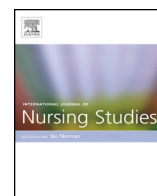




ELSEVIER

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/ijns

Incidence, risk factors and clinical outcomes of peripherally inserted central catheter spontaneous dislodgment in oncology patients: A prospective cohort study



Xiao-xia Qiu^{a,1}, Yan Guo^{a,1}, Hong-bin Fan^a, Jie Shao^a, Xue-bin Zhang^{a,b,*}

^a Cancer Center, Renji Hospital, School of Medicine, Shanghai JiaoTong University, Shanghai 200127, China

^b Department of Interventional Radiology, Renji Hospital, School of Medicine, Shanghai JiaoTong University, Shanghai 200127, China

ARTICLE INFO

Article history:

Received 9 May 2013

Received in revised form 21 September 2013

Accepted 23 October 2013

Keywords:

Peripherally inserted central catheter

Spontaneous dislodgment

Catheter-related thrombosis

Tip position

Risk factor

ABSTRACT

Purpose: Peripherally inserted central catheter (PICC) spontaneous dislodgment is insidious in onset and prone to cause complications. We performed a prospective cohort study to examine the incidence, risk factors and clinical results of PICC spontaneous dislodgment in oncology patients to facilitate successful early diagnosis, prophylaxis and management.

Patients and methods: Consecutive oncology patients, undergoing placement of PICCs, were enrolled and prospectively followed up until their catheters were removed or PICC spontaneous dislodgment presented. The patients with PICC spontaneous dislodgment or catheter-associated thrombosis (CRT) were followed up for an extra three months from the date of diagnosis. The main endpoint was PICC spontaneous dislodgment, and the sub-endpoints were CRT and catheter in-place time. The PICC insertion team, nurses, interventional radiologists and oncology doctors collected longitudinal data.

Results: Over a total of 60,894 days of cumulative follow-up, 21 out of 510 PICCs presented spontaneous dislodgment, leading to an incidence rate of 4.12%. The CRT rate of the group with PICC spontaneous dislodgment was much higher than that of the group without PICC spontaneous dislodgment (RR = 17.46, 95% CI: 8.29–36.82, $p = 1.09 \times 10^{-17}$). Five baseline exposure factors, including primary lung cancer, metastatic lung cancer, chest radiotherapy, vigorous coughing and severe vomiting, were significant risk factors of PICC spontaneous dislodgment. Basilic vein access (odds ratio [OR] = 0.39, 95% CI: 0.16–0.95, $P = 0.04$) was a protective factor against PICCSD in univariate analysis. Among these factors, the independent significant risk factors were vigorous coughing (OR = 6.14, 95% CI: 1.70–22.16, $P = 0.01$) and severe vomiting (OR = 3.70, 95% CI: 1.28–10.68, $P = 0.02$).

Conclusion: The incidence rate of PICC spontaneous dislodgment is 4.12% (0.34 per 1000 catheter-days); PICC spontaneous dislodgment significantly increases the risk of CRT and shortens catheter in-place time. Vigorous coughing and severe vomiting were independent risk factors of PICC spontaneous dislodgment among oncology patients.

© 2013 Elsevier Ltd. All rights reserved.

What is already known about the topic?

- The real incidence, risk factors and particular clinical results of PICC spontaneous dislodgment remain uncertain because of the small number of reported cases.
- Cases reports indicate that central venous catheter spontaneous dislodgment may induce catheter-related thrombosis.

* Corresponding author at: Department of Interventional Radiology, Renji Hospital, No.1630, Dongfang Rd., Shanghai 200127, China.
Tel.: +86 021 68383131; fax: +86 021 50896639.

E-mail address: zhangxuebinwqy@163.com (X.-b. Zhang).

¹ These authors contribute equally to the work.

What this paper adds

- This research provides that the incidence rate of PICC spontaneous dislodgement is 4.12% or 0.34/1000 catheter-days.
- The probability of catheter-related thrombosis of PICCs with spontaneous dislodgment was 17.46-fold higher than that of PICCs without spontaneous dislodgment.
- Primary or metastatic lung cancer, chest radiotherapy, vigorous coughing and severe vomiting are risk factors for PICC spontaneous dislodgement. Among them, the independent significant risk factors are vigorous coughing and severe vomiting.

1. Introduction

The tips of peripherally inserted central catheters (PICCs) are normally located in the superior vena cava (SVC) (James et al., 1993), and may dislodge from the SVC to neighboring veins during indwelling time (DiGirolamo and Tarlian, 1991). This PICC spontaneous dislodgment (PICC spontaneous dislodgment) often occurs silently and cannot always be detected until complications present.

