Abstract Title:	CT angiography: Multi-path curved planar reformation of the peripheral arterial tree
Author Block:	A. Kanitsar, D. Fleischmann, R. Wegenkittl, P. Felkel, M.E. Gröller; *Vienna/AT*
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Purpose: Curved Planar Reformations (CPR) through the long axis of the vasculature of interest allow excellent assessment of both, the flow lumen and the vessel wall in patients with peripheral arterial occlusive disease. The main drawback of this technique, however, is the restriction to the visualization of only one vessel at a time. We propose a new technique to display multiple CPRs in a single image, thus preserving spatial perception.

Materials and Methods: A semi-automatic centerline detection algorithm was used to obtain a set of branching curves in 3D space representing the vessel-tree's central axis. For each centerline a temporary CPR was calculated and subsequently composited into one multi-path CPR image. An image-based compositing technique, exploiting an enhanced z-buffer, was applied to avoid overlapping artefacts caused by high intensity regions. For each of 3 patients with peripheral arterial occlusive disease a set of 21 multi-path CPR views over an angular range of 180° was computed. Adjusting the viewing angle was done interactively due to the linear complexity of the algorithm. The CPR views were directly compared to digital subtraction angiography images.

Results: Each set of multi-path CPR images displayed the entire vascular tree, without obscuration of vessels due to bony structures and with only minimal overlap of crural vessels at extreme angular views (e.g. lateral).

Conclusion: Multi-path CPR allows a comprehensive cross-sectional assessment of the entire vascular tree within a single set of images. This may substantially reduce the amount of data to be stored for diagnostic purpose.