Anatomical, functional and pain hand assessment after transulnar artery access with ipsilateral RAO for percutaneous coronary interventions


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Aims: The purpose of our research comes from the increasing need for an alternative approach when the standard right radial is not accessible, most commonly due to the presence of RAO. The use of this approach is still controversial in the interventional community, due to lack of published studies. Our purpose was to prove its’ safety and success.

Material and methods: In the period from September 2019 until April 2021, 103 consecutive patients underwent PCI through primarily chosen TUA with ipsilateral RAO. These patients were included in a prospective single center study of effectiveness and safety. We examined clinical and procedure characteristics, access site bleeding and ischemic complications and failure mode of initial TUA. Anatomical, functional and pain assessment of the punctured arm was performed at baseline and after the procedure and at follow-up. Using pre-procedural UA angiography, we measured the diameter of the UA and the collateral circulation for the occluded RA by QCA (Quantitative angiography). Values of UA diameter were compared with previous angiographies before RAO. Additional functional assessment of the arm was performed using JAMAR dynamometer for hand strength and self-assessment with QUICK DASH questionnaire. VAS score was used for pain assessment. Clinical and duplex ultrasound evaluation for ulnar patency were examined.

Results: Mean age of patients was 62.9±9 years with 30% females. Previous TRA was present in all patients, 32% of patients had multiple previous TRA (>3), with 10 being the largest number. Procedural success through primary chosen TUA with ipsilateral RAO was 96.2%. In 4 (3.8%) patients we had an inability to puncture the right UA and were transferred to left TRA. Procedural success after UA puncture was 100%. Number of punctures of the UA was 1.6±0.9 (1–6 punctures). Access site bleeding complications were detected in 4% (EASY score >2). On duplex ultrasound follow up, there wasn’t a single case of UAO detected. There were no clinical or ischemic hand complications seen during long-term follow up. Local bleeding complications were found to be related to larger number of punctures, time of puncture and longer procedural time (p<0.0001). QCA assessment showed an increasing of UA diameter after RAO of 0.28±0.35 mm (p<0.0001). Dynamometer values of arm strength showed a small decrease in values 12 hours after procedure (72.6±23 vs. 71.9p, p=0.029), but without changes in initial strength on 1, 6 and up to 1 year after procedure. QUICK DASH self-assessment showed no significant changes in the follow-up period.

Conclusion: Transulnar approach with ipsilateral RAO is safe and successful for PCI. The existence of appropriate collateral support for the occluded RA, allows for a safe TUA with ipsilateral RAO. Anatomical, functional and pain assessment of the punctured arm affirmed the safe use of this approach as the best alternative for right TRA and preservation of wrist access benefits.