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Case report

DISTAL TRANSRADIAL APPROACH IN HIGH-RISK PATIENT WITH STEMI AND CARDIOGENIC SHOCK – A CASE REPORT

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Abstract

Conventional transradial access has been considered as a recommended choice in PCI and myocardial revascularization.The vascular complications such as radial artery occlusion, perforation and spasm have led to the development of a new approach, which was proposed to overcome these limitations. This was a distal transradial approach (snuffbox approach).

Aim. The efficacy of distal transradial approach (dTRA) as an alternative approach in a high-risk patient.

A 74-year-old woman presented to the emergency department with oppressive chest pain and dyspnea formore than 3 hours.On clinical examination, the patient appeared pale and diaphoretic, with weak and rapidpulsation and systolic blood pressure below 70mmHg. A 12 lead ECG lead was performed, whichshowed ST segment elevation of 4 mm in inferior lead.She was admitted to the catheterization laboratory with blood pressure 70/40mmhg andnorepinephrine vasopressor support. A 6Fr introducer sheath was placed in distal radial (anatomical snuffbox). The coronary angiography revealed RCA with acute total occlusion and high thrombotic burden TIMI 5 in proximal segment,normal LMCA, LAD and Circumflex. RCA was engaged with a guide catheter and advanced distally a floppy guidewire, then the occlusion site was predilated with a balloon and advanced stent from proximal segment with TIMI3 final flow. 2D transthoracic echocardiography was performed, and it showed heart failure with mildly reduced ejection fraction and hypokinesia of the inferior wall.

Distal transradial access is a new approach which might offer several advantages over conventional radial access such as reduction of the risk of radial artery occlusion, short hemostasis andsaving the radial artery for possible future coronary artery graft.

Keywords: distal transradial access, efficacy, advantages

Introduction

Distal transradial approach in percutaneous coronary interventions was mentioned for the first time in 2011 by Babunashvili A *et al.*, as a treatment of occluded radial artery through retrograde recanalization. In 2017, Kiemeneijshared his study of selected patients, who underwent cardiac catheterizationvia a distal radial artery (DRA) at the anatomic snuffbox (AS)[1,2]. The AS is a small triangular shaped area, bordered by the *abductor pollicis longus* and *extensor pollicis brevis* on lateral side and the *extensor pollicis longus* medially.The base of the triangle is made by *proccesus styloideus* of the radius and the

trapezium and scaphoid bones. Because of its superficial course, anterior wall puncture is recommended, avoiding pain from periosteum of the underlying bone. The puncture is made 30-45 degrees from lateral to medial site.

Conventional transradialaccess has been considered as the default approach for percutaneous intervention. In 2015, the European Society of Cardiology gave class I recommendation to use transradial approach as a default access in treatment of acute coronary syndrome.The vascular limits and complications such as perforation, radial occlusion, spasm, forearm discomfort, bleeding, AV fistula and regional pain syndrome have led to the development of a new approach[1-4]. Faced with difficulties from the conventional access, we present a case report with the novel (snuffbox approach) approach, which was proposed to overcome these limitations.

Case report

A 74-year-old woman presentedto the emergency department with oppressive chest pain and dyspnea formore than 3 hours.On clinical examination, the patient appeared pale and diaphoretic, with weak and rapidpulsation and systolic blood pressure below 70 mmHg. A 12 lead ECG lead was performed, which showed ST segment elevation of 4 mm in inferior lead. She was admitted to the catheterization laboratory with blood pressure 70/40mmHg and norepinephrine vasopressor support. A 6Fr introducer sheath was placed in distal radial (anatomical snuffbox) (Figure 1 and 2).

