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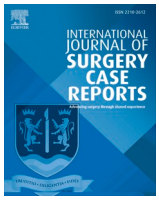

Case report

Axillary massage induced lateral thoracic artery pseudoaneurysm rupture: Case report

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ABSTRACT

Introduction and importance: Massage is a form of health care, but incorrect techniques can potentially harm the human body (Qin et al., 2023 [1]). While there have been no reported cases of lateral thoracic artery pseudoaneurysm and rupture induced by axillary massage, it is important to further explore how to address and prevent such potential risks.

Case presentation: This case study highlights a rare occurrence where a 61-year-old female patient experienced a lateral thoracic artery pseudoaneurysm and ruptured as a result of an axillary massage. The patient, self-taught in Chinese medicine and massage, regularly rubbed the Jiquan points in her armpits to promote heart health, with each session lasting 30–60 min for two years. She presented with symptoms such as dizziness, palpitations, left armpit pain, and oedema, leading to her admission to a nearby hospital. Despite receiving blood transfusions, her symptoms did not improve, necessitating her to refer to our hospital. A CT angiography scan of her upper limb arteries revealed the presence of a left lateral thoracic artery pseudoaneurysm and rupture, resulting in subcutaneous hematoma in the left axilla, chest, and back. Following angiography, successful embolisation was performed. Three months after surgery, the patient regained full mobility and was free from pain in her left upper limb.

Clinical discussion: The armpit region contains a high concentration of nerves and blood vessels, making it crucial to have a thorough understanding of its anatomy and to use precise massage techniques. Damage to the axillary arteries can result in severe complications, which can be addressed through either open or endovascular interventional procedures. This article reviews existing literature and guides in managing these specific scenarios.

Conclusion: Caution should be exercised when performing an armpit massage, as a thorough understanding of the anatomy of the axillary area is crucial. Injury to the lateral thoracic artery is a potential risk during axillary massage, and in such cases, endovascular intervention may be considered.

1. Introduction

The armpit is a vital connection between the neck, chest, and upper limbs. It is made up of blood vessels, nerve tissues, and a variety of lymphatic tissues. According to modern medicine, regular armpit massage can improve blood supply, lymphatic circulation, metabolism, immunity, and the functionality of the upper limbs, shoulder, and knuckle joints [1]. In traditional Chinese medicine, the Jiquan point at the axillary artery's pulsation point at the armpit's apex is considered the primary point of the Heart Meridian of Hand Shaoyin. Pressing and rubbing this point can help treat various heart conditions, such as coronary heart disease, myocarditis, and angina pectoris [2]. It is important to note, however, that improper massage techniques not only do not promote physical health but can also be harmful to the body. Based on the available literature, improper abdominal or neck massage can potentially lead to vascular damage in these specific regions [3,4]. However, no documented evidence shows injury to the lateral thoracic artery resulting from axillary massage.

This case report was prepared in accordance with the SCARE guidelines [5].

