



Ultrasound-guided venipuncture and tip location by intracavitary electrocardiogram have many advantages during the insertion of peripherally inserted central catheters, both in terms of safety and cost-effectiveness” Yin et al (2018).

Abstract:

INTRODUCTION: Ultrasound-guided venipuncture and tip location by intracavitary electrocardiogram have many advantages during the insertion of peripherally inserted central catheters, both in terms of safety and cost-effectiveness. Recently, a new tip-conductive peripherally inserted central catheters and new Doppler ultrasound device integrated with intracavitary electrocardiogram have been introduced into clinical practice in China. A randomized multicenter study (clinical trial no. NCT03230357) was performed to verify the feasibility and accuracy of intracavitary electrocardiogram, as performed with this new peripherally inserted central catheters and device.

METHODS: Our study enrolled a total of 2250 adult patients in 10 different Chinese hospitals. The patients were randomly assigned to either the study group (intracavitary electrocardiogram) or the control group (anatomical landmark guidance) in a 2:1 allocation. Ultrasound was used in both groups for venipuncture and tip navigation. All patients underwent chest X-ray after the procedure to verify the position of the catheter tip.

RESULTS: No insertion-related complications were reported in either group. In the study

group, first-attempt successful tip location was 91.7% (95% confidence interval: 90.3%-93.1%), significantly higher than 78.9% (95% confidence interval: 76.0%-81.9%) observed in the control group ($p < 0.001$). As evaluated by post-procedural chest X-ray, tip location in the study group had a sensitivity of 99.3% (95% confidence interval: 98.8%-99.7%), significantly higher than 86.8% (95% confidence interval: 84.4%-89.2%) observed in the anatomical landmark group ($p < 0.001$). CONCLUSION: These results indicated that during peripherally inserted central catheters insertion in adult patients, tip location with intracavitary electrocardiogram guidance, as carried out by a new tip-conductive peripherally inserted central catheters and intracavitary electrocardiogram integrated ultrasound device, was more effective and more accurate than tip location using anatomical landmarks.

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Reference:

Yin, Y.X., Gao, W., Li, X.Y., Lu, W., Deng, Q.H., Zhao, C.Y., Liu, X.R., Zhou, C., Hou, W.B., Lu, S.T., Liu, G., Wang, L.N., Li, M.Q. and Zhang, H.J. (2018) Insertion of peripherally inserted central catheters with intracavitary electrocardiogram guidance: A randomized multicenter study in China. The Journal of Vascular Access. December 31st. .

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