Comparison of a monomeric and a dimeric contrast agent in electron beam tomography (EBT) of the coronary arteries

Wiese T H, Taupitz M, Höhn S, Borges A C, Dohmen P, Hamm B

Purpose
To quantitatively and qualitatively compare two contrast media in EBT-based coronary angiography.

Methods and materials
59 patients with coronary heart disease (51 men) underwent EBT prior to conventional coronary angiography. Patients were randomly studied with loversol (Optiray, monomeric, 320 mg/ml, n=29) or lodixanol (Visipaque, dimeric, 320mg/ml, n=30). Volume and flow rate were individually adapted to the body surface (120-190 ml, 3.0-4.8 ml/s; injection time 40 s). 60 ECG-triggered slices were acquired (slice thickness 3mm, increment 2mm). The density in the aorta was measured. Examinations were subdivided into 4 intervals of 15 scans each. The area under curve was determined. Three blinded radiologists qualitatively assessed shaded surface display reconstructions of the coronary arteries. Wilcoxon's test was used for statistical evaluation.

Results
The median blood density of scans 1-15, 16-30, 31-45 and 46-60 for loversol and lodixanol was 317 and 293 (p<0.01), 334 and 309 (p<0.01), 281 and 291, 190 and 195 HU (both not significant), respectively. No significant difference was found between the 3D-reconstructions of the contrast agents.

Conclusion
The monomeric agent loversol achieves significantly higher intravascular density than the dimeric substance in cardiac scanning with EBT. However, quality of surface reconstructions of the coronaries does not differ significantly.

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