

VASCULAR ACCESS FOR HEMODIALYSIS BY ULNAR-BASILIC-TRANSPOSITION IN AXILLARY LOOP

ABSTRACT

The population on dialysis is increasing because of multiple factors, including the rise in life expectancy that has taken place during this century and the admission of increasingly younger patients affected by diseases such as diabetes. Further, the life expectancy of the population on dialysis has also grown thanks to improvements in medical technology. Classical native vascular accesses like Brescia-Cimino radiocephalic AVF, the brachiocephalic AVF and transposition of basilic and ulnar veins continue to be the first choice since they present higher patency and lower complication rates as compared to prosthetic materials. Once all conventional access alternatives in the upper limbs have been exhausted, a viable alternative is the creation of an ulnar-basilic AVF in axillary loop.

This procedure was performed with good results in four patients with an age range of 30 to 52 with chronic renal insufficiency, receiving dialysis three times a week.

Key words: hemodialysis, vascular access, arteriovenous fistula, PTFE prosthesis, axillary artery, basilic vein

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INTRODUCTION

Currently, the population on dialysis is increasing due to multiple factors⁽¹⁾, such as the increase in life expectancy in this century and the admission of increasingly younger patients due to diseases such as diabetes. The life expectancy of the population on dialysis has also increased as a result of improvements in medical technology at the service of patients with Chronic Renal Insufficiency. In recent years, more than 7,000 patients have been admitted annually and in worse conditions than in previous years. The latter is explained by the fact that there is a reduction in previous contact with the nephrologist, which determines the admission of a high percentage of young patients with severe anemia and great clinical deterioration. The main cause of admission is diabetic nephropathy and nephroangiosclerosis⁽¹⁾. Although there has been an increase in recent years in the population on peritoneal dialysis (PD), the highest percentage of patients continues with the hemodialysis (HD) modality, with the use of temporary catheters as the first admission modality. This increases the risk of death from 40 to 52%^(1,2).

Classic native vascular accesses such as the Brescia-Cimino Radiocephalic AVF, the Brachiocephalic AVF, and transpositions of the basilic and ulnar veins continue to be the first choice^(3,4) as they present a higher rate of patency and a lower rate of complications compared to prosthetic materials⁽⁵⁾. Within the prosthetic materials, PTFE prostheses have advantages because they allow for repairs such as thrombectomies and reanastomosis. They also have shorter waiting times for puncture as there are prostheses with rapid puncture technology, heparinized and with external structural support such as rings that allow crossing flex zones. However, PTFE prostheses can develop serious infectious complications that increase the morbidity and mortality of patients. On the other

hand, none of the existing prostheses has demonstrated greater patency than the vein. The greater survival of patients, as well as the long times on the waiting list for transplantation and peritoneal exhaustion make it necessary to use these accesses for a long time, which can lead to local and systemic complications. Such complications include infection, puncture pseudoaneurysm, anastomotic pseudoaneurysm, stenosis, distal ischemia⁽⁶⁾, bacterial endocarditis, and pulmonary embolism. Given the exhaustion of all the possibilities of conventional access in the upper limbs, an alternative is the creation of an ulnar-basilic AVF in an axillary loop.

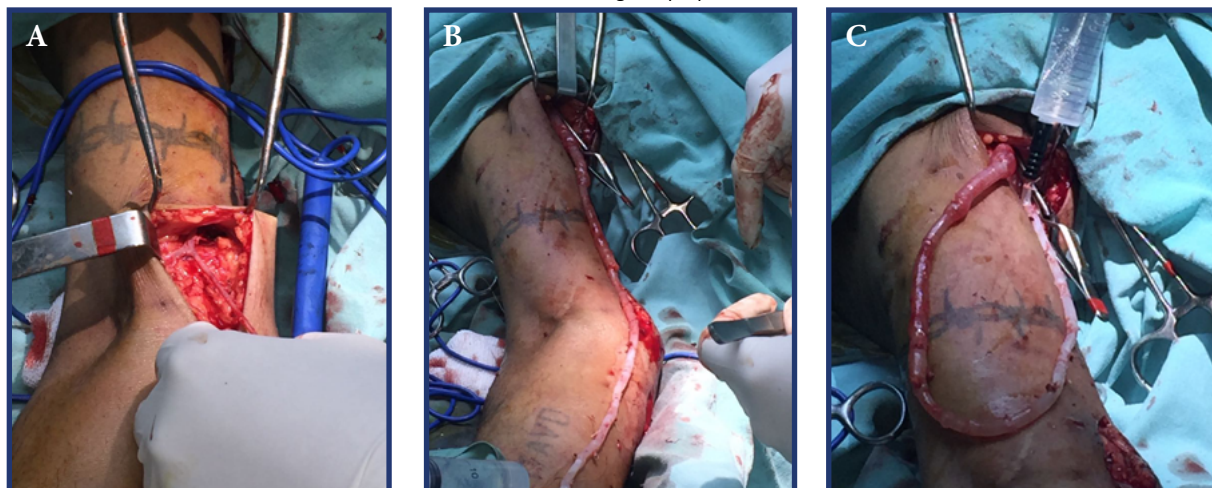
OBJECTIVES

To describe the behavior of the ulnar-basilic venous axis transposed subcutaneously anastomosing to the distal axillary artery as AVF for hemodialysis.

