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The use of carbon dioxide wedged hepatic venography to identify the portal vein: comparison with direct catheter portography with iodinated contrast medium and analysis of predictive factors influencing level of opacification.

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Abstract

PURPOSE:

This study was conducted to assess the value of wedged hepatic venography (WHV) with CO(2) as a contrast agent for identification of the portal venous system in patients with cirrhosis. Additionally, the predictive value of several parameters that potentially influence the level of portal vein opacification by CO(2) WHV was analyzed.

MATERIALS AND METHODS:

In 163 patients, CO(2) WHV was performed before transjugular intrahepatic portosystemic shunt creation to opacify and map the portal vein for subsequent targeting by intrahepatic puncture technique. Concordance between CO(2) WHV and direct catheter portography with iodinated contrast medium was assessed by analysis of sensitivity parameters. Additionally, analysis of factors potentially influencing the opacification of the portal vein with use of CO(2) WHV was assessed.

RESULTS:

CO(2) WHV was successfully performed in all 163 patients. In three patients (1.8%), CO(2) extravasation was noted, but without any clinical consequence. Sensitivity rates of CO(2) WHV for opacification of the right and left portal veins and the portal main trunk were 93.83% and 68.52%, respectively. Positive predictive factors ($P < .05$, Wilcoxon two-sample test) were high portosystemic gradient, spontaneous splenorenal shunt, esophageal varices, and reversed portal flow. One negative predictive factor was a patent umbilical vein.

CONCLUSIONS:

CO(2) WHV is safe, highly efficient, and reliable in the identification of the right and left portal veins. CO(2) WHV is clearly less effective in opacifying the entire portal main trunk. With use of CO(2) WHV, the portal venous system is most distinctly opacified in patients presenting with a high portosystemic gradient, a spontaneous splenorenal shunt, esophageal varices, and reversed portal flow.