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Case Review Article

Obstructed PICC Line in the Emergency Department: Case Review and Approach to PICC Line Troubleshooting

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ABSTRACT

A peripherally-inserted central catheter, or PICC line, is a long indwelling percutaneous catheter typically inserted from a vein from the upper limb threaded to the cavoatrial junction.[1–3] These devices are a popular alternative to central venous catheters (CVCs) for their functionality in an outpatient setting, lower maintenance cost, and lower risk of major procedural complications (e.g., pneumothorax).[1–3] In this paper, we describe a case of an obstructed PICC line, discuss the variations in PICC line structure and placement, and strategies for troubleshooting common issues in PICC line management.[1–5]

Keywords: PICC line; Emergency Department; Central Venous Catheters (CVCs)

INTRODUCTION

A peripherally-inserted central catheter, or PICC line, is a long indwelling percutaneous catheter typically inserted from a vein from the upper limb threaded to the cavoatrial junction.[1–3] These devices are a popular alternative to central venous catheters (CVCs) for their functionality in an outpatient setting, lower maintenance cost, and lower risk of major procedural complications (e.g., pneumothorax).[1–3] If appropriately cared for, PICC lines can be used and left in situ for months at a time.[1–3] It should be noted that rates of central line-associated bloodstream infections (CLABSIs) and catheter-related thrombosis may be higher amongst patients with PICC lines relative to CVCs, although existing data regarding that matter are conflicting.[1–4]

Common indications for PICC insertion include administration of irritant medications, like potassium chloride, vasoactive agents, or chemotherapy; prolonged administration of IV medications like antibiotics or antifungals; infusion of hypertonic solutions or those with extreme pH like TPN; and in patients who require frequent venous access like those who receive repeat blood transfusions, repeated blood sampling, or poor peripheral access.[1–3] PICC lines can also be placed in patients with anatomic abnormalities in the chest or neck that make standard CVC access quite difficult.[3]

In this paper, we describe a case of an obstructed PICC line, discuss the variations in PICC line structure and placement, and strategies for troubleshooting common issues in PICC line management.

CASE REPORT

A middle-aged adult male with a history of diabetes mellitus and hypertension presented to the emergency room for a chief complaint of a malfunctioning PICC line. The patient was using the device for home administration of intravenous metronidazole and cefepime after discharge from the hospital. His double-lumen PICC was originally placed after the patient had undergone amputation of his left second and third metatarsals for osteomyelitis. The patient stated that he could not administer his home medications for the last 3 days and that he was experiencing a modest sharp pain in his right brachium and right lateral neck.

On physical examination, his bilateral upper extremities were equal in circumference and non-tender. His right upper limb demonstrated a PICC line in situ with clean dressings and healthy skin around the site of insertion into the right basilic vein. Attempts to flush saline or withdraw blood from the PICC line were unsuccessful, and no extravasation was appreciated with forceful attempts to flush.

A chest x-ray (Figure 1) was obtained revealing an obvious notch in the PICC line at the level of the right subclavian vein. The patient's PICC line was subsequently removed demonstrating the obvious deformity as demonstrated in (Figure 2). The patient was subsequently referred for replacement of his PICC line by a member of our vascular access team, in which placement was uncomplicated.

