1: Gastrointest Endosc. 2007 Oct;66(4):814-9.

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

Giday SA, Ko CW, Clarke JO, Shin EJ, Magno P, Jagannath SB, Buscaglia JM, Kantsevoy SV.

Department of Medicine, Division of Gastroenterology, Johns Hopkins Hospital, Baltimore, Maryland 21205, USA.

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 (CO(2)) 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 CO(2). 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). CO(2) 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 CO(2) 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 CO(2) using a small (25 gauge) FNA needle appears feasible, technically simple, and safe.

PMID: 17905028 [PubMed - indexed for MEDLINE]

Lab, Medical +