

Case Report



A Pericatheter Abscess Following Acupuncture in a Patient With VP Shunt

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Conflict of Interest

The author has no financial conflicts of interest.

ABSTRACT

We report a rare case of pericatheter abscess formation after scalp acupuncture in a 25-year-old woman who had a history of meningitis and hydrocephalus, which were treated using ventriculoperitoneal shunt placement at the age of 5 years. Prior to the current hospitalization, the patient received acupuncture therapy for a subgaleal hematoma. Clinical and laboratory examinations revealed a retained catheter and an associated abscess in the lateral neck. The abscess was immediately treated with radical debridement, washing of the cavity, and removal of the implant. Culture studies of the pus drainage yielded *Staphylococcus aureus*. The patient recovered well after active antibiotic treatment. Considering the increasing application of this alternative medicine modality by practitioners, careful interventions are required to minimize acupuncture-related infections and other serious complications.

Keywords: Acupuncture; Head trauma

INTRODUCTION

Acupuncture has been widely accepted as part of the treatment plan by the public in many countries. It is primarily used for the patients with various conditions which cause acute and chronic pains. However, a plethora of reports regarding complications associated with acupuncture have been demonstrated in the relevant literature.^{1,19)}

A shunt abscess associated with acupuncture in a healthy one which involved the neck has not been evaluated to date. The author experienced a pyogenic infection of the tube remnant in the neck following acupuncture for scalp contusion in a shunted woman. The need for aseptic technique for this traditional treatment is stressed and the reported literature on its adverse events is briefly reviewed.

CASE REPORT

A 25-year-old female with fever and neck pain was hospitalized to university-based hospital. The past history revealed the presence of hydrocephalus and meningitis, occurring 20 years

before coming to the emergency department. She recovered well after inserting VP shunt of the silicone catheter, and was not followed up afterwards.

Four weeks earlier, she had a blunt injury to the parietal eminence. There was no break in the skin (**FIGURE 1A**). While the hematoma fluctuated during the resolution stage, she visited a Korean traditional medicine clinic. The hemorrhagic fluid under the scalp was evacuated several times by acupuncturist. Her last procedure was done 5 days prior to this admission. Subsequently, our patient began to experience a pain and lump over the tube insertion in the left lateral neck.

Besides high fever over 39°C, she was hemodynamically stable, and neurologically unremarkable. An elongated mass was palpated along the medial border of the sternocleidomastoid muscle. The overlying skin was significantly distended and congested. There was no pain and fluid collection in the involved scalp. She had no distant infectious process such as dental caries, sinusitis, or otitis. The septic profiles showed increased C-reactive protein and white blood cell counts. Blood culture result was positive for with *Staphylococcus aureus* and cerebrospinal fluid (CSF) was sterile.

