

Case Report

# Percutaneous drainage management of an abscess developed from conservatively treated retroperitoneal haematoma caused by acupuncture

Jin Soo Kim, Ki Hoon Kim and Woon Won Kim\*

Department of Surgery, Inje University Haeundae Paik Hospital, Busan, Republic of Korea.

Received 29 September, 2016; Accepted 23 November, 2016

With acupuncture treatment becoming a widely used technique in medicine to control chronic pain, there have been increasing reports on its associated complications. Although pneumothorax is the most frequently reported, infectious complications may not be uncommon. However, retroperitoneal or intraabdominal abscess caused by acupuncture may be much more serious conditions than pneumothorax. We experienced a 67-year-old man presenting with retroperitoneal abscess developed from retroperitoneal haematoma after acupuncture. The patients were treated conservatively, and then abscess developed from the haematoma was successfully retreated with sono guide percutaneous drainage with antibiotic therapy. Application of better knowledge on anatomy by acupuncture practitioners will reduced serious complications associated with acupuncture.

**Key words:** Acupuncture, complications, retroperitoneal haemorrhage (haematoma), retroperitoneal abscess, percutaneous drainage.

## INTRODUCTION

Acupuncture is generally regarded as a safe procedure in the general population although several complications have been reported (Endres et al., 2004; White et al., 2001). The incidence of mild, transient complications range from 6.71 to 15%. The most common adverse events of this type were local pain from needling (range: 1.1 to 2.9%) and slight haemorrhage or haematoma (range: 2.1 to 6.1%) (Zhang et al., 2010). According to the puncture sites, mild, transient complications may become serious, life-threatening complications. The retroperitoneum is an organ-rich region with several vital structures. When injury occurs to vessels within retroperitoneal space, it can be a source of significant

occult blood loss resulting in more serious conditions. We report a rare case of serious infectious complications that management of an abscess developing from a retroperitoneal haematoma after acupuncture.

## CASE PRESENTATION

A healthy 67-year-old man visited our emergency department with a constant tingling in the left lower quadrant and abdominal pain. He had undergone acupuncture therapy along the lower back region for chronic back pain 1 day prior to the occurrence of

\*Corresponding author. E-mail: [hq369@hanmail.net](mailto:hq369@hanmail.net). Tel: +82 10 5530 6670. Fax: +82 51 797 0276.



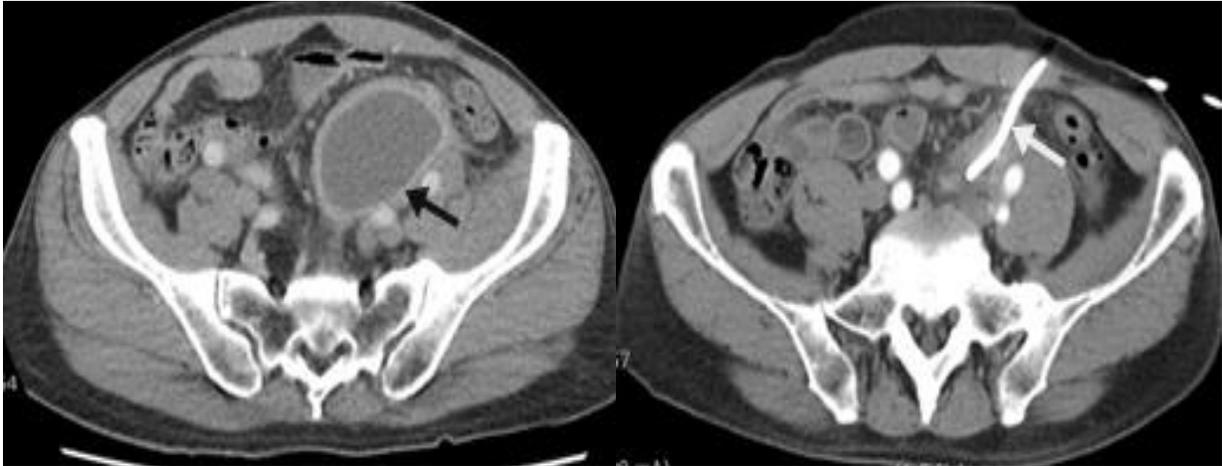
**Figure 1.** A large, smooth-shaped mass in the left side of the abdomen with extravasation (black arrow).



