Conclusions: iFR and FFR had equivalent agreement with HSR classification of coronary stenoses severity across the entire spectrum of stenosis severities. This suggests iFR may be suitable as a vasodilator-free alternative to FFR.

TCT-239

Does Adenosine Administration Improve Diagnostic Classification Of The Instantaneous Wave–Free Ratio (iFR)?

calibrated using fully-automated algorithms.

Methods: In 51 vessels intra-coronary pressure and flow velocity was measured distal to the stenosis at rest and during adenosine mediated hyperaemia. iFR, iFRa, FFR and HSR were calculated using.

Results: Mean iFR and FFR were both significantly higher than mean iFRa (0.84±0.2 iFR vs 0.79±0.2 FFR vs 0.69±0.2 iFRa, p<0.001 for both). Despite being numerical different, both iFR and iFRa had equivalent agreement with FFR (ROC AUC 95% iFR vs 100% iFRa, p=0.15) and with HSR (ROC AUC 0.93 iFR vs 0.94 FFR, p=0.66).

Conclusions: iFR and iFRa had equivalent agreement with HSR and FFR treatment classification of coronary stenoses. Although administration of adenosine results in lower values of iFR, it does not lead to an improvement in treatment classification. This suggests that providing the wave-free period can be isolated reliably, iFR can be used as a vasodilator-free alternative to FFR.

TCT-240

Benefits and costs of routine fractional flow reserve assessment in all major epicardial vessels during elective invasive angiography

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Background: Fractional flow reserve (FFR) is commonly reserved to assess the functional significance of coronary lesions with intermediate stenoses. We sought to determine the benefits and costs of routine FFR assessment in all major epicardial vessels during elective invasive coronary angiography (IA).

Methods: 144 vessels in 48 patients with stable chest pain were assessed by IA immediately followed by FFR in all major epicardial vessels. FFR was assumed to be 0.5 in vessels with >90% stenosis and 0.95 in smooth arteries. Interventionists recorded the management strategy on per vessel and patient basis (vasorelaxation or medical therapy) before and after knowledge of FFR results. Time taken, contrast volume and radiation dose were documented for both components of IA and FFR.

Results: 93 vessels were successfully interrogated with FFR with no adverse effects (mean 1.9 vessels per-patient). In the remaining 51 vessels, 26 had >90% stenoses and 25 in vessels with >90% stenosis and 0.95 in smooth arteries. Interventionists recorded the management strategy on per vessel and patient basis (vasorelaxation or medical therapy) before and after knowledge of FFR results. Time taken, contrast volume and radiation dose were documented for both components of IA and FFR.

Conclusions: Routine FFR performance in all major epicardial coronary arteries during elective invasive angiography altered the initial angiographic-guided management in 23% of patients and 11% of vessels. Routine FFR assessment is safe and associated with increased procedural time, contrast volume, radiation dose and financial cost.

TCT-241

Value of Optical Coherence Tomography beyond the Napkin-Ring Sign in CT Angiography for Detecting Coronary Lipid-Core Plaques as Determined by Histology: A Multimodality Imaging Study in Human Donor Hearts

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Background: In CT angiography (CTA), the napkin-ring sign (NRS) is a specific marker for coronary high-risk plaque, which may warn further evaluation by invasive imaging like Optical Coherence Tomography (OCT). We thought to determine the visualization of CTA-NRS lesions by OCT and its value above CTA with histology as the gold-standard.

Methods: Of human donor hearts, 9 coronary arteries were imaged by CTA, OCT and histology whereon coronary lesions as well presence of lipid-core plaque (LCP; fibroatheroma with core diameter >200μm, core circumference >60°, and cap thickness <450μm) were defined. Each cross-section of a lesion was evaluated for NRS in CTA and lipid-rich plaque in OCT.

Results: In total, 292 cross-sections were assessed in CTA, OCT and histology and grouped into 45 lesions of them 13 (29%) contained LCP. LCP lesions had higher plaque burden (82 vs 73%, p=0.001 and were longer (8 vs 5mm, p=0.02) compared to non-LCP lesions in histology. NRS in CTA had 46% sensitivity and 97% specificity to detect LCP lesions. Containing ≥1 cross-sections lipid-rich plaque in OCT led to moderate specificity (66%) for LCP, but increased to 94% (p=0.004) if ≥2 cross-sections lipid-rich plaque in OCT were used as the positivity criteria, while sensitivity remained unchanged at 77%. OCT was independent and incremental to CTA while area under the ROC curve for LCP detection increased from 0.715 for CTA only to 0.898 for using both, CTA and OCT (p=0.01). Those findings remained after adjustment for confounders. Based on CTA, 7 NRS lesions were identified, of those 5 were also positive in OCT (71% agreement), all 5 lesions contained LCP in histology. Of lesions with disagreement, OCT was false negative in one case (significant calcification associated with the necrotic core) and true negative in the other.

Conclusions: OCT had incremental value above CTA for detecting LCP lesions as determined by histology. However, a high sub-sequential agreement was achieved between NRS lesions in CTA and lipid-rich lesions in OCT.

Accuracy of Optical Coherence Tomography beyond the Napkin-Ring Sign in CT Angiography for Detecting Coronary Lipid-Core Plaques as Determined by Histology: A Multimodality Imaging Study in Human Donor Hearts

TUESDAY, OCTOBER 23, 8:00 AM–10:00 AM

Imaging

Hall D

Tuesday, October 23, 2012, 8:00 AM–10:00 AM

Abstract nos: 241-313

Background: Although frequency domain OCT (FD-OCT) has been introduced recently in clinical practice, efficacy and feasibility of it has not been described yet in vivo in human. Thus, the aim of this study was to compare the reliability and feasibility of FD-OCT and IVUS to intravascular ultrasound (IVUS) in coronary lesion assessment.

FD-OCT and IVUS were performed prospectively in 5 centers in 100 patients before and after stenting (60 cases) and at stent follow-up (20 cases). Quantitative analyses were performed in minimum lumen diameter and area (MLD and MLA, respectively) in FD-OCT, IVUS and quantitative CAG (QCA) in addition to qualitative morphological assessment.

Conclusions: Compared with CQA, MLD was significantly greater in OCT and IVUS (1.85 vs 0.77 ± 0.19 and 0.77 ± 0.70 vs 2.10 ± 0.59 mm, p=0.001, respectively), and it was significantly greater in IVUS compared with OCT (p<0.001), although there were significant correlations one (IVUS vs OCT, QCA vs OCT and CQA vs IVUS; R=0.92, 0.83 and 0.82, p=0.001 respectively). MLA was also significantly greater in IVUS compared with OCT (3.70 ± 2.04 vs 3.36 ± 2.28 mm², p=0.001), although a significant correlation was observed between them (y = 0.85±0.83, p=0.001). Furthermore, OCT was superior to IVUS in inter-operator variability in MLA (y =1.01±0.01, p=0.01).

JACC Vol 60/17/Suppl B | October 22–26, 2012 | TCT Abstracts/POSTER/Imaging

B69