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Editorial Comment

Combining Coronary Angiography and Intravascular Ultrasound in Three-Dimensional Space

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The accompanying article by Bourantas et al. describes the feasibility of using a specially developed software program, called ANGIOCARE[†], to reconstruct three-dimensional representations of the coronary arteries. Biplane angiography as well as intravascular ultrasound images are used to provide both luminal as well as three-dimensional plaque volume data. This is a laudatory project and has potentially important implications for the way that these data may be presented in the future.

The purpose of the present article is to show the feasibility of performing this technique in humans. They describe the results achieved in 27 vessels from 19 patients. A comparison study with standard IVUS would be necessary to demonstrate that it was preferable either from a user-friendly standpoint or because it provided more information than standard angiography and ultrasound imaging. Nevertheless, as a work in progress, it is an interesting concept.

My primary concern is whether the validation of the computer-generated plaque volume is truly accurate. Unless I have worked with a computerized program or

an imaging system, I may not understand the nuances and the accuracy, despite what is portrayed in an article. I am also somewhat skeptical of the presentation in that it appears to be selling this technology rather than presenting scientific data and letting the reader draw his own conclusions. I wonder for example, how easy is this purported “ease of use”? Is it fast enough for clinical benefit, and fundamentally is it better than IVUS alone? This would need to be tested by comparing standard IVUS versus ANGIOCARE[†] in some independent laboratories. Specific criteria would need to be developed for comparisons such as for diagnosis, sizing of the artery wall or stenting, or the benefit for research studies such as for restenosis. Until the time that those kinds of studies are done, I think we have to be careful in embracing this information. For example, the descriptive adjectives that the postprocessing is “fast” when it can take between 10 and 30 min, is not at all fast for a busy laboratory. In addition, “almost real time” is more like 30 sec in my mind, not 10–30 min. I know the images look realistic in their portrayal of the three-dimensional morphology, but will a 3D representation of the artery really make any difference in the way I perform a coronary angioplasty? Will the three-dimensional representation of the IVUS images of the lumen and plaque volume have any clinical benefit in how or where I place a stent or choose a balloon to post dilate it compared with the two-dimensional cross-sectional ultrasound images themselves? These questions need to be answered by randomized controlled studies before we decide to go with pretty images.

[†]ANGIOCARE: an automated system for fast three dimensional coronary reconstruction by integrating angiographic and intracoronary ultrasound data.

Conflict of interest: None.

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