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Intraluminal Assessment of Coronary Arteries With Ferumoxytol-Enhanced Magnetic Resonance Angiography

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DIAGNOSTIC ANGIOGRAPHY IS SOMETIMES INEVITABLE IN PATIENTS WITH ESTIMATED GLOMERULAR filtration rate (eGFR) of <30 ml/min/1.73 m² who are not yet on dialysis. However, iodine- or gadolinium-based contrast agents pose a risk of acute kidney injury or nephrogenic systemic fibrosis, respectively (1). Ferumoxytol-enhanced cardiac magnetic resonance angiography (cMRA) (**Figure 1**) can be an alternative but anaphylactic reactions have been described. We present a brief pictorial overview of our experience of its use in 5 patients (**Figures 2 to 5**, Online Videos) for assessing the coronary artery tree without complications.

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(A) Four-chamber view, clockwise: main pulmonary artery, descending thoracic aorta, left ventricular chamber, right ventricular chamber, and ascending thoracic aorta. (B) Sagittal reconstruction with visualization of left coronary artery (arrow) and overlying main pulmonary artery. (C) Multiplanar reconstruction of the coronary tree viewed superior to inferior showing distribution of right coronary, left main continuous with left anterior descending artery, and left circumflex beginning at the level of the ascending aorta (left to right, green lines). cMRA = cardiac magnetic resonance angiography.

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FIGURE 2 cMRA After Intravenous Ferumoxytol Injection Correlated With Cardiac Catheterization Performed 154 Days Previously in Patient #1

(Ai) Left heart cardiac catheterization with demarcated section of left coronary artery (blue arrow = proximal; red arrow = distal) corresponds to MRA demarcation and Online Video 11. (Aii) Three-dimensional reconstruction (with ventricular wall subtraction) showing the path of vessel descent and the axial cross section showing the left lateral direction of vessel. Aortic root (asterisk).
(Bi) Multiplanar straight-line and (Bii) curvilinear reconstruction shows ferumoxytol-containing left main origin and left anterior descending (green line) vessels. (Biii) Luminal cross section at the proximal (left) and distal (right) segment, respectively. Abbreviation as in Figure 1.



FIGURE 3 Ferumoxytol cMRA Correlation With Cardiac Catheterization in Patient #1

(Ai) Right heart cardiac catheterization with demarcated section of right coronary artery (blue arrow = proximal; red arrow = distal) corresponds to MRA demarcation and Online Video 12. (Aii) Three-dimensional reconstruction (with ventricular wall subtraction) showing path of vessel descent and axial cross section showing right lateral direction of vessel. Aortic root (asterisk).
(Bi) Multiplanar straight line and (Bii) curvilinear reconstruction shows patent, continuous, ferumoxytol-containing proximal-to-mid right coronary artery (green line). (Biii) Luminal cross section at the proximal (left) and distal (right) segment, respectively. Scale bar = 5 mm. Abbreviation as in Figure 1.

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