Prognostic Value of the Residual SYNTAX Score After Functionally Complete Revascularization in ACS

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ABSTRACT

BACKGROUND The residual SYNTAX (Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery) score (RSS) quantitatively assesses angiographic completeness of revascularization after percutaneous coronary intervention (PCI) and has been shown to be a predictor of events after angiography-guided PCI. In stable patients undergoing functionally complete revascularization with fractional flow reserve (FFR) guidance, RSS did not predict outcome. Whether this is also true in patients with acute coronary syndromes (ACS) is unknown.

OBJECTIVES The purpose of this study was to determine whether the RSS could predict outcomes in patients with ACS.

METHODS From the DANAMI-3-PRIMULTI (Primary PCI in Patients With ST-elevation Myocardial Infarction and Multivessel Disease: Treatment of Culprit Lesion Only or Complete Revascularization), FAME (Fractional Flow Reserve Versus Angiography for Multivessel Evaluation), and FAMOUS-NSTEMI (Fractional Flow Reserve Versus Angiographically Guided Management to Optimise Outcomes in Unstable Coronary Syndromes) trials, 547 patients presented with ACS and underwent functionally complete revascularization with fractional flow reserve (FFR) guidance. Major adverse cardiac events (MACE) were defined as the composite endpoint of all-cause death, nonfatal myocardial infarction, and any repeat revascularization. The RSS was based on the recalculation of the SYNTAX score after PCI. We compared differences in 2-year outcome by the RSS subgroups: 0, 1 to < 5, 5 to < 10, ≥ 10 (RSS = 0 represents angiographically complete revascularization).

RESULTS The study population consisted of 271 patients with unstable angina/non-ST-segment elevation myocardial infarction and 276 with ST-segment elevation myocardial infarction. The mean RSS was 6.7 ± 5.8. MACE at 2 years occurred in 69 patients (12.6%). Patients with and without MACE had similar RSS after PCI (RSS: 7.2 ± 5.5 vs. 6.6 ± 5.9; p = 0.23). Kaplan-Meier curve analysis showed a similar incidence of MACE regardless of the RSS subgroups (p = 0.54). With and without adjustment of clinical variables, RSS was not a significant predictor of MACE or of each component of MACE.

CONCLUSIONS After complete revascularization of functionally significant stenosis by FFR, the extent of residual angiographic disease is not associated with subsequent ischemic events in patients presenting with ACS. These results suggest that the concept of functionally complete revascularization is applicable even in ACS patients. (Fractional Flow Reserve Versus Angiography for Multivessel Evaluation [F.A.M.E.] NCT00267774; Fractional Flow Reserve Versus Angiographically Guided Management to Optimise Outcomes in Unstable Coronary Syndromes [FAMOUS NSTEMI] NCT01764334; Primary PCI in Patients With ST-elevation Myocardial Infarction and Multivessel Disease: Treatment of Culprit Lesion Only or Complete Revascularization [DANAMI-3-PRIMULTI]; NCT01960933) (J Am Coll Cardiol 2018;72:1321-9) © 2018 by the American College of Cardiology Foundation.
The residual SYNTAX (Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery) score (RSS) (1,2) was developed to quantitatively assess the degree and complexity of residual stenoses, based on recalculating the SYNTAX score from coronary angiography after percutaneous coronary intervention (PCI) (3,4). The intention of this index is to quantitatively assess the angiographic completeness of revascularization. Higher RSS has been associated with worse outcome in patients undergoing angiography-guided PCI (1,2,5,6).

Recent studies have found that the functional significance of a lesion based on fractional flow reserve (FFR) is a more important determinant of future adverse cardiac events than angiographic severity (7,8). PCI of lesions that are angiographically significant but not functionally significant based on FFR can be deferred safely with good long-term outcomes in stable patients (9). For example, in our previous study of stable angina patients undergoing FFR-guided PCI, residual angiographic disease as assessed by the RSS was not predictive of adverse outcome, supporting the concept of functionally complete revascularization (10,11).

