

Hemodialysis vascular access salvage: case report

Salvamento de acesso vascular para hemodiálise: relato de caso

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Abstract

Chronic renal insufficiency (CRI) has high prevalence and the majority of the patients are in hemodialysis program and, then, they need a vascular access. Arteriovenous fistulas (AVF) are the more indicated accesses and have a long term use. Even in cases of complications, the salvage of these accesses must be tried. Researches of literature show the possibility of access salvage of AVF's, even in a long time after the complication. The repair of the present access must always be tried, avoiding the depletion of the venous system. This study is a case report of a 69 years-old female patient with CRI presenting thrombosis of a brachial-cephalic AVF with drainage to basilic vein by collateral branches, which matured that vein. Basilic vein was used on the access repair, avoiding catheter use.

Keywords: Renal insufficiency, renal dialysis, arteriovenous fistula.

Resumo

A insuficiência renal crônica (IRC) tem alta prevalência e a maior parte dos pacientes acometidos está em programa de hemodiálise necessitando, portanto, de acesso vascular. As fístulas arteriovenosas (FAV) são os acessos mais indicados e duradouros. Mesmo em casos de complicações, deve-se tentar o salvamento desses acessos. Trabalhos da literatura mostram a possibilidade de salvamento das FAV's, mesmo de maneira tardia. Deve-se tentar sempre a reparação do acesso atual, evitando o esgotamento do sistema venoso. Este trabalho relata o caso de uma paciente de 69 anos com IRC apresentando uma trombose de FAV braquiocefálica com drenagem para veia basilíca por ramos colaterais, o que a tornou maturada. Essa veia foi utilizada no reparo do acesso, evitando o uso de cateteres.

Palavras-chave: Insuficiência renal, diálise renal, fístula arteriovenosa.

Introduction

Chronic renal failure (CRF) is a common disease. According to the Brazilian Public Health System (SUS, acronym in Portuguese), its prevalence is estimated in 46.2 patients in need of dialysis per 100,000 Brazilians¹. The vast majority of these patients participate in a hemodialysis program. Data from the 2008 Census of the Brazilian Nephrology Society showed that 89.4% of dialysis patients use the hemodialysis method².

It is consensus that the best vascular access for these patients is an arteriovenous fistula (AVF) with autogenous vein. Many studies show the importance of preservation

and care with AVF in order to increase³ its "useful life" period^{3,4}.

The most common complications of vascular accesses are: thrombosis, stenosis, pseudoaneurysms and infection. Even facing these events, in some cases it is possible to try to salvage the access. The utilization of operations such as thrombectomy in early occlusions^{5,6} and vein interposition in the correction of pseudoaneurysms or endovascular procedures for stenosis⁷ avoid the utilization of catheters and the making of new AVFs, thus preserving these patients' veins for future use.

This paper reports a case of brachiocephalic AVF occlusion with anomalous drainage into the basilic vein through

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a collateral branch, which was repaired with the proper use of this conduit.

Case report

A 69-year-old female patient had been in a hemodialysis program for 10 years, using a brachiocephalic fistula. The patient denied previous use of central venous catheters and upper limb edema. She reported a decrease in AVF bruit/thrill for the past month and right upper limb pain during hemodialysis. Physical examination showed a 3+/4+ bruit/thrill in a short venous segment (about 5 cm) of the cephalic vein at the anterior aspect of the distal arm, with absence of bruit/thrill from this point on along the course of the cephalic vein. There was also bruit/thrill in the course of the basilic vein from the elbow until the proximal third of the right arm. No edema or collateral venous circulation was present. Fistulography (Figure 1) showed occlusion of the right brachiocephalic AVF in its proximal third and

venous drainage into the proximal basilica vein by collateral branches and absence of distal stenosis in the venous system. The patient underwent construction of new access using the mature basilic vein: a long longitudinal incision overlying the basilic vein in the medial aspect of the right arm was performed and the basilic vein was dissected from the AV anastomosis to its junction with the brachial vein in the upper arm. The basilic vein had good caliber and 4+/4+ bruit/thrill. After releasing the length of the basilic vein, the fascia with a layer of subcutaneous tissue was closed underneath the vein, with the objective of making it superficial without causing any kinking or placing it anteriorly to the incision line (Figure 2). After this step, a 4+/4+ thrill/bruit was obtained, without signs of flow resistance. The remaining superficial subcutaneous tissue and skin were then closed over the basilic vein. Superficialization of the mature basilic vein was thus achieved without the need for a new anastomosis. Due to the proximity of the new AVF to the skin incision, we chose to maintain the patient in dialysis

