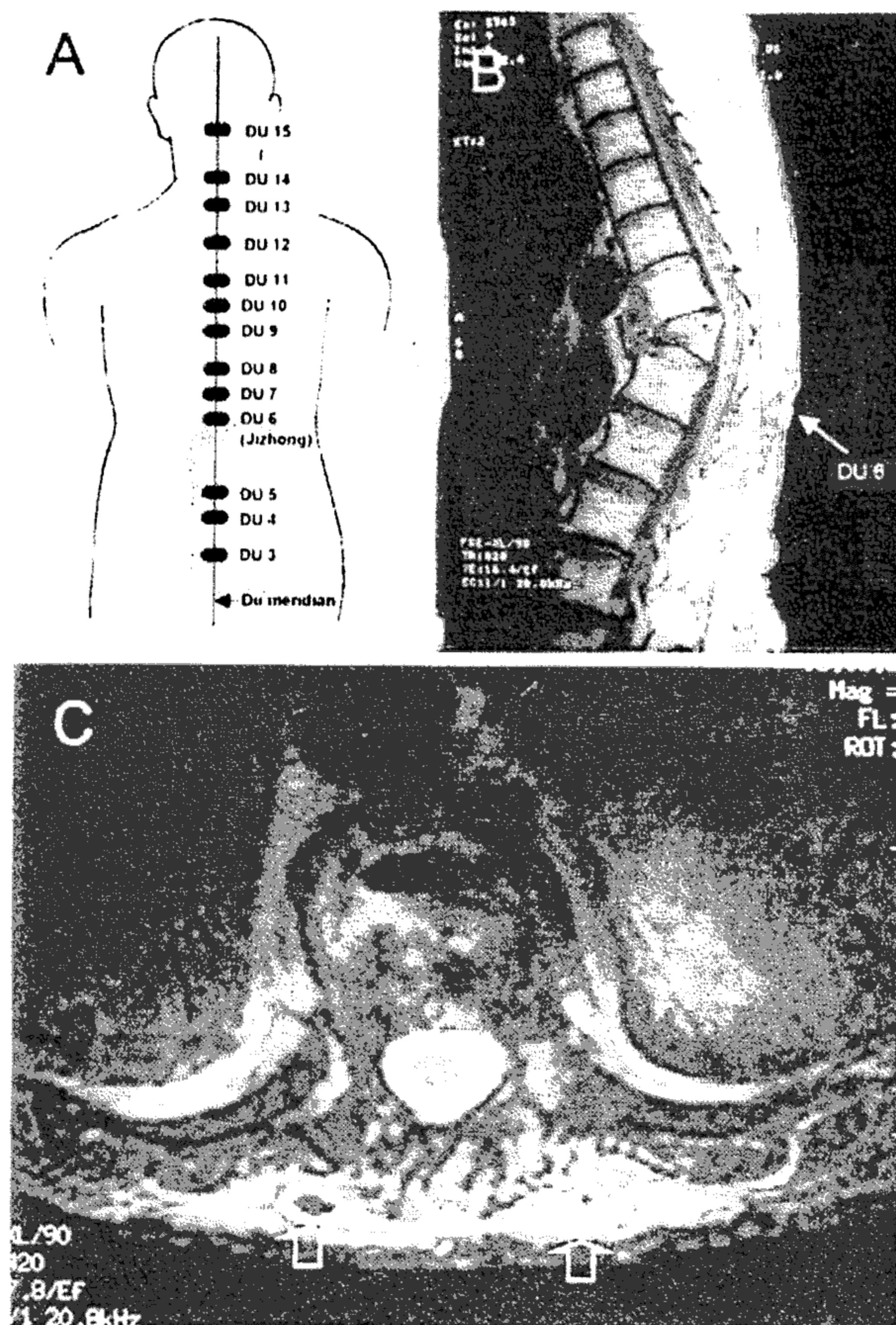


FIGURE 1 - Sagittal T<sub>1</sub>-weighted magnetic resonance imaging of the thoraco-lumbar spine (B) and axial T<sub>2</sub>-weighted magnetic resonance imaging at T12 level (C) after acupuncture at the DU 6 (Jizhong) acupuncture point along the Du meridian (A), showing collapse of T11 (\*) with a gibbous and a hyperintense, dumbbell-shaped subcutaneous abscess (open arrows) lying immediately superficial to the erector spinae muscles.

ted by acupuncture. One of the indications of acupuncture at the DU 6 acupuncture point is lumbar stiffness and pain, compatible with the history of the patient (Chen, 1995). Acupuncture at this acupuncture point requires insertion of the acupuncture needle at the space below the spinous process of T11 and puncture upwardly and obliquely to a depth of 0.5-1 inch. This is in line with the localization of the abscess.

