

To evaluate the accuracy of the simultaneous analysis of three radiographic anatomical landmarks – diaphragm, cardiac silhouette, and vertebral bodies – when determining the position of the umbilical venous catheter distal end using echocardiography as a reference standard” Guimarães et al (2016).

Abstract:

OBJECTIVES: To evaluate the accuracy of the simultaneous analysis of three radiographic anatomical landmarks – diaphragm, cardiac silhouette, and vertebral bodies – when determining the position of the umbilical venous catheter distal end using echocardiography as a reference standard.

METHOD: This was a cross-sectional, observational study, with the prospective inclusion of data from all neonates born in a public reference hospital, between April 2012 and September 2013, submitted to umbilical venous catheter insertion as part of their medical care. The position of the catheter distal end, determined by the simultaneous analysis of three radiographic anatomical landmarks, was compared with the anatomical position obtained by echocardiography; sensitivity, specificity, positive predictive value, negative predictive value, and accuracy were calculated.

RESULTS: Of the 162 newborns assessed by echocardiography, only 44 (27.16%) had the catheter in optimal position, in the thoracic portion of the inferior vena cava or the junction between the inferior vena cava and the right atrium. The catheters were located in the left atrium and interatrial septum in 54 (33.33%) newborns, in the right atrium in 26 (16.05%), intra-hepatic in 37 (22.84%), and intra-aortic in one newborn (0.62%). The sensitivity, specificity and accuracy of the radiography to detect the catheter in the target area were 56%, 71%, and 67.28%, respectively.

CONCLUSION: Anteroposterior radiography of the chest alone is not able to safely define the umbilical venous catheter position. Echocardiography allows direct visualization of the catheter tip in relation to vascular structures and, whenever possible, should be considered to identify the location of the umbilical venous catheter.

Reference:

Guimarães, A.F., Souza, A.A., Bouzada, M.C. and Meira, Z.M. (2016) Accuracy of chest radiography for positioning of the umbilical venous catheter. *Jornal de Pediatria*. July 13th. . doi: 10.1016/j.jpmed.2016.05.004.

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