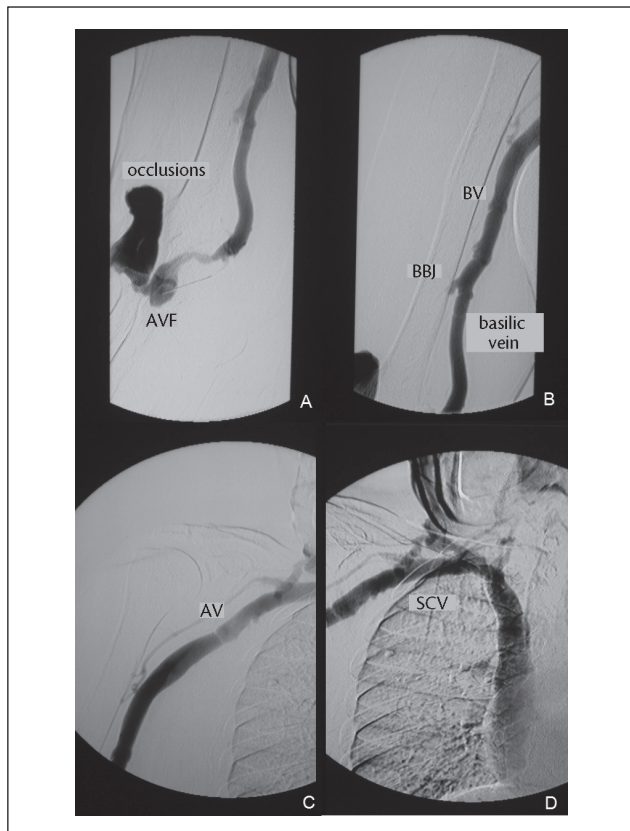


Figure 1 – Fistulography showing (A) previous brachiocephalic anastomosis with AVF thrombosis and drainage to the collateral basilic vein; (B) basilic vein and brachial vein (BV) without stenosis; brachio-basilic junction (BBJ); (C) axillary vein (AV) without stenosis; (D) subclavian vein (SCV) without stenosis.

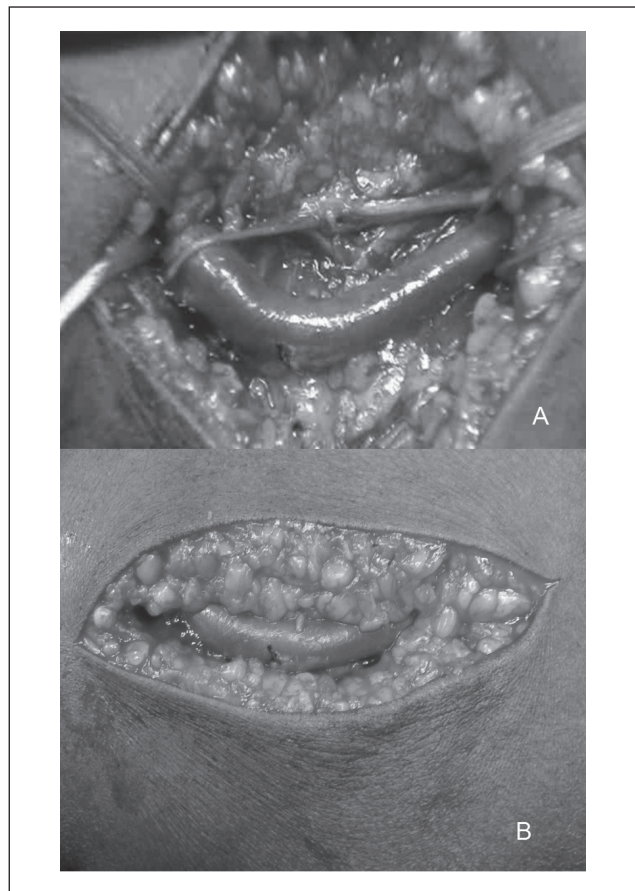


Figure 2 – Intraoperative: (A) subfascial basilic vein right after dissection; (B) basilic vein placed on suprafascial level after confection of the subcutaneous level.

through the short cephalic vein segment till the wound was healed. In the first postoperative (PO) day, the patient had no complaints, the bruit/thrill along the basilica vein was 4+/4+, hematomas were absent, and the surgical wound was in good condition. In the tenth PO day, the patient was in good condition, without pain on dialysis and the surgical wound was healing, so the sutures were removed. AVF Doppler ultrasound showed that the basilic vein was about 15 cm long, with 5.2 mm in diameter and satisfactory flow (Figure 3). In the 30th PO, the surgical wound was completely healed, and thrill/bruit was present along the AVF in the mid-portion of the arm. The patient was asymptomatic. Hemodialysis was performed without complications using the new segment, with flow of 250 mL/min for three and a half hours, in compliance with the recommendations by the Nephrology service.