**Figure 2.** Decreased haematoma size (white arrow) with no active bleeding.

symptoms. He denied the use of any medications, including nonsteroidal anti-inflammatory drugs. An abdominal examination revealed normal bowel sounds and guarding, fullness in the left lower quadrant where non-movable tender mass was palpable without overlying ecchymosis. His vital signs were a blood pressure of 110/60 mm Hg, pulse rate of 98 beats/min, respiration rate of 20 breaths/min and a body temperature of 37°C. His haemoglobin level was 8.4 g/dl, haematocrit was 25.1%, platelet count was 74,000/mm<sup>3</sup> and disseminated intravascular coagulation was fibrin degradation product (FDP) 5.8 ug/ml, D-dimer 0.60 ug/ml, fibrinogen 125 mg/dl, antithrombin III 62.2%. Abdominal/pelvic CT showed a large, smooth-shaped mass in the left side of the abdomen with extravasation (Figure 1). The patient was immediately transferred to the intervention clinic for angioembolization. Arteriography did not reveal any

definite evidence of active contrast leakage or vascular abnormality and conservative treatment was started. After 14 days, abdominal/pelvic CT showed that the haematoma had decreased in size and there was no active bleeding (Figure 2). The patient was discharged from the hospital 15 days after admission. Eleven days after discharge, the patient revisited our emergency department with left lower abdominal pain and chills. His vital signs were a blood pressure of 140/70 mm Hg, pulse rate of 107 beats/min, respiration rate of 22 breaths/min and body temperature of 38.4°C. The patient's haemoglobin and haematocrit levels were unremarkable, and his white blood cell count was 13,900/mm<sup>3</sup>. Abdominal/pelvic CT showed that the haematoma had increased in size coupled with internal liquefaction in the left side of the abdomen (Figure 3). Sono guided percutaneous drainage was performed and 120 cc of pus



**Figure 3.** Increased haematoma size with internal liquefaction in the left side of the abdomen (black arrow) and percutaneous drainage insertion (white arrow).



**Figure 4.** Resolved state of the haematoma at the 1-month follow-up.

was drained. After adequate drainage and antibiotic therapy, the patient was discharged from the hospital 14 days after the drain was removed. No expanding haematoma was observed during a 1-month follow-up abdominal/pelvic CT (Figure 4).

## DISCUSSION

Acupuncture is practically defined as the insertion of solid needles along a set of defined points to treat diseases and their symptoms. The tip of the needle often lies in a muscle, but many recognized acupuncture points overlie important structures, including blood vessels and nerves. The retroperitoneum is the anatomical space in the abdominal cavity behind the peritoneum. Retroperitoneal

structures include urinary organs (kidneys and ureter), the circulatory system (aorta and inferior vena cava) and digestive organs (head, neck, and body of the pancreas; ascending and descending portions of the colon and the rectum) (Killeen et al., 1999). In particular, the circulatory system, the largest vessel in the body and injury to this vessel within the retroperitoneal space can result in significant yet occult blood loss and much more serious conditions (Wang and Wang, 2013). Signs of a retroperitoneal haemorrhage (haematoma) may include hypotension, abdominal pain or nerve-compression effects, including thigh pain and motor or sensory deficits. A fall in haemoglobin level may result in retroperitoneal haemorrhage. Abdominal/pelvic CT is the imaging study of choice for detecting a retroperitoneal haemorrhage, its location and its possible source (Mirvis, 2003). CT can

also assess the relative stability of a haemorrhage on the basis of its size and presence (or absence) of active extravasation of intravascular contrast material. Clinical management depends on the presence of active contrast material extravasation, haematoma size and stability and the haemodynamic status of the patient. Contrast extravasation on abdominal/pelvic CT, which indicates the leakage of contrast medium from vessels, appearing as a localized or diffuse high-density region is regarded as an evidence of active bleeding or vascular injury (Yuan et al., 2012).