However, whether this is also true in patients presenting with acute coronary syndromes (ACS), who have functionally insignificant but potentially active nonculprit plaques, is unknown. Accordingly, the primary goal of the present study is to investigate the prognostic value of RSS in patients presenting with ACS, who undergo functionally complete revascularization with FFR guidance.

METHODS

STUDY DESIGN AND PATIENT POPULATION. The present study is a patient-level, post hoc, pooled analysis of the FFR-guided revascularization/deferral cohorts from 3 randomized controlled trials (Figure 1) (12-14). The detailed study protocols for each study have been published previously (15-17).

In brief, FAME (Fractional Flow Reserve Versus Angiography for Multivessel Evaluation) is a prospective, randomized, controlled, multicenter trial investigating the superiority of FFR-guided PCI over angiography-guided PCI in patients presenting with stable angina, unstable angina, or non-ST-segment elevation myocardial infarction (NSTEMI) (NCT00257774) (12,15). In patients with multivessel coronary artery disease amenable to PCI, the investigators indicated which lesions had at least 50% diameter stenosis and were thought to require PCI. Thereafter, patients were randomly assigned to either FFR- or angiography-guided PCI. FAMOUS-NSTEMI (Fractional Flow Reserve Versus Angiographically Guided Management to Optimise Outcomes in Unstable Coronary Syndromes) is a prospective, randomized, controlled, multicenter trial comparing an FFR- versus angiography-guided revascularization strategy in patients presenting with NSTEMI (NCT01764334) (13,16). Patients were randomized immediately after coronary angiography to either FFR- or angiography-guided management, which included PCI, coronary artery bypass grafting, or medication. DANAMI-3-PRIMULTI (Primary PCI in Patients With ST-elevation Myocardial Infarction and
Multivessel Disease: Treatment of Culprit Lesion Only or Complete Revascularization (14,17) in patients presenting with ST-segment elevation myocardial infarction (STEMI) and at least 1 nonculprit vessel coronary stenosis after primary PCI. Patients were randomized to FFR-guided complete revascularization or deferral of PCI of the nonculprit lesion(s).

In the present study, patients who presented with ACS and underwent FFR-guided functionally complete revascularization were enrolled to investigate the prognostic value of the residual coronary stenosis from the 3 prospective randomized controlled trials. ACS — acute coronary syndrome; CR — complete revascularization; DANAMI-3-PRIMULTI — Primary PCI in Patients With ST-elevation Myocardial Infarction and Multivessel Disease: Treatment of Culprit Lesion Only or Complete Revascularization; EHJ — European Heart Journal; FAME — Fractional Flow Reserve Versus Angiography for Multivessel Evaluation; FAMOUS-NSTEMI — Fractional Flow Reserve Versus Angiographically Guided Management to Optimise Outcomes in Unstable Coronary Syndromes; FFR — fractional flow reserve; NEJM — New England Journal of Medicine; NSTEMI — non-ST-segment elevation myocardial infarction; PCI — percutaneous coronary intervention; STEMI — ST-segment elevation myocardial infarction; UA — unstable angina.

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The original studies were approved by an institutional review committee from each participating site, and informed consent was obtained from all patients. **FFR MEASUREMENT AND TREATMENT.** PCI was performed according to standard coronary interventional techniques primarily with drug-eluting stents. In the DANAMI-3-PRIMULTI trial, patients presenting with STEMI and randomized to FFR-guided complete revascularization were brought back to the cardiac catheterization laboratory within 48 h after the index procedure. In all patients in the current analysis, FFR was measured with a 0.014-inch pressure sensor guidewire (then St. Jude Medical, Uppsala, Sweden). After intracoronary injection of nitroglycerin, equalization to the guide catheter pressure with the sensor positioned at the ostium of the coronary artery was performed, and the pressure guidewire was advanced beyond the stenosis in the target coronary artery. To induce maximal hyperemia, intravenous adenosine was administered at 140 μg/kg/min. Simultaneous measurement of the mean proximal coronary pressure with the guide catheter and the mean distal coronary pressure with the pressure guidewire was
performed. FFR was calculated as the ratio of the mean distal to proximal coronary pressure during hyperemia. All patients received dual antiplatelet therapy for at least 1 year after PCI (15-17).

