Editorial

Risk Stratification by SYNTAX Score Systems in Current Percutaneous Revascularization Era

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Conflict of Interest

The author has no financial conflicts of interest.

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► See the article “SYNTAX Score and SYNTAX Score II Can Predict the Clinical Outcomes of Patients with Left Main and/or 3-Vessel Disease Undergoing Percutaneous Coronary Intervention in the Contemporary Cobalt-Chromium Everolimus-Eluting Stent Era” in volume 50 on page 22.

The Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery (SYNTAX) score (SS)¹⁾ has been widely accepted as a standard metric to evaluate and weigh the severity of coronary artery disease (CAD) and one of useful prognostic tools.²⁾ However, there are some limitations that it only includes anatomical parameters such as extent of coronary lesions with stenosis $\geq 50\%$ and lesion characteristics regarding the difficulty of percutaneous revascularization in stable CAD.¹⁾ Prognostic role of SS has been illustrated in patients undergoing percutaneous coronary intervention (PCI) with left main CAD³⁾ and all-comer patients treated with drug-eluting stent (DES).⁴⁾ However, it is reasonable to assume that it may have a greater prognostic value if including clinical variables such as age and comorbidities.⁵⁾ Nevertheless, SS has been in a unique position for assessment of anatomical severity and established its prognostic value integrated into the SS II including comprehensive clinical variables such as age, sex, peripheral vascular disease, and renal, pulmonary, and left ventricular function.⁶⁾ The SS II was firstly developed and well-validated for prediction of mortality in patients undergoing PCI with first generation DES or coronary artery bypass graft (CABG).⁶⁾ In the current issue, Kang et al.⁷⁾ investigated whether SS and SS II have prognostic values in terms of patient-oriented outcomes including all-cause death, any myocardial infarction, and any revascularization and lesion-oriented outcomes including cardiac death, target-vessel myocardial infarction, and target lesion revascularization in 1,248 patients undergoing PCI with second-generation everolimus-eluting stent for left main or three vessel disease from 2 all-comer registries. Among them, both SS and SS II had prognostic values for patient-oriented and lesion-oriented outcomes. Interestingly, SS II demonstrated a superior predictability to SS for patient-oriented outcomes but not for lesion-oriented outcomes. Such difference in the predictability for patient-oriented outcome was mainly derived from a difference in prediction of all-cause death. While there were no differences in predictability for lesion-oriented outcome between SS versus SS II across different risk groups, SS II had a superiority for prediction of patient-oriented outcomes in high risk group. It should be noted that high SS II strata including about one third of the overall patients resulted in 6 times more incidence rate of all-cause death compared with low SS II strata, whereas high SS strata including one eighth of the overall patients showed up to 2 times more mortality rate compared with the lowest strata. Given that SS II may have a superiority to define fragile patients at risk with shorter life-expectancy over SS, SS II

may be also applicable for the decision of revascularization strategy and evaluation of need for more intensive risk modification in addition to SS in clinical practice. The SS has been used as a powerful stratification tool allowing standardized assessment of coronary disease extent and guidance of revascularization strategies of PCI and CABG for research purposes and daily practice based on the findings of SYNTAX trial that patient with low SS had similar clinical outcomes after PCI compared with CABG and that PCI was inferior than CABG in patients with higher SS.⁸⁾ Contrast to the SYNTAX trial, there was no significant interaction between SS and revascularization method on clinical outcomes in recent major trials, Percutaneous Coronary Angioplasty Versus Coronary Artery Bypass Grafting in Treatment of Unprotected Left Main Stenosis (NOBLE) and Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization (EXCEL) including patients with left main disease.⁹⁾¹⁰⁾ High variability and limited functional significance of SS and post-PCI SS should be carefully considered in interpretation and utility of SS. Considering advancements in percutaneous devices, procedural techniques and strategies, SS may not have an absolute value for evaluation of anatomical severity in terms of therapeutic difficulty. Nevertheless, it is still valid to play an important role as a systematic scoring system in which each anatomical characteristic should be recognized as a detrimental factor and dealt with by further validation in contemporary PCI era. SS and SS II should be standardized measurements for assessment of disease severity and risk stratification in patients with left main coronary disease or multivessel disease until then, and its clinical utility for decision of revascularization methods and strategy of risk modification should be further debated. Currently, Kang et al.⁷⁾ claims that SS is still valuable for risk stratification in contemporary DES era. Given that both SS and SS II were calculated and acquired at a core lab which may enable more accurate evaluation of disease severity, SS and SS II may be more practical and feasible for risk stratification in such conditions.

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