Assessment (screening or diagnosis)

Doppler echocardiography was not accurate for diagnosing asymptomatic thrombosis associated with an umbilical venous catheter in infants


QUESTION: What is the accuracy of Doppler echocardiography for diagnosing asymptomatic thrombosis associated with an indwelling umbilical venous catheter (UVC) in infants?

Patients
47 infants (mean gestational age 32.2 wks, mean birth weight 1962 g, 51% boys) who had in situ UVCs for ≥ 48 hours and the catheter was scheduled for elective removal. All catheters had single lumens and were made of polyvinyl chloride; heparin was not added to intravenous solutions and no blood products were given through the UVC. Exclusion criteria were symptoms and signs of catheter associated thrombosis or catheter malfunction; known anatomic defects of the heart and great vessels; failure to position the tip of the catheter just above the diaphragm, in either the inferior vena cava or the right atrium; and unstable conditions requiring > 80% of supplemental oxygen.

Description of test and diagnostic standard
A 2 dimensional echocardiogram supplemented with pulsed wave Doppler and colour Doppler imaging was done by 1 of 3 experienced technologists. The unedited tapes of each echocardiogram were independently reviewed by 3 paediatric cardiologists who were blinded to the venography results and made a definitive diagnosis about the presence or absence of a thrombus in the right atrium, inferior vena cava, or ductus venosus. The diagnostic standard, contrast venography, was done by a radiologist using a portable image intensifier. A second radiologist, who was blinded to the echocardiographic findings, viewed the videotaped image and noted the presence or absence of a thrombus and its diameter and location.

Main outcome measures
Sensitivity, specificity, and likelihood ratios of Doppler echocardiography.

Main results
14 patients (30%) had thrombosis on venography (4 in the right atrium, 7 in the inferior vena cava, and 3 in the ductus venosus). The test characteristics of Doppler echocardiography were poor (table).

Conclusion
Doppler echocardiography was not accurate for diagnosis of asymptomatic thrombosis associated with an indwelling umbilical venous catheter in infants.