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1: *Kidney Int* 1998 Sep;54(3):945-50

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## CO<sub>2</sub> and gadopentetate dimeglumine as alternative contrast agents for malfunctioning dialysis grafts and fistulas.

Spinosa DJ, Angle JF, Hagspiel KD, Schenk WG 3rd, Matsumoto AH

Department of Radiology, University of Virginia Health Sciences Center, Charlottesville 22908, USA.

**BACKGROUND:** Hemodialysis grafts and native fistulas are frequently evaluated angiographically utilizing iodinated contrast material to determine the cause of malfunction. Occasionally, patients are not able to receive iodinated contrast material due to a history of previous severe allergic reaction or concern that iodinated contrast material could worsen renal function requiring premature initiation of permanent dialysis. We set out to test the feasibility of gadopentetate dimeglumine as an alternative contrast agent in conjunction with carbon dioxide (CO<sub>2</sub>) angiography in the evaluation and treatment of hemodialysis grafts and native fistulas in patients who have a contraindication to iodinated contrast material. **METHODS:** Six patients with a malfunctioning hemodialysis graft and native fistula were evaluated. Four patients were successfully evaluated using carbon dioxide and gadopentetate dimeglumine. Two additional patients underwent balloon angioplasty using gadopentetate dimeglumine alone as the alternative contrast agent. **RESULTS:** All six patients successfully were evaluated and treated using gadopentetate dimeglumine either alone or as a supplement to CO<sub>2</sub> angiography. Five of these patients had lesions successfully treated using gadopentetate dimeglumine alone or in combination with CO<sub>2</sub> as the angiographic contrast agents. One patient underwent a successful diagnostic angiogram using gadopentetate dimeglumine and CO<sub>2</sub> as alternative contrast agents and was subsequently treated with surgical revision. The gadopentetate dimeglumine angiograms identified the arterial anastomosis and more clearly identified stenotic lesions and venous outflow anatomy compared to carbon dioxide angiograms. **CONCLUSION:** Gadopentetate dimeglumine is useful as an alternative contrast agent in conjunction with CO<sub>2</sub> in patients with malfunctioning hemodialysis grafts and fistulas, who have a contraindication to the administration of iodinated contrast material.

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1: *J Vasc Interv Radiol* 1998 Nov-Dec;9(6):909-16

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## Gadolinium-based contrast and carbon dioxide angiography to evaluate renal transplants for vascular causes of renal insufficiency and accelerated hypertension.

Spinosa DJ, Matsumoto AH, Angle JF, Hagspiel KD, Isaacs RB, McCullough CS, Lobo PI

Department of Radiology, University of Virginia Health Sciences Center, Charlottesville 22908, USA.

**PURPOSE:** To evaluate the utility and potential nephrotoxicity of gadolinium-based contrast angiography when used with carbon dioxide angiography in renal transplant patients with suspected vascular causes of renal insufficiency and/or accelerated hypertension. **MATERIALS AND METHODS:** Thirteen consecutive renal transplant patients with suspected vascular causes of renal insufficiency and/or accelerated hypertension were evaluated with gadolinium-based contrast and CO<sub>2</sub> angiography with use of digital subtraction techniques. Stenotic lesions were treated with angioplasty with/without stent placement. No iodinated contrast agents were used. Serum creatinine levels were obtained before and at 24 and 48 hours after the procedure. An increase in creatinine levels greater than 0.5 mg/dL (44 micromol/L) was considered significant. **RESULTS:** Nine patients were studied for renal insufficiency, two for accelerated hypertension, and two for both. All 13 studies were considered diagnostic. Significant stenoses were treated in four patients with angioplasty with or without stent placement. Two patients had progression of their renal insufficiency. One of these patients underwent biopsy and was found to have both acute and chronic rejection. The other patient underwent cardiac catheterization 2 days after a transplant renal artery angioplasty. In the remaining nine patients with renal insufficiency (creatinine range, 1.8-3.9 mg/dL [159-345 micromol/L]; mean, 2.7 mg/dL [239 micromol/L]), renal function improved or did not worsen. **CONCLUSION:** Based on this limited study, gadolinium-based contrast angiography appears to be a promising supplement to CO<sub>2</sub> angiography for the diagnosis and treatment of vascular lesions in patients with renal transplant insufficiency and/or accelerated hypertension. Further study is necessary to determine safety, optimal gadolinium dosage, and imaging parameters.

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