

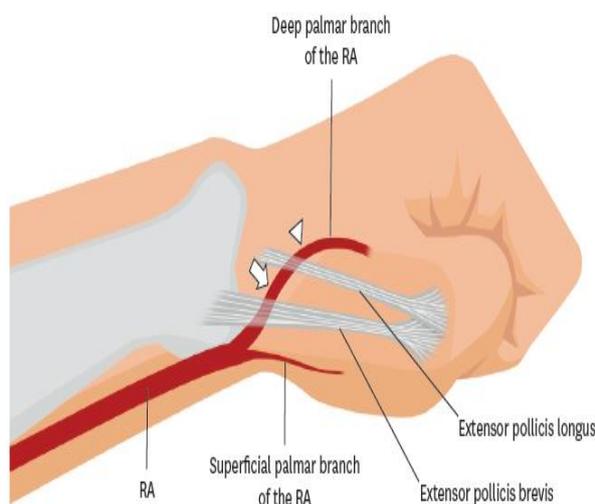
Dorsal Access to Radial Artery: The Anatomical snuffbox Approach

Novel access provides excellent procedural success and safety

Transradial access has become the default strategy for routine coronary procedure, but there is still scope for improvement. A new technique of accessing the distal radial artery in the anatomical snuffbox is introduced as a safe and feasible approach and is currently gaining interest as an alternative to traditional wrist puncture for radial artery catheterisation. Indeed, distal transradial (DTR) access allows for persistence of flow in forearm radial artery with further reduce risk of proximal radial artery occlusion.

