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### Gadolinium, carbon dioxide, and iodinated contrast material for planning inferior vena cava filter placement: a prospective trial.

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**PURPOSE:** To prospectively compare the diagnostic accuracy of CO(2) and gadolinium to iodinated contrast material for inferior vena cavography before inferior vena cava (IVC) filter placement. **MATERIALS AND METHODS:** Forty patients underwent injection of iodinated contrast material, CO(2), and gadolinium. Iodinated contrast material was used as the standard. Caval diameter was determined with calibrated software. Three readers blinded to contrast agent used measured the distance from the superior image border to the inferior margin of the renal veins and from the inferior image border to the iliac bifurcation. The measurements with CO(2) and gadolinium were compared to those with iodinated contrast material to obtain the interobserver and intraobserver variability. The presence or absence of caval thrombus and variant anatomy was noted. The same readers reexamined 12 studies in a separate session to determine intraobserver variability and correlation. **RESULTS:** Caval diameter differed by 0.4 mm or less for all three agents. Measurements with all agents were within 2 mm of each other for all patients. Gadolinium and CO(2) were not significantly different from one another in measuring caval diameter. At the initial reading, compared with iodinated contrast material, gadolinium had greater mean interobserver error in measuring the distance to the iliac bifurcation and both renal veins (range, 1.6-1.8 mm) than CO(2) (range, 0.2-1.4 mm). This finding, although statistically significant for gadolinium (P <.05), was of doubtful clinical relevance. Interobserver correlation was significantly worse for CO(2) at the levels of the iliac bifurcation (P =.02) and right renal vein (P =.008). Interobserver correlation for gadolinium was similar to that for iodinated contrast material at all levels. At repeat reading, there was significantly inferior intraobserver correlation with use of CO(2) for both renal veins (P <.05) compared to iodinated contrast material and for the left renal vein (P <.05) compared to gadolinium. Gadolinium identified three of three renal vein anomalies identified with iodinated contrast material whereas CO(2) localized one of three. **CONCLUSION:** CO(2) and gadolinium had limitations when compared with iodinated contrast material. Gadolinium provided superior consistency in identifying relevant landmarks for filter placement. CO(2) demonstrated significantly greater mean correlative error than gadolinium at initial and repeat readings.

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