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Brachiocephalic A-V fistula through the median cubital vein; A reliable option to failure of forearm fistulas. A case report from CHU Yaoundé

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ABSTRACT

INTRODUCTION: Renal replacement therapy in end-stage kidney disease relies on dialysis in low-income countries. This maintenance treatment needs a reliable vascular access and is done through central venous catheter or creation of A-V fistulas. Several types of A-V fistulas can be done but due to some individual conditions, those possibilities may be exhausted rapidly.
CASE PRESENTATION: A 31 year old female was diagnosed with an end stage renal disease for which she was prescribed maintenance dialysis. She first denied her condition and went to traditional healer. After some months her clinical state worsened and she was dialyse with catheter and refer to us for A-V fistula construction. The first two attempts on the forearm failed and we found small radial artery both proximally and distally on the left forearm. We finally did a left brachiocephalic fistula with initial retrograde flow on the median cubital vein.
DISCUSSION: Despite arm base fistula may be theoretically easy to build because of bigger size vessels, brachiobasilic fistula may be less effective due to difficult venipuncture. Brachiocephalic fistula through median cubital vein may be more effective option with no further procedure needed.
CONCLUSION: Brachiocephalic fistula should be considered as option in vascular access especially when a reliable option is needed after previous attempt failure.

1. Introduction

Vascular access for permanent hemodialysis is a key issue in treating a patient with chronic renal failure [1–3]. It needed an artery of good size without wall damage from underlying disease as atherosclerosis, calcification and a patent superficial venous network that has not been spoiled by a repetitive venous puncture [4]. For each individual patient, the condition is variable and it is mandatory to clinically evaluate the possibilities to choose the most suitable for timely maturation. On the other side several surgical sites of native A-V fistula has been developed in the surgical literature as well as several tips to improve the effectiveness of fistulas as elevation, superficialization and retrograde flow [5,6]. Superficialisation and retrograde flow have been use for Brachiobasilic fistulas because of the difficulties of puncture while the vein is deep-seated. For the brachiocephalic fistulas, the retrograde flow goes through a median cubital vein at the Elbow to reach the cephalic vein that is more easily accessible at the arm level. For some cases when the cephalic vein is already damage, blood may return through a consistent perforating vein to the deep system [7]. We report here a case of brachiocephalic fistula through a median cubital vein that was used for a patient with two anterior angioaccess failures on the same limb. This case report is in line with the SCARE criteria [8].

2. Case report

The patient in this case report aged 31 Year old was diagnosed with an end-stage renal disease due to hypertension for which she started hemodialysis in December 2016. She first denied the medical treatment as recommended and went to traditional healers. After sometimes her case worsens and she was transferred to Yaoundé General Hospital, where the dialysis was initiated as an emergency with a temporal catheter. She was addressed to us for a permanent vascular access in March 2017 (three months after

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Fig. 1. Image of the forearm with the previous site at the distal radial artery (Cimino-Brescia) and proximal radial artery fistula.

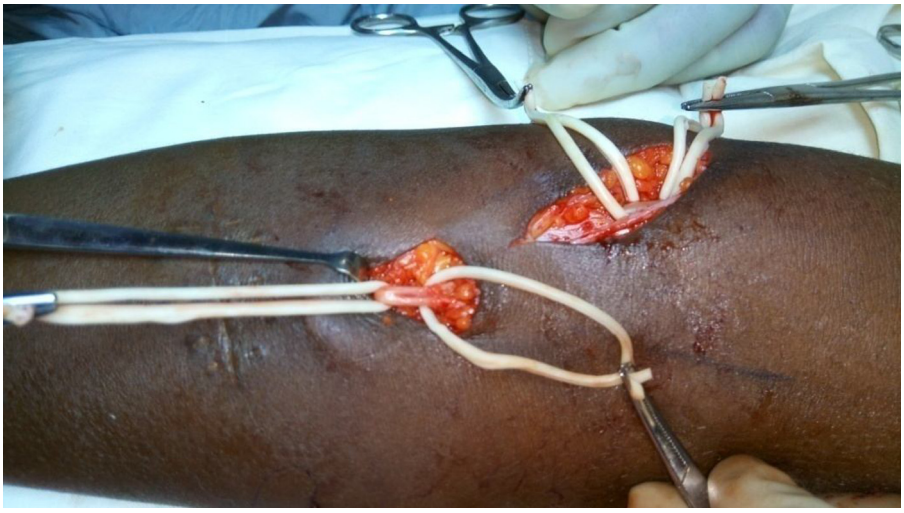

Fig. 2. Brachiocephalic fistula with a retrograde flow in the median cubital vein. The forearm cephalic vein is ligated before the division and a perforating deep vein is also ligated at the antecubital fossa of the elbow.

initiation of dialysis). After the clinical examination, we found a good patent cephalic vein but with a poorly perceived pulse at the wrist on both sides. We decided nevertheless to attempt a Brescia and Cimino type A-V fistula on the left side since she was a right-handed but per operatively we found a very thin radial artery of 2 mm like diameter and we perform the fistula that initially work but later stop vibrating (Fig. 1). Another attempt was done on the same side at the antecubital fossa that also stops working a week later (Fig. 1) (ref) [9]. We have two possibilities left for a native fistula on that upper limb: the Brachio-basilic fistula with the risk of difficult venipuncture and the necessity of superficialisation or the brachiocephalic fistula with a retrograde flow through the **median cubital vein**. We did the Brachio-cephalic fistula with the retrograde flow with a favorable short-term outcome and successful access for hemodialysis (Figs. 2 and 3) the proximal end of the median cubital vein was ligated to have an end to side anastomosis.

3. Discussion

Vascular access for maintenance hemodialysis has been a significant advance in the management of end-stage chronic renal failure [3,10,11]. The first such access was realized since 1966 by Brescia and Cimino who did a radio-cephalic A-V fistula at the distal forearm for maintenance dialysis. Several types of A-V shunt has been described since that time and it is agreed that hierarchically it remains the “workhorse” for the creation of A–V shunt [11–13]. Many factors nevertheless influence the choice of a type of vascular access among which the patency of the venous network, the quality of the pulse feel on that site or through Doppler assessment, the age of the patient with a general principle to avoid distal fistulas in children due to small size vessels. Some vascular differences may be congenital such as high division of the brachial artery with a small radial artery at the wrist that incidence is reported to be as high as 15–20% [7]. Our patient had a small distal radial artery (DRA) that to our opinion was the reason for failure in the previous two attempts but we could not do angiography of the upper limb. We could have done another trial on the distal right forearm but we believe since the anatomy could be the same it wouldn’t have been more successful. The A–V fistula with the retrograde flow is known and use in angioacess for dialysis but with outflow based on perforating veins in the antecubital fossa [13]. In this case, the flow was directed to the cephalic arm vein by ligating the perforating vein at the elbow and the forearm cephalic vein. The dilatation of the vein that we usually do by injection of the saline mix with hep-