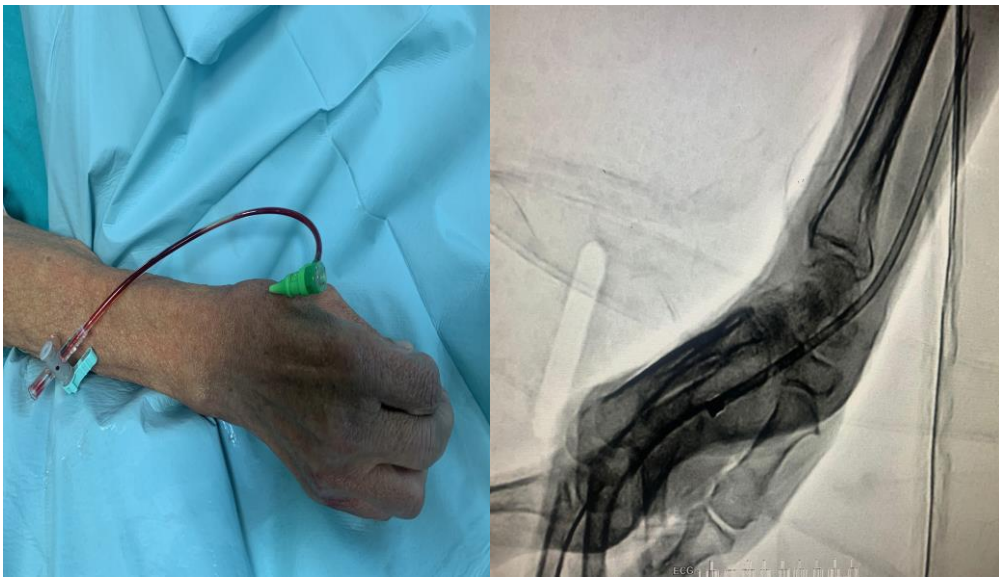

Fig. 1 and 2. Distal radial approach

The coronary angiography revealed RCA with acute total occlusion and high thrombotic burden TIMI 5 in the proximal segment,normal LMCA, LAD and Circumflex. RCA was engaged with a JR4 6Fr guide catheter and advanced distally a 0.014” floppy guidewire, then the occlusion site was predilated with 2.0x15mm balloon and advanced 3.0x 48mm everolimus stent from proximal segment and was deployed at 14 atm with TIMI3 final flow (Figure 3 and 4). During the 24-hour monitoring in the Intensive care unit, the patient was stable without chest pain and stable vital signs. The average blood pressure was 115/75 and an ECG with reversing signs and ST segment on isoelectric line without residual ST segment elevation. After the procedure, there was no need for inotropic support. 2D transthoracic echocardiography was performed, and it showed reduced ejection fraction and hypokinesia of the inferior wall. The patient was discharged on the fourth day in good condition.

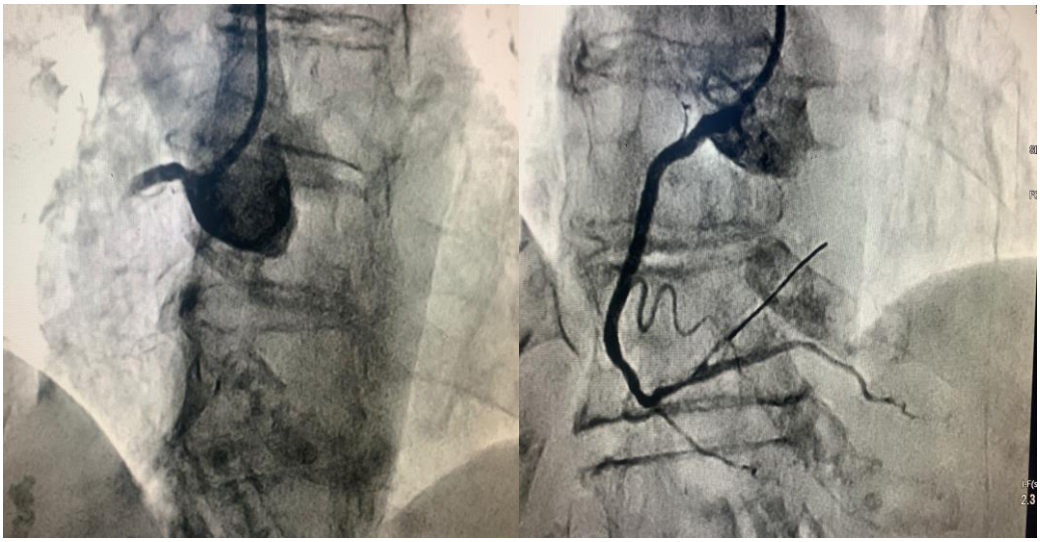

Fig. 3 and 4. Coronary angiography and PCI on RCA

Discussion

The distal transradial approach has some advantages and disadvantages over conventional radial accesss. The maindisadvantage is access time and success rate of puncture, because of the smaller diameter of the artery and its tortuosityand punctured mediated vasospasm.This can be overcome if the procedure is performed by well-trained interventionalists.The new approach has some advantages over the conventional access. First at all, the arm position during the interventionsis comfortable for the patient, who does not have to expose the palmar side of the arm while flexing the upper arm towards the operator.The second and one of the most important advantagesis the shortened time of hemostasis. Hemostasis can be achieved byfinger compression of the puncture site for 15 min after diagnostic angiography, and also after PCI the finger pressure can help in achieving hemostasis in patients with an ACT < 250 seconds at the end of the procedure. Post-catheterization stenosis and occlusion of the radial artery are common complications with range up to 10% with conventional radial approach.

The incidence of distal radial artery occlusion (dRAO) was relatively low according to recent literature, ranging from 0.0-5.2% in a bicentric longitudinal study made in Lybia. The low occlusion rate through dTRA is due to the smaller diameter of the artery and superficial position supported with bony platform. In addition, hemostasis is shorter and does not require too much pressure from the bandage. Although the minor hematoma occurs sometimes, the prevalence of major hematoma is actually very low. The prevalence of hematoma more than 10 cm was reported only in 0.2% of cases. The novel technique in our center was applied in patients with stable angina pectoris, acute coronary syndrome and ST-elevated acute myocardial infarctions. If the puncture is successful an dthe wire crosses the forearm,almost all of the cardiac catheterizations can be completed without cross-over to other approaches [4-7].

This was the first case in our catheterization laboratory wherethisapproach was used in a patient with STEMI and cardiogenic shock. Ensuring vascular access for intervention is the biggest challenge in patients with cardiogenic shock, especially for the interventionalists who prefer radial approach.Our decision to use DRA approach was due to the absence of radial pulsations in the forearm and the placement of the artery in an anatomically limited small area[6-8].In the literature, there is insufficient data for the use of this approach in patients who are in cardiogenic shock and this is the first case with this condition in our center.

Conclusion

Distal transradial access is a new approach which offers several advantages over conventional radial access such as: reduction of the risk of radial artery occlusion, short hemostasis andsaving the radial artery for possible future coronary artery graft. DRA is the best alternative choice for conventional approach for radial artery preservation and patients' comfort. Our presentation of the first case with distal transradial approach in a STEMI patient with cardiogenic shock has shown that this approach is save and promising in treatment of high-risk patients and a step forward in collecting data to become a recommended choice.

Conflict of interest statement. None declared.

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