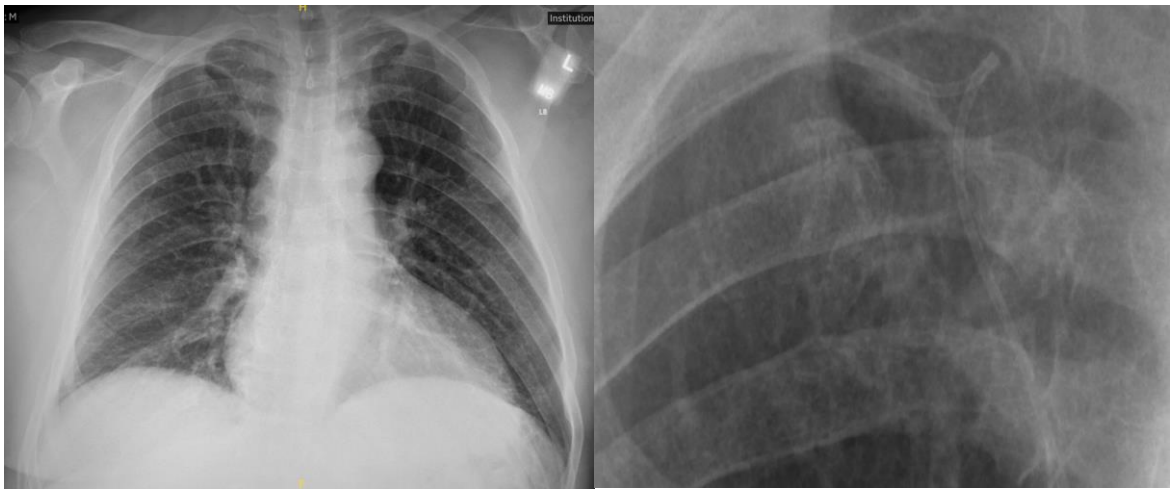

Figure 1: Portable AP chest x-ray revealing a kinked PICC line within the right subclavian vein.

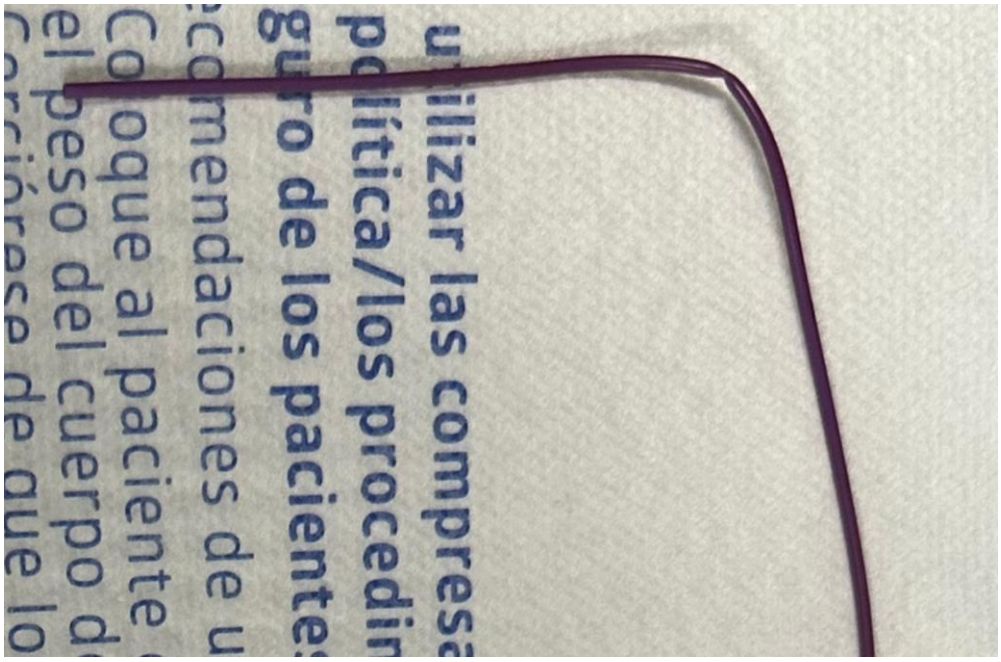

Figure 2: A deep kink in the PICC line is observed to occlude the lumen of the catheter after extraction from the patient

DISCUSSION

Review of the Case

PICC lines have a risk of migration after insertion. In the case of this patient, a previously functioning PICC line appears to have buckled on itself, resulting in a more proximal obstruction of the catheter. Initial placement of the catheter in the correct location is crucial to their success. There have been documented cases of PICC lines migrating from the right subclavian vein to the left subclavian vein, up the internal jugular vein, and into the azygos vein.[1,3]

Device Configuration

PICC lines are generally between 50 - 60 cm long and come in varieties of single-, double-, or triple-lumen catheters.[1–3] Catheters with more lumens have been shown to have an increased risk of many complications such as CLABSI, thrombosis, accidental withdrawal and migration.[1,2,4] These catheters can be made of a hydrophobic polymer, a hydrophilic polymer, or a combination of both.[2] Many modern designs often contain an antithrombogenic coating or valved clamp, the latter of which has been shown by some RCTs to reduce risks of infection and occlusion.[1,2] Depending on the agent used, antimicrobial coatings may or may not show a statistically significant reduction in CLABSI.[1,2,4]

Placement of the PICC line

PICC lines are most commonly inserted in the upper extremity within the basilic vein for its accessibility, lack of tortuousness, and its relative distance from crucial structures.[1-3] Other veins in the upper extremity or the

saphenous veins of the lower limbs are also potentially suitable targets. Among neonates, the head and neck veins such as the temporal and postauricular may also be accessed.[3]

