침 치료 후 사춘기 여아에게서 발생한 기흉

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Pneumothorax secondary to acupuncture in an adolescent girl

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Although acupuncture is a form of traditional Chinese medicine that is gaining popularity and usage in children, the relevant complications are rarely reported. We present a case of 17-year-old girl who underwent acupuncture. The girl visited the emergency department with chest pain and dyspnea on the day after receiving the acupuncture. A chest radiograph showed a left-sided pneumothorax. She was hospitalized for observation and supplemental oxygen, and improvement was noted on follow-up radiograph. She continued to follow up in the outpatient clinic until complete resolution of the pneumothorax. Raising awareness of the potential complications of acupuncture is crucial to aid in patient education and establishment of safety guidelines.

Key words: Acupuncture; Adolescent; Iatrogenic Disease; Pediatrics; Pneumothorax; Complication

Introduction

Acupuncture is a primary therapeutic technique used in traditional Chinese medicine. It refers to the stimulation of specific pressure points along the body

surface with heat, pressure, or insertion of thin needles¹. In our review of the literature, acupuncture-related complications are rarely reported, particularly in children. The rare reports are usually by the clinicians managing the complications rather than the acupuncturists. One study found that only 20% of reports were authored by the acupuncturists who performed the procedures causing the adverse events². Because acupuncture is gaining popularity and usage among children, raising awareness of the potential complications is crucial. Reporting complications contributes to education, recognition, and establishment of safety guidelines for this alternative therapy in children. We report a case of iatrogenic pneumoth-

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orax, a potentially life-threatening complication, after acupuncture in an adolescent girl. Written informed consent was obtained from the patient and her family to publish this case and her radiograph.

Case

A 17-year-old girl underwent a back massage and her first acupuncture session. Two hours later, the girl began experiencing chest pain and dyspnea, which persisted despite taking nonsteroidal anti-inflammatory medications. She also experienced palpitations as well as pain radiating down her left arm. These symptoms persisted the next day, thus she presented to the emergency department (ED).

On physical examination, she looked well and was not in respiratory distress. Initial vital signs were as follows: blood pressure, 117/82 mmHg; heart rate, 82 beats/min; respiratory rate, 20 breaths/min; tem-

perature, 37.2°C; and oxygen saturation, 100% on room air. Initial electrocardiogram was normal. On auscultation, there was decreased air entry on the left side and the girl reported pain with inspiration. The remainder of the examination was normal.

A chest radiograph showed a left-sided pneumothorax (Fig. 1). She was placed on supplemental oxygen via nasal prongs and hospitalized to the pediatric surgical ward for observation. Given the hemodynamic stability and small size of the lesion, needle aspiration or tube thoracostomy was not necessary. A repeat radiograph was performed the next morning, which showed some improvement of the pneumothorax but not complete resolution. She was discharged with a follow-up appointment in 1 week.

At 1-week follow-up, the girl remained mildly symptomatic with some chest discomfort. Her chest radiograph demonstrated a persistent, small apical pneumothorax. She was subsequently seen at 4-week follow-up where she was asymptomatic and her radiograph showed complete resolution of the pneumothorax.

Fig. 1. Chest radiograph on presentation showing a small left-sided pneumothorax. The arrow indicates the visceral pleura.

Discussion

Acupuncture has gained popularity in many parts of the world, including high-income countries. In Canada, the Fraser Institute in 2016 reported that 11% of children had used acupuncture³. This procedure has been increasingly used to treat a variety of pediatric medical conditions including tic disorder, pain, attention deficit hyperactivity disorder, autism spectrum disorder, asthma, vomiting, myopia, nocturnal enuresis, and cerebral palsy⁴. While treatment with acupuncture for many of these conditions is controversial, studies have shown clinical improvement for cerebral palsy, tic disorder, amblyopia, pain, and nocturnal enuresis⁴.

Although acupuncture is generally considered safe with properly trained personnel¹, several adverse events have been reported. They can be mild, such as crying, pain, and bruising, or serious, including nerve impairment, hemoptysis, and pneumothorax.

The overall incidence of any adverse event in children was reported as 11.8% in the systematic review by Adams et al¹⁾. Of note, the majority of these events were mild, with only 1 patient reported to have a pneumothorax¹⁾. Another review included 1,865 children and estimated the risk of adverse events to be 1.55/100 treatments and serious adverse events to be 5.36/10,000 treatments⁵⁾. To our knowledge, 5 fatalities from acupuncture in children have been reported: a 9-year-old who died from cardiac rupture⁶⁾, a 2-year-old who died from pneumothorax⁷⁾, a 5-year-old who died from subarachnoid hemorrhage⁸⁾, a 15-year-old who died from subarachnoid hemorrhage⁹⁾, and a 2-year-old who died of tetanus¹⁰⁾.

Pneumothoraces may be asymptomatic, but if they are large enough, children commonly complain of dyspnea and pleuritic chest pain. On physical exam, children may have decreased breath sounds and hyperresonant percussion. In more severe cases, they may have tachypnea, cyanosis, and signs of increased work of breathing. Chest radiography can confirm the diagnosis with the presence of air between the visceral and parietal pleura. Children with pneumothorax should be referred to EDs. Depending on the size of the lesion and the clinical condition of the child, treatment may be conservative with supplemental oxygen therapy and observation, or the child may require needle aspiration or tube thoracostomy. Children with tension pneu-

mothorax, which is suspected initially with tachycardia, hypotension, cyanosis, and a deviated trachea, require emergency needle aspiration followed by tube thoracostomy.

Although rare in children, pneumothorax is a known complication of acupuncture, and has led to at least 1 pediatric death⁷⁾. With the growing number of children utilizing acupuncture and other complementary medicine modalities, it is important to obtain this information as part of any clinical history. If a pneumothorax is suspected, obtain a chest radiograph and refer to EDs if confirmed.

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Conflicts of interest

No potential conflicts of interest relevant to this article were reported.

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References

1. Adams D, Cheng F, Jou H, Aung S, Yasui Y, Vohra S. The safety of pediatric acupuncture: a systematic review. *Pediatrics* 2011;128:e1575-87.
2. Zhang J, Shang H, Gao X, Ernst E. Acupuncture-related adverse events: a systematic review of the Chinese literature. *Bull World Health Organ* 2010;88:915-921C.
3. Esmail N. Complementary and alternative medicine: use and public attitudes 1997, 2006, and 2016. Vancouver: Fraser Institute; 2017.
4. Yang C, Hao Z, Zhang LL, Guo Q. Efficacy and safety of acupuncture in children: an overview of systematic reviews. *Pediatr Res* 2015;78:112-9.
5. Jindal V, Ge A, Mansky PJ. Safety and efficacy of acupuncture in children: a review of the evidence. *J Pediatr Hematol Oncol* 2008;30:431-42.
6. Ye TG. Death caused by acupuncture needle piercing the heart. *J Tradit Chin Med* 1956;8:433-4.
7. Du JY. Report of 10 cases of pneumothorax caused by acupuncture. *Central Plains Med J* 1981;2:22.
8. Liu ZH, Xia HP, Liu JS, Dai ZW. Analysis of 12 cases of subarachnoid hemorrhage after acupuncture at nape acupoints. *People Mil Surg* 1984;12:51-2.
9. Zhou JW. Once case of death after acupuncture Feng-chi. *J Sichuan Trad Chin Med* 1988;10:52.
10. Yang BS, Wu Y, Wang LY, Xu YX. One case about tetanus caused by needling in Ex-UE19. *Chin Community Dr* 1990;2:31.