Area Of Myocardium At Risk And Lesion Length Are Predictors Of TCT-623

Conclusions: In this study, we have shown that successful recanalization of CTO, MLA, and reference segment LD independently predicts invasively determined FFR. CCTA might be used as a gatekeeper to exclude significant ischemia in the subset of lesions with ≥50% luminal narrowing.

TCT-622

Assessment of Noninvasive Coronary Flow Velocity Reserve Before and After Recanalization of Chronic Total Occlusion

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Background: Coronary flow velocity reserve (CFVR) has been considered an important diagnostic index of the functional capacity of coronary arteries. A donor artery providing collateral distal to a chronic total occlusion (CTO) may have diminished blood flow. The aim of this study was to evaluate, by noninvasive CFVR, whether the blood flow of donor artery reverts to normal after successful percutaneous coronary intervention (PCI) of CTO.

Methods: We evaluated 25 patients (20 men, 5 women; mean age 57.5 ± 14.1 years) who underwent successful PCI of right coronary artery (RCA) CTO, whose collateral provided by left anterior descending artery (LAD). The coronary flow velocities in the distal LAD were measured using transthoracic Doppler echocardiography at rest and during hyperemia induced by intravenous infusion of adenosine at 3 time periods: before (basal), 24 hours after (early) and within 3 months (late) of successful PCI. CFVR was calculated as the hyperemic to resting coronary diastolic peak velocities ratio.

Results: There was no difference between basal, early and late left ventricular ejection fraction values (53.5 ± 10.2, 53.3 ± 9.5, 53.3 ± 11.2, respectively). The CFVR at third month was significantly increased compared to the basal and early CFVR (1.8 ± 0.3 vs. 2.3 ± 0.3; p < 0.001 and 1.8 ± 0.2 vs. 2.3 ± 0.3; p = 0.001, respectively). On the other hand, there was no significant difference between basal and early CFVR (1.8 ± 0.3 vs. 1.8 ± 0.2; p = 0.89, respectively).

Table 1. LAD CFVR values before and after recanalization of RCA CTO

<table>
<thead>
<tr>
<th></th>
<th>Basal</th>
<th>Early</th>
<th>Late</th>
<th>P1</th>
<th>P2</th>
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</thead>
<tbody>
<tr>
<td>CFVR</td>
<td>1.8 ± 0.3</td>
<td>1.8 ± 0.2</td>
<td>2.3 ± 0.3</td>
<td>0.89</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

P1: basal vs. early CFVR, P2: basal vs. late CFVR, P3: early vs. late CFVR, values are mean ± standard deviation

Conclusions: In this study, we have shown that successful recanalization of CTO results in increased CFVR-induced blood flow in the donor artery within 3 months.

TCT-623

Area Of Myocardium At Risk And Lesion Length Are Predictors Of Functionally Significant Coronary Artery Stenoses Assessed By Fractional Flow Reserve

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Background: Angiographic evaluation of diameter stenosis has only modest predictive value for functionally significant coronary-artery-stenoses as assessed by fractional-flow reserve (FFR). Lesion length and area of myocardium at risk (BARI-myocardial-jeopardy-index) subtended by the stenotic coronary arteries are also predictors of functionally significant coronary-artery-stenoses. We compared the diagnostic accuracy of minimal-lumen-diameter (MLD), lesion length and BARI-myocardial-jeopardy-index (MJ) in prediction of significantly reduced FFR (≤0.8).

Methods: We assessed consecutive patients who underwent coronary angiography and FFR. Lesion length and MLA were assessed by QCA. Estimation of area-of-myocardium at risk subtended by coronary stenoses was performed using the BARI-MJI. Coronary stenoses were classified as functionally significant when FFR ≤ 0.8.

Results: 196 consecutive patients (age 65.6 ± 10.9, 69% male, 306 vessels) were included. 117 vessels (51%) had FFR ≤ 0.8. The BARI MJI was 34.2 ± 13.8 in vessels with FFR ≤ 0.8 compared to 21.8 ± 11.0 in vessels with FFR > 0.8 (p < 0.001). The mean lesion length in vessels with FFR ≤ 0.8 was 18.7 ± 9.3 mm in vessels with FFR > 0.8 (p < 0.001). The MLA in vessels with FFR ≤ 0.8 was 1.6 ± 0.458 mm compared to 1.51 ± 0.470 mm in vessels with FFR > 0.8 (p < 0.001). The boot-strapped Harrell’s c-statistic of BARI MJI, lesion length and MLA in predicting significant FFR were 0.76 (0.71-0.82), 0.75 (0.70-0.80) and 70 (0.65-0.75) respectively.

Conclusions: Diameter stenosis alone has modest predictive value of significant FFR. Area of myocardium at risk and lesion length are also predictors of functionally significant coronary artery stenoses.

TCT-624

Real-time utilisation of instant wave-free ratio (iFR) is feasible when performed by clinicians: results of the ADVISE in-practice, an international, multi-centre evaluation of iFR in clinical practice

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Background: Instant wave-free ratio (iFR) is a new index of coronary stenosis severity calculated without the need for vasodilators. iFR uses automated algorithms over baseline pressure traces to detect a phase in the cardiac cycle when resistance is lowest and most stable. Previous studies have calculated iFR of offline, and the feasibility of real-time iFR measurement has never been assessed. In this study we explore the real-time iFR measurement in humans undergoing invasive functional assessment of intermediate coronary stenoses.

Methods: 92 angiographically intermediate stenoses from 16 centers in Europe, Asia and Africa were included. iFR and FFR were measured in real-time, by clinicians, on clinically available consoles. The agreement between iFR and FFR was calculated for both clinical (0.80) and ischaemic (0.75) FFR cut-offs.

Results: iFR and FFR maintain a close level of agreement when both are measured by clinicians in real-time (for a ischaemic 0.75 FFR cut-off: ROCauc 0.90, classification match 98%; for a clinical 0.80 FFR cut-off: ROCauc 0.87, classification match 80%; if the FFR 0.75-0.80 gray zone is accounted for: ROCauc 0.93, classification match 92%). The diagnostic performance of iFR is summarized in Figure 1.

Conclusions: iFR measurement is feasible and practical for clinicians in a real world setting. By simplifying stenosis evaluation, iFR may expand adoption of physiology-guided revascularization.