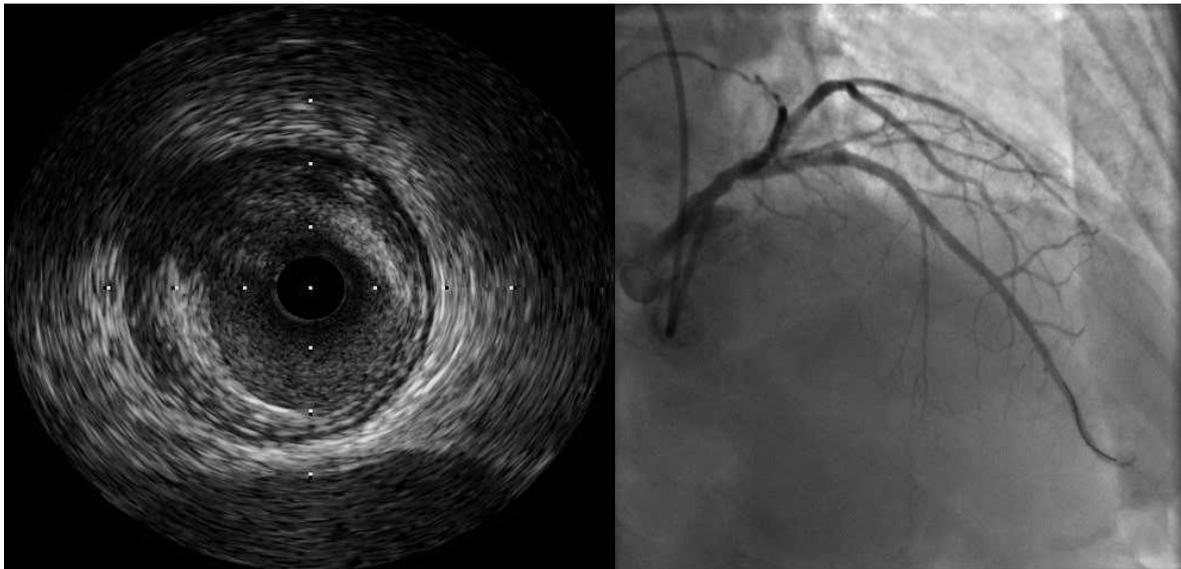
Clinical case

A 62 year old male hypertensive, who had undergone coronary angioplasty a year back was admitted with complaints of chest pain of recent onset duration. His ECG was unremarkable, however troponin I levels were elevated. Coronary angiography was performed from distal right radial artery in the anatomical snuffbox. Radial artery was cannulated with 20 gauge needle and 5Fr Terumo Radifocus Introducer II sheath was introduced into the artery. Two stents in osteoproximal and mid to distal LAD were patent, however the intervening area between two stents had 70-75% tubular stenosis. IVUS imaging was opted to ascertain the plaque burden and morphology. 5Fr Terumo radial sheath was upgraded to 6Fr Terumo Radifocus Introducer II sheath in anatomical snuffbox. IVUS imaging using Boston Scientific Opticross (3F x 135 cm) revealed significant plaque burden, entailing coronary angioplasty which was accomplished using stent Xience Prime 3 X 28 mm in LAD.



(Left) The pathway of RA via anatomical snuffbox and puncture site (white arrow). (Right) Right hand posture of patient with sheath through the puncture site.

The anatomical snuffbox is a triangular shaped depression on the radial, dorsal aspect of the hand at the level of the carpal bones. Within this narrow triangular space, various structures are located, including the distal radial artery (RA), a branch of the radial nerve, and the cephalic vein. The RA gives off the superficial palmar branch before curving around the wrist. The superficial palmar branch usually anastomoses with the end of ulnar artery (UA) to complete superficial palmar arch (SPA). Thereafter, the RA passes across the floor of the anatomical snuffbox and through the first interosseous space, crosses the palm, and ends up completing the deep palmar arch (DPA) at the fifth metacarpal base with deep palmar branch of the UA.



(Left) IVUS image showing significant plaque burden. (Right) Coronary angiogram depicts no residual stenosis after stenting of mid LAD lesion.

The distal radial access through snuffbox has recently been performed despite short available length, shallow depth and small diameter of the RA in the snuffbox with complex surrounding structures. The snuffbox approach has numerous **advantages** over conventional radial access. **First**, the approach reduces the risk of occlusion in the RA located proximal to wrist, a frequent finding in patients who develop a forearm RA occlusion due to puncture trauma or hemostasis trauma at the traditional radial puncture site. Also, even if the vascular sheath has blocked the artery, blood supply to the hand would maintain via the SPA. **Second**, hard structures (Carpal bones) just underneath the access site and small diameter of distal RA in the snuffbox make hemostasis easy. **Third**, subcutaneous hematoma rarely spreads to the upper part of the forearm. **Fourth**, no need for compression around the wrist for hemostasis makes the wrist free to move, which limits venous congestion of the hand. **Fifth**, in case of vasospasm and hematoma from unsuccessful needling which make further trials harder, and operator could easily move to the conventional radial approach. **Sixth**, for patients with chronic kidney disease, vascular injury caused by conventional radial approach occasionally preclude arterio-venous fistula formation for hemodialysis. The snuffbox approach spares the site for future arterio-venous fistula. **Seventh**, the snuffbox saves more undamaged length of the RA for potential coronary artery bypass surgery candidates.

Nevertheless, there are several **limitations** of the snuffbox approach. **First**, because of small caliber and more tortuous course of RA in snuffbox, needling is more difficult than that via the conventional radial approach. **Second**, sheaths larger than 7Fr are difficult to introduce. **Third**, due to 3-5 cm distal to the conventional radial access, the snuffbox approach can reduce the effective length of the guide

catheter. Therefore, catheters may not reach the coronary ostium, especially in situations such as tall patients and tortuous arteries.

BLK Experience:

Patients planned for coronary procedure were selected for distal radial access based on manual palpation of artery in anatomical snuffbox. We have, so far performed 30 coronary procedures using this novel access site. All patients underwent coronary angiogram and total 8 adhoc coronary angioplasty procedures were performed. We were able to perform coronary imaging (IVUS) on patients from same access site. No complications were encountered in any of the patients. There was no crossover of access site to either traditional radial or femoral site. Early experience shows that snuffbox radial access is technically feasible and offers a safe access site with improved patient comfort and represents a viable alternative to conventional radial access for coronary intervention procedures.