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A simple DSA method to detect air contamination during CO2 venous studies.

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The use of CO2 as a contrast agent has increased significantly for visualization of the central veins, inferior vena cava, and portal vein. The most serious complication associated with CO2 studies is air contamination. We evaluated a simple digital subtraction angiogram (DSA) method to detect air contamination during CO2 venous studies. After injections of 5, 10, and 20 cm3 of CO2 and 5 cm3 of air into the inferior vena cavas of five domestic swine in the left lateral decubitus position, a DSA was performed using the cross-table lateral projection to visualize the gases trapped in the right atrium. The time to complete dissolution of CO2 at increased doses was compared to that of air. Vital signs were observed during and after CO2 or air injection. In all animals, DSA showed the trapped gas outlining the wall of the right atrium. Five cubic centimeters of CO2 was cleared from the right atrium in an average of 46 sec (21-60 sec), whereas 5 cm3 of air remained visible over 5 min. Ascending doses of CO2 increased the time of dissolution to 54 sec (47-67 sec) for 10 cm3 and 70 sec (45-90 sec) for 45 cm3. Vital signs remained stable during the study. Using DSA, CO2 can be distinguished from air by demonstrating rapid absorption of the former, thus allowing detection of air contamination during CO2 venous studies. If the gases trapped in the right atrium remain visible 90 sec after the injection, air contamination should be suspected.

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