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Journal

Circulation, 92(8 Supplement 1)

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Publication Date

1995

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Peer reviewed

1905

Clinical Feasibility of an 0.018" Intravascular Ultrasound Imaging Device

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Intravascular ultrasound imaging (IVUS) is limited by the size of the imaging catheter. To facilitate imaging prior to and during interventions, a 30 MHz ultrasonic imaging device was developed that is the same dimension as an 0.018" guidewire. This imaging core was tested in 8 patients with the use of a monorail guiding sheath that was advanced through a 7Fr catheter. In addition, the standard guidewire was removed and the imaging core was placed inside a compatible balloon and imaging was performed following 6 coronary interventions. The mean lumen CSA was $6.8 \pm 3.2 \text{ mm}^2$. The lumen-plaque interface and the media-plaque interface were clearly visualized in all patients. In 4 patients, imaging was also performed with a standard 2.9 Fr IVUS catheter. There was no detectable loss in image quality between the new imaging device and the larger IVUS catheter, and measurements of lumen CSA were not statistically different.

Conclusions: Improvements in manufacturing technology have permitted the development of a mechanically rotating ultrasound imaging core which is 0.018" in diameter. It is compatible with current balloon catheters without degradation of image quality.