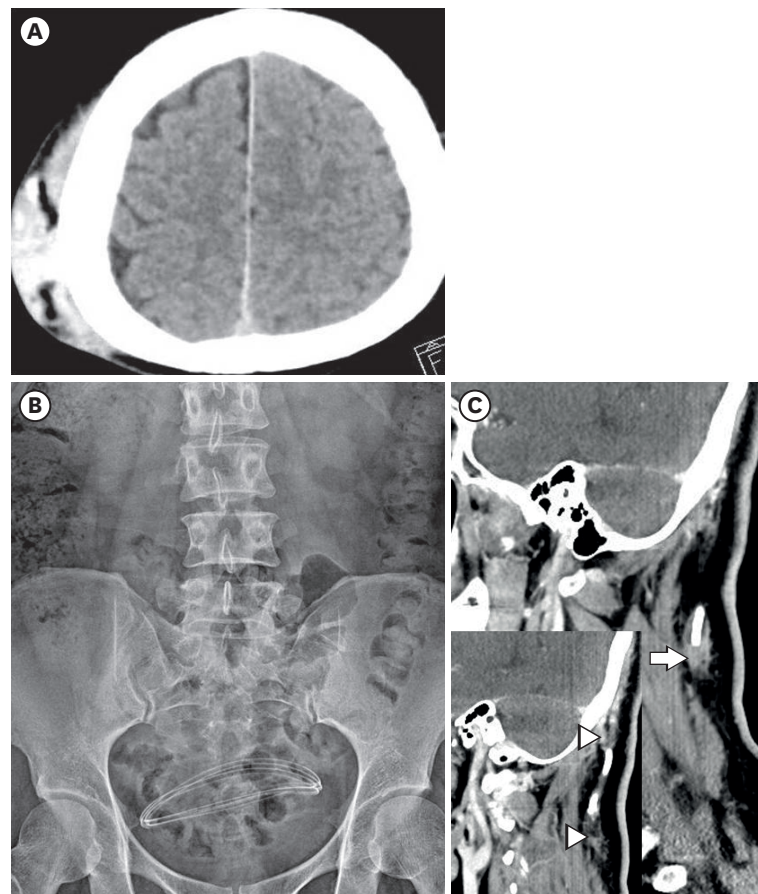


FIGURE 1. Pericatheter abscess after scalp acupuncture. (A) There is a scalp swelling and bleeding in the parietal region. (B) X-ray demonstrates intra-peritoneal positioning of the disconnected distal shunt tubing. (C) The tip of the residual tube fragment is embedded in an abscess cavity on sagittal section of computed tomography (arrow). The inset shows a smooth-walled, enhancing mass, spreading along the route of the previously implanted catheter in the posterior lateral neck (arrowheads).

X-ray showed the coiling of distal tube into the pelvic space (**FIGURE 1B**). Neck computed tomography (CT) revealed a well-enhanced and tubular structure, circumferentially surrounding the route of the catheter, suggesting an abscess. The calcified and fragmented tube entering the fluid-filled cavity was also delineated (**FIGURE 1C**). No signs of abnormalities were noted on CTs scanned the chest and abdomen-pelvis.

An emergent operation was performed to clean out the infected mass invading the suboccipital and cervical regions. A considerable amount of pus expressed from the subcutaneous track. As the surgeon exposed the shunt valve, no CSF leaking was observed. The decision was made to remove the nonfunctional reservoir and the ventricular catheter. A radical debridement, extract of infected implant, and washout of the abscess cavity were done. The catheter was fragmented and densely encrusted with mineral deposits. Culturing of the aspirated pus yielded *S. aureus*. The patient started ampicillin/sulbactam therapy leading to complete recovery.

DISCUSSION

The undesirable effects are enumerated in the patients who have got acupuncture. The literature has reported that up to 20% of the procedures were complicated with injury to the internal organs, tissues, vessels, or neural systems.⁸⁾ The most serious events were bruise, pneumothorax, cardiac rupture, hemoperitoneum, cerebral hemorrhages, and spinal cord injury.¹²⁾ The occurrence of these alarming accidents has been owed to the improper techniques for the clinical acupuncture operations. More educations for anatomy, pathophysiology, and technique need to be done for monitoring and minimizing the risks related to the therapy. In addition, the needling has been associated with transmission of many infectious agents.⁹⁾ Therefore, the sterilized equipments, hygienic settings, using disposable needles, and clean medical supplies are essential to prevent future procedure-related infections.

Localized collection of pus at the tubing site is a very rare entity, so that the available knowledge is based on the case observations only. The victims succumbed to the abscess of the pelvis, the abdomen, and the brain and their consequences, secondary to incompletely treated shunt tract infection.^{4,15)} Also, the suitable characteristics of the hosts may potentiate this rare complication of VP shunt surgery. There are some conditions susceptible to infection such as liver cirrhosis, diabetes, alcoholism, obesity, renal failure, steroid therapy, cancer, drug abuse, tuberculosis, and valve heart disease.^{6,17)} For the illustrated case, the source of cervical abscess considered as *S. aureus* infection subsequent to several acupuncture sessions. Reportedly, acupuncture point of the head became infected most frequently, because the hairs make it difficult to carry out the sterile procedures. An aged catheter served as a nidus for the bacterial colony that spread hematogenously from a puncture point. The microbiology results of her blood culture corresponded to that of aspirated pus obtained at the neck exploration.

Clinical pictures of infection and suggestive changes on the imaging are clues for diagnosing the pericatheter abscesses in the shunted patient.¹³⁾ If a history of recent needling to the symptomatic area or at a remote site is obtained, a high index of suspicion should be maintained and then appropriate examinations are performed to establish the diagnosis of abscess. For ours, the cause of cervical abscess was presumed when she expressed the recent

use of acupuncture for relieving the scalp swelling. As demonstrated in this report, contrast-enhanced CT is the first-line imaging method in confirming the diagnosis and determining the strategies for cervical pathologies. When regarding the underlying etiologies mimicking a pyogenic abscess, the differentiation includes inflammatory, congenital, and neoplastic subgroup in adults with head and neck masses.³⁾

