

The First Iraqi Experience of Coronary Intervention through the Distal Trans-Radial Artery (d-TRA) Access

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Abstract: Background:- Distal trans-radial artery access (d-TRA) being a new site for coronary intervention with advantages over the commonly used access namely traditional trans-radial artery (TRA) & femoral artery access (FA), the main advantage being the low incidence of radial artery occlusion (RAO) when compared with TRA, and minimal local complication with shorter stay time after the procedure when compared with both (TRA & FA), but still the only disadvantage being the need for a good experience for safe and rapid cannulation of this small artery. It was considered in all coronary interventional procedures, including coronary angiography, Angioplasty with coronary stenting and the interventions of complex coronary procedures. The aim of the study: - To highlight the first Iraqi experience with the d-TRA approach for coronary angiography and intervention and to detect any local vascular and other complications during this access in comparison with the traditional proximal radial artery (TRA) and femoral artery (FA) access. Methods: - the study was done in Iraq, Thiqar, Alrabea cardiac center where a total number of ninety-six cases of patients with different acute and chronic coronary syndrome were included covering the period from the first of January to tenth of April 2022. It's a prospective, randomized study. Results And Discussion: - A total number of ninety-six patients were included in this study they were randomly arranged into three groups, the first group includes Thirty-two patients with twenty-six cases of them being CCS and six cases were ACS and all the procedures within this group were done through the distal radial artery access(d-TRA). The second group includes another thirty-two cases and they have their coronary procedure done through femoral artery (FA) approach eight of them were ACS and twenty-four cases were CCS. The third group includes thirty-two patients, twenty-two of them were CCS and ten of them were ACS and the vascular access was the traditional radial artery (TRA) access.

Keywords: Coronary Intervention, Distal Trans-Radial Artery (d-TRA) Access, (TRA & FA).

INTRODUCTION

Cardiovascular diseases still considered as a leading cause of mortality & morbidity all over the world and many advances had been occurred in order to decrease this burden, one of the important therapeutic advances being coronary intervention which was started to be done through femoral artery access and later on it was changed to trans radial artery access which has a shorter stay time after the procedure with less local vascular complication and early mobilization after the end of procedure and ultimately more cost effective than trans femoral access, for these reasons they considered as the default and the preferred procedure in the various coronary interventional procedures.

In 1993 they started the early use of radial artery as an access site for coronary intervention and as any new procedure it was not fully accepted or even it was rejected because of the possibility of complication and the special requirement to perform the procedure, but with time and with more understanding and increasing the experience with the cases that done with radial approach it became more acceptable and more widely used and even considered as the default approach by many interventionist but, still it is not indicated when we are planning for the future use of radial artery for dialysis fistula or replacing the

saphenous vein as conduit in cases of CABG.

The European Society of Cardiology in 2015 recommended that the use of the TRA as the preferred route of access for any percutaneous coronary intervention regardless of clinical presentation [Roffi, M. *et al.*, 2016].

The occlusion of radial artery (RAO) being the most common and most important complication that considered in this arterial access and to avoid this complication, different policies had been adapted to do so including patent hemostasis, variable compression pressure guided by mean arterial pressure, and cannulation of radial artery more distally.

Recently, a new and promising technique suggested and it labeled as the "distal Trans radial approach (d-TRA) and some call it the (snuffbox approach)" which was developed to overcome the problem of (RAO) and also to make the position more comfortable for the patient and for the operator at the same time it providing an advantage over the femoral approach. Kiemeneij suggested the first publication in 2017, and since then, a huge number of researches have examined the safety and practicality of this novel technique [Kiemeneij, F, 2017].

Anatomically speaking the distal radial artery (DRA), will take a superficial course within the anatomical snuffbox first and then more distally through first inter-metacarpal space so it could be palpated and punctured at these two sites.

