intervention. However, the need for crossover to secondary access from the femoral artery was reported in up to 7.6%. The value of ultrasound to improve primary access from the wrist warrants further scrutiny.

METHODS Intra-procedural ultrasound assessment of both the radial (RA) and ulnar arteries (UA) was performed in a consecutive series of patients undergoing cardiac catheterization and/or intervention at a tertiary referral center. The diameters of the RA and UA were defined as the mean of two perpendicular measurements. The RA or UA was defined as larger if the difference in diameter was >20%. In the case of a dual artery, measurements of the dual arteries and the proximal confluent were obtained. Prior to ultrasound assessment, all patients were pre-treated with 0.4mg of sublingual nitroglycerin.

RESULTS A total of 566 RA/UA measurements were analyzed in 565 patients (female: n=201 [35.5%], mean age: 66.5 years). The mean diameters of the RA and UA were 3.03 ± 0.57 mm and 2.70 ± 0.57 mm (P<0.01), respectively. Comparing gender, the mean diameter of the RA was 3.2 ± 0.56 mm in male and 2.7 ± 0.45 mm in female patients (P<0.001) as well as 2.8 ± 0.57 mm and 2.4 ± 0.47 mm for the UA (P<0.001). The RA was larger (>20%) than the UA in 210 (37.1%) and the UA was larger (>20%) than the RA in 37 (6.5%) measurements. In 15 patients, the RA diameter was <2.0 mm with a mean RA diameter of 1.6 ± 0.6 mm. The corresponding ipsilateral UAs were significantly larger in these 15 patients with a mean diameter of 2.6 ± 1.02mm (P=0.0012). A dual RA was present in 25 (4.4%) measurements. Of these, the smaller dual RA had a mean diameter of 1.82 ± 0.37 and the larger dual RA of 2.59 ± 0.36 mm (P<0.01). The corresponding proximal confluent of the dual RA measured 3.10 ± 0.40 mm. No dual UA was observed.

CONCLUSIONS The present study showed that systematic ultrasound assessment of both RA and UA revealed anatomical particularities in 10.9% of patients, which is not assessable by palpation. In 10.9% of patients, an UA significantly larger than the RA or a dual RA with a more accessible confluent was observed. This information can only be obtained by ultrasound-guided arterial access, and may improve access rates from the wrist by allowing the operator to choose the UA when the RA is significantly smaller, thereby possibly preventing spasm by placing too large of a sheath in a small RA, and access the confluent of a dual RA, rather than a smaller dual RA branch.

CATEGORIES OTHER: Vascular Access: Transradial

KEYWORDS Radial artery, Ulnar Artery, Ultrasound guided

TCT-425
Rotterdam Radial Access Research: Radial Artery Access Evaluation After Coronary Procedures With Very High Resolution Ultrasound; The Puncture’s Footprint
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BACKGROUND The radial artery is a common access site for coronary diagnostics and intervention. Despite the advantages, low rate of radial pulse and arterial occlusions are known complications (0.6-12%). The Rotterdam Radial Access Research (R-RADAR) study aims to determine patterns of radial healing and the impact on occlusion and loss of pulsation by visualizing the radial artery non-invasively with very high resolution ultrasound.

METHODS The radial artery was assessed by a 40 MHz linear external ultrasound prior to the procedure, at 3 hours follow up and 30 days follow up. Study endpoints were safety and feasibility of imaging the radial artery with a 40 MHz probe, incidence of loss of radial pulse, radial artery occlusion, pain or discomfort at the hand or wrist and procedure related functional compromise at 3 hours and 30 days follow up.

RESULTS A total of 90 patients were enrolled in this prospective study. All showed acute wall injuries after cannulation 3 hours and at 30 days follow up. Observed injuries were dissections, hematoma, pseudo-anurysm, thrombus and spasm often resulting in lumen compromise. Persisting occlusion occurred in 3.9% of the patients, loss of pulsation in 9.7%. One patient showed a fistula of the radial artery and vein. 44 patients experienced pain/discomfort of the hand at 3 hour follow up (29.5%) and at 30 days (31.2%). Nineteen patients had function compromise at 3 hours (13.6%) and at 30 days follow up (11.7%). 14 patients experienced both pain and function compromise. Multiple puncture attempts correlated with loss of pulsation (OR 2.64 p<0.027), occlusion (OR 3.49 p<0.022) and physical symptoms (OR 2.24 p<0.05) at 30 days follow up. All structural changes were observed with the 40 MHz high resolution linear probe and were not visible on the 6.2 MHz ultrasound system. There were no complications related to the 40 MHz ultrasound acquisition.

CONCLUSIONS Ultrasound acquisition of the radial artery with a 40MHz linear external probe is safe and feasible. Structural radial artery wall are omnipresent Acute wall injuries did not correlate with pulsation loss, occlusions and symptoms at follow up, however there was a significant correlation of multiple puncture attempts with loss of pulsation, occlusion and symptoms.

CATEGORIES OTHER: Vascular Access: Transradial

KEYWORDS Percutaneous coronary procedure, Radial access, Vascular ultrasound

TCT-426
The Impact Of Operator Experience During Institutional Adoption Of Transradial Cardiac Catheterization
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BACKGROUND Trans-radial (TR) cardiac catheterization offers numerous benefits over trans-femoral (TF) cardiac catheterization, but the TR approach has been slowly adopted in the United States. The purpose of this study is to examine trends in TR cardiac catheterization and the impact of institutional operator experience on TR outcomes in contemporary practice.

METHODS We reviewed all cases of attempted TR cardiac catheterization at a single tertiary care academic medical center from the initial adoption of the TR approach in May, 2008 until April, 2015. TR cannulation failure was defined as inability to cannulate the radial artery, and TF cross-over was defined as conversion from a TR to TF approach after successful radial artery cannulation. We assessed trends over time by a non-parametric test of trend. We used generalized estimating equations for categorical variables and linear mixed models for continuous variables, and we adjusted models for performance of percutaneous coronary interventions (PCI) and differences between individual operators.

RESULTS Over the study period, 4177 attempted TR cardiac catheterization cases were performed by 12 operators. Operator experience at the study institution ranged from 13 to 935 TR cases. Overall, PCI was performed in 859 (20.5%) TR cases, and the percentage of TR cases performed with PCI increased from 9.7% in 2009 to 26.3% in 2014 (P-trend <0.001). The overall TR cannulation failure rate was 2.8%, and the overall TF cross-over rate was 2.9%. Over the study interval, the rate of TR cannulation failure decreased from 4.3% in 2009 to 2.5% in 2014 (P-trend = 0.05), and the rate of TF cross-over decreased from 4.3% in 2009 to 2.2% in 2014 (P-trend <0.05). Increasing operator experience was associated with lower rates of TR cannulation failure and TF cross-over (table). Operators with over 100 cases had the lowest odds of TR cannulation failure, while operators with over 200 cases had the lowest odds of TF cross-over. Increasing operator experience was also predictive of shorter mean fluoroscopy time and lower mean contrast dye dosing (table). Performance of PCI was not a significant predictor of TR cannulation failure, but was a predictor of TF cross-over (odds ratio 1.99, 95% confidence interval 1.56 to 2.54, P<0.001), higher mean contrast dye