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Can MRI provide accurate 3D images of the arterial maternal anatomy and their relation with uterus and placenta in cases of placenta accreta spectrum?

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Objectives: To evaluate the use of a non-contrast MRI sequence (time of flight; TOF) for the anatomical reconstruction of the maternal vessels in cases of Placenta accreta spectrum (PAS).

Methods: In women referred for MRI study of PAS, the TOF sequence was performed using the Siemens Aera (Erlangen, Germany). The parameters are described in table 1. MRI sequences were acquired based on the intravascular flow velocity, in three different planes. The images were acquired in three planes, reconstructed in 3D and the images were fused in software MIMICS.

Results: Seven patients with PAS were evaluated using the TOF sequence. The sequences in different lanes were acquired satisfactorily. The bidimensional images were gathered into one file, forming a 3D image of the arterial anatomy of the maternal pelvis. Using the software MIMICS, the images of the maternal arteries were segmented, exported, and fused with traditional T2-weighted sequences for spatial correlation with other pelvic structures.

Conclusions: The TOF MRI sequence can demonstrate the main characteristics of the maternal pelvic arterial anatomy in cases of PAS using bidimensional and tridimensional images, with the arterial anatomy fused into other sequences such as T2-weighted HASTE and TRUFI.

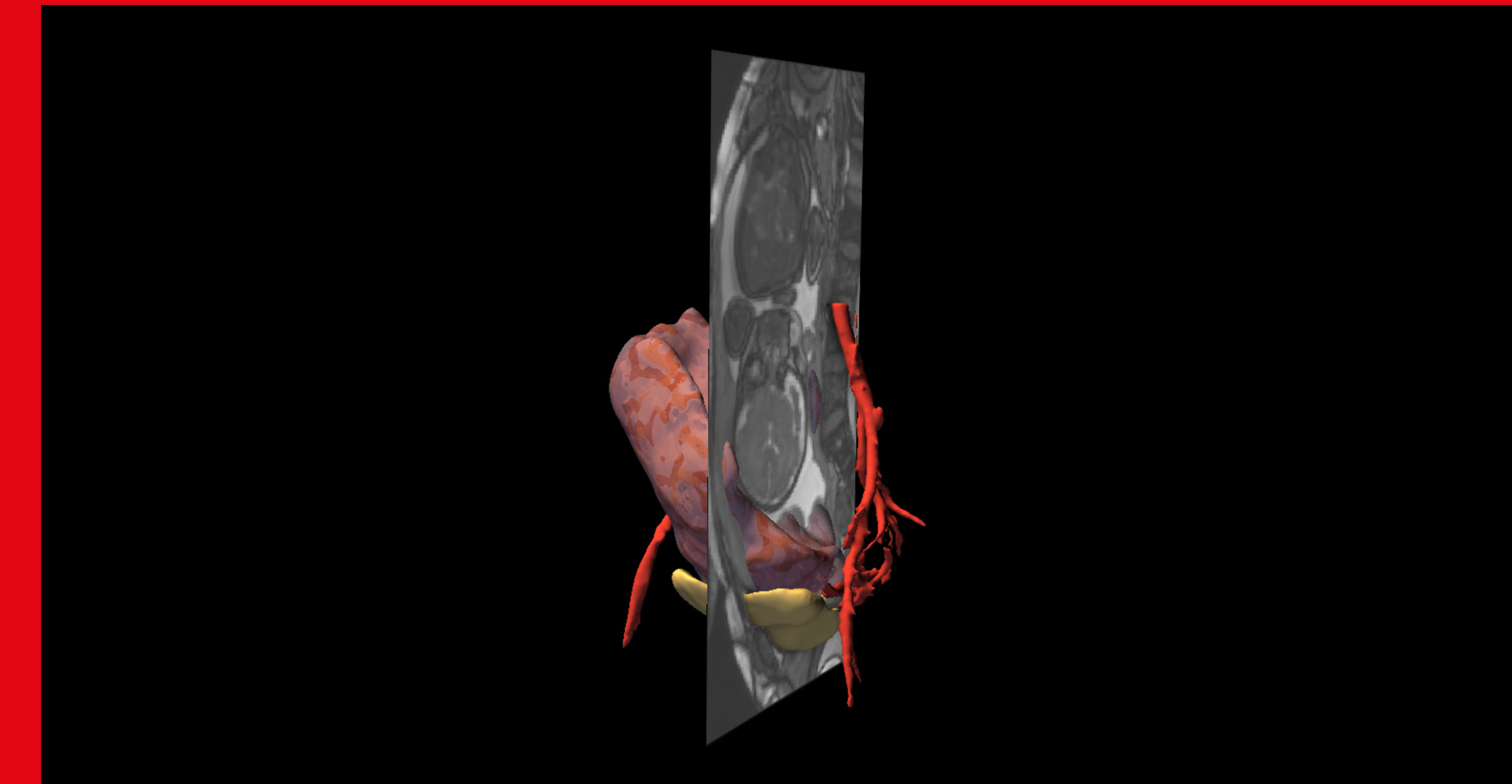


Figure: 3D reconstruction of maternal arterial anatomy (red), placenta (brown) and bladder (yellow) acquired by TOF MRI sequence in a case of PAS. The tridimensional image can be fused to other MRI sequences as T2-weighted images as HASTE and analyzed in any anatomical plane.