**CALCULATION OF RSS.** The detailed methodology for calculating the SYNTAX score can be found elsewhere (3,4). In brief, the SYNTAX score can be calculated from the pre-procedural angiogram, in which each coronary lesion producing ≥50% diameter stenosis in vessels ≥1.5 mm by visual estimation is scored separately using the SYNTAX score algorithm from the website, and they are added together to obtain the overall SYNAX score.

For the calculation of the RSS, post-procedural angiograms were reviewed on all patients enrolled in this study by a dedicated interventional cardiologist who was blinded to the baseline clinical characteristics, procedural data including FFR values, and clinical outcomes. From the post-procedural angiogram, each coronary lesion producing ≥50% diameter stenosis in vessels ≥1.5 mm by visual estimation but left untreated was scored separately, and individual scores were added to provide the RSS (2). A higher RSS value suggests more coronary artery disease left untreated after PCI, and RSS = 0 suggests angiographic complete revascularization. Post-procedural angiograms from 50 patients were randomly selected and reanalyzed by the same interventional cardiologist (Y.K.) and by a second independent interventional cardiologist (T.N.) to assess the intraobserver and interobserver variability of the RSS.

**ENDPOINTS.** An independent clinical events committee was prospectively established in the design of each of the trials. The clinical events committee members who were blinded to the baseline characteristics, procedural data including FFR values, and clinical outcomes. The primary endpoint of this study was major adverse cardiac events (MACE), defined as a composite of all-cause death, myocardial infarction, or any repeat revascularization at 2 years after the index procedure.

**STATISTICAL ANALYSIS.** Categorical variables, including the primary endpoint and its individual components, are presented as counts and percentages. The chi-square test was used for comparisons of categorical variables. Continuous variables are presented as mean and SD. Normality of the continuous variables was confirmed with the Shapiro-Wilk test. Depending on the result of Levene test for homoscedasticity, 2-sets of variables with normal distribution were compared with the Student’s t-test or Welch t-test, as appropriate. If the normality test failed, 2-sets of variables were compared with the Mann-Whitney U test. An overall difference of variables among the subgroups was determined by 1-way analysis of variance or Jonckheere-Terpstra test. The reproducibility of the RSS was evaluated by calculating intraobserver and interobserver variability using the intraclass correlation. Kaplan-Meier curves are shown for the time-to-event distributions of MACE as stratified by RSS subgroups. Patients without event were censored at 2 years (730 days). Cox-proportional hazards model was used to estimate unadjusted and adjusted hazard ratios of RSS as a continuous variable. Adjustment was performed using the 2 models. Model 1 included the following key clinical variables: age, sex, diabetes, hypertension, hypercholesterolemia, previous myocardial infarction, presentations, and culprit vessel. Model 2 included the same variables as model 1 and the predefined additional following continuous variables: creatinine, peak troponin T, and ejection fraction. A p value < 0.05 was considered statistically significant. Statistical analyses were performed using SPSS version 21 software (SPSS, Chicago, Illinois).

**RESULTS**

A total of 547 patients who presented with ACS from the FFR-guided PCI cohort of the FAME, FAMOUS-NSTEMI, and DANAMI-3-PRIMULTI were enrolled in this study (Figure 1). Overall, the mean age was 63 ± 11 years, 78% were male, and 77% of patients completed the 2-year follow-up. The mean and median RSS was 6.7 ± 5.8 and 6.0 (2.0 to 10.0), respectively. The intraobserver variability of the RSS using the intraclass correlation analysis was 0.94, 95% confidence interval: 0.90 to 0.97 (p < 0.001), and the interobserver variability of the RSS using the intraclass correlation analysis was 0.95, 95% confidence interval: 0.91 to 0.97 (p < 0.001).

About one-half of the patients (n = 271, 49.5%) presented with unstable angina or NSTEMI and the remaining one-half (n = 276, 50.5%) presented with STEMI (13). The mean RSS was similar between the 2 groups (6.6 ± 6.0 vs. 6.8 ± 5.6; p = 0.35).

