Diameter changes of occluded venous coronary artery bypass grafts in electron beam tomography: preliminary findings


Objective
To differentiate acute from chronic graft occlusions through diameter measurements by means of electron beam tomography (EBT).

Methods
Contrast enhanced EBT volume studies were carried out in 37 patients with one or more occluded venous coronary bypass grafts. Seventeen of 37 patients did not meet the inclusion criteria and were excluded from the assessment. The remaining 20 patients had a total of 39 bypasses (16 patent, 23 occluded) and were assigned to one of three groups: group A consisted of patent grafts only (patent grafts, 13 patients). Group B comprised 11 of 23 occluded grafts diagnosed within 10 days after bypass surgery (acutely occluded grafts, ten patients). Group C contained 12 of 23 bypass occlusions that were at least 6 months old as documented by coronary angiography (chronically occluded grafts, ten patients). The mean graft diameter was determined by repetitive measurements on a workstation through blinded readers. The Mann-Whitney-U-test for unpaired samples was used for statistical evaluation.

Results
Mean graft diameter for Groups A-C (patent, acutely, and chronically occluded bypasses, respectively) was 3.9 mm (±0.6; n=16), 5.4 mm (±1.9; n=11), and 0.3 mm (±0.9; n=12), respectively (p<0.01 each). Sensitivity and specificity for the detection of acute and chronic occlusions were 87 and 92% (cut-off 4.5 mm), respectively, and 92 and 96% (cut-off 1 mm), respectively.

Conclusions
EBT may allow for non-invasive differentiation between acute and chronic venous coronary bypass occlusions. This could help prevent unnecessary invasive recanalization procedures. Body veins may conserve their ability to increase in diameter in acute thrombosis when transplanted as coronary bypasses.

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