

# Endovascular revascularization of central veins and subsequent cardiac catheterization for hemodialysis in a patient with exhaustion of conventional vascular accesses

## Revascularización endovascular de venas centrales y posterior colocación de catéter para hemodiálisis en una paciente con agotamiento de accesos vasculares

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### ABSTRACT

**Objective.** Exhaustion of conventional vascular accesses (ECVA) in patients with end-stage renal disease is associated with higher morbidity and mortality rates. Consequently, maintenance of existing VA sites is of utmost importance for hemodialysis. We describe a technique used for the endovascular revascularization of central veins and subsequent catheter placement regarding hemodialysis in a patient with exhaustion of conventional vascular accesses. **Methods.** This is the case of a patient with exhausted vascular access and requirement for emergency dialysis. Endovascular revascularization of central veins and subsequent catheter placement for hemodialysis were successfully performed.

**Results.** The patient still remains on hemodialysis at the follow-up without any complications being reported.

**Conclusion.** Endovascular revascularization of central veins for hemodialysis is a known and accepted technique that can extend the use of VAs in complex patients over time.

**Keywords:** vascular access, hemodialysis, endovascular.

### RESUMEN

**Objetivo.** El agotamiento de los accesos vasculares (AV) en pacientes con enfermedad renal en etapa terminal se asocia con una mayor morbilidad y mortalidad. En consecuencia, el mantenimiento de los AV existentes es de suma importancia para la hemodiálisis. Describimos una técnica de revascularización endovascular de venas centrales y posterior colocación de catéter para hemodiálisis en una paciente con agotamiento de accesos vasculares.

**Métodos.** Reportamos una paciente con agotamiento de accesos vasculares y requerimiento de diálisis de urgencia. Se efectuó revascularización endovascular de venas centrales y posterior colocación de un catéter transitorio para hemodiálisis de forma exitosa.

**Resultados.** La paciente se encuentra en hemodiálisis post-procedimiento sin complicaciones.

**Conclusión.** La revascularización endovascular de venas centrales para hemodiálisis es una técnica conocida y aceptada que puede extender en el tiempo la utilización de accesos vasculares en pacientes complejos.

**Palabras clave:** acceso vascular, hemodiálisis, endovascular.

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### INTRODUCTION

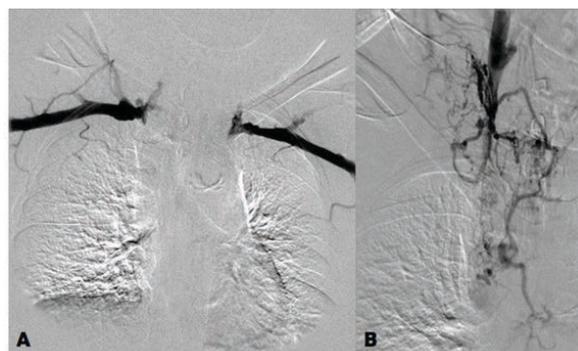
The gradual increased number and age of the population on dialysis runs parallel to the advances made in nephrological care, and makes us to wonder whether the number of patients with exhaustion of conventional vascular accesses will increase with the passing of time. Exhaustion of conventional vascular accesses for dialysis is rare. However, in their routine practice, most dialysis centers will eventually encounter patients with very few options and in poor condition.<sup>1</sup> Patients who have been on dialysis through catheters for many years often show stenosis or occlusion of their central veins. Also, patients on dialysis through native or prosthetic vascular accesses often show exhaustion of the veins in the upper extremities. In these patients, vascular access is fairly limited, and if their current access fails the patients' chances of eventually being unable to receive dialysis grow.<sup>2</sup> This is the case of a woman with exhaustion of conventional vascular accesses who required emergency dialysis. The patient was successfully

treated with andovascular revascularization of the central veins followed by the placement of a transient hemodialysis catheter.

### CASE REPORT

This is the case of a 58-year-old woman with stage 5 kidney disease who has been on dialysis for a number of years. The patient has a past medical history of thrombosed native and prosthetic vascular accesses in both upper extremities, and multiple central venous catheters at both jugular and subclavian level. Also, the patient's 2 femoral veins have already been used for this purpose too.

