

Carbon Dioxide May be a More Sensitive Contrast Agent in Unmasking Endoleaks in Transcaval Aortic Aneurysm Intervention

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Introduction

Endoleaks are a common complication of endovascular aorta repair (EVAR) and often require intervention. Transcaval approaches have emerged as safe and efficacious, however, endoleaks may be subtle and precise localization can be difficult. We describe two cases of transcaval interventions in which CO2 angiography demonstrates superiority over standard iodine-containing contrast medium (ICCM) in localizing elusive endoleaks.

Case 1: Transcaval ICCM vs Transcaval CO2

84-year-old male with prior EVAR for abdominal aortic aneurysm (AAA) with enlargement of the aneurysm sac from 6.6x6.9cm to 8x7.2cm. A transcaval endovascular approach was performed, and no significant endoleak was localized using ICCM. The sac was prophylactically coiled, and repeat angiography was again unrevealing. CO2 was then used, with clear evidence of a type Ib right iliac limb endoleak. This diagnosis facilitated timely intervention with iliac limb extension.

Case 2: CO2 aortography vs Transcaval CO2

53-year-old male with prior EVAR with multiple visceral snorkels for AAA with aneurysm sac enlargement from 10x10.9cm to 13x12.6cm. Transcaval angiography with ICCM was attempted but no obvious endoleak was detected. Using CO2, a type 3 endoleak at the superior mesenteric artery (SMA) snorkel apparatus was clearly demonstrated. The patient later underwent successful definitive repair with visceral debranching and subsequent mesenteric and renal bypasses.

Discussion

The results of these two cases note clinical superiority of CO2 over ICCM in diagnosis of type I and type III endoleaks. Multiple comparisons have been drawn between ICCM and CO2 in standard endovascular approaches for endoleak management, and several recent studies advocate general superiority of CO2. This benefit may be especially pronounced in transcaval approaches, likely relating to the buoyancy and dissipative properties of CO2, complimented by the limited volume within the aneurysm sac. In current literature, transcaval approaches are being increasingly favoured in management of endoleaks, and authors propose that CO2 may increase the probability of intervention success. Large comparative studies are required to determine quantitative benefit of this strategy.

