

## Radio Cephalic Fistula Transposition (Superficalization): A case Report

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### ABSTRACT

**Background:** The primary (Brescia-Cimino) radio cephalic fistula on the forearm is commonly recognized as the best vascular access for the chronic hemodialysis because of its fewer complications.

**Patient and method:** A male patient aged 48 years old, BMI 33.5, came to Mansoura health insurance hospital, vascular surgery outpatient clinic at august 2019 complaining of failure of putting dialysis needle on the hemodialysis machine.

**Results:** ability to do full time hemodialysis process with a functioning well acting AV shunt.

**Conclusion:** Proper evaluation of the patency and function of dialysis access is mandatory for proper further decision to make a patent, well-functioning line for life for CKD patients.

**Keywords:** Dialysis access; AVF; Chronic renal failure; Hemodialysis; Vein Transposition

### INFORMATION ABOUT THE CASE

A male patient aged 48 years old, BMI 33.5, came to Mansoura health insurance hospital, vascular surgery outpatient clinic at august 2019 complaining of failure of putting dialysis needle on

the hemodialysis machine, annoying from difficulty in accessing dialysis. On examination he has mid-forearm distal fistula with good thrill, he said that he tries to cannulate but failed, on duplex examination the cephalic vein with depth 6 mm, adequate PSV and EDV.

### INTRODUCTION

The primary (Brescia-Cimino) radio cephalic fistula on the forearm is commonly recognized as the best vascular access for the chronic hemodialysis because of its fewer complications (such as hematoma, thrombosis, infection, and stenosis) as well as its longer term of use [1,2]. Recent studies have encouraged the use of native arteriovenous (AV) fistula and, therefore, there has been an increase in the percentage of patients with an AV fistula [3, 4].

Experience many centers shows that the creation of a native arteriovenous fistula is feasible in 95% of the chronic renal disease patients [5]. However, despite proper blood flow, for some patients, especially those who are obese, considerable

difficulties occur with the fistula puncturing due to their deep vein position [6]. In all of those patients, a transposition under the skin of the venous part of the fistula was attempted to facilitate good cannulation [7].

### ANATOMY HIGHLIGHTS

The cephalic vein is a superficial **vein of the upper limb** and it's one of the two main veins of the arm. Its name derives from 'cephalic' meaning head, as the vein runs up to the **shoulder**. The superficial venous network is the source of blood for most blood tests, and is the easiest place to access venous blood. In this article we will discuss the anatomy and clinical relevance of the cephalic vein. The cephalic vein drains the radial part of the **hand, forearm** and **arm** and communicates along its course with the basilic vein, which drains the ulnar part. The cephalic vein empties directly into the axillary vein.

### COURSE

The cephalic vein drains the dorsal venous network of the hand that crosses the anatomical snuffbox, runs superficial to the **radial styloid process** and then ascends in the superficial fascia of the forearm. The cephalic vein then communicates with the basilic vein at the cubital fossa, via the median cubital vein. At this point the vein lies superficially in the lateral part of

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the **elbow joint** crease. The cephalic vein now runs along the groove between the **brachioradialis** (elbow flexor and forearm supinator) and **biceps brachii** (forearm supinator and elbow flexor) muscles. The vein continues to ascend in the superficial fascia anterolateral to biceps brachii and superficial to the lateral cutaneous nerve of the forearm, which is a sensory branch of the musculocutaneous nerve (ventral rami of C5-7) that innervates the muscles of the anterior compartment of the arm. The cephalic vein continues to ascend in a groove between the pectoralis major and **deltoid muscles**. The deltoid branch of the thoracoacromial trunk accompanies the cephalic vein in this region.

The radial artery is a continuation of the **brachial artery** and is one of the major **blood supplying vessels** to the structures of the **forearm**. The brachial artery terminates at the **cubital fossa** where it bifurcates into the **ulnar artery** and a smaller radial artery. It runs on the lateral aspect of the forearm before it reaches the wrist and branches out to supply the **hand**. The radial artery is also important clinically due to its location at the **wrist**, as it can be felt as a pulse and can be used to determine the heart rate.

## COURSE

The radial artery begins at the inferior portion of the cubital fossa after it has bifurcated from the brachial artery (a continuation of the **axillary artery**), but it appears almost as a direct continuation of the brachial artery.

