Title of Paper
"Hybrid" Lower Extremity Arteriography Utilizing Iodinated Contrast or Gadodiamide to Supplement CO2 Arteriography in Patients With Renal Insufficiency: A Preliminary Report

PURPOSE: To determine if small amounts of nonionic contrast (NIC) when used to supplement carbon dioxide (CO2) angiography in patients with peripheral vascular disease (PVD) and renal insufficiency (RI) result in significant worsening of renal function compared with angiograms performed with and without gadodiamide (Gd).

METHODS: Thirty-seven consecutive lower extremity arteriograms were performed in 32 patients with RI (baseline serum creatinine < 1.5 mg/dl) using CO2 alone or CO2 supplemented with either NIC or Gd (up to 0.3 mmol/kg) as needed to include run-off vessels to the foot and obtain pre and post-angiograms at the site of an intervention. Serum creatinine (Cr) levels were obtained pre-procedure (pre) and at 48 hours post-procedure (post). The peak Cr level was also determined for patients with a significant (> 0.5 mg/dl) Cr elevation.

RESULTS: Thirty-seven lower extremity angiographic procedures (15 diagnostic and 22 diagnostic/interventions) were performed in 32 patients with a mean Cr pre of 2.39 mg/dl and a post mean Cr of 2.64 mg/dl. Thirteen procedures (6 interventions) were performed utilizing CO2 and NIC in patients with a mean pre Cr of 2.28 mg/dl and a mean post Cr of 2.62 mg/dl. Five of these 13 patients (38%) demonstrated a Cr increase > 0.5 mg/dl at 48 hours. The mean pre Cr in these patients was 2.28 mg/dl, and the peak post Cr equaled 3.48 mg/dl. Seven procedures (2 interventions) were performed with CO2 alone on patients with a mean pre Cr of 2.30 mg/dl and a mean post Cr of 2.3 mg/dl. Seventeen procedures (13 interventions) were performed with CO2 and Gd in patients with a mean pre Cr of 2.52 mg/dl and a post mean Cr of 2.80 mg/dl. One out of 17 patients (5.8%) demonstrated an increase in Cr > 0.5 mg/dl at 48 hours, with a pre Cr of 3.3 mg/dl and a peak post Cr equal to 6.1 mg/dl. The difference between the pre Cr for each group (CO2 + NIC, CO2, CO2 + Gd and the 5 patients who significantly increased their Cr following NIC) was not statistically significant (p = 0.299). The number of patients who developed worsening renal function (5/13) in the NIC group compared with the CO2 and CO2/Gd group (1/24) is statistically significant (p = 0.04). The average volume of supplemental contrast was similar in the NIC and Gd groups (52 mg vs. 56.5 mg, respectively). The average volume of supplemental NIC in the 5 patients who increased their Cr was 44.6 ml (range 33-55 ml).

CONCLUSION: The use of small volumes of NIC to supplement CO2 angiography in patients with PVD and RI appears to increase the risk of worsening renal function when compared to CO2 angiogram performed with and without Gd.

Deadline: This application must be received by October 9, 1998.
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