

## **The ECG-guided technique represents a safe and accurate technique to verify the position of PICC tip in patients with AF and could potentially remove the requirement for postprocedural chest X-ray among the patients with AF” Gao et al (2018).**

### Abstract:

**BACKGROUND:** Tip position verification of peripherally inserted central catheters (PICCs) is essential to the use of the catheter. Postprocedural chest X-ray as the “gold standard” practice for PICC tip confirmation can lead to a significant delay for patient IV therapy, cost more, and lead to radiation exposure for both patients and staffs. Intracavitary electrocardiogram (IC-ECG)-guided PICC placement which provides real-time tip confirmation during the insertion procedure has been widely used. However, safety and accuracy of ECG for abnormal surface ECG patients, such as patients with atrial fibrillation (AF), have not been reported.

**OBJECTIVE:** To determine the safety and accuracy of IC-ECG technique for PICC tip position verification among the patients with AF.

**PATIENTS AND METHODS:** A prospective cohort study was conducted in a teaching and tertiary referral hospital with more than 3,600 beds in Qingdao, People’s Republic of China. Adult patients with diagnosis of AF who need a PICC for infusion from June 2015 to May 2017 were enrolled in the study. For every included patient with AF, ECG was used to detect the PICC tip position during catheterization and X-ray was done to confirm the tip position as the “gold standard” after PICC insertion. The effectiveness and accuracy of ECG-guided catheter tip positioning and chest X-ray confirmation were compared.

**RESULTS:** Totally, 118 AF patients with 118 PICCs were enrolled (58 male and 60 female, age range 50-89 years old). There was no catheterization-related complication. When the catheter entered the lower 1/3 of superior vena cava, the amplitude of f wave reached the maximum. There was no statistical difference between X-ray PICC tip position verification and IC-ECG PICC tip position verification among patients with AF ( $\chi^2=1.31$ ,  $P=0.232$ ). Utilizing the cutoff point of f wave change  $\geq 0.5$  cm, a sensitivity of 0.94, a specificity of 0.71, a positive predictive value of 0.98, and a negative predictive value of 0.42 were observed. The area under the receiver operating characteristic curve was 0.909 (95% CI:

0.810-1.000).

**CONCLUSION:** The ECG-guided technique represents a safe and accurate technique to verify the position of PICC tip in patients with AF and could potentially remove the requirement for postprocedural chest X-ray among the patients with AF.

Full Text

Reference:

Gao, Y., Liu, Y., Zhang, H., Fang, F. and Song, L. (2018) The safety and accuracy of ECG-guided PICC tip position verification applied in patients with atrial fibrillation. *Therapeutics and Clinical Risk Management*. June 6th. .

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