Case Report

Journal of Behavioral Health
www.scopemed.org
DOI: 10.5455/jbh.20160416013431

Deep neck abscess with mediastinum involvement following acupuncture: A case report

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Received: March 02, 2016
Accepted: April 09, 2016
Published: April 16, 2016

ABSTRACT

Traditional acupuncture is a growing modality of treatment worldwide. However, various acupuncture-related adverse effects had been reported. We report a case of deep neck abscess involving mediastinum following acupuncture. A 56-year-old immunocompromised gentleman developed extensive neck abscess with mediastinum involvement and inflammatory aortitis following acupuncture for shoulder pain. *Staphylococcus aureus* was isolated from the abscess culture. Surgical drainage with systemic antibiotic admission resulted in a good clinical recovery and resolution of infection.

KEY WORDS: Acupuncture, extensive neck abscess, mediastinum involvement, inflammatory aortitis

INTRODUCTION

Traditional acupuncture originated in China approximately 2000 years ago for treatment of variety conditions including chronic pain, nausea, and headache. Throughout decades, the practice of acupuncture is increasingly used not only in traditional eastern medicine but also in the western country. Acupuncture involved needling insertion, moxibustion thermal stimulation, or cupping techniques at acupuncture points. Adverse effect of acupuncture can be broadly classified into three categories: (1) Organ and tissue injuries, (2) infection, and (3) others such as allergic reaction. Infections were still the major complication of acupuncture, caused by skin contact at acupuncture points. However, when conducted under well-controlled conditions, the serious adverse effect from acupuncture can be prevented.

CASE REPORT

A 56-year-old gentleman, with multiple underlying co-morbidities, presented with 1-week history of left neck and anterior chest wall swelling following acupuncture therapy. He had underlying diabetes mellitus, hepatitis B, and end-stage renal failure secondary to polycystic kidney disease and was on regular hemodialysis.

1 week before presentation, he had sudden left shoulder pain with difficulty to lift up left upper limb. There was no prior trauma or fever. Treatment was sought at a Chinese traditional clinic where twice acupuncture therapy was performed at left neck and shoulder. Despite no resolution of pain, he developed left neck and anterior chest swelling which was increasing in size. He also had a low-grade fever and further reduction of left shoulder range of movement.

On physical examination, there was palpable swelling with size of 7 cm × 3 cm over left sternocleidomastoid muscle, extending downward involving left anterior chest wall. Overlying skin was erythematous, warm, and tender on palpation. ENT examination showed no upper airway obstruction. Total white count was minimally raised of 13.2 × 10/L with neutrophils predominant. Computed tomography (CT) neck and thorax showed extensive intramuscular collection involving the left sternocleidomastoid and left pectoralis muscle with intrathoracic extension where there is thickening of aortic wall at the arch of aorta which is suggestive of inflammatory aortitis [Figures 1 and 2]. Expert opinion was sought from cardiothoracic team to rule out complication of the infected aortic aneurysm. However, there was no clinical sign and imaging was not suggestive of aortic aneurysm.

He was admitted and started on intravenous co-amoxiclav and metronidazole. Hemodialysis was continued and blood sugar controlled with insulin. Incision and drainage of left neck abscess was performed. There was multiloculated abscess along

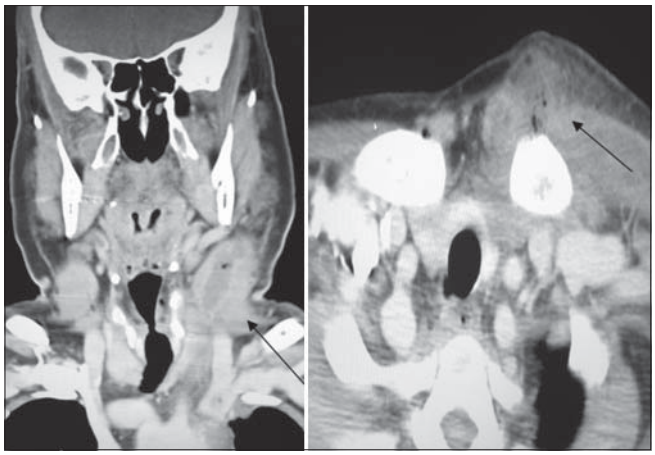

Figure 1: Coronal (left) and axial view (right) of computed tomography neck and thorax showed multiloculated collection and air pockets within the whole length of left sternocleidomastoid muscle and extending into left pectoralis major muscle