2. Case report

A 61-year-old retired female accountant was referred to our hospital

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from a regional hospital due to a subcutaneous hematoma under the left armpit and restricted movement of the left upper limb. The patient reported experiencing discomfort in her left axilla after receiving a bilateral axillary massage five days ago. The mild pain persisted for three days and then subsided. However, on the fourth day, she suddenly developed severe pain in the left axillary area, along with swelling, dizziness, and palpitations. Consequently, she was promptly brought to the hospital. A routine blood examination revealed the following results: RBC 2.06*10^9/L, HGB 57 g/L, and blood pressure 65/45 mmHg. Additionally, a chest CT examination showed the presence of a left axillary hematoma. The patient was initially treated with a chest compression bandage and a blood transfusion; however, her condition did not improve. The swelling in her left armpit intensified. Consequently, the patient was referred to our hospital. Following a physical examination, the patient exhibited swelling in the left armpit, left chest, and back, accompanied by the presence of hemorrhagic ecchymoses in multiple areas beneath the skin (Fig. 1A). Notably, the patient had a 10-year history of hypertension, underwent coronary stent implantation five years ago, and had no history of trauma or drug allergies. According to the patient, she has been self-teaching Chinese medicine and massage techniques for the past two years. As part of her routine, she massages the Jiquan point on both armpits daily to improve heart health. The massage session typically lasts for 30 to 60 min (Fig. 1B). An emergency upper limb arterial CTA examination revealed the presence of a pseudoaneurysm and rupture in the left lateral thoracic artery, leading to the formation of a subcutaneous hematoma in the left axilla, chest, and back (Fig. 2A, B). Following consultation with the patient and their family, A left axillary arteriography was performed by two vascular experts. The angiographic examination revealed a rupture in the left lateral thoracic artery along with the development of a pseudoaneurysm (Fig. 3A). Microcoil embolisation was successfully carried out (Fig. 3B), significantly relieving pain in the patient's left axilla. Additionally, there was no further drop in red blood cell count after blood transfusion treatment, and blood pressure returned to 145/78 mmHg. The patient's chest tightness and palpitations also improved significantly. After three months of follow-up, the chest hematoma had disappeared without any symptoms.

3. Discussion

Massage, as a complementary and alternative therapy, aims to alleviate physical discomfort, anxiety, and depression [2]. Patients and doctors have widely used and acknowledged it for its benefits. In traditional Chinese medicine, the Jiquan point, located at the top of the armpit where the axillary artery pulses, is considered a crucial acupoint [6]. Massage or acupuncture at this point has shown effectiveness in treating circulatory system diseases such as coronary heart disease, angina pectoris, sequelae of cerebrovascular disease, breast disease, frozen shoulder, and neurological diseases [7–10]. However, it is essential to note that the armpit has a complex anatomical structure, housing vital nerves and blood vessels. Incorrect massage techniques may risk damaging these critical blood vessels and nerves. There are reports that incorrect massage of the neck and upper limbs can lead to vertebral artery dissection, thrombosis, and brachial plexus injury [11,12]. The lateral thoracic artery, a branch of the axillary artery, runs medially along the lower edge of the pectoralis minor muscle and reaches the anterior surface of the serratus anterior muscle. It is less susceptible to damage in this region [13]. The patient has received bilateral axillary massage for two years in the described case. Five days before admission, the patient began to experience discomfort in the left axilla, suspected to be related to the formation of a pseudoaneurysm. Despite this discomfort, the patient continued to massage, which may be an important factor leading to the rupture of the pseudoaneurysm. In addition, the patient received long-term antiplatelet therapy, which resulted in significant blood loss and shock symptoms such as dizziness and discomfort. It is speculated that this process may be related to damage to the lateral thoracic artery caused by long-term axillary massage.

Limited reports have been on treating lateral thoracic artery rupture; no professional recommendations are available. Lee et al. reported a case of spontaneous rupture of the left lateral thoracic artery in a patient

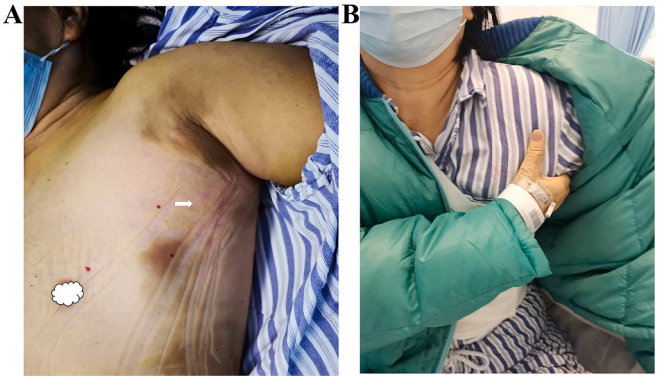

Fig. 1. Appearance of left armpit hematoma and patient's demonstration of usual massage postures. (A) Formation of left armpit hematoma (The white arrow points to the hematoma). (B) The patient demonstrates massaging the left armpit with the right hand.