Discussion

The AVFs remain the best accesses for hemodialysis, the closest to the “ideal access”. Large studies recommend its use and establish a program of surveillance aiming at its preservation^{3,4}.

The malfunction of an AVF due to thrombosis or stenosis is not a reason for abandoning the access, for various techniques have been proposed to correct such problems. Beathard⁶ recommended salvage of occluded AVFs, even when the diagnosis is delayed. Spergel et al.⁸ reported the importance of early recognition for better results, but they also emphasized that even with late intervention some AVFs may be salvaged.

We report an uncommon case in which thrombosis of the distal segment of a brachiocephalic AVF has not totally occluded it. Collateral branches not only maintained the venous outflow, but were also capable of maturing the adjoining basilic vein.

With the objective of not losing the access and using the mature basilic vein without the need for new anastomosis, we worked out the tactics of dissecting the mature basilic vein and placing it in a subcutaneous suprafascial level. According to the Kidney Disease Outcomes Quality Initiative (KDOQI) recommendations³, the fistula with a native ideal vein must present at least 6 mm in diameter and flow superior to 600 mL/min, and be at a depth of 0.5 to 1 cm of the skin. At ultrasonography, a depth of 1.15 cm was noticed. The caution not to provoke a dissection that could be too close to the skin to avoid necrosis with AVF exposition justifies the depth beyond the recommended value. Clinically, the fistula is considered mature, that is,

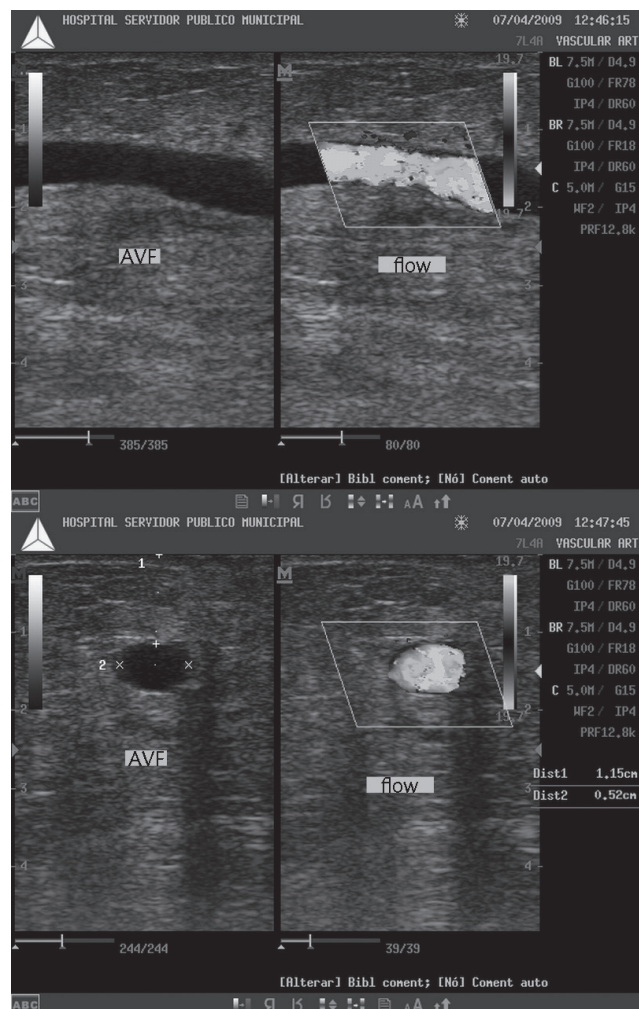


Figure 3 – Doppler ultrasound on postoperative day 10 showing AVF with flow. Notice the small distance between the fistula and the skin, and the good diameter of the vein.

ready to be used for dialysis when it is easily punctured and capable of providing adequate flow at the hemodialysis machine⁹. According to the KDOQI³, palpation of strong thrill over the entire AVF course presupposes a flow superior to 450 mL/min. After the intervention, this patient has not presented any problem regarding punctures, and dialysis presents the flow recommended by the Nephrology, with no access restriction.

The success of the procedure avoided the need for a central venous catheter and all its complications, and improved the quality of hemodialysis for the patient, as no other venous segments or prostheses were used for the access salvage.

Therefore, it is demonstrated that even in long-term AVFs with chronic occlusions it is advisable to try the access salvage. The performance of this relatively simple

procedure could maintain the patient on dialysis through the new access. In order to maintain this modality of renal replacement therapy – that may be necessary for years or even definitively for some patients – one should try to spare the venous system, thus avoiding exhaustion of the hemodialysis access pool.

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 Writing of the paper: MANJ, RCM, CCA and ARF
 Critical analysis: NVPJ, MLSY, AP, ER and RM
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