Angiographic Scoring System for Predicting Successful Percutaneous Coronary Intervention of In-Stent Chronic Total Occlusion

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Abstract

BACKGROUND No scoring models for IS-CTO have been established because of its in-stent characteristics. The purpose of this study was to develop a scoring model to predict the technical success of recanalizing in-stent chronic total occlusion (IS-CTO) by percutaneous coronary intervention (PCI). METHODS We retrospectively collected data from 474 patients who underwent an IS-CTO PCI from January 2015 to December 2018, consecutively. We selected clinical and angiographic factors and utilized a derivation and validation cohort (4:1 sampling ratio) analysis. Factors with strong correlations with technical failure, according to multivariable analysis, were assigned 1 point, and a scoring system with a 4-point maximum was established. The model was then validated with a validation cohort. RESULTS The overall procedural success rate was 77.4%. On multivariable analysis, the factors that correlated with technical failure were proximal bending (beta coefficient [β] = 2.142), τορτυοσιτψ (β = 2.622), stent under expansion (β = 3.052), and poor distal landing zone (β = 2.004). The IS-CTO score demonstrated good calibration and excellent predicting capacity in the derivation (receiver-operator characteristic [ROC] area = 0.973 and Hosmer-Lemeshow Chi-squared = 5.252; p = 0.072) and validation (ROC area = 0.976 and Hosmer-Lemeshow Chi-squared =0.916; p = 0.632) cohorts. In the validation subset, the IS-CTO score demonstrated superior performance to the J-CTO and PROGRESS CTO scores for predicting technical success (area under the a curve [AUC] 0.976 vs 0.662 vs 0.579, respectively; difference in AUC between the IS-CTO score and J-CTO score = 0.314, p < 0.01; difference in AUC between the IS-CTO score and PROGRESS score = 0.397, p < 0.01). CONCLUSIONS Our results suggest that the IS-CTO score system is a helpful tool to predict the technical success of IS-CTO PCI. Key words: In-stent chronic total occlusion; Percutaneous coronary intervention; Predicting factor; Scoring sys

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