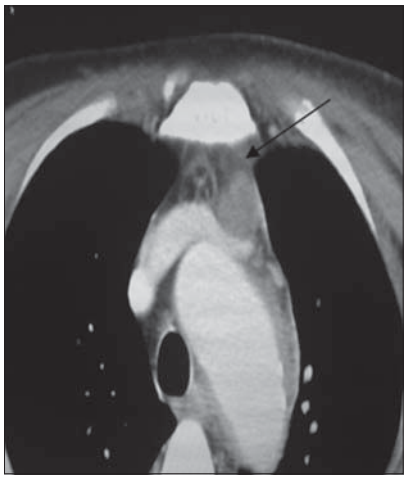

Figure 2: Axial view of computed tomography thorax showed anterior mediastinum retromanubrium intrathoracic extension of the collection with air pocket within and abutting the aortic wall

the left sternocleidomastoid muscle which tracked downward into the left anterior chest wall at the level of the clavicle. The abscess collection over anterior chest wall was drained through the same extended incision. Around 20 ml of pus was drained and *Staphylococcus aureus* was cultured. The patient responded well to antibiotic and on regular dressing after surgical drainage. Neck wound was closed with secondary suturing 2 weeks later. Repeated CT neck showed resolving intrathoracic extension but with localized osteomyelitis of the medial end of clavicle and manubrium. However, the patient was asymptomatic and well.

DISCUSSION

Acupuncture is a form of traditional Chinese medicine that is used to treat the patient with various conditions such as chronic pain, headache, and even malignancy by inserting thin, solid, metallic needles into the skin at very specific point of the body. Acupuncture originated in China 2000 years ago and is recognized by the World Health Organization.

In a 12-year systemic review, 294 adverse effects from 25 countries and regions were reported associated with acupuncture [1]. Acupuncture has low rate of adverse effect and serious adverse effects seem to be rare with the regulation of acupuncture practice. Majority adverse effects of acupuncture still remain as infections followed by organ and tissue injuries. Hepatitis cross-infections due to reused needles were once the most frequent source of infection. Trend of infection, however, had changed from hepatitis infection to mycobacterium and staphylococcus infection through the introduction of disposable needles [1]. Other organisms being reported include *Escherichia coli*, *Pseudomonas*, *Klebsiella*, and *Clostridium* species.

In this case, the patient was an immune compromised patient with diabetes mellitus and kidney failure. This put the patient at higher risk of developing an infection. Furthermore, sterility of the acupuncture clinic remains questionable. Through the insertion of an acupuncture needle, organism was inoculated from skin into the subcutaneous tissue and locally spread to the sternocleidomastoid muscle. Thus, pus culture grew *S. aureus*, which is a normal flora of the skin. Deep neck infections descend to the mediastinum through the retropharyngeal space (71% of cases) or the carotid sheath (21% of cases) [2].Infection spread to the mediastinum is facilitated by gravity and negative intrathoracic pressure during respiration [3].

Deep neck infection is a serious and life-threatening clinical condition. Mortality of deep neck infection is as high as 40-50% [4]. Deep neck infection can cause respiratory obstruction, mediastinitis, pleural empyema, pericarditis, major venous thrombosis, and septic shock. With contrast enhanced CT imaging, early detection and treatment can help to reduce mortality from deep neck infection [5]. Surgical intervention remains the mainstay treatment for deep neck infections. Abscesses more than 3 cm in diameter involve prevertebral, anterior visceral, or carotid spaces or that involve more than two spaces should be surgically drained [6].

Infectious aortitis is an infectious and inflammatory process of the aortic wall induced by microorganisms. The most common pathogens, which account for almost 40% of infections, include *S. aureus* and *Salmonella* species [7]. Mechanisms of infection include hematogenous spread, contiguous seeding from adjacent infection, and traumatic or iatrogenic inoculation. In this case, the mechanism of infection is due to adjacent spread of infection. An infected aortic aneurysm is a consequence of infectious aortitis that ultimately disrupts the vessel wall, creating pseudoaneurysm. The infected aortic aneurysm is infrequent, with a documented prevalence of 0.06-2.6% among all aneurysms [8]. Medical treatment combined with surgery carries a better prognosis. Surgical débridement and revascularization should be completed early because delay may lead to aneurysm rupture, which increases mortality.

Drainage and debridement of the deep neck abscess must be performed to eliminate the source of infection. The transcervical approach is the most commonly used approach but it provides limited access to the mediastinum [6]. In a more advanced infection, a maximum chance of cure is to proceed with thoracic

drainage and debridement. This patient, however, responded well with only cervical drainage and systemic antibiotic. Thus, thoracic drainage was not performed. Follow-up CT scan showed good recovery and resolved mediastinitis.

CONCLUSION

Hygienic clinical settings, sterilized equipment, and clean supplies are critical for preventing infections not only in western medicine but also in traditional medicine. Although serious adverse effect associated with acupuncture are rare, the risk of infection exists. Meticulous sterility and adequate training in biomedical knowledge such as anatomy and microbiology played a critical role in minimizing the number of adverse effects from acupuncture.

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Source of Support: Nil, Conflict of Interest: None declared.