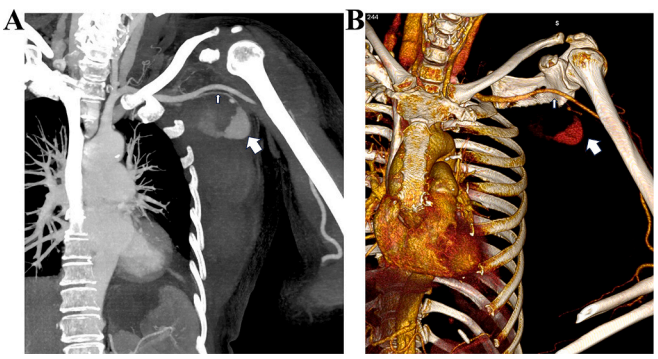

Fig. 2. CT angiography. (A) The pseudoaneurysm in the left axilla ruptured to form a hematoma (The thin white arrow points to the lateral thoracic artery, and the thick white arrow points to the ruptured pseudoaneurysm). (B) 3D reconstruction of blood vessels suggests lateral thoracic artery rupture and pseudoaneurysm formation (The thin white arrow points to the lateral thoracic artery, and the thick white arrow points to the ruptured pseudoaneurysm).

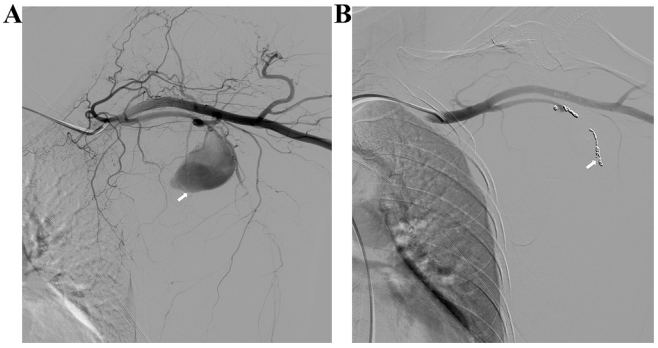

Fig. 3. Digital subtraction angiography and micro coil embolisation. (A) Axillary arteriography shows a pseudoaneurysm originating from the lateral thoracic artery (The white arrow points to the ruptured pseudoaneurysm). (B) Repeat angiography after embolisation of the lateral thoracic artery showed that the pseudoaneurysm was not visualized (White arrow points to the micro coils.).

with liver cirrhosis [14]. The patient was successfully treated with gelatin particle embolisation. Similarly, Pontell et al. reported a case of a patient with a pseudoaneurysm caused by a knife stab wound, and this patient was successfully treated with microcoil embolisation [15]. In a retrospective analysis conducted by D'Alessio et al., 52 patients with limb vascular injuries were studied. The study found that 88.5 % of these patients underwent open surgery, while the remaining underwent interventional embolisation. Open surgery is more suitable for cases involving nerve and bone tissue damage. On the other hand, endovascular surgery may be a better option for vascular injuries in complex anatomical areas such as the abdomen, pelvis, shoulders, and neck [16].

4. Summary

This case report presents the first documented injury to the lateral thoracic artery resulting from axillary massage. It serves as a reminder to patients and massage therapists to exercise caution when performing massages in the axillary region. Improper massage techniques can not only fail to promote physical health but may also cause harm to the body.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

Qiu-Chi Li and Ming-Hui Gong contributed equally by collecting medical records and providing images for the manuscript. Zheng-Dong Wan reviewed the manuscript and made critical revisions, finalizing the version for submission.

Guarantor

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Research registration number

None.

Declaration of competing interest

None.