Central venous catheter (CVC) spontaneous dislodgment may block venous blood flow and cause intimal injury, and thus may induce catheter-related thrombosis (CRT) (Novitsky and Jacobs, 1980; Rasuli et al., 1992; Wu et al., 2005), and even neurological complications (Saxena et al., 1976; Zhang et al., 2011), infection and venous perforation (Josiak et al., 2007). Therefore, a better understanding of the frequency of PICC spontaneous dislodgment occurrence, risk factors and harms is important for the identification of high-risk populations, early diagnosis, prevention and treatment, especially for cancer patients requiring chemotherapy.

There are only a few cases or case serial reports of PICC spontaneous dislodgment (Mullen et al., 1977; Zhang et al., 2011); however, descriptive studies on CVC or catheter-ports spontaneously dislodging are presented in the literature (Ahn et al., 2008; Collin et al., 1997; Meranze et al., 1988; Rasuli et al., 1992; Wu et al., 2005). Some potential risk factors causing spontaneous dislodgment described in the literature include flexible silastic catheters (Mullen et al., 1977), vigorous coughing (Jacobs and Zaroukian, 1991; Wu et al., 2005), vomiting (Jacobs and Zaroukian, 1991), upper arm or pectoralis muscle movement (Meranze et al., 1988) and jetting effects (Wagman, 1989; Wagman and Neifeld, 1986). However, the real incidence, risk factors and particular clinical results remain uncertain because of the small number of reported cases.

Without accurate data on PICC spontaneous dislodgment, it is difficult to identify patients who have a high risk for PICC spontaneous dislodgment and to determine the need for prophylaxis and management. To improve our knowledge about PICC spontaneous dislodgment and patient care, we designed a prospective cohort study to determine the incidence, risk factors and clinical outcomes of PICC spontaneous dislodgment in patients with cancer.

2. Material and methods

2.1. Patients

This prospective study was conducted at the cancer center of Renji Hospital, Shanghai Jiao Tong University Medical School. The inclusion criteria included the following: (1) consecutive oncology patients admitted to our hospital from July 1, 2010 to December 31, 2011; (2) patients who had successfully undergone a PICC insertion; and (3) patients using 4-French (Fr) Groshong catheters (Bard PowerPICCs, Bard Access Systems Inc., Salt Lake City, UT, USA) with three-way valves. The exclusion criteria included the following: (1) patient used any other types of catheter; (2) the catheter broke during the indwelling time; (3) the catheter was accidentally removed after insertion; and (4) follow-up was not possible. The project was approved by our Institutional Review Board. Consent was obtained at the time of PICC insertion, and the potential baseline risk factors presented during the indwelling time for PICC spontaneous dislodgment were recorded. The PICC insertion team, interventional radiologists and oncology doctors collected longitudinal data.

For the analysis, we counted each PICC placement as a new event. Therefore, all presented calculations use PICC placements rather than each individual patient as the unit for counting.

2.2. PICC insertion and maintenance

Trained registered nurses performed all venous access procedures, and all PICCs were inserted blindly or using ultrasound guided under standard sterile conditions. The right arm was favored as the preferred puncture site, and if unsuitable, the left arm was used. The PICCs were preferably inserted into the basilic vein when possible. The cephalic vein or the brachial vein was used only when the basilic vein was not suitable. Standard posteroanterior chest radiography was performed to identify whether the catheter tip was correctly located in the SVC after successful insertion. If the tip was not correctly positioned, then the patient was transferred to the radiology department, and the tip was repositioned in the SVC immediately under fluoroscopy by an experienced interventional radiologist. All catheters were secured in place by using StatLock PICC Plus Stabilization Device (Bard company, USA). Nurses would check the catheter insertion length at the skin site 24 h after placement, and check again during each maintenance period. Routine chest radiographs of all patients were obtained to determine the correct position of the catheter before each treatment cycle of infusion. The PICC tips were considered to be “central” if they resided anywhere within the SVC. The chest radiographs were stored and retrieved from the digital imaging program using Picture Archiving and Communication Systems (PACS). The fluid infused through the PICCs included hypertonic parenteral nutrition, antibiotics and chemotherapy drugs.

Registered nurses provided maintenance care for all of the PICCs. Dressings were changed once a week to keep the puncture site clean and dry. The catheters were sealed with

Download English Version:

<https://daneshyari.com/en/article/1076346>

Download Persian Version:

<https://daneshyari.com/article/1076346>

[Daneshyari.com](https://daneshyari.com)