The Doppler echocardiography performed revealed the presence of an occlusion in both internal jugular veins, and fe-



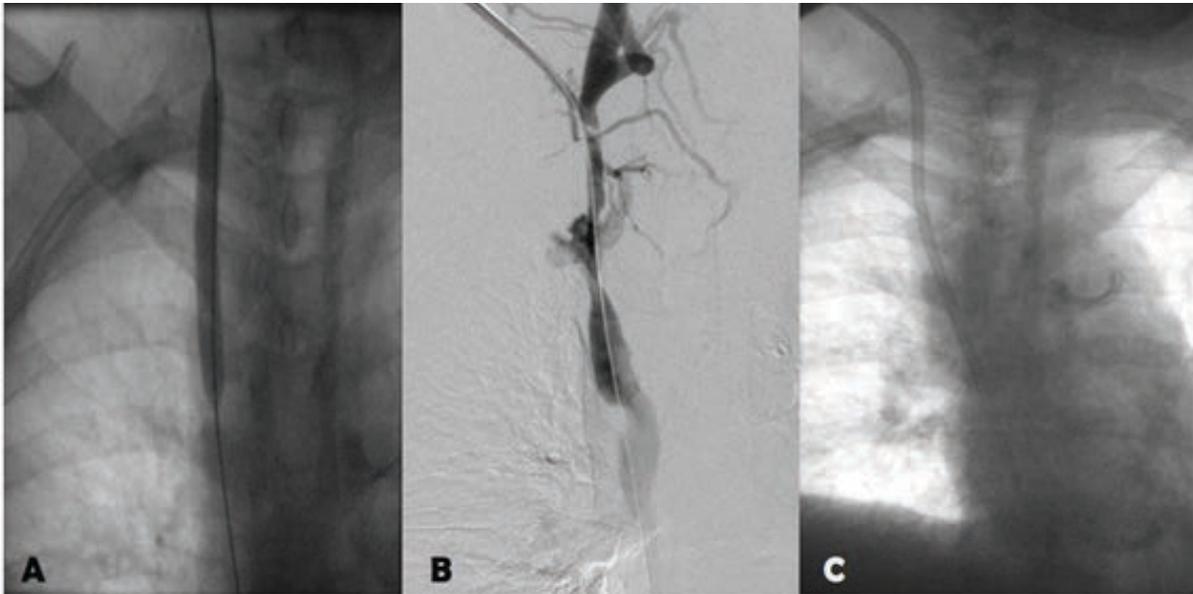
**Figura 1.**

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**Figura 2.**

moral veins. The phlebography performed revealed the presence of an occlusion at the right confluence of the subclavian and internal jugular veins, innominate left venous trunk, and superior vena cava (figure 1A). Since an emergency dialysis was required, an ultrasound-guided puncture of a patent segment was performed that confirmed the reduced caliber of the right internal jugular vein using a 18 G Abbocath catheter. Then, a phlebography performed through the catheter confirmed the occlusion of the right internal jugular vein (figure 1B). Afterwards, an 8-Fr introducer sheath was inserted with support from a 5-Fr 2 Cobra catheter and a 0.035 in hydrophilic guidewire. The occlusion located at right internal jugular vein and superior vena cava level was crossed uneventfully and the guidewire was advanced towards the inferior vena cava. Then, the hydrophilic guidewire was exchanged for a 300 cm Amplatz extra-support guidewire. To allow the passage of the transient hemodialysis catheter, the balloon used in the angioplasty had 8 mm in diameter and 400 mm in length (figure 2A). Finally, the recanalization of the vessel was achieved (figure 2B). Afterwards, a transient 12-Fr Arrow catheter was placed 20 cm above the right atrium without any complications being reported (figure 2C).

## RESULTS

No procedural complications have been reported to this date. The patient remains on postoperative hemodialysis with good fluid dynamics through the catheter placed.

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## DISCUSSION

The rate of patients with exhaustion of conventional vascular accesses is low. Estimating the prevalence of the problem is not easy, and there is no mortality data associated with this entity.<sup>3</sup> The percentage of patients with exhaustion of conventional vascular accesses requiring a procedure is also hard to tell. Shakarchi et al. proved that only 2 patients from a cohort of 97 patients referred due to complex vascular access actually had complete exhaustion of conventional vascular accesses.<sup>4</sup> The arrival of new technologies and the chances of recovering vascular accesses using complex endovascular techniques for the management of patients considered untreatable can prevent these accesses from deteriorating to a point where these patients can be in a life-threatening situation.<sup>5</sup>

## CONCLUSION

We reported the case of a patient with exhaustion of conventional vascular accesses who required emergency dialysis. The patient was treated successfully via endovascular access through a central venous angioplasty that allowed the advancement of a transient hemodialysis catheter towards the right atrium. The endovascular revascularization of central veins for dialysis is a well known and accepted technique that can extend the life of vascular accesses in complex patients.