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Editorial Comment

Which Do You Prefer, OCT or IVUS?

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Key Points

- OCT has higher resolution than IVUS.
- This study compared the measurements of lumen and stent diameters from IVUS or OCT but the images were chosen by the 11 observers so that the exact same images were not measured.
- The standard deviation of the measurements is tighter with OCT images. The absolute difference in measurements was small. This may be clinically insignificant, but operators may feel that it is easier to measure stent size from the OCT images.

IMPLICATIONS

There is still a fair amount of debate whether OCT or IVUS is the preferable method to image intra vascular events. The OCTIVUS [1] study assessed the inter-observer variability of measurements of five intracoronary stents imaged by both OCT and IVUS and interpreted by 11 different observers. The corresponding images were chosen by the operator, which could account for some of the variability. The main finding was that OCT and IVUS measurements of stents are fairly close but the scatter of data is less with OCT due to the higher resolution of OCT images. This makes sense if you have a very clear margin that you are measuring such as a stent strut. My non-financial disclosure for this editorial is that I helped to develop IVUS imaging in the 1980s so perhaps I have some emotional attachment to IVUS. However, I like OCT and appreciate the improvement that higher resolution brings to any imaging modality. When trying to discern which method of imaging is preferable, my concern is that it depends on what question you are asking. Stent struts are seen more clearly with OCT. But if you want to use intravascular imaging to view arterial plaque and the structure of the entire arterial wall, then I prefer IVUS because it has greater power to penetrate the plaque. OCT images often have drop out of information, which are interpreted variously but there basically is no data behind a shadow, either on IVUS or OCT. Tissue characterization and quantitative measurements of plaque size are still superior with IVUS compared with OCT. But if all you want to do is measure the stent diameters, then

OCT is equivalent to IVUS in terms of absolute measurements, has better resolution than IVUS images in the near field, and therefore tighter standard deviation of measurements between observers. This is a study of measurements; it is not a clinical outcomes trial. We have no information that OCT imaging provides any greater clinical benefit in the decision-making process. In this OCTIVUS study, readers were in agreement that a stent met MUSIC criteria 80.4% of the time using IVUS compared to 81.1% using OCT ($P = 0.78$). If anything, although prior studies suggest that OCT shows minute dissections and minor fractions of a millimeter of stent non-apposition in greater detail than IVUS images, these observations may be clinically irrelevant, and potentially could lead to excess interventions that are unnecessary and might produce more complications. Indeed, in this OCTIVUS comparison, the readers were more likely to recommend further stenting or ballooning with OCT (64%) than IVUS (50%). We do not know whether the clinical outcome would differ with the interpretation of OCT vs. IVUS.

REFERENCES

1. Magnus PC, Jayne JE, Garcia-Garcia HM, Swart M, van Es G-A, Tijssen J, Kaplan AV. Optical Coherence Tomography vs. Intra-vascular Ultrasound in the Evaluation of Observer Variability and Reliability in the Assessment of Stent Deployment: The OCTI-VUS Study. *Catheter Cardiovasc Interv* 2015;86:229–235.

Conflict of interest: Nothing to report.*Correspondence to: Jonathan Tobis, Director of Interventional Cardiology, UCLA, B976 Factor Building CHS, 10833 Le Conte Avenue, Los Angeles, CA 90095. E-mail: jtobis@mednet.ucla.edu

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