Among the 16 anecdotal case reports of pyogenic bacterial infections complicating acupuncture described in the English literature (MEDLINE Search 1996-2002), *S. aureus*

was documented to be the causative agent in 9 (56%) (Izatt and Fairman, 1977; Jones and Cross, 1980; Hadden and Swanson, 1982; Pierik, 1982; Lee and McIlwain, 1985; Spelman *et al.*, 1993; Garcia and Venkataramani, 1994; Kirschenbaum and Rizzo, 1997). The epidemiology, clinical diseases, treatment, and outcome of these 9 cases and the present case are summarized in Table 1. Cases have been reported from both developing and developed countries in America, Europe, Asia, and Australia. The male to female ratio was 1:1. The median age of the patients was 57.5 (range 20-76). Nine of the 10 patients received acupuncture treatment for chronic pain, including rheumatoid arthritis in 3 (cases 4, 5, and 7), low back pain in 3 (cases 3, 8, and 10), knee pain in 1 (case 1), foot pain in 1 (case 2), and shoulder pain in 1 (case 9). Three patients had septic arthritis (cases 4, 5, and 9), 2 had chronic osteomyelitis (cases 2 and 3), 2 had abscess formation (cases 8 and 10), 1 had chondritis (case 6), and 1 had infective endocarditis (case 7). Five patients (50%) had *S. aureus* bacteremia (cases 1, 4, 5, 6, and 7). All patients who recovered required prolonged antibiotic treatment of 5-6 weeks, and 6 of the 10 patients required drainage and/or debridement. Overall, 3 of the 10 patients (30%) died.

The emergence of acupuncture transmitted infections is of great concern. Blood borne viruses, including hepatitis B virus, hepatitis C virus, and human immunodeficiency virus, transmitted by acupuncture have been well described. Acupuncture transmitted mycobacterial infections caused by *Mycobacterium chelonae* and *Mycobacterium nonchromogenicum* with reduced susceptibility to alcohol killing and acupuncture transmitted pyogenic bacterial infections are emerging problems. Since the acupuncture points are often situated 1-2 inches beneath the skin, contaminated needles or improperly disinfected skin will easily result in deep-seated infections that often require a long course of antibiotic treatment, surgical drainage, and prolonged hospitalization. Depending on the site and depth of acupuncture, the infections can be associated with serious complications such as septicemia, psoas ab-

TABLE 1  
Staphylococcus aureus infections complicating acupunctures

Case number	References	Country	Sex/Age	Reasons for acupunctures	Diagnosis	Treatment	Outcome
1	Izatt & Fairman, 1997	United Kingdom	M/66	Osteoarthritis of knees	Bacteremia with disseminated intravascular coagulation	Ampicillin, cloxacillin for 6 weeks	Remission
2	Jones & Cross, 1980	Korea	F/23	Foot pain	Chronic osteomyelitis	Keflin, then dicloxacillin for 6 weeks	Remission
3	Hadden & Swanson, 1982	United Kingdom	M/20	Low back pain	Chronic osteomyelitis	Cephadrine for 6 weeks	Remission
4	Pierik, 1982	Poland	F/58	Rheumatoid arthritis	Septic arthritis, bacteremia	Surgical drainage, antibiotics	Died
5	Pierik, 1982	Poland	F/57	Rheumatoid arthritis	Septic arthritis, abscess, bacteremia	Methicillin, arthrotoomy, drainage of abscess	Died
6	Lee & McIlwain, 1982	United Kingdom	F/56	Quit smoking	Auricular chondritis, infective endocarditis, bacteremia	Ampicillin, flucloxacillin then floxapen, netilmicin for 6 weeks, surgical debridement	Remission
7	Spelman <i>et al.</i> , 1993	Australia	F/61	Rheumatoid arthritis	Infective endocarditis, bacteremia	Flucloxacillin, rifampicin	Died
8	Garcia & Venkataramani, 1994	USA	M/49	Low back pain	Psoas abscess	CT-guided drainage, nafcillin, then dicloxacillin for 6 weeks	Remission
9	Kirschenbaum & Rizzo, 1997	USA	M/76	Shoulder pain	Septic arthritis	Debridement, partial synovectomy, surgical drainage, oxacillin for 6 weeks	Remission
10	The present case	Hong Kong	M/73	Low back pain	Subcutaneous abscess	Surgical drainage, debridement, cloxacillin for 5 weeks	Remission

cess, and even death. Although the relatively shallow puncture in the present case resulted in a relatively superficial abscess, surgical debridement and intravenous antibiotics and hospitalization of over 3 weeks were necessary for its cure. Although infection control guidelines for acupuncture are available in developed countries, they are generally not available in developing countries. Furthermore, the implementation of such guidelines, even in developed countries, is far from ideal. The case reported here is just the tip of the iceberg of a global emerging problem. We advocate that more resources should be spent on implementation of proper infection control guidelines, as the money lost due to prolonged hospitalization and medication would far exceed that used for implementation.

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