

# Immediate and one-year safety of intracoronary ultrasonic imaging. Evaluation with serial quantitative angiography

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## **Abstract**

### Background

Intracoronary ultrasound (ICUS) has the ability to quantitatively evaluate vessel wall morphology and is well suited for serial studies of coronary artery disease regression and progression. However, the potential risk for catheter-induced endothelial damage and accelerated atherosclerosis in instrumented vessels is a concern. The acute effects as well as the 1-year safety of ICUS regarding its impact on the atherosclerotic process were assessed.

### Methods and results

The acute studies include 240 intracoronary studies performed in 170 cardiac transplant recipients. Patients were systematically heparinized. Only vessels  $\geq 2$  mm in diameter were visualized. Coronary arteries of 38 patients were measured by quantitative coronary angiography in matched angiograms at an interval of 1 year after the initial ICUS examination was performed to assess long-term effects. The angiographic measurements in the previously instrumented and noninstrumented vessels were compared. Forty-nine vessels that had been imaged (IM) in these 38 patients with a 5F ICUS catheter were compared with 61 vessels not previously imaged (NIM) in the same patients. Absolute and percentage change in angiographically measured mean vessel diameters in the ICUS imaged and nonimaged segments were compared. Despite pretreatment with nitroglycerin, 20 patients (8.3%) had angiographically evident coronary spasm. In all cases, this was reversed by giving nitroglycerin. One year after the original imaging study, no difference was noted between imaged and nonimaged vessels in change in absolute vessel diameter (IM,  $-0.11 \pm 0.28$  mm vs NIM,  $-0.07 \pm 0.22$  mm;  $P = .49$ ) or in percentage change in diameter (IM,  $-5 \pm 11\%$  vs NIM,  $-3 \pm 7\%$ ;  $P = .32$ ).

### Conclusions

Intracoronary ultrasound in cardiac transplant recipients was associated with no clinical morbidity and a low incidence of vessel spasm in large and medium-size coronary arteries. It does not accelerate progression of angiographically quantifiable coronary artery disease. This study suggests that ICUS can be safely used even in coronary arteries not undergoing interventions.