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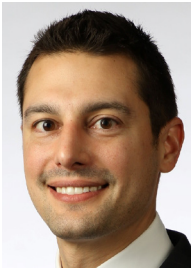
Avoiding Patient-Stent Mismatch: Incorporating Optical Coherence Tomography Into Routine Practice



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In this issue, Paraggio et al. report their single-center experience with 877 patients who had optical coherence tomography (OCT) assessment. They demonstrated the safety profile of OCT in a real-world setting, as well as the feasibility of utilization of OCT in daily practice. This study highlights a number of important issues.

The large dataset from Paraggio and colleagues provides a number of unique insights into the real-world use of OCT, some of which dispel common misconceptions. First, there was no need for renal replacement therapy in any of the 877 patients, including in 45 patients with chronic kidney disease [1]. Judicious use of contrast is always important; however, with a primary intravascular imaging approach, a reduction in necessary angiographic acquisitions can be achieved, minimizing overall contrast use. Second, the authors demonstrated that routine OCT imaging of the left main coronary artery is feasible in appropriately selected cases. Third, further optimization was needed based on OCT findings in a significant number of cases in which the operators thought they had completed their intervention. These are scenarios that would be missed without the routine use of intravascular imaging. Lastly, minimum lumen area (MLA) was an independent predictor of target vessel failure (TVF), which is consistent with prior literature.

In this study, OCT was unable to cross in 5 lesions (<0.5%) because of lesion severity [1]. A true baseline assessment, however, is not always necessary when encountering difficulty advancing OCT beyond a lesion. In these scenarios, lesion preparation should be utilized, and intravascular imaging can occur prior to stent implantation to ensure that adequate lesion preparation has been achieved and for appropriate stent sizing. The ILLUMIEN protocol for OCT-guided stenting encourages use of pre-dilatation with a small non-compliant balloon as needed to facilitate OCT assessment prior to stent implantation [2]. Assessment prior to stent implantation is essential to accurately select the optimal stent. In the ILUMIEN I study, physician decision-making was affected by OCT imaging prior to PCI in 57% and post-PCI in 27% of all cases [3]. The ULTIMATE trial investigators demonstrated that when pre-specified optimal outcomes are achieved with intravascular imaging, defined by a larger minimal stent area (MSA), and absence of significant residual edge disease, outcomes are enhanced beyond the indiscriminate use of intravascular imaging alone [4]. We, therefore, recommend that a systematic and algorithmic approach to OCT be incorporated into daily practice [5].

This study, in conjunction with existing literature, supports expanded use of OCT. The impact of routine OCT in one's own clinical practice can be easily assessed with a simple exercise. For the next 10 interventions completed with OCT, prior to baseline imaging, record the stent diameter and length you would select based on angiography and whether adjunctive therapies (cutting balloon, atherectomy, intravascular lithotripsy) are likely to be needed for lesion preparation. Following baseline OCT, see how you performed compared to your initial assessment. Significant discordance is not a limitation of the operator. This highlights the inherent limitations of angiography, which is based on a two-dimensional lumenogram to assess a complex, dynamic, three-dimensional structure. This exercise can quickly impact one's daily practice. As we strive to avoid patient-prosthesis mismatch with structural heart interventions, we must do the same with coronary interventions, using all the tools available to avoid *patient-stent mismatch*. We owe it to our patients to offer them the most precise treatment available while making our best effort to ensure optimal outcomes with each intervention.

References

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