

7. 5 Initial Results with Clinical Blood Pool Enhanced MRA: Added value over First Pass?

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Over the past years first pass contrast-enhanced MRA has emerged as the MRA technique of choice for vascular imaging of the abdominal aorta and the lower extremities. However, despite many recent technical refinements, venous enhancement in the calf and foot as well as low signal-to-noise ratio at high spatial resolution imaging persistently preclude a high level of diagnostic confidence in a substantial fraction of patients.

The recent clinical introduction of the blood pool MR contrast agent gadofosveset (Vasovist®) has the potential to overcome these issues because of the much higher relaxivity and prolonged intravascular residence time. Theoretically these characteristics not only enable better first pass imaging, but also offer the possibility to perform ultra-high spatial resolution equilibrium phase imaging of both arterial and venous structures.

The purpose of the current ongoing study is to in-

vestigate the added value of ultra-high spatial resolution equilibrium phase imaging over standard first pass imaging of lower as well as upper extremity arteries. Initial results indicate improved signal-to-noise ratio in the first pass compared to imaging with extracellular agents, and the ability to acquire images in the equilibrium phase with truly acquired voxel sizes down to 0.4x0.4x0.4 mm³ (64 μm³). Also, the addition of venous imaging enabled detection of concomitant disease such as deep venous thrombosis, and allowed for characterization of venous structures prior to peripheral arterial bypass surgery using autologous veins.

In conclusion, gadofosveset-enhanced MR angiography enables better first pass image quality as well as the ability to significantly improve diagnostic yield and confidence by the addition of ultra-high spatial resolution equilibrium phase information.