

# Postural Ventricular Tachycardia from Peripherally Inserted Central Catheter Line Placed Using a Tip Confirmation System

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## Abstract:

We report a striking and florid case and management of ‘postural’ ventricular tachycardia caused by the mis-confirmed tip of a peripherally inserted central cannula (PICC) placed via a Tip Confirmation System (TCS).

**Key words:** arrhythmia; picc line; ventricular tachycardia; peripheral inserted central cannula; tip confirmation system

## Introduction

PICCs are widely used venous access devices in clinical practice and are largely regarded as safe and effective. [1] A rare complication of PICCs is cardiac arrhythmias, including positional ventricular tachycardia (VT) [2,3]. Literature review of this complication reveals reliance upon chest x-ray (CXR) or Tip Confirmation Systems (TCS) such as the Sherlock 3CG® for confirmation of correct placement. A TCS allows for magnetic tracking of the PICC tip during insertion and confirmation of placement with ECG, meaning most patients will not require a CXR. [4]

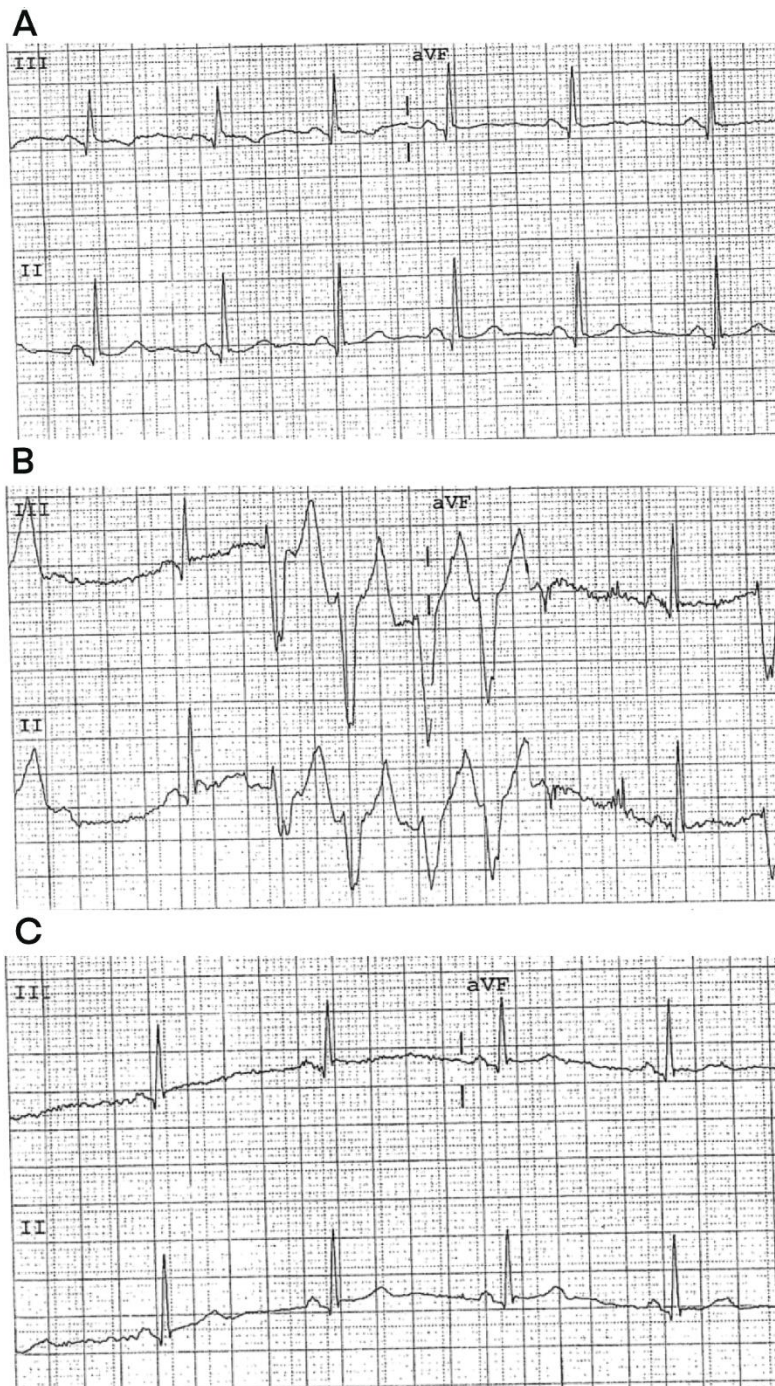
## Case History

A 31-year-old female presented to our University Emergency Department complaining of position provoked palpitations for the past two days. She had non-Hodgkin’s Lymphoma (NHL) for which she was receiving intravenous chemotherapy; a PICC line inserted into her right arm two days prior to presentation. After insertion of the PICC line which was verified using a TCS she began having feelings of “pounding” in her chest which were made worse when leaning forward, lying on right or left lateral decubitus or prone positions. Notably, the palpitations resolved immediately once the above positions were abandoned.

## Examination & Investigations

In the resuscitation bay she was anxious but hemodynamically stable. Her PICC site was satisfactory; heart sounds were normal, as was the respiratory exam. Her 12-lead ECG was consistently in normal sinus rhythm in the supine position. But when asked to move to the left lateral decubitus position immediately her heart rhythm switched to a VT pattern. (SEE FIGURE B) This was accompanied by palpitations, and light headedness. The arrhythmia and symptoms resolved upon moving from the lateral decubitus position to the supine position.

A chest X-ray, taken while asymptomatic, showed the tip of the PICC to be appropriately projected over the junction of the superior vena cava and right atrium. [4] Her bloods including full blood count, renal function, and venous blood gas were unremarkable. Discussion with the PICC-insertion team revealed, that the PICC had been satisfactorily inserted using the Sherlock 3CG® Tip Confirmation System of PICCs. [4]



**Figure Legend 1:**

- A: Baseline, supine position, normal rhythm  
 B: VT in lateral decubitus position  
 C: In lateral decubitus position after re-positioning tip of PICC

### Discussion & Conclusion

After wide consultation with the PICC insertion nurse, cardiology team, radiology team, emergency staff, and the patient, it was agreed upon to attempt to reposition the PICC with the aim of migrating the PICC 1.5cm proximally; this was achieved without complication. Post-migration the patient was asked to assume the triggering positions again (right and left

lateral decubitus, and prone). The palpitations did not occur, and the ECG remained in normal sinus rhythm (See Figure C). The patient was discharged home and for routine PICC service follow up.

In summary, although rare, position-dependent VT following PICC insertion with the utilisation of a TCS, and appropriately positioned PICC on CXR can occur. Careful history taking, exam, investigation, and clinical suspicion, can lead to effective and timely treatment. We believe

this to be the first reported case of ‘postural’ VT following PICC insertion following a TCS.

**Conflict of Interest:** None to declare

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