

Item S1. Multidetector Computed Tomography (MDCT) Angiogram Protocol

Precontrast axial CT scans were followed by a CT angiogram using a standard prep delay of 15-18 seconds after initiation of the intravenous contrast injection or with bolus timing software. Using the earlier 4-channel multidetector CT exam the precontrast images were acquired in an HQ mode with 5mm slice slice thickness, 7.5 mm/rotation and 160 mA from the top of the kidneys to the iliac crest. From the iliac crest to the pubic symphysis the technique was in the HQ mode at 5mm slice thickness, 15mm/rotation and 190 mA. Using the 64-channel MDCT scanner a collimation of 24x1.2mm was used with a pitch of 0.8 mm and 23 mm/rotation with 120 KVP and a quality reference mass of 160. The 4-channel MDCT CTA evaluation began 2 cm above the celiac axis to the iliac bifurcation in the HS mode using 1.25 mm slice thickness and 7.5 mm/rotation with 140 kVp and 320 mA. The 64-channel CTA exam was acquired with 64 x 0.6 collimation, a pitch of 1.2, and 23 mm/rotation with 120 kVp and quality reference mAs of 350. In addition a modulated tube current (CARE Dose) was applied.

A nephrographic phase CT acquisition was obtained at 55 seconds after the start of IV contrast injection from the dome of the liver to the top of the iliac crest in the HQ mode with 5 mm slice thickness, 7.5 mm/rotation and 190 mA. For the 64-channel CT evaluation a 64 x 0.6 collimation was used, pitch of 1.2, 23 mm/rotation, 120 kVp and a Quality reference mAs of 240 also using the modulated tube current. Ureteral compression balloons were inflated over the lower abdomen two minutes after intravenous contrast injection with acquisition of a traditional overhead film-screen urogram at 8-minutes and an excretory phase CT scan and a 10-minute urogram could be obtained at the discretion of the radiologist. Automated coronal reformatted reconstructions were obtained at the operators console and 3D-volume rendered images were obtained at an independent workstation by dedicated 3D-technologists.