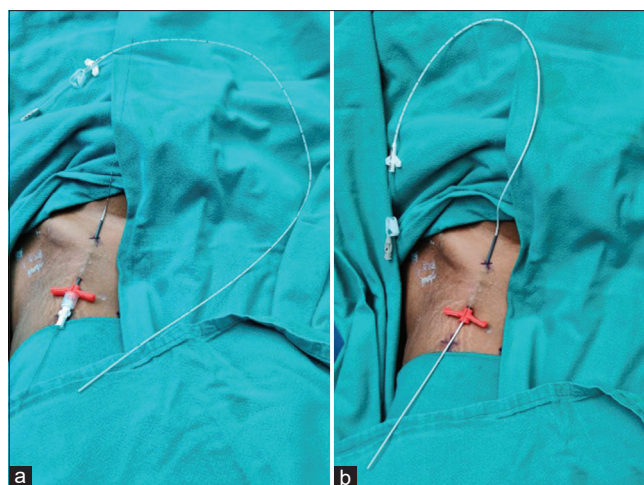


## Femoral peripherally inserted central catheter in superior vena cava syndrome - Challenges of tunnelling

Sir,

Peripherally inserted central catheters (PICCs) are long-term vascular access devices commonly used for delivering chemotherapy, antibiotics or parenteral nutrition. PICCs are placed under ultrasound guidance in deep arm veins and the tip is placed in the lower third of the superior vena cava (SVC).<sup>[1]</sup> In SVC obstruction syndrome, the upper extremity is best avoided for vascular access due to raised venous pressures.<sup>[2]</sup> We describe the placement technique of femoral tunnelled PICC in a patient with SVC syndrome.

An 18-year-old female diagnosed with mediastinal B-cell non-Hodgkin lymphoma with SVC syndrome was referred to us for PICC placement to initiate chemotherapy. She complained of breathlessness at rest and facial swelling. She had a heart rate of 110/min, blood pressure of 100/60 mmHg, respiratory rate around 30/min and oxygen saturation (SpO<sub>2</sub>) of 94% on room air. Her positron emission tomography-computed tomography (PET CT) scan showed bilateral internal jugular vein and SVC thrombosis secondary to her mediastinal tumour. A femoral PICC line with tunnelling superiorly to the inferolateral part of the abdomen under local anaesthesia was decided. The patient was counselled and consent for the same was taken. The patient was placed in a 30° propped up position with oxygen supplementation. An open-ended, 60 cm, single lumen 5 Fr PICC ( BARD (POLY PER-Q-CATH)® (Bard Access Systems, Inc., Salt Lake City, UT 84116 USA) was selected for a femoral vein size of 9.8 mm. Under aseptic precautions, the tentative route for tunnelling with an exit point on the inferolateral part of the abdomen was marked and local anaesthetic infiltration was done. Tunnelling was done in a stepwise sequential manner from the exit point till the catheter was brought near the femoral vein puncture point. The patient was made supine for tunnelling around the groin and immediately propped up again. Care was taken to avoid the superficial branches of inferior epigastric vessels using ultrasound. The stepwise tunnelling included passing the puncture needle



**Figure 1:** Steps of tunnelling femoral PICC depicting use of dilator sheath on guidewire (a) followed by passage of PICC through the sheath (b)

through the desired tract followed by a dilator sheath over the guidewire [Figure 1a]. Then the dilator and guidewire were removed and the catheter was passed through the sheath [Figure 1b]. This was sequentially repeated thrice along the desired tunnelling route till the catheter reached the desired puncture point over the femoral vein. Then, an ultrasound-guided femoral vein puncture was done and PICC was inserted using the modified Seldinger technique. Fluoroscopy was used to avoid kinking of PICC in the groin and confirm correct tip placement just inferior to the diaphragm. Figure 2 depicts the final position of PICC. There was no cardiorespiratory worsening, bleeding or haematoma formation at the PICC site. On the fourteenth day post-procedure, the patient succumbed to the disease. There were no delayed complications like occlusion or local infection related to the PICC.

Femoral venous access is a suitable option in patients with SVC syndrome.<sup>[3]</sup> No specific product is marketed for femoral PICC, but there are reports of its off-label use.<sup>[4]</sup> There is a paucity of literature on tunnelling techniques for femoral PICCs. Literature has references of lower extremity PICCs placed without tunnelling with an exit point in the mid-thigh area.<sup>[4,5]</sup> We chose tunnelling superiorly towards the abdominal wall, due to the cultural and dressing preferences in our country. Indian dressing style, e.g., saree, pyjama has better access to umbilical than mid-thigh region. A major limitation for tunnelling PICCs is that tunnelling equipment is not available with the kit. We have earlier used the chemoport tunneller for tunnelling femoral PICC line.<sup>[6]</sup> But such equipment may not be available



**Figure 2:** External position of tunnelled femoral PICC with exit point on the abdomen. Red arrows show the puncture points of sequential stepwise tunnelling of femoral PICC

every time and also in non-oncological set-ups. Hence, we devised this indigenous technique of sequentially stepwise tunnelling PICCs for longer distances as in this case. The limitation of tunnelling is the need for an extra length of PICC that should be verified before use.

To conclude, tunnelling of femoral PICC line can be safely done with equipment available in the PICC kit for patients with SVC syndrome.

#### Declaration of patient consent

Consent was taken from the patient about the publication of case details and clinical photographs without disclosing the patient identity.

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Nil.

#### Conflicts of interest

There are no conflicts of interest.

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