I Prefer Imaging-Guided PCI

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Coronary angiography is routinely employed to guide decision making in patients undergoing percutaneous coronary interventions (PCI). However, its luminological limitations are well known. Intravascular ultrasound (IVUS) is a well-established intravascular imaging tool that not only assesses the severity of luminal stenosis but also can provide an accurate description of plaque morphology and composition. More recently, optimal cohesion tomography (OCT) has been providing extremely high spatial resolution, and similar to IVUS, it can be of great value in optimizing PCI outcomes. The importance of using these imaging techniques is particularly paramount during complex PCI procedures and in evaluating high-risk coronary lesion subsets involving left main, ostial, or bifurcation sites [1].

As the introduction of IVUS, many registries and randomized controlled trials were published in attempt to evaluate the potential role of IVUS-guided PCI on the short- and long-term clinical outcomes. The results of these trials were often contradictory, and as such this topic remains controversial. A meta-analysis of the randomized controlled trials comparing IVUS-guided PCI to angiography-guided PCI in the bare metal stents (BMS) era were previously published as well as a meta-analysis of mainly registries in the drug-eluting stent (DES) era. The role of OCT-guided PCI was also studied [2].

With recent a global systematic review pooling together both IVUS and OCT intravascular imaging studies for guidance of PCI showed that imaging guidance was associated with a significantly larger postintervention minimal luminal diameter and imaging-guided stenting was associated with a significant decrease in the major adverse cardiac events (MACE) in the DES patients (odds ratio: 0.810. 95% CI: 0.719–0.912. P <0.01). Imaging guidance was associated with significantly lower events of death from all causes in DES patients (odds ratio: 0.654. 95% CI: 0.468–0.916. P <0.01).The risk of myocardial infarction (MI) was significantly lower with imaging guidance in both, DES patients (odds ratio: 0.551. 95% CI: 0.363–0.837. P <0.01) and combined DES and BMS patients (odds ratio: 0.589. 95% CI: 0.425–0.816. P <0.01). This may, in part, be explained by the

significantly lower risk of stent thrombosis in imaging-guided DES patients (odds ratio: 0.651. 95% CI: 0.499–0.850. P <0.01) and combined DES and BMS patients (odds ratio: 0.665. 95% CI: 0.513–0.862. P <0.01). Patients who received a DES showed no difference between imaging guidance and angiography guidance in repeated target lesion revascularization, while the analysis of BMS alone and the DES and BMS combined showed significant superiority of the imaging-guided PCI group [1]. Furthermore, OCT-guided PCI using a specific reference segment external elastic lamina-based stent optimization strategy was safe and resulted in similar minimum stent area to that of IVUS-guided PCI (3).

Imaging-guided PCI significantly lowered the risk of death, MI, stent thrombosis, and the combined MACE in DES-implanted patients and all stented patients (DES or BMS). Although IVUS and OCT each have inherent strengths and weaknesses, these techniques can complement each other, and selective utilization in appropriate patient subgroups or combined usage is expected to be beneficial during PCI procedures.

References

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