

Persistent hiccup caused by peripherally inserted central catheter migration

Yeling Zhang · Haiping Jiang · Lili Wei ·
Hongsheng Yu

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Abstract A peripherally inserted central catheter (PICC) provides an important access for patients requiring prolonged intravenous infusion. However, intravascular migration and subsequent malposition of a PICC may be caused by its flexibility and thinness and by changes in intrathoracic pressure and body position. In this report, we describe one case of persistent hiccup whose PICC migrated to and was bent and folded in the right subclavian vein.

Keywords Peripherally inserted central catheter · Complication · Hiccup

A 60-year-old male patient who was diagnosed with non-small cell lung cancer (NSCLC) with brain metastases was admitted to our department on December 27, 2009, with a Karnofsky performance scale score of 40. The patient reported a previous history of sporadic transient hiccup but denied a history of persistent hiccup. After admission, antitussives and a conformal radiotherapy of the head were administered. Total parenteral nutrition was required after the radiotherapy. Because of poor peripheral vascular conditions, placement of a peripherally inserted central catheter (PICC) was performed on January 27, 2010. A 4 Fr. single-lumen catheter (Bard, USA) was inserted into the median cubital vein of the right arm. The procedure went well. Postoperative routine radiography showed the catheter tip in the lower part of the superior vena cava proximal

to the right atrium (Fig. 1). Infusion of total parenteral nutrition (TPN) via the PICC was successful, and cranial radiotherapy was continued. The patient presented with hiccup at a frequency of 1 bout/5–10 s at 2 p.m. on February 4. Changes in frequency occurring before and after eating were not significant. Abdominal computed tomographic (CT) scanning showed no hepatic metastases. At 3 p.m., the infusion rate was found to be decreased but could be increased when the head of the patient tilted to the left. At 8 p.m., after infusion, 10 ml sterile saline was used to successfully wash the catheter. On February 6, the patient still presented with hiccup at the same frequency. At 9 a.m., when bolus injection of another 10 ml sterile saline was performed, a considerable resistance was felt and distension of the right jugular vein was shown. Considering a possibility of catheter migration, X-ray films were taken immediately, which showed that the catheter was bent and folded in the right subclavian vein (Fig. 2). Removal of the catheter was then conducted, which proceeded smoothly. The tip of the catheter was intact. In the morning of Feb. 7, hiccup and distension of the right jugular vein were resolved.

This report is the first to describe hiccup caused by migration of a PICC to the subclavian vein. With an incidence of approximately 1.5% [2], catheter migration may be induced by various causes, including changes in patient's breathing, lying position, and activity, as well as the type of catheter selected and the position of catheterization [1]. During brain radiotherapy, because he was bedridden, the patient had been moved frequently between the ward and accelerator couch in the radiotherapy center, which resulted in frequent abduction and adduction of the catheterized arm. A shift of about 2 cm of the PICC tip position has been reported to be caused by abduction and adduction of the catheterized arm [3]. The frequent

Y. Zhang · H. Jiang (✉) · L. Wei · H. Yu
Department of Oncology, The Affiliated Hospital of Medical
College, Qingdao University, Jiangsu Road 16,
Qingdao 266003, China
e-mail: jhaiping@foxmail.com



Fig. 1 On Jan. 7, 2010, postoperative routine radiography showed the catheter tip in the lower part of the superior vena cava proximal to the right atrium

movement and cough might be the cause of catheter drift to the right subclavian vein.

The second chest film showed that the catheter was bent and folded in the right subclavian vein, resulting in its significant distension. The subclavian vein following the subclavian artery passes through the space between the clavicle and the first rib and is adjacent to the brachial plexus. In the chest, the right vagus nerve runs in front of the right subclavian artery and along the right side of the trachea down into the thoracic cavity. The phrenic nerve, anteromedial to the cervical pleura and lateral to the vagus nerve, passes between the subclavian artery and vein into the thoracic cavity. Therefore, a strong possibility exists that the distended subclavian vein may have compressed and stimulated the adjacent right vagus nerve or phrenic nerve, causing diaphragmatic spasm that led to persistent hiccup. The malposition of the catheter may be explained by frequent movement of the catheterized arm during cranial radiotherapy and by changed intrathoracic pressure from the irritable cough. Distension of the right jugular vein may result from impaired blood reflux caused by



Fig. 2 On Feb. 6, 2010, X-ray film showed that the catheter was bent and folded in the right subclavian vein

vasospasm induced by stimulation of the vessels by the catheter. Once the catheter was withdrawn, the subclavian vein recovered to normal, and hiccup and distension of the right jugular vein were resolved. Therefore, healthcare providers should pay great attention to the occurrence of catheter migration and replace the migrated catheter with a new one if migration exists [4].

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