In the prior studies, the author found the majority of infections to be bacterial, caused by the normal flora of the skins at the acupuncture sites.²⁰⁾ The isolate from blood or tissue cultures is most often monobacterial. They were usually staphylococcus, streptococcus, mycobacterium, and other gram-negative bacilli for those with skin and soft tissue infections.¹⁰⁾ As confirmed in our patient, *S. aureus* is the most frequently encountered organism in the acupuncture clinics. In recent years, an emerging of methicillin-resistant *S. aureus* is another worrying problem.¹⁸⁾ Mycobacterium plays an important role as a responsible pathogen on the outbreak associated with poor sterilization of equipments.¹⁾ Pathogenic gram-negative bacilli include *Klebsiella pneumoniae*, *Escherichia coli*, *Serratia marcescens*, *Pseudomonas aeruginosa*, *Listeria monocytogenes*, *Bacteroides fragilis*, and *Fusobacterium varium*.^{9,12)} The mechanism of bacterial inoculation might be the translocation of these causative pathogens from other organs caused by the puncture needles overlying other anatomic structures.

As advocated, optimal management of a retained catheter should be individualized to the patient's presentation, symptoms and signs, and their needs. For those of an infected shunt fragment, the rapid and correct treatment is mandatory to avoid the lethal consequence such as deep abscess and septic shock.^{4,6,15)} In groups with functioning shunts, an external ventricular drain should be changed to a shunt in a new location, when CSF is aseptic on repeated culturing and the abscess appears resolved on the images. As a rule, managing the pericatheter abscess requires removal of the retained instrument, decompression with evacuating the suppuration, copious irrigation, and intravenous antibiotics.¹⁷⁾ When possible, chemotherapy for the abscess should be tailored to the antibiotic susceptibilities of the individual bacteria in question. However, though identifying the organisms allows for targeted antibiotic treatment, no offending pathogens were isolated from the cultures in 14%–55% of cases with acupuncture-related infections.^{1,9,12,18)} Previous researches on this topic recommend that holding the therapy until blood or tissue cultures are performed to increase the probability of a targeted therapy, unless the patient is unstable.^{8,19)} Practically, when pathogen is not established, the empiric antibiotic combination of ceftriaxone and vancomycin, is often the first line of antibiotic therapy.²⁰⁾ If there is no response to the initial therapy, medical treatment should be changed by a specialized cooperation with department of infectious disease.

Images for this case depicted a calcified sleeve around the shunt disconnection in the neck. The abnormal calcification indicates degeneration and cracking, fibrosis and granuloma formation, and tethering of the distal tubing.¹⁴⁾ This phenomenon was observed predominantly on the exoluminal surface within an average of 10 years after initial VP shunt placement.^{14,16)} Nearly all fracturing were at or adjacent to the calcifications, predominantly at the neck and upper chest wall, where the catheter was subject to continuous biomechanical stress.⁵⁾ Tubing discontinuation is the second most common cause of mechanical failure in growing children; therefore it must be inspected during routine follow-ups.²⁾ They also can manifest discomforts over the shunt track and limitation of the neck motions. The present case tolerated a calcification and breakage of the shunt over 20 years until she got a pericatheter abscess. This kind of unfortunate complications might be observed more frequently, with increasing longevity following successful VP shunt surgery.

It is well-known that the silicone tubes that aseptically placed are inert and hardly cause the tissue reactions in the hosts.¹¹⁾ The incidence of infection and meningitis is low even if the shunt catheter is left in place.^{4,7)} Notwithstanding, closer interval follow-up or early intervention should be indicated in the patients found to have the calcifications of the shunt catheter. In this sense, our case emphasizes the point that the retained tube fragments should be removed whenever possible during the revisions for shunt implantation. The retained old catheters in the ventricle, neck, chest, abdomen, and pelvis are often encountered in those with lifelong shunt-dependency who underwent revision operations.⁷⁾ Unlike this case, for those in which the ventricular tube adherent to the choroid plexus, it would be rationale to leave the catheter due to the risk of life-threatening hemorrhage. But, in terms of distal system, the long segment of subcutaneously retained tubes could be totally withdrawn through the minimized incisions perpendicular to the line of the subcutaneous tract, even for the patients similar to ours where years and decades have gone between the revisions.

CONCLUSION

An old case of VP shunt developed a bacterial abscess around the retained implants in the neck following acupuncture for scalp trauma. The report raises awareness of such condition and hazard of this old-fashioned alternative treatment which gained popularity worldwide.

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