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Editorial Comment

What's New With IVUS?

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Bruining et al. should be congratulated on their informative paper demonstrating that electrocardiogram (ECG) gating improves volumetric measurements from three-dimensional intracoronary ultrasound images [1]. The ECG gating not only smooths the longitudinal image and makes it visually more pleasing, it also improves the quantitative analysis. The volumes of the artery lumen and the vessel (i.e., the area bounded by the media) were larger when measured by a nongated computer edge-detection program as compared with the ECG-gated program. The major downside to this method is that the image acquisition rate is slow at 1 min/cm of artery. This rate may be feasible for dedicated IVUS researchers, but the casual user of intravascular ultrasound may find this too laborious. However, the longitudinal images more closely approximates an angiographic view and therefore is a more familiar presentation for the interventional cardiologist. As the authors have pointed out, the ECG-gating technique may be more appropriate for serial studies that attempt to look at the volume of atherosclerotic plaque over time.

This article reminds us that, in addition to ECG gating, there are new developments in the field of intravascular ultrasound imaging. Perhaps the most significant advance is complete digital storage of all the cross-sectional ultrasound images. With this new capability, the operator will be able to scroll through the database of images to review all cross-sectional information and the long-axis reconstructed projections. The ability to recall the images from a digital

format will prevent the loss in image quality that occurs from digital-to-analog conversion and playback from the videotape. Although videotape will still be used as a storage medium, there will be the capacity to download the digital images to the hard drive and then to a writable compact disk (CD) that can store up to 650 megabytes of data. Several cases can thus be stored on a single CD. The digital format will also facilitate reports by incorporating the quantitative results measured from the digital images and by providing the ability to embed the ultrasound images directly into the report printout.

The second area of significant improvement is in catheter design. Boston Scientific will be coming out with a smaller 2.6-French monorail design catheter using a 40-MHz transducer. Although the reflections from blood are slightly annoying, the lower profile of this catheter permits its entrance into smaller lesions that could not be passed with the 3.2-French catheter. Endosonics has also dramatically improved their images along with their 64-element transducer tipped catheter. Hewlett-Packard has improved the pull-back device for operators that like to acquire data in a continuous fashion. The newer pull-back devices are smaller and more user friendly. This should make the ECG-gating technique described by Bruining et al. even more feasible.

It is encouraging to see these impressive improvements in catheter design, image quality, and digital image manipulation, which demonstrate a healthy commitment by industry to the future progress of intravascular ultrasound.

REFERENCE

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