The main causes behind the development of radial artery occlusion (RAO) in TRA approach being the intimal damage and local blood flow stoppage which causing local thrombosis at the puncture site, so in case of d-TRA we could overcome this complication because the puncture site is farther away from the wrist and with use of smaller sheath (usually 6 Fr) the intimal damage will be minimal also the radial artery already give arise to a few branches which in turn enhances blood flow and prevent local stoppage of blood flow if intimal trauma occurred.

d-TRA when done from the left side it provides important clinical benefits when compared to the traditional TRA including comfortable posture for both the patient and the operator ,the patient going to put his hand on his belly toward his right groin and the thumb being below the four fingers which is the more neutral position and another advantage for the patient being in particular in those right – handed individuals that it is going to provide freedom in mobilization of the right hand and avoid restriction after the procedure ,also the operator on the other hand will reach the access site more easily and no need for bending over the patient , As a result, the doctor could work at a safe distance from the source of radiation [Andrade, P.B. *et al.*, 2018], [Kis, M. *et al.*, 2020]

Distal trans-radial artery access (d-TRA) being a new site for coronary intervention with advantages over the commonly used access namely traditional trans-radial artery (TRA) & femoral artery access (FA) ,the main advantage being the low incidence of radial artery occlusion (RAO) when compared with TRA, and minimal local complication with

shorter stay time after the procedure when compared with both (TRA & FA) ,but still the only disadvantage being the need for a good experience for safe and rapid cannulation of this small artery .It was considered in all coronary interventional procedures, including coronary angiography , Angioplasty with coronary stenting and the interventions of complex coronary procedures

THE AIM OF THE STUDY:

To highlight the first Iraqi experience with the d-TRA approach for coronary angiography and intervention and to detect any local vascular and other complications during this access in comparison with the traditional proximal radial artery (TRA) and femoral artery (FA) access.

METHODS

The study was done in Iraq, Thiqr, Alrabea cardiac center where a total number of ninety-six cases of patients with different acute and chronic coronary syndrome were included covering the period from the first of January to tenth of April 2022. It's a prospective, randomize study.

RESULTS AND DISCUSSION

A total number of ninety-six patients were included in this study they were randomly arrange into three groups, the first group includes Thirty-two patients with twenty-six cases of them being CCS And six cases were ACS and all the procedures within this group were done through the distal radial artery access(d-TRA). The second group includes another thirty-two cases and they have their coronary procedure done through femoral artery (FA) approach eight of them were ACS and twenty-four cases were CCS. The third group includes thirty-two patients, twenty-two of them were CCS and ten of them were ACS and the vascular access was the traditional radial artery (TRA) access.

The most important comparative parameters were shown in the following tables.

Table (1-1): shows the types of coronary access site, age, sex and percentages of RAO

Access site	No. Of cases	Mean age	Number of arterial occlusions	Percentage of the arterial occlusion
Distal radial	32 20 male 12 female	68y +_ 12	Zero %	Zero %
Proximal radial	32 22 male 10 female	65+_ 14	2	6%
Femoral artery	32 5 male 27 female	65+_ 16	Zero	Zero

Table (1-2): shows Average Time from the needle to the sheath insertion

Access site	Time in minutes
d-TRA	3.88 minute
TRA	1.64 minute
FA	0.50 minute

Table (1-3): shows the Patients feeling of comfortability and cost effectiveness

Access site	No.	Percentage
d-TRA	30	93.7%
TRA	31	96.8%
FA	18	56.2%

Table (1-4): shows Local vascular complications (hematomas, compartment syndrome, dissection, limb ischemic)

Access site	No.	Percentage
d-TRA	Zero	Zero%
TRA	2	6.2%
FA	4	12.5%

Table (1-5): shows Average time for patient hospital discharge (post procedure)

Access site	Time / hours
d-TRA	2.1 hours
TRA	3.4 hours
FA	18 hours



THE CONCLUSION

The use of radial artery approach for diagnostic coronary angiography and coronary intervention considered as class one in the most recent guidelines whether the American or the European interventional cardiology guidelines. The distal radial approach is a promising technique and in our study we established that it is a safe and feasible approach for coronary angiography and interventions, it carries a significant reduction in the rate of RAO when compared with TRA also it is more comfortable for the patient and the operator when compared to conventional TRA and FA. There was a significant reduction in wrist hematoma and other local complications when using d-TRA. The success rate of d-TRA is related to increase in the operator experience with increasing in the number of cases.

RECOMMENDATION

- 1- d-TRA is the preferred coronary access and all Iraqi cardiac centers and younger cardiologists should be encouraged for this approach
- 2- Peoples and medical health providers must be educated through the media and health programs about the safety, efficacy, cost effectiveness of this novel type of intervention.

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ABBREVIATIONS:

ACS : Acute coronary syndrome
CCS : chronic coronary syndrome
d-TRA : Distal transradial access
FA : Femoral artery approach
PCI : percutaneous coronary intervention
RAO : Radial artery occlusion
STEMI :ST elevation myocardial infarction
TRA Transradial access

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