TCT-24

Combined Near-Infrared Spectroscopic and Intravascular Ultrasound Assessment Of Coronary Plaque Burden and Lipid Pools: Validation With Histology

Rishi Puri[1], Sean Madden[2], James Muller[3], Kathy Wolski[1], Ryan Madder[4], Yu Kataoka[1], Kiyoko Uno[1], Jordan Andrews[1], Karilane King[1], Steve Sum[3], Craig Balog[1], E Murat Tuzcu[1], Samir Kapadia[5], Akiko Maehara[6], Gary Mintz[7], Stephen Nicholls[1]

[1]Cleveland Clinic, Cleveland, OH, [2]Infraredx, Inc, Burlington, MA, [3]Infraredx, Inc., Burlington, MA, [4]Frederik Meijer Heart & Vascular Institute/Spectrum Health, Grand Rapids, MI, [5]Cleveland CLinic, Cleveland, USA, [6]Cardiovascular Reserach Foundation and Columbia University Medical Center, New York, NY, [7]CRF, washington, United States

Background: Near-infrared spectroscopy (NIRS) enables specific identification of coronary lipid core plaques in vivo, which are thought to mediate plaque vulnerability. IVUS-derived coronary plaque burden is associated with clinical events. The relationship between coronary plaque burden and lipid core expression is yet to be evaluated.
Methods: Ex-vivo catheter-based coronary NIRS and IVUS imaging was performed through blood in 108 vessels from 51 autopsy hearts (mean donor age 65.9±15 yrs, 71% male). A single histological section was analyzed for every 2-mm block of artery, and assigned a modified American Heart Association (AHA) pathological grading scheme (1=normal/adaptive intimal thickening, 2=fibrous/calcified fibrous, 3=pathological intimal thickening, 4=fibroatheroma/ruptured plaque). For each block, percent atheroma volume (PAV) and lipid core burden index (LCBI) were derived from IVUS and NIRS respectively.
Results: Correlations were found between PAV vs LCBI ($r=0.34$, $p<0.0001$), PAV vs AHA grade ($r=0.64$, $p<0.0001$) and AHA grade vs LCBI ($r=0.40$, $p<0.0001$). There were significant interrelationships between AHA plaque classification, LCBI and PAV values (Grade 1: n=942, mean LCBI 16.7±60, mean PAV 35.4±10; Grade 2: n=477, mean LCBI 38.2±88, mean PAV 54.8±9; Grade 3: n=367, mean LCBI 87.2±155, mean PAV 53.5±11; Grade 4: n=284, mean LCBI 162±206, mean PAV 60.5±10.8; $p<0.001$ for test of trend for both LCBI and PAV according to AHA grade). Table 1 highlights the 3-way relationship between tertiles of PAV, corresponding block LCBI values and plaque sub-types found within each PAV tertile.

Table 1

Block Parameter	Tertile 1 PAV (0 - 38.5) N=690	Tertile 2 PAV (38.51 - 53.5) N=690	Tertile 3 PAV (53.6 - 82.6) N=690	p-value (test of trend)
Block LCBI	13.5±58	36.8±97	112±172	<0.001
Mean PAV	29.9±5.6	46.7±4.3	62.9±6.6	<0.001
AHA Grade 1 N(%)	631 (91.4)	261 (37.8)	50 (7.2)	N/A
AHA Grade 2 N(%)	20 (2.9)	207 (30.0)	250 (36.2)	N/A
AHA Grade 3 N(%)	33 (4.8)	161 (23.3)	174 (25.2)	N/A
AHA Grade 4 N(%)	6 (0.9)	62 (9.0)	216 (31.3)	N/A
LCBI and PAV data are presented as mean±SD.				

Conclusions: Plaque burden on IVUS and NIRS-derived lipid core are modestly correlated, and each associate with increasing histological plaque complexity. This suggests that the combination of the two variables may yield enhanced characterization of plaques and possibly more effective prediction of clinical events.

Access Sites and Their Mangement

C219

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TCT-25

Cardiac catheterization via Ulnar. Deductive approach after 10 years of Experience.

Raul Valdesuso[1], Juan Gimeno[1], Francisco Lacunza[1], Juan Garcia de Lara[1], Jose Hurtado[1], Eduardo Pinar[1], Mariano Valdes[1]