PICC lines are generally inserted using a variation of the Seldinger technique: needle insertion, guidewire insertion, and advancement of the catheter over the needle before retraction of the guidewire.[3] PICC lines can be placed at the bedside or under fluoroscopic guidance or ultrasound-guidance.[3] Fluoroscopic-guided placement by a radiologist allows visualization in real time in patients with difficult or variant anatomy. Contrast material is inserted into the vein before the needle is placed. Ultrasound-guidance can be used as an alternative in pregnant patients, a group in which fluoroscopy is contraindicated.[3] There also exists an ECG-guided method in which the P wave is monitored and gradually increases in size as the catheter tip approaches the cavoatrial junction.[3] The P wave peaks and inverts upon entering the atrium, and ectopy can be observed if advanced too far. If the catheter is advanced too far and into the right ventricle, there is a risk of inducing ventricular tachycardia.[3] Thus, placement under cardiac monitoring is strongly recommended.

Major procedure-related complications of PICC line include inadvertent malpositioning, bleeding, hematoma formation, nerve injury, arterial puncture/cannulation, air embolism, arrhythmias, and accidental guide wire retention.[1-4]

PICC Line Troubleshooting

The Obstructed PICC Line

When encountering the PICC line that won't flush, start by forcefully flushing the line as there is no major risk of damaging the line that way.[5] If a 10 cc saline flush is insufficient, one can escalate to higher PSI mediums like a smaller 3 mL or 1 mL syringe. Dilute thrombolytics such as the Cathflo system can be trialed after forceful flushing.[5] Also consider patient positioning: a PICC may not flush if the upper limb is bent or rotated, and flow may improve simply by readjusting or straightening the extremity.[5] If these maneuvers do not relieve obstruction, consider obtaining an x-ray series to search for a kink in the line.[1,3,5] This generally requires replacement of the PICC line. If the limb in question is swollen or warm, consider obtaining a formal DVT ultrasound study to assess for thrombophlebitis.[1-5]

The Oozing PICC line

Management of oozing from a PICC line can vary. Blood leaking from around a PICC generally should stop quickly, even when a patient is anticoagulated.[5] Simply start by applying pressure. In lines that are draining clear fluid, the oozing liquid may represent serosanguinous or lymphatic fluid.[5] Pressure will not relieve the situation in this instance, and the site will likely require repeated dressing changes until the PICC is no longer required.[5] It is also possible that the source may be a hole in the PICC itself if the liquid appears similar in quality to the substance being injected.

Suspected PICC Line Infection

If a patient is stable, blood cultures should be obtained from both the PICC line and a separate peripheral site.[1,3,5] The PICC line is likely the culprit of infection if it has much greater colonies than the other site.[1,3] Culture of the tip will require removal of the PICC line if this is being considered.[3] PICC line removal should only be seriously considered in suspected line infection if the patient is septic.[5]

CONCLUSION

In summary, PICC lines can be placed in patients of all ages for long-term central venous access of medications that are chemical irritants. PICC lines come in a variety of configurations and are most common in the upper limbs. Regardless of whether they are placed under ultrasound or fluoroscopy, they are associated with CLABSI and venous thromboembolism. An obstructed PICC line should be flushed hard or with a dilute thrombolytic agent before escalating to withdrawal. An oozing PICC line can usually be kept in situ and monitored closely until it is no longer needed. Consider the various options available before resorting to frank removal and replacement of the malfunctioning PICC line.

REFERENCES

1. Moureau N. Preventing PICC complications: whose line is it? Agency for Healthcare Research and Quality PSNet. 2012.
2. Moureau NL, McKneally E, Hofbeck D, Sharp J, Hanley B, Williams V. Integrative review: complications of peripherally inserted central catheters (PICC) and midline catheters with economic analysis of potential impact of hydrophilic catheter material. Int J Nurs Health Care Res. 2022;5:1347.
3. Paje D, Chopra V. Peripherally inserted central catheter (PICC line). In: StatPearls Publishing StatPearls. Treasure Island (FL): StatPearls Publishing. 2024.
4. Patel P, et al. Complications associated with peripherally inserted central catheters and midline catheters in hospitalized patients. MDPI Healthcare. 2025;13(16):1993.
5. Solberg M. EM@3AM: PICC line complications [Internet]. Total EM. 2024 [cited 2026 May 23]. Available from: https://www.totalem.org/emergency-professionals/podcast-166-em-id-picc-line-complications-with-dr-solberg