Clinical characteristics of the patients in the 3 trials are summarized in Online Table 1. Although there were significant differences in some clinical characteristics such as age, comorbidities, and previous history of myocardial infarction or PCI, as might be expected, the mean RSS was similar (FAME vs. FAMOUS-NSTEMI vs. DANAMI-3-PRIMULTI: 6.9 ± 6.0 vs. 6.3 ± 6.0 vs. 6.8 ± 5.6; p = 0.65).

**COMPARISONS OF BASELINE DATA AMONG RSS SUBGROUPS.** Comparisons of clinical characteristics among RSS subgroups (RSS = 0, 1 to <5, 5 to <10, ≥10)
Baseline patient clinical characteristics were similar among RSS subgroups, except for age (p for trend < 0.01) and incidence of diabetes (p for trend < 0.01). The incidence of diabetes was lowest in patients with RSS = 0, which represents angiographically complete revascularization. The proportion of presentations was also similar among RSS subgroups (p for trend = 0.37).

**CLINICAL OUTCOMES.** MACE occurred in 69 patients (12.6%) during 2-year follow-up. RSS was similar between patients with and without MACE (RSS: 7.2 ± 5.5 vs. 6.6 ± 5.9; p = 0.23). As shown in Table 2, MACE and each component of MACE was not different among the RSS subgroups. Kaplan-Meier curves stratified by the RSS subgroups showed no significant separation (log-rank p for trend = 0.54) (Figure 2), and RSS = 0 and the highest RSS subgroups were superimposed.

Table 3 summarizes the unadjusted hazard ratio of RSS in predicting MACE and each component of MACE. By univariable Cox proportional hazards model, RSS was not predictive of MACE and each component of MACE (all p > 0.05). Online Table 2 summarizes the adjusted hazard ratio of RSS in predicting MACE and each component of MACE. After adjusting for patient age, sex, risk factors, previous myocardial infarction, presentation, and culprit vessel (model 1), RSS was not predictive of MACE or each component of MACE (all p > 0.05). In this model, diabetes was a significant predictor of MACE (p = 0.003) and hypercholesterolemia was a significant predictor of myocardial infarction (p = 0.003) and death or MI (p = 0.009). After adjusting for parameters included in model 1, creatinine, peak troponin T, and ejection fraction (model 2), RSS was not predictive of MACE and each component of MACE (all p > 0.05). In this model, peak troponin T was a predictor of MACE (p = 0.01) and death or myocardial infarction (p = 0.01). Similarly, age was a significant predictor of death (p = 0.01).

**DISCUSSION**

The principal finding of the present study is that the RSS is not a significant predictor of MACE or each component of MACE at 2-year follow-up in patients who underwent functionally complete revascularization with FFR guidance after presenting

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**Table 1** Comparison of Clinical Characteristics Among the RSS Subgroups

<table>
<thead>
<tr>
<th></th>
<th>Overall (N = 547)</th>
<th>RSS</th>
<th>0 (n = 83)</th>
<th>1 to &lt; 5 (n = 139)</th>
<th>5 to &lt; 10 (n = 179)</th>
<th>≥10 (n = 146)</th>
<th>P Value for Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, yrs</td>
<td>63 ± 11</td>
<td>61 ± 11</td>
<td>62 ± 11</td>
<td>65 ± 12</td>
<td>64 ± 11</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>426 (77.9)</td>
<td>72 (86.7)</td>
<td>104 (74.8)</td>
<td>136 (75.6)</td>
<td>114 (78.6)</td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>78 (14.3)</td>
<td>4 (4.8)</td>
<td>16 (11.5)</td>
<td>31 (17.2)</td>
<td>27 (18.6)</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>264 (48.4)</td>
<td>37 (44.6)</td>
<td>62 (44.6)</td>
<td>87 (48.6)</td>
<td>78 (53.8)</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>247 (45.2)</td>
<td>36 (43.4)</td>
<td>53 (38.1)</td>
<td>82 (45.6)</td>
<td>76 (52.4)</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Family history</td>
<td>266 (48.6)</td>
<td>41 (50.6)</td>
<td>70 (51.1)</td>
<td>93 (51.7)</td>
<td>62 (43.4)</td>
<td>0.26</td>
<td></td>
</tr>
<tr>
<td>Current smoker</td>
<td>235 (43.0)</td>
<td>32 (38.6)</td>
<td>70 (50.4)</td>
<td>74 (41.1)</td>
<td>59 (40.7)</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Previous myocardial infarction</td>
<td>90 (16.5)</td>
<td>13 (15.7)</td>
<td>18 (12.9)</td>
<td>31 (17.2)</td>
<td>28 (19.3)</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Previous PCI</td>
<td>71 (13.0)</td>
<td>8 (9.6)</td>
<td>18 (12.9)</td>
<td>24 (13.3)</td>
<td>21 (14.5)</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>UA/NSTEMI</td>
<td>271 (49.5)</td>
<td>45 (54.2)</td>
<td>70 (50.4)</td>
<td>86 (47.8)</td>
<td>70 (48.3)</td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td>STEMI</td>
<td>276 (50.5)</td>
<td>38 (45.8)</td>
<td>69 (49.6)</td>
<td>94 (52.2)</td>
<td>75 (51.7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values are mean ± SD or n (%).

