Human aorta: preliminary results with virtual endoscopy based on three-dimensional MR imaging data sets

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PURPOSE: To determine the feasibility of use of magnetic resonance (MR) imaging data sets to perform virtual intraarterial endoscopy (VIE).

MATERIALS AND METHODS: Seven female and 14 male patients (aged 9-86 years [mean, 42 years]) with various pathologic aortic conditions underwent three-dimensional gadolinium-enhanced spoiled gradient-echo MR imaging. With prototype software, VIE postprocessing algorithms (based on ray casting) were applied to the imaging data sets. Findings at conventional angiography were used as the standards of reference.

RESULTS: The vessel wall was seen from the inside in each case, and the following pathologic conditions were depicted clearly: the two lumina in a congenital double aortic arch and the single lumen after correction, vessel narrowing in coarctations, characteristics of Leriche syndrome, stenoses, occlusions, and the true and false lumina of dissections.

CONCLUSIONS: Limitations of VIE include the image quality of the original data set, the threshold chosen to minimize intraluminal artifacts, and the inherent smoothing of vessel walls.

type: journal paper/review (English)
date of publishing: 4-1996
journal title: Radiology (199/1)
ISSN print: 0033-8419
pages: 37-40