



The intracavitary electrocardiogram method had a more favorable positioning accuracy versus traditional X-ray method for peripherally inserted central catheter placement in adult patients” Liu et al (2019).

Abstract:

BACKGROUND: Recently, intracavitary electrocardiogram technology has been applied to peripherally inserted central catheter placement and demonstrates many potential advantages. However, the tip positioning accuracy of intracavitary electrocardiogram technology compared to conventional X-ray method is unknown.

OBJECTIVE: We did a meta-analysis to compare the tip positioning accuracy between intracavitary electrocardiogram technology and conventional X-ray method.

DATA SOURCES: We searched several databases, including Cochrane Library, PubMed, Web of science, and Embase. Additional studies were identified through hand searches of bibliographies and Internet searches. All human studies published in full text, abstract, or poster form were eligible for inclusion. Search terms included peripherally inserted central catheter, PICC, intracavitary electrocardiogram, IC-ECG, EKG, ECG, and catheter tip location.

STUDY ELIGIBILITY CRITERIA: Only randomized controlled trials of using intracavitary electrocardiogram technology versus X-ray method for peripherally inserted central catheter

placement were included. All studies included adult patients aged at least 18 years.

STUDY APPRAISAL AND SYNTHESIS METHODS: Independent extraction of articles by two authors using predefined data fields, including study quality indicators. Of the 178 citations identified, 5 studies that included 1672 patients met the eligibility criteria. It was found that statistical heterogeneity existed among the various studies ($I^2 = 16\%$, $p < 0.00001$); therefore, the fixed effect model was used in the meta-analysis ($p < 0.05$). The meta-analysis compared the tip positioning accuracy between intracavitary electrocardiogram technology and X-ray method and showed that intracavitary electrocardiogram technology had a better positioning accuracy (odds ratio: 2.88, 95% confidence interval: 2.15-3.87, $p < 0.0001$).

LIMITATIONS: Only five randomized trial met inclusion criteria, and the lack of an incomplete search led to the publication bias seen in these results.

CONCLUSION: The intracavitary electrocardiogram method had a more favorable positioning accuracy versus traditional X-ray method for peripherally inserted central catheter placement in adult patients. The intracavitary electrocardiogram can be a promising technique to guide tip positioning of peripherally inserted central catheter.

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Reference:

Liu, G., Hou, W., Zhou, C., Yin, Y., Lu, S., Duan, C., Li, M., Toft, E.S. and Zhang, H. (2019) Meta-analysis of intracavitary electrocardiogram guidance for peripherally inserted central catheter placement. The Journal of Vascular Access. March 6th. .

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