

## Case report: transhepatic insertion of long-term dialysis catheter

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### ABSTRACT

Transhepatic insertion of long-term dialysis catheter is an exception procedure used to obtain access in patients with central vein occlusion of lower and upper limbs. We report on a case of a young patient with history of dialysis for 15 years, who was submitted to an unsuccessful renal transplantation. This patient was in dialytic emergency and had confirmed occlusion of upper limb central veins and iliac veins. Transhepatic insertion of a long-term catheter was performed under general anesthesia. The catheter tip was placed at the level of the right atrium. Dialysis was satisfactorily performed on the same day.

Keywords: Transhepatic insertion, hemodialysis, access.

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### RESUMO

O implante transhepático de cateteres de diálise de longa permanência é um procedimento de exceção, utilizado para obter um acesso em pacientes com oclusão de veias centrais de membros superiores e inferiores. O caso descrito relata um paciente jovem, com história de 15 anos de diálise, que foi submetido no passado a um transplante renal sem sucesso. Esse paciente encontrava-se em urgência dialítica e oclusão comprovada de veias centrais de membros superiores e de veias ilíacas. Foi realizado o implante do cateter de longa permanência pelo acesso

transparietohepático sob anestesia geral. A ponta do cateter foi posicionada ao nível do átrio direito. A diálise foi realizada satisfatoriamente no mesmo dia.

Palavras-chave: Implante transhepático, hemodiálise, acesso.

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## Introduction

The number of patients in need of dialysis is increasing worldwide and in Brazil.<sup>1</sup> It is believed that there is a 6% growth in dialytic patients per year.<sup>1,2</sup> These patients remain under dialysis for a long period due to transplantation impossibility and to the large number of patients in the waiting list. Central catheters are an access modality for dialysis that should be considered an exception procedure, since they cause stenosis and/or central vein occlusion in up to 40% of cases.<sup>2,3</sup> It is recommended that only 10% of patients should use central long-term catheters for dialysis.<sup>3</sup> In practice, however, that number is much higher and has been increasing, which restricts creation of vascular access. This was decisive in the search of new sites for the implantation of long-term catheters.<sup>4-10</sup>

When there is central vein occlusion of the lower and upper limbs, optional accesses are translumbar,<sup>3,4</sup> transhepatic,<sup>4-6,8</sup> transrenal<sup>7</sup> and transazygos.<sup>4</sup>

Transhepatic access was described in 1994 by Po et al.<sup>10</sup> Since then, some series have been published with small number of cases using that access. Incidence of primary success and infection are equal to those reported in other accesses.<sup>5,6</sup> Complications regarding thrombosis and catheter migration have higher incidence when compared to translumbar and transjugular accesses.<sup>5,6</sup> Primary patency was 50% in 120 days in one of the largest published series.<sup>6</sup>

## Case report

A 35-year-old male patient, hypertensive and former smoker. He has had chronic renal insufficiency due to hypertension for 15 years, on dialysis for 14 years and submitted to a renal transplantation in the left iliac fossa 3 years ago, with no success.

The patient was on dialytic urgency, with the following values in laboratory tests: hemoglobin 5.5, potassium 7.1, creatinine 19.4, urea 319, sodium 142, phosphorus 6.3, calcium 6.3, leukocyte count 12950 and platelet 254000.

*Duplex scan* was performed, showing occlusion of common femoral veins bilaterally, and upper limb phlebography, which showed occlusion of the left brachiocephalic vein and right subclavian vein. Superior vena cava had segmental occlusion in its medium third (Figure 1).



**Figure 1 - Phlebography of central veins performed by puncture of the right internal jugular vein; unsuccessful attempt of superior vena cava recanalization**

Attempts of lesion transposition were performed, but with no success.

