Peripherally inserted central venous catheter line removal leading to brachial vein stripping- Need for more caution

INTRODUCTION

Use of central venous catheter is a standard of care in the management of critically ill patients and during major surgery. Their use in long-term fluid management, antibiotic therapy, parenteral nutrition, electrolyte replacement and inotropic drug therapy is well-established. Although there is limited scientific evidence to support the superiority of peripherally inserted central venous catheters (PICCs) over traditional central lines,[1] they are increasingly being used due to cost effectiveness, ease of insertion and lesser chances for serious complications. We report an unusual complication that happened during removal of PICC line.

CASE REPORT

A 46-year-old male patient diagnosed with hollow viscous perforation leading to peritonitis was posted for exploratory laparotomy. In view of significant dehydration, two large bore venous accesses were secured, one with a 16 gauge intravenous cannula on the left hand and another with a right sided PICC line (14 gauge cannula 16 gauge 70 cm single lumen catheter) inserted through a brachial vein. There was no resistance while removing the guide wire. The catheter was fixed at 50 cm mark on the skin. Backflow of the blood through the catheter was good and the line was secured with a sterile dressing.

Post-operatively, the PICC line was used for 3 days for giving antibiotics, fluids and total parenteral nutrition (TPN). On day 3, right upper limb swelling was noticed. The attending nurse avoided using the catheter and closed it without heparin or saline flush. On day 4, it was decided to remove the PICC line that took more than usual force to pull it out. However, while removing the line, about 15 cm length of brachial vein got stripped off along with the catheter [Figure 1]. The distal end of the vein

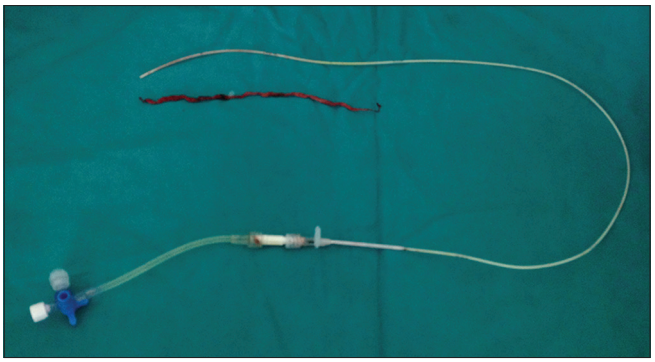

Figure 1: Stripped brachial vein with peripherally inserted central catheter line

was bleeding, so it was compressed with a sterile gauge for 10 min. The antecubital fossa was explored under aseptic conditions and the distal end of the vein was ligated. The right upper limb was kept elevated and crepe bandage was applied for prolonged compression.

DISCUSSION

Indwelling central venous catheters are used widely for a range of indications such as chemotherapy, cardiac pacing, intraoperative and post-operative administration of fluids, antibiotic, total parenteral nutrition (TPN), blood products, inotropic drugs and electrolyte correction. Many complications related to the PICC lines such as upper limb deep vein thrombosis, infection, catheter obstruction, migration, bleeding, fracture,[2,3] guide wire perforating the vein and knotting of the catheter inside the vein[4] are well-documented. A prospective study of 222 patients was done to assess the complications related to PICC line in a French hospital.[5] The reported complications included line obstruction, deep venous thrombosis, and infection.

In our case, PICC line was inserted for long-term post-operative use for repeated blood sampling, TPN and long-term antibiotic, fluid and electrolyte management. Although the device was working well, its use was discontinued due to ensuing local limb oedema. Upper limb oedema was present on both the sides that could have been due to low albumin and dependent position of the limb. We used single lumen catheter, and the removal of the guide wire during PICC line insertion was smooth, so the possibility of guide wire perforating the vein was ruled out. Doppler scan was not done, as anaesthesia

team was called after the PICC line was removed by the ward resident. After removal, the vein was found tightly adherent to the catheter in its entire length. Discontinuation of use of PICC line without flushing with heparinised saline or normal saline could have led to thrombus formation, spasm of the vein and tight adherence of the vein to the catheter that caused stripping of the vein during its removal. Although, there is insufficient evidence on use of heparinised or normal saline flush for preventing catheter block.[6]

We advised compression, affected limb elevation and improvement of nutritional status. The Doppler study done at this stage showed no evidence of venous thrombosis. The patient was discharged without any limb compromise. On the 10th day visit following discharge, limb oedema had reduced and overall limb function was good.

King Edward Memorial Hospital, Australia has given elaborate guidelines for PICC line removal.[7] According to them, the maximum resistance felt during removal is caused by venous spasm. In the case of failure of removal on the first attempt, they have suggested repositioning of the arm, a slow saline flush and application of warm heat along the vein for 15–20 min prior to reattempting the removal.

CONCLUSION

Although safe PICC line management should not be taken lightly, also it should have a continuous flow or should be heparinised to avoid thrombus formation. Complications can be avoided by stringent management protocols.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Aarti Kabra, Atul Purohit, Vinod Parashar
Department of Anaesthesia and Santokba Institute of Digestive and Surgical Sciences, Santokba Durlabhji Memorial Hospital, Jaipur, Rajasthan, India

Address for correspondence:
Dr. Aarti Kabra,
52/102, 1st Floor, Veer Tejaji Road, Mansarovar,
Jaipur, Rajasthan, India.
E-mail: aarti.kabra@gmail.com

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Access this article online	
Quick response code	Website: www.ijaweb.org
	DOI: 10.4103/0019-5049.171580

How to cite this article: Kabra A, Purohit A, Parashar V. Peripherally inserted central venous catheter line removal leading to brachial vein stripping- Need for more caution. Indian J Anaesth 2015;59:814-5.