

Editorial / Editöryal Yorum

Distal transradial angiography

Distal transradial anjiyografi

Mehmet Fatih Yılmaz M.D. , Can Yücel Karabay M.D. 

Department of Cardiology, Siyami Ersek Chest and Chest Surgery Training and Research Hospital, İstanbul, Turkey

Distal transradial angiography (DTRA) has been adopted widely by the interventional cardiologists in recent years. Prior randomized clinical trials established the benefit of conventional radial angiography compared to the femoral approach regarding bleeding complications and patient comfort. However, despite the fact that it is generally asymptomatic, radial artery occlusion (RAO) can be seen frequently following the procedure.^[1] Presence of large carpal and metacarpal anastomoses between the forearm arteries prevents ischemic complications associated with RAO and is therefore often underrecognized.^[2,3]

This complication has the potential to preclude patients to undergo hemodialysis fistula preparation, coronary artery bypass grafting operations, reconstructive surgery and the most importantly future repeat transradial angiography. To overcome these issues, DTRA has been proposed as the preferred approach on the basis of anatomical and physiological grounds.^[4] Radial angiography with distal access is performed in the area known as the anatomical snuff box and with this approach RAO is diagnosed less frequently.^[5,6] This technique particularly provides the opportunity for reliable compression hemostasis thanks to favorable surrounding anatomy. Recent registries consistently demonstrated that with DTRA operators can perform the same procedures as they can perform with traditional TRA, including the left main coronary artery and complex bifurcation lesions.^[7-9] Furthermore, the practices where DTRA is adopted such as interventional radiology and interventional neuroradiology are increasing as the tools and tech-

niques improve and more evidences emerge.^[10,11]

DTRA can be performed with or without the ultrasound guidance.

The major advantage of the ultrasound is that it delineates the location of the artery with high accuracy. This can also provide preventing injury to the superficial branch of the radial nerve. The size and the tortuosity of the radial artery can be determined by the ultrasound which allows operator to select the right material during the procedure.^[12]

It is important to ensure that the distal radial artery is not smaller than the size of the sheath intended to be used. This helps preventing arterial damage and reduces the risk of RAO significantly.^[13] It should be kept in mind that the diameter of the distal radial artery of women is significantly less than that of men.^[14]

There are several complications during DTRA that have been reported which were mainly associated while attempting to cannulate more proximal to the vessel. These include access site hematoma, nerve injury, major bleeding and RAO. The incidence of RAO during traditional proximal transradial access ranges from 1% to 10%.^[15] The most important advantage of DTRA is its lower incidence of RAO. Furthermore, local hematoma, nerve injury and major bleeding are less common.^[16,17]

Abbreviations:

BMI	Body mass index
DTRA	Distal transradial angiography
LDTRA	Left distal transradial access
PCI	Percutaneous coronary intervention
RAO	Radial artery occlusion
STEMI	ST-segment elevation myocardial infarction



Kiemeneij et al.^[18] reported a series of 70 patients in whom the left distal transradial access (LDTRA) was performed. The success rate for achieving radial access was 89%, and 3% of patients experienced major adverse events during the post procedure period.^[18] The benefits described were that the patient can move the wrist more easily after the procedure, operator felt more comfortable, hemostasis achieved more rapidly and no RAO occurred.^[14] In another study which included 200 patients, the efficacy and safety of DTRA were compared with the traditional radial approach. The crossover rate to another access site was 30% and 2% of patients who were grouped into DTRA and traditional radial approach respectively. While the cannulation time was longer with DTRA, the time for hemostasis was shorter.^[19]

More recently, Kim et al.^[20] included patients with ST-segment elevation myocardial infarction (STEMI) who underwent percutaneous coronary intervention (PCI) by using DTRA. Of 138 patients, 128 were performed successful PCI with LDTRA, and no significant bleeding complications were observed. Local hematoma was noted only in 3 patients. It was noted that the tortuosity of the left subclavian artery was less compared to the right subclavian artery in most patients which increased the success rate of the procedure.

In this issue of the Archives of the Turkish Society of Cardiology, Erdem et al.^[21] aimed to compare the DTRA and conventional radial angiography in patients with acute coronary syndrome. In this single-center retrospective study, 70 patients underwent DTRA and 63 patients underwent conventional radial angiography. Although the time of sheath insertion was higher in the distal group, there was no difference in the total duration of the procedure and the amount of radiation received. As expected, radial spasm and radial occlusion were higher in the conventional group (7.9% vs 1.4% and 3.1% vs 1.4%, respectively, $p=0.27$ and $p=0.45$). Time for hemostasis was shorter in the distal group (33.35 ± 6.64 vs 43.98 ± 5.20 , $p<0.001$). Lower duration of hemostasis and incidence of RAO in the DTRA group was consistent with previous findings. Remarkably, minor bleeding and hematoma were more common in the DTRA group. This might be due to the operator's lack of experience with distal puncture.

There were no major bleeding events in either group. The procedure success rate was higher in the conven-

tional group, but no statistically significant difference was found (94.2% vs 98.4%, $p=0.217$). The high rate of success in achieving access was in accordance with other studies.^[22,23] The procedure was unsuccessful in 3 patients in the DTRA group, but there was no information about possible reasons in these cases. There might be several explanations for failure in the DTRA access. For instance, in a prior report by Lin et al.,^[22] low body mass index (BMI) was identified as a risk factor for unsuccessful access by using DTRA.

A good knowledge of the radial artery anatomy of the hand is absolutely necessary for effective and safe distal radial artery puncture. Ultrasound-guided puncture should be performed during the learning phase. Recent studies show that DTRA can be utilized as a safe alternative access.^[24,25] Whether it will ever replace transradial approach as the default technique remains to be determined with future large randomized clinical trials.

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