Bolus timing in high-pitch CT angiography of the aorta

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OBJECTIVE
To investigate the bolus geometry in high-pitch CT angiography (CTA) of the aorta without ECG synchronisation in comparison to single-source CT.

METHODS
Overall 160 consecutive patients underwent CTA either in conventional single-source mode with a pitch of 1.2 (group 1), or in dual-source mode with a pitch of 3.0 (groups 2, 3 and 4) using different contrast media timings with bolus triggering at 140 HU (5s, group 1; 10s, group 2; 12s, group 3; 14s, group 4). Contrast material, saline flush, flow rate and kV/mAs settings were kept equal for optimum comparability. Aortic attenuation was measured along the z-axis of the patient at different anatomic landmarks and subjective image quality was compared.

RESULTS
The most homogeneous enhancement of the aorta was reached with a delay of 10s after reaching the trigger threshold. The imaging length was not significantly different, but the examination time was significantly (p<0.001) shorter in the high-pitch group (7.7s vs. 1.7s for group 1 vs. 2, 3 and 4).

CONCLUSION
In high-pitch CT angiography using a start delay of 10s after a trigger threshold of 140 HU in the descending aorta is reached, a homogenous contrast along the z-axis is accomplished.