Further interventions, such as surgery or transcatheter arterial embolization, are usually indicated for haemostasis if extravasation is present with other unstable presentations (Fang et al., 2006; Yao et al., 2002). Transcatheter arterial embolization of a retroperitoneal haemorrhage caused by trauma or another specific cause is a well-documented and commonly used procedure (Velmahos et al., 2002). However, there is not much discussion regarding a negative angiography after contrast extravasation on abdominal/pelvic CT. A discrepancy between abdominal/pelvic CT and the following angiography is possible because abdominal/pelvic CT only has a 76% sensitivity and 80% positive predictive value for detecting bleeding or vascular injury (Marmery et al., 2008). Cerva et al. (1996) provided a brief report regarding 30 patients with pelvic fractures and a discrepancy rate of approximately 11.1%. Yuan et al. (2012) described a 26.4% incidence of discrepant results in patients with blunt torso trauma.

There are some possible reasons for this discrepancy. One is that some contrast extravasation was actually venous bleedings, non-vascular contrast leakage or small fragmented parenchyma of solid organs. The other possibility is spontaneous endogenous haemostasis. Many retroperitoneal haematomas are self-limiting, and patients can be treated by observation alone if they remain haemodynamically stable with no extra-luminal gas or active extravasation of the contrast material (Feliciano, 1990; Chan et al., 2008). In our case, contrast extravasation on abdominal/pelvic CT following angiography did not reveal any definite evidence of active contrast leakage or vascular abnormality. The patient was haemodynamically stable, and the angiography showed no extravasation of contrast leakage and embolization was not needed. We treated the patient conservatively, and the haematoma had decreased in size based on follow-up imaging 2-weeks later. Although retroperitoneal haematomas generally resolve, they may also develop into an abscess. Lately, advances in image-guided percutaneous drainage have provided a safe and effective alternative to surgical debridement (Gerzof et al., 1981). In patients with a surgical indication, it also helps to delay surgery, thus improving the patient's condition for surgery because it decompresses, evacuates, and provides continuous abscess drainage without disseminating the infection. Most would consider image-

guided percutaneous abscess drainage as the treatment of choice because it offers a relatively simple, minimally invasive option with the goal of averting the development of sepsis, reducing the length of the hospital stay and reducing the cost of treatment. Abscesses < 3 cm are often treated with antibiotic therapy alone (Jeffrey et al., 1988). These can be sampled or aspirated with a needle for the assessment of optimal antibiotic coverage. Depending on the location, cavities < 3 cm may not be amenable to percutaneous placement of a drainage catheter. In addition, drainage failure of an abscess can be due to non-liquefaction of the contents. Eleven days after discharge, the patient complained of left lower abdominal pain, fever and chills, and a follow-up abdominal/pelvic CT showed that the haematoma had increased in size to 8.1 cm with internal liquefaction. We performed sono-guided percutaneous drainage, and pus was drained. Practically all authors agree on the criteria for removing drainage: Cessation of drainage in the absence of catheter obstruction, CT confirmation that the collection has disappeared, absence of fever and normalization of the leukocyte count (Fowler and Perkins, 1994; Lang, 1990). The patient satisfied these criteria for drainage removal, and he was discharged without complications once the drain was removed.

## Conclusion

It is recommended that when conservative management of a retroperitoneal haematoma by acupuncture is chosen, follow-up imaging should be used to assess the stability of the haematoma with the necessity for a strict follow-up to reduce early and late complications.

## Conflicts of interests

The authors have not declared any conflict of interests.