Due to that situation, the transhepatic access was chosen. The procedure was performed at the Sector of Endovascular Surgery, with the patient in a supine position, under general anesthesia. Puncture was performed using a Chiba needle (kit NPAS-100, William Cook EuropeCook®) on the 10th right intercostal space in posterosuperior direction (Figure 2). After identification of the right hepatic vein by injecting contrast under fluoroscopy, a guide wire was introduced using the *road-mapping* technique toward the right atrium, with further placement of the introducer sheath (Figure 3). Once the position of the distal extremity of the sheath was confirmed at the level of the right atrium through injection of iodinated contrast, the support guide wire was introduced with further dilatation of the hepatic parenchyma for sheath and catheter introduction (Permcath® Quinton Instrument Co, Seattle, USA). Creation of the subcutaneous tunnel was performed at the level of the medial axillary line (Figure 4). The catheter was placed and fixated with its tip at the level of the right atrium (Figure 5). The patient was referred to the hemodialysis sector in the immediate postoperative period, with proper catheter functioning.

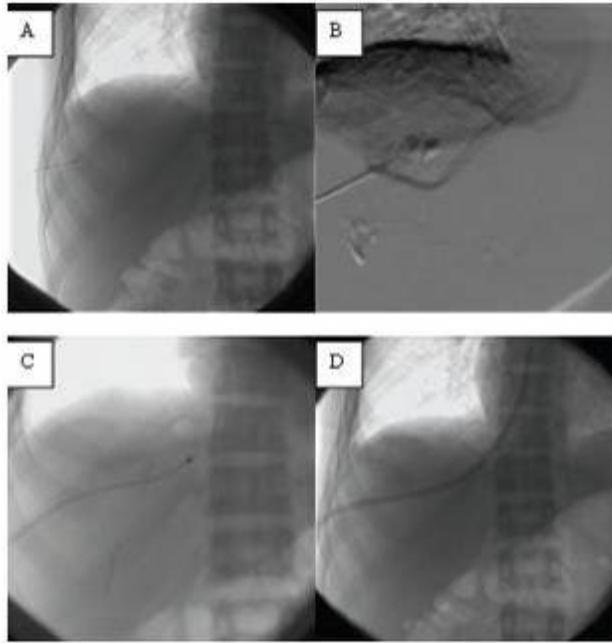


Figure 2 - Puncture on the 10th intercostal space in medial axillary line



Figure 3 - A) Puncture on the 10th intercostal space in right medial axillary line; B) catheterization of the right hepatic vein; C) passage of the guide wire until the right atrium and passage of the introducer sheath; D) final result after passage of the long-term catheter



**Figure 4 - Passage of long-term catheter in subcutaneous tunnel**



**Figure 5 - Final result**

## Discussion

Transhepatic access is an exception procedure. This access, as well as the translumbar, is only justified when the other accesses have been discarded. The procedure was performed under general anesthesia, since the patient presented with hyperpotassemia and high uremia.

Catheterization of the hepatic vein has some difficulties, and it is necessary to have proper anatomical, radiological and technical knowledge by the interventionist. Presence of adequate materials for the transhepatic puncture and proper visualization in radioscopia are factors directly influencing procedure success.

Complications related to the procedure are biliary fistulas, vascular lesions (portal vein and inferior vena cava), hepatic capsule rupture, pneumothorax and cardiac arrhythmia due to inadequate

placement of catheter tip. In addition to complications inherent to the procedure, catheter removal can cause formation of fistulas across its path, which requires its occlusion using embolization materials.

Dialysis performed on the following day occurred satisfactorily, with flow higher than 300 mL/minute. Some authors describe that the main complication in this type of implant is thrombosis or formation of fibrin around the catheter.<sup>3,4</sup> For that reason, monitoring of machine flow is an important factor, since it allows an early approach for catheter exchange. Catheter migration is another reported complication, which is probably related to respiratory movements and atrial contraction.<sup>4</sup>

We conclude that it is extremely important to know this access, which is an effective alternative in the treatment of dialytic urgency in cases such as that described in this report.

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