METHODS

Four patients between 30 and 52 years long-standing chronic renal failure on hemodialysis three times a week were considered. Two of them with transient catheter dialysis and another two with permanent tunneled catheter. The four patients had diabetes, hypertension, and a history of multiple native and prosthetic accesses in both arms. In none of the cases the axillary cavity had been previously approached. Only two of them presented thrombosis of the brachial artery without a palpable distal pulse but without signs of ischemia and with normal pulse oximetry. All of them underwent total basilic AVF in the axillary loop, extracting said native graft from the forearm or ulnar area and the arm area, from a deeper location and with disconnection of the median elbow (*Figures 1A and 1B*) until reaching the axillary region, creating a "subcutaneous loop" (*Figure 1C*) aided by tunnelers and "passage ports"

FIGURES 1A, 1B AND 1C. Harvesting and preparation of the basilic vein.



(Figure 2), until reaching the proximity of the axillary artery. Said technique of skeletonization and tunneling of the entire basilic vein was performed in a single step using staggered dermal approaches with the corresponding anesthesiological support through the implementation of neuroleptanalgesia associated with the use of 1% lidocaine without epinephrine. Finally, a spatulated anastomosis was performed with the axillary artery in a lateral-terminal manner (Figure 3), leaving a native conduit of optimal caliber and length. Then, meticulous hemostatic closure of the wounds in simple skin planes was carried out (Figure 4).

RESULTS

All the accesses began to be punctured between days 40 and 50 (Figure 5A) with good dynamics, no signs of dysfunction and presented acceptable dynamics during dialysis. PA: 120-180; VP: 200-220; QB: 400-450ml/Hs; kTv: 1.9-2.1 (Figure 5B). Neither of the two

patients with brachial thrombosis showed signs of vascular access steal syndrome. All patients presented medium-term patency without complications to date and showed identical values during the first twelve months of follow-up.

CONCLUSIONS

Though there are no randomized studies on this type of transpositions and more complex approaches done under general anesthesia are required, this technique seems to be a valid alternative, providing good venous patency in the medium and long term. Moreover, the technique used in these cases decreases the use rate of prosthetic material.

Conflicts of interest

The authors have no disclosures to declare.



FIGURE 2. Tunnelization.

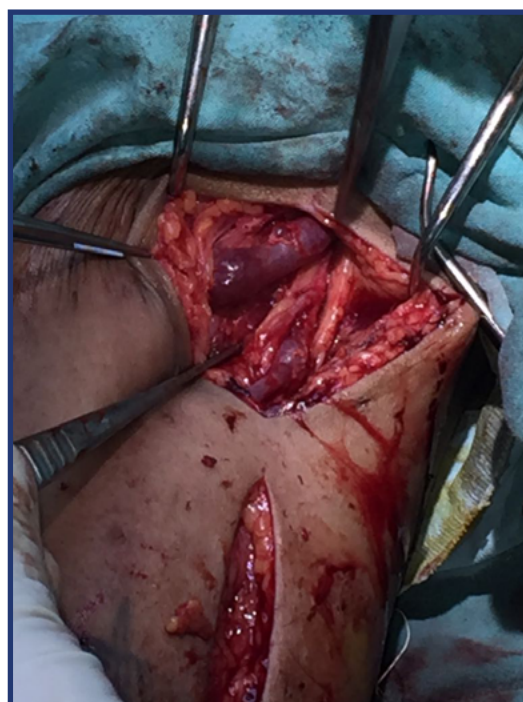
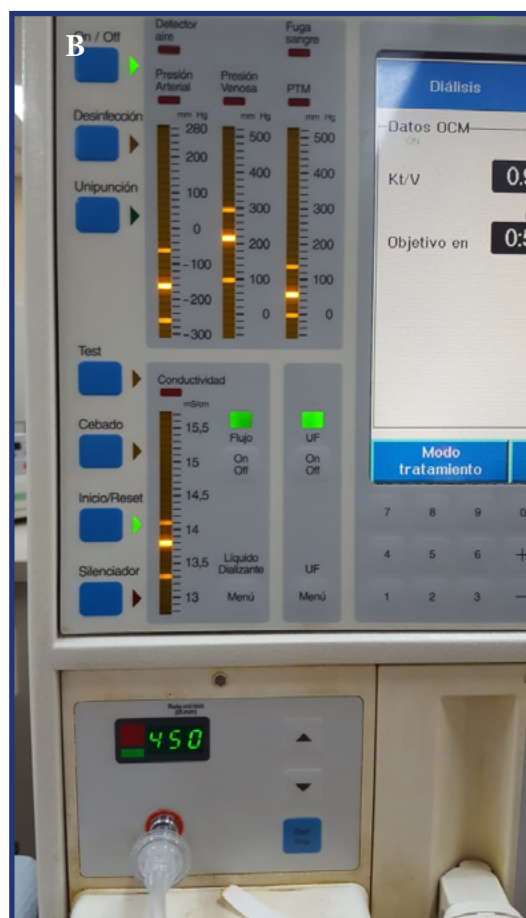


FIGURE 3. Anastomosis of the axillary artery.



FIGURE 4. Closure of wounds.

FIGURES 5A AND 5B. Postoperative controls.



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