[1]Hospital Universitario Virgen de la Arrixaca, Murcia, Spain

Background: The Ulnar Artery (UA) access is rarely employed in cardiac catheterization. The "how to do" of the puncture has not been established. We propose how and where to puncture the UA after careful evaluation of complications and failures of the technique.
Methods: We reviewed the results of 1,157 consecutive patients (pts) in which the UA approach was attempted from Nov-2001 till May-2012. All studies were performed by operators with experience in transradial approach. Follow-up was achieved in 93% of pts at 24 hours and 91% at 3 months after procedure. Haematomas (H) and neurological complications related to the UA puncture were recorded.
Results: Of a total of 22,825 pts, (73% radial approach) 1,357 (6%) were attempted via UA (mean aged 67 ± 14 years. 65% males, and risk factors the usual of a non-selected population). In the pts attempted, UA pulse was as strong as radial in 28% and even stronger in 26%. The UA was punctured over or near the wrist's skin fold or 3 - 4 cm proximal (the 2 sites where the artery can be felt best). In 128 pts (11%) UA was attempted after failure of radial puncture in the same wrist. Study was completed in 1,205 pts (89%). The main cause of ulnar cross over was the puncture failure (75% of cases) with a mean delay time 5 ± 7 min. Out to 1,533 procedures performed (77% via the right UA) 691 (45%) were PCI. A total of 75 H > 6 cm were documented; 12 (12%) of them within the first 100 cases performed, and the rest 63, in the following 1,105 (6%) pts ($p<0.05$). There were 3 temporary neurological complications related to the nerve compression by big H and 15% of unintentional nerve punctures without sequelae at follow up (ulnar nerve runs medial and slightly below the artery). In a multi-variable analysis, H was related to a proximal puncture place, that difficult the artery compression.
Conclusions: Ulnar approach is more difficult and time consuming than radial. Puncture must be done over the carpal bones (at the level of the wrist's skin fold) to diminish vascular complications. Needle must be directed from lateral to medial (45°) to avoid unintentional ulnar nerve puncture. UA might be a better approach than radial when ulnar pulse is felt stronger than radial.

TCT-26

Radial vs Femoral access for Primary PCI, observational data from the British Cardiovascular Intervention Society Database.

Karim Ratib[1], Mamas Mamas[2], Adrian Large[1], Samer Arnous[1], Helen Routledge[3], Peter Ludman[4], Doug Fraser[2], Jim Nolan[1]

[1]University Hospital of North Staffordshire, Stoke-on-Trent, UK, [2]Manchester Royal Infirmary, Manchester, UK, [3]Worcestershire Royal Hospital, Worcester, WR5 1DD, UK, Worcester, UK, [4]University Hospital Birmingham, Birmingham, UK

Background: Primary PCI is the gold standard treatment for patients with STEMI with a significant mortality benefit compared to thrombolysis. Advances in anti-thrombotic therapy have improved the prognosis of patients presenting with STEMI, reducing ischemic events and mortality, at the expense of increased bleeding complications. Radial access significantly reduces the risk of access site bleeding and is associated with a reduction of mortality similar to that observed with the switch from thrombolysis. We sought to assess the real world effects using of radial access for primary PCI using BCIS PCI database.
Methods: This study includes data collected by the British Cardiovascular Intervention Society under the auspices of the Central Cardiac Audit Database. The BCIS PCI database is a prospectively maintained database that aims to record every PCI in the United Kingdom. We retrospectively analyzed all primary PCI procedures between January 2006 and September 2011. For our analysis patients were grouped according to arterial access either transradial access (TRA) or transfemoral access (TFA). Patients were excluded if there was mixed access or if an other access site was used.
Results: Between 2006 and 2011, use of TRA increased from 12.5% to 55.9% of procedures. TFA was utilized in 32,525 patients (55.9%) whilst TRA was used in 23,678 patients (40.0%). The remaining 2941 (5.0%) patients had either multiple access sites utilized or access site was unknown. 30-day mortality was 2622 / 56203 (4.6%) of which 2068/32,525 (6.4%) occurred with TFA whilst 554/ 23,679 (2.3%) occurred with TRA ($P<0.0001$). Multivariate stepwise logistic regression analysis adjusted for baseline procedural and demographic characteristics demonstrated that radial access was independently associated with a reduction in both 30-day mortality (HR 0.66; 95% CI 0.51-0.86: $P<0.005$).
Conclusions: TRA has become the preferred access site for PPCI in the UK. In this observational study, TRA is associated with a significant reduction in 30 day mortality. This mirrors the findings of recent randomised controlled trials and meta-analyses.

TCT-27

Transformation from a predominant Transfemoral to Transradial Access site for Percutaneous coronary intervention (PCI): Insights into an Achievable Revolution within Five Years.

Shantu Bundhoo[1], Ganesh Shivu[2], Tim Kinnaird[3], Richard Anderson[4]

[1]University Hospital of Wales, Cardiff, South Glamorgan, [2]University Hospital of Wales, cardiff, Wales, [3]university Hospital of Wales, Cardiff, wales, [4]University Hospital of Wales, Cardiff, Wales

Background: PCI via the radial (R) route continues to gain wider acceptance. The main limiting factors for its adoption include a learning curve, concerns of technical difficulty, longer fluoroscopy time and radiation doses. Little information is available on the learning curve in adopting this technique. Our study examines the change in practice in a high volume centre with regard to PCI access site.
Methods: Prospective study examining procedures and outcomes of all patients undergoing PCI between Jan 2006 and Dec 2010 at our centre. We performed between