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EUS-guided portal vein carbon dioxide angiography: a pilot study in a porcine model.

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BACKGROUND: Direct portal vein (PV) angiography can provide valuable clinical information but is not performed due to the high risk of complications. **OBJECTIVE:** To assess the feasibility of EUS-guided PV angiography with a small-caliber FNA needle by using carbon dioxide (CO₂) as a contrast agent in a porcine model. **SETTING:** Acute experiments with 50-kg pigs under general anesthesia. **DESIGN AND INTERVENTIONS:** Under linear array EUS guidance, the intrahepatic PV branch was punctured with a 25-gauge FNA needle. Portal venography was performed with iodinated contrast (Hypaque) and then with medical grade CO₂. After portography, the needle was removed from the PV and the animals were observed for 30 minutes, then euthanized for necropsy. **MAIN OUTCOME MEASUREMENT:** Ability to visualize portal anatomy. **RESULTS:** Six animal experiments were performed without complications. EUS-guided PV puncture with 25-gauge FNA needle was technically straightforward. Injection of ionic iodinated contrast through the 25-gauge FNA needle was arduous (mean [±SD] pressure 76.7 ± 5.2 pounds per square inch [psi]), resulting in short (6.02 ± 1.15 seconds) and poor opacification of the PV (visualization score 1.33 ± 0.52). CO₂ injection through a 25-gauge needle was simple and easy (pressure 20.8 ± 2.0 psi), producing prolonged (19.83 ± 1.68 seconds) opacification of the entire portal system (visualization score 4.33 ± 0.52). There was a statistically significant difference in all compared parameters (P < .0001) favoring injection of CO₂ over viscous iodinated contrast during portal angiography through a 25-gauge FNA needle. Postmortem examination revealed no active bleeding and no damage to the liver, other intra-abdominal organs, or blood vessels. **LIMITATION:** Acute animal experiments. **CONCLUSIONS:** EUS-guided portal venography with CO₂ using a small (25 gauge) FNA needle appears feasible, technically simple, and safe.

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