

## Non-contrast-enhanced MR angiography of adrenal veins as a preprocedural examination of adrenal vein sampling.

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**TARGET AUDIENCE** – Researchers involved in non-contrast enhanced MR angiography, abdominal/genitourinary radiologists and interventional radiologists.

**PURPOSE** – Preprocedural investigation of location and direction of adrenal veins is crucial for successful adrenal vein sampling. Contrast-enhanced CT is considered to be the modality of choice, but contrast agent and radiation burdens are remaining problems. The purpose of this study was to assess feasibility and diagnostic performance of non-contrast-enhanced MR angiography of adrenal veins.

**METHODS** – 34 patients who were planned to undergo adrenal vein sampling were included in this study. Non-contrast enhanced MR angiography of both right and left adrenal veins were obtained using respiratory-triggered fat-saturated axial 3D balanced steady-state free precession (SSFP) sequence. Detailed scan parameters were as follows: TR/TE = 4.2/2.1 ms, flip angle = 70 degree, FOV = 32 x 32 cm, NEX = 0.8, slice thickness/interval = 2/1 mm, matrix = 256 x 256 x 120-172, and parallel imaging factor = 2.3.

Adrenal vein sampling was performed within three days after MR angiography. Venography of bilateral adrenal vein and cone-beam CT during right adrenal venography were performed in all cases as gold standard for the evaluation of MRA.

Visualization of bilateral adrenal veins in MR angiography was evaluated using both source images and interactive multiplanar reformation.

**RESULTS** – Non-contrast enhanced MR angiography of adrenal veins was successfully performed in all of the patients. Right adrenal veins were visualized in 27 of 34 patients, and left adrenal veins were visualized in 32 of 34 patients.

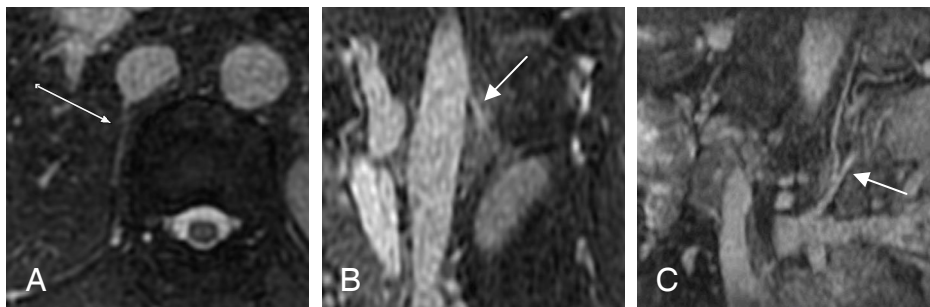


Fig. 1 Right adrenal vein (A, B: arrows) and left adrenal vein (C: arrow) are clearly visualized on axial source image (A) and multiplanar reformation images (B, C). Location of orifices and direction of the branches can be assessed, which is essential for successful adrenal vein sampling.

**DISCUSSION** – Right adrenal veins were detected in 79%, which was comparable to previously reported performance of contrast-enhanced CT<sup>1</sup>. Visualization of both right adrenal veins and accessory hepatic veins in the same image series was considered to be an advantage of MR angiography over CT.

**CONCLUSION** – Non-contrast enhanced MR angiography is feasible for preprocedural examination of adrenal vein sampling. Improvement of the scan sequence is necessary for better visualization, especially for right adrenal veins.

**REFERENCE** – 1. Matsuura T, Takase K, Ota H, et al. Radiologic anatomy of the right adrenal vein: preliminary experience with MDCT. *AJR Am J Roentgenol.* 2008 Aug;191(2):402-8.