References

[1] W.X. Qin, J.F. Xu, Y. Gao, J.Q. Du, Research on the ancient and modern application rules of Jiquan point, World J. Tradit. Chin. Med. 18 (2023) 2387–2391 (In Chinese).
[2] Y. Yan, Z.Q. Fang, W. Yang, Research on the construction of psychological theory in Huangdi Neijing, Western Tradit. Chin. Med. 32 (2019) 36–41 (In Chinese).
[3] Z.J. Haskal, Massage-induced delayed venous stent migration, J. Vasc. Interv. Radiol. 19 (2008) 945–949.
[4] E. Shariff, Al, Aldamigh FA, Alghamdi AG, Aleisawi YM, Aloqalaa KF and Sallout BZ: home self-massage device necessitates public awareness: vertebral artery dissection associated with a home massage device, Cureus 15 (2023) e33394.
[5] C. Sohrabi, G. Mathew, N. Maria, A. Kerwan, T. Franchi, R.A. Agha, The SCARE 2023 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. Lond. Engl. 109 (5) (2023) 1136.
[6] Q.F. Gao, X.M. Shi, P. Li, J.L. Bian, Y. Li, J.G. Zheng, Clinical observation on acupuncture and moxibustion for treatment of aorto-arteritis of arterial type in the head and arm, Chinese Acupuncture & Moxibustion 25 (2005) 523–525 (In Chinese).
[7] L.A. Braun, C. Stanguts, L. Casanelia, O. Spitzer, E. Paul, N.J. Vardaxis, F. Rosenfeldt, Massage therapy for cardiac surgery patients–a randomized trial, J. Thorac. Cardiovasc. Surg. 144 (2012) 1453–1459.
[8] C. Zhang, G. Xiong, J. Wang, X. Shi, T. Guo, Y. Jin, Y. Zhao, X. Tai, A multicenter, randomized controlled trial of massage in children with pediatric cerebral palsy: efficacy of pediatric massage for children with spastic cerebral palsy, Medicine (Baltimore) 100 (2021) e23469.
[9] M.S. Lee, E.N. Lee, E. Ernst, Massage therapy for breast cancer patients: a systematic review, Ann. Oncol. 22 (2011) 1459–1461.
[10] M. Liu, Y. Liu, C. Peng, H. Wang, Y. Xu, S. Jiao, Y. Ding, Effects of massage and acupuncture on the range of motion and daily living ability of patients with frozen shoulder complicated with cervical spondylosis, Am. J. Transl. Res. 13 (2021) 2804–2812.
[11] G. Dutta, A. Jagetia, A.K. Srivastava, D. Singh, H. Singh, R.K. Saran, "crick" in neck followed by massage led to stroke: uncommon case of vertebral artery dissection, World Neurosurg. 115 (2018) 41–43.
[12] C.Y. Chang, Y.T. Wu, L.C. Chen, R.C. Chan, S.T. Chang, S.L. Chiang, Massage-induced brachial plexus injury, Phys. Ther. 95 (2015) 109–116.
[13] H. Miyazaki, K. Igari, T. Kudo, T. Iwai, Y. Wada, Y. Takahashi, Y. Inoue, S. Asamura, Significance of the lateral thoracic artery in pectoralis major musculocutaneous flap reconstruction: quantitative assessment of blood circulation using indocyanine green angiography, Ann. Plast. Surg. 79 (2017) 498–504.
[14] T.H. Lee, Y.S. Park, D.J. Chung, J.H. Kim, S.M. Kim, E.H. Im, K.C. Huh, Spontaneous rupture of the lateral thoracic artery in patients with liver cirrhosis, Korean J. Intern. Med. 23 (2008) 152–155.
[15] M. Pontell, D. Scantling, J. Babcock, A. Trebelev, A. Nunez, Lateral thoracic artery pseudoaneurysm as a result of penetrating chest trauma, J. Radiol. Case Rep. 11 (2017) 14–19.
[16] I. D'Alessio, M. Domanin, D. Bissacco, S. Romagnoli, P. Rimoldi, F. Sammartano, O. Chiara, Operative treatment and clinical outcomes in peripheral vascular trauma: the combined experience of two centers in the endovascular era, Ann. Vasc. Surg. 62 (2020) 342–348.