PCI = percutaneous coronary intervention; RSS = residual SYNTAX score; STEMI = ST-segment elevation myocardial infarction; UA/NSTEMI = unstable angina/non-ST-segment elevation myocardial infarction.

**Table 2** Comparison of Outcomes at 2 Years Among the RSS Subgroups

<table>
<thead>
<tr>
<th></th>
<th>Overall (N = 547)</th>
<th>RSS</th>
<th>0 (n = 83)</th>
<th>1 to &lt; 5 (n = 139)</th>
<th>5 to &lt; 10 (n = 179)</th>
<th>≥10 (n = 146)</th>
<th>P Value for Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACE</td>
<td>69 (12.6)</td>
<td>11 (13.3)</td>
<td>7 (7.9)</td>
<td>29 (16.1)</td>
<td>12 (14.4)</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>14 (2.6)</td>
<td>2 (2.4)</td>
<td>1 (0.7)</td>
<td>8 (4.4)</td>
<td>3 (2.1)</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>31 (5.7)</td>
<td>4 (4.8)</td>
<td>7 (5.0)</td>
<td>11 (6.1)</td>
<td>9 (6.2)</td>
<td>0.58</td>
<td></td>
</tr>
<tr>
<td>Repeat revascularization</td>
<td>37 (6.8)</td>
<td>5 (6.0)</td>
<td>7 (5.0)</td>
<td>15 (8.3)</td>
<td>10 (6.9)</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Death or myocardial infarction</td>
<td>43 (7.9)</td>
<td>6 (7.2)</td>
<td>8 (5.8)</td>
<td>17 (9.4)</td>
<td>12 (8.3)</td>
<td>0.48</td>
<td></td>
</tr>
</tbody>
</table>

Values are n (%).

MACE = major adverse cardiac event(s) (defined as a composite of all-cause death, myocardial infarction, or any repeat revascularization); RSS = residual SYNTAX score.
with an ACS (Central Illustration). The RSS of our population was similar to or higher than previous studies showing prognostic value of RSS after angiography-guided PCI (1,2). These results suggest that an FFR-guided PCI strategy offers an appropriate level of revascularization even in ACS patients with potentially vulnerable nonculprit stenoses.

There has been concern regarding the safety and accuracy of FFR measurements in the ACS setting. This stems in part from the potential for transient coronary microvascular dysfunction in the culprit vessel territory, which theoretically could involve nonculprit territories as well, leading to a blunted maximal coronary flow down the nonculprit vessels and a falsely elevated FFR. Deferral of PCI on unrecognized significant disease could lead to increased event rates. Concern also stems from the possibility that nonculprit disease, which is not hemodynamically significant based on FFR, might be more likely to cause events in the ACS setting because of systemic inflammation and plaque vulnerability. In the study by Hakeem et al. (18), deferring PCI using FFR in patients presenting with ACS was associated with significantly worse outcomes than in patients with stable angina; however, this may be due to the inherently higher risk of patients presenting with ACS than stable angina. The data from the current study and from a recent animal study do not support these concerns, at least in patients treated with dual antiplatelet therapy for 1 year (19).

