Assessment of peripheral arterial occlusive disease: comparison of multislice-CT angiography (MS-CTA) and intraarterial digital subtraction angiography (IA-DSA).

PURPOSE: The aim of the study was to assess the arterial vascular system of the lower extremities in patients with peripheral arterial occlusive disease using Multislice-CT angiography (MS-CTA) and to compare the results with the standard of reference, intraarterial digital subtraction angiography (IA-DSA).

MATERIALS AND METHODS: MS-CTA and IA-DSA of the lower extremities were carried out on 23 patients with peripheral arterial occlusive disease (Fontain Stage IIb: 18, III: 3, IV: 2). MS-CTA comprised a 4 x 2.5 mm collimation, 15 mm table feed/rotation, 0.5 sec rotation time and 3 mm slice thickness (1.5 mm reconstruction increment). Delay time was determined by bolus tracking. 150 ml of contrast media were injected intravenously at a flow rate of 3 ml/sec. Maximum intensity projection (MIP) reformations were performed using a semi-automatic vessel tracking program. MS-CTA (axial and MIP-reformatted images) and IA-DSA were reviewed by two radiologists. The grade of vascular stenosis as well as occlusion were rated on a scale of 0 to 3 (0=0-50% stenosis, 1 = 51-75% stenosis, 2 = 76-99% stenosis, 3 = occlusion). RESULTS: For MS-CTA, the mean delay time was 30.2 s (23-40 s), mean scan time was 37.4 (33-42 s). Data analysis was based upon a total of 1136 vascular segments for both methods (568
each). A comparison of all the evaluated segments in both techniques revealed a MS-CTA / IA-DSA 86.3% match. Out of 442 segments proximal the trifurcation, 386 were correctly assessed in MS-CTA (87.3%) and distal the trifurcation, 101 out of 126 segments were rated correctly (80.2%). In MS-CTA, an overall confidence interval of 95% can be achieved in 83.2% to 89.0% for correctly rated stenosis grading. CONCLUSIONS: In patients with peripheral arterial occlusive disease, MS-CTA of the lower extremity is a promising minimal-invasive method for detection of relevant arterial stenoses. However, the technique was limited to routine diagnostic purposes due to severe calcifications and time consuming reconstruction procedures.