## REFERENCES

- Endres HG, Molsberger A, Lungenhausen M, Trampisch HJ (2004). An internal standard for verifying the accuracy of serious adverse event reporting: the example of an acupuncture study of 190,924 patients. *Eur. J. Med. Res.* 9(12):545-51.
- White A, Hayhoe S, Hart A, Ernst E (2001). Adverse events following acupuncture: prospective survey of 32 000 consultations with doctors and physiotherapists. *BMJ.* 323(7311):485-6.
- Zhang J, Shang H, Gao X, Ernst E (2010). Acupuncture-related adverse events: a systematic review of the Chinese literature. *Bull. World Health Organ.* 88(12):915-21.
- Killeen KL, DeMeo, JH, Cole TJ (1999). Computed tomography of traumatic and nontraumatic retroperitoneal emergencies. *Emerg. Radiol.* 6(4):232-43.
- Wang F, Wang F (2013). The diagnosis and treatment of traumatic retroperitoneal hematoma. *Pak. J. Med. Sci.* 29(2):573-6.
- Mirvis SE (2003). Injuries to the urinary system and retroperitoneum. In: *Imaging in trauma and critical care.* 2<sup>nd</sup> ed. Philadelphia: Saunders. pp. 507-516.

- Yuan KC, Wong YC, Lin BC, Kang SC, Liu EH, Hsu YP (2012). Negative catheter angiography after vascular contrast extravasations on computed tomography in blunt torso trauma: an experience review of a clinical dilemma. *Scand. J. Trauma. Resusc. Emerg. Med.* 20(46).
- Fang JF, Wong YC, Lin BC, Hsu YP, Chen MF (2006). Usefulness of multidetector computed tomography for the initial assessment of blunt abdominal trauma patients. *World J. Surg.* 30(2):176-82.
- Yao DC, Jeffrey RB Jr, Mirvis SE, Weekes A, Federle MP, Kim C, Lane MJ, Prabhakar P, Radin R, Ralls PW (2002). Using contrast-enhanced helical CT to visualize arterial extravasation after blunt abdominal trauma: incidence and organ distribution. *Am. J. Roentgenol.* 178(1):17-20.
- Velmahos GC, Toutouzas KG, Vassiliu P, Sarkisyan G, Chan LS, Hanks SH, Berne TV, Demetriades D (2002). A prospective study on the safety and efficacy of angiographic embolization for pelvic and visceral injuries. *J. Trauma.* 53(2):303-308.
- Marmery H, Shanmuganathan K, Mirvis SE, Richard H, Sliker C, Miller LA, Haan JM, Witlous D, Scalea TM (2008). Correlation of multidetector CT findings with splenic arteriography and surgery: prospective study in 392 patients. *J. Am. Coll. Surg.* 206(4):685-93.
- Cerva DS Jr, Mirvis SE, Shanmuganathan K, Kelly IM, Pais SO (1996). Detection of bleeding in patients with major pelvic fractures: value of contrast-enhanced CT. *Am. J. Roentgenol.* 166(1):131-135.
- Feliciano DV (1990). Management of traumatic retroperitoneal hematoma. *Ann. Surg.* 211(2):109-23.
- Chan YC, Morales JP, Reidy JF, Taylor PR (2008). Management of spontaneous and iatrogenic retroperitoneal haemorrhage: conservative management, endovascular intervention or open surgery? *Int. J. Clin. Pract.* 62(10):1604-13.
- Gerzof SG, Robbins AH, Johnson WC, Birkett DH, Nabseth DC (1981). Percutaneous catheter drainage of abdominal abscesses: a five-year experience. *N. Engl. J. Med.* 305(12):653-7.
- Jeffrey RB Jr, Federle MP, Tolentino CS (1988). Periappendiceal inflammatory masses: CT-directed management and clinical outcome in 70 patients. *Radiology* 167(1):13-6.
- Fowler JE Jr., Perkins T (1994). Presentation, diagnosis and treatment of renal abscesses: 1972-1988. *J. Urol.* 151(4):847-51.
- Lang EK (1990). Renal, perirenal and pararenal abscesses: percutaneous drainage. *Radiology* 174(1):109-113.