This current study builds on data from previous trials. As first shown in a FAME substudy, the benefit of using FFR to guide PCI is similar in an unstable angina/NSTEMI population as compared with a stable angina population (20). Subsequently, the use of FFR including the culprit lesion of NSTEMI was shown to be feasible and safe in the randomized controlled trial setting (13). In the STEMI population, 2 large-scale randomized controlled trials have demonstrated the feasibility and safety of using FFR to assess nonculprit disease after primary PCI (14,21). These trials and other previous studies compared either an angiographically or functionally complete revascularization strategy against a culprit-only revascularization strategy (14,21-23). In this context, the current study may broaden the applicability of functionally complete revascularization to the ACS population by showing that residual coronary disease is not predictive of outcome in this population either.

As previously shown by Nam et al. (24), the prognostic value of the angiography-based SYNTAX score measured before PCI is enhanced by integrating functional information and calculating the “functional SYNTAX score.” We did not explore the predictive value of the SYNTAX score or functional SYNTAX score in this study, because these scoring systems are not universally used in ACS, especially STEMI, due to the large effect of culprit lesion location (total occlusion) on both the score and the clinical outcome (25).

**STUDY LIMITATIONS.** First, given the pooled analysis, differences in trial design, such as the definition
In patients presenting with acute coronary syndromes (ACS) and multivessel disease, 3 management strategies exist after the revascularization of the culprit vessel. First, one can treat the nonculprit disease medically (culprit-only revascularization). Second, one can treat only nonculprit lesion(s) with positive fractional flow reserve (FFR) (functionally complete revascularization). Third, one can treat all nonculprit stenoses based on the angiogram (angiographic complete revascularization). As shown in previous studies, complete revascularization of nonculprit disease leads to a better prognosis compared with culprit-only revascularization, in patients presenting with acute coronary syndromes and multivessel disease. In this study, we found that the extent of residual coronary disease after functionally complete revascularization is not prognostically important, adding support to the concept that functionally complete revascularization is the best mode of revascularization in this setting. LAD = left anterior descending artery; LCx = left circumflex artery; MACE = major adverse cardiac events; PCI = percutaneous coronary intervention; RCA = right coronary artery; RSS = residual SYNTAX score; Rx = treatment.
of myocardial infarction (26,27), revascularization strategy, or antiplatelet therapy, may have affected the results. Second, we do not have a clear answer about whether single-staged or multistaged PCI (and FFR measurement) is preferable in a STEMI population, whereas Sardella et al. (28) showed the superiority of single-staged complete revascularization in the NSTEMI population. Third, although this pooled analysis involves more than 500 patients presenting with ACS, the statistical power may not be adequate to prove our hypothesis. Nevertheless, the fact that typical variables associated with outcome were significant but RSS was not suggests that RSS will not be a stronger predictor than these well-known variables. Fourth, although the goal in this study was to achieve functionally complete revascularization based on FFR guidance, likely some functionally significant lesions were left untreated due to disease complexity, procedural failure, or operator discretion. As shown in a recent study, a “functional” RSS assessed by post-PCI FFR measurements is related to adverse outcome (29). Therefore, the results of the current study could be even more robust if all patients achieved a functionally complete revascularization by post-PCI FFR measurements. Finally, because this study is a post hoc analysis of the FFR-guided PCI arm of the 3 clinical trials, which were not designed to assess the impact of residual lesions after FFR-guided PCI, the results of the present study should be interpreted as hypothesis-generating.

CONCLUSIONS

After complete revascularization of functionally significant stenoses by FFR, the extent of residual angiographically significant but functionally insignificant disease is not a predictor of subsequent ischemic events in patients presenting with ACS. These results suggest that functionally complete revascularization is applicable even in ACS patients with potentially vulnerable nonculprit stenoses.

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PERSPECTIVES

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KEY WORDS acute coronary syndromes, complete revascularization, fractional flow reserve, residual SYNTAX score

APPENDIX For supplemental tables, please see the online version of this paper.