## FOREARM

In the forearm, the radial artery travels down from the medial aspect of the neck of the **radius** to the styloid process of the anterior surface of the radius. Proximally, the artery lies deep to the **brachioradialis muscle** while distally it is only covered by fascia and **skin**. It lies between the tendon of the brachioradialis and the **flexor carpi radialis** muscles. Lying deep to the radial artery is the common tendon of the **biceps brachii**, **pronator teres**, **supinator** and **flexor digitorum superficialis** muscles.

## WRIST AND HAND

At the wrist, the radial artery goes around it laterally and then travels across the floor of the **anatomical snuffbox** to the palm of the hand.

## CASE REPORT

A male patient aged 48 years old, BMI 33.5, came to Mansoura health insurance hospital, vascular surgery outpatient clinic at august 2019 complaining of failure of putting dialysis needle on the hemodialysis machine, annoying from difficulty in accessing dialysis. On examination he has mid-forearm distal fistula with good thrill, he said that he tries to cannulate but failed, on duplex examination the cephalic vein with depth 6 mm, adequate PSV and EDV. The decision was superficialization (transposition) of the deep venous limb.

## SURGICAL PROCEDURE

Under the local anesthesia with 1% Mepivacaine, with minimal sedation, the incision 10 to 15cm over and slightly laterally to the fistula was made (to avoid puncturing the fistula through a postoperative scar). The arterialized median antebrachial vein was exposed and mobilized. Due to precise ligation of collaterals and suturing the vein bed (the bed of venous part of fistula were sutured in layers using absorbable sutures 2.0) the superficial transposition of the vessel above all subcutaneous fat was achieved. At the last stage, the venous part of fistula was placed in a created subcutaneous pocket Fig 1 and Fig 2. Subsequently, the skin was typically closed. On follow up functioning dialysis line on the hemodialysis machine 3 sessions per week.

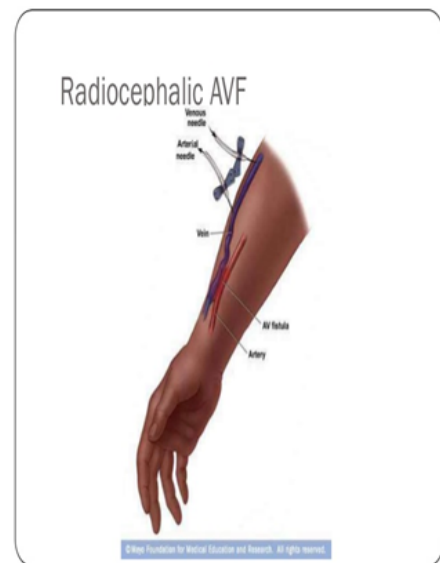


Figure 1: picture of RC fistula

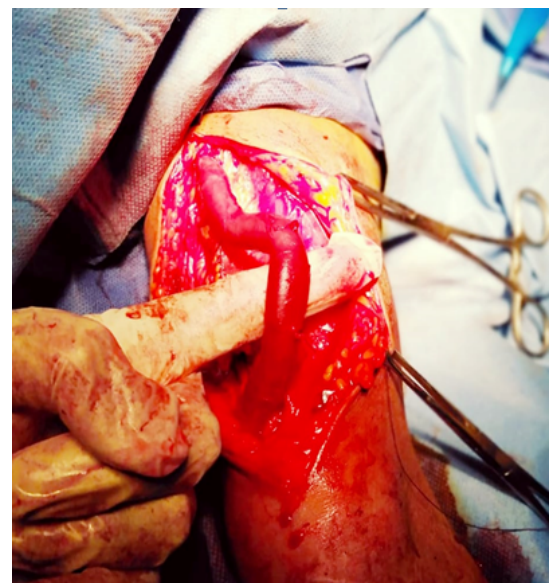


Figure 2: cephalic vein transposition

## CONCLUSION

Superficialization or transposition of a deep vascular access is a must for proper dialysis process, while it is a common procedure

in case of proximal brachiobasal fistula or deep brachiocephalic fistula especially in obese patient, our case report includes radio cephalic (distal) fistula which is rarely in need to this procedure. Proper evaluation of the patency and function of dialysis access is mandatory for proper further decision to make a patent, well-functioning line for life for CKD patients.

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