CASE REPORT

Using recanalized external iliac vein for tunneled hemodialysis catheter insertion

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ABSTRACT

The frequent insertion of cervical venous catheters for hemodialysis is closely related to venous stenosis or occlusion. As an alternative, femoral catheter insertions are helpful but are also associated with femoral vein occlusion and an even higher infection rate. Alternative venous accesses have been increasingly used when the aforementioned accesses are not feasible. We report a case in which a recanalized external iliac vein was used for hemodialysis tunneled catheter insertion. The technique approach is discussed, focusing on its advantages and disadvantages.

Keywords: Catheterization, central venous, hemodialysis, iliac vein, radiology, interventional.

RESUMO

O uso de cateteres venosos cervicais para hemodiálise leva freqüentemente à oclusão dessas veias. Como alternativa, os acessos venosos femorais são válidos, porém o seu uso também está associado à oclusão dessas veias e a um maior índice de infecção. Vias alternativas são cada vez mais utilizadas na impossibilidade dos acessos previamente mencionados. Descrevemos neste relato de caso uma alternativa para o implante de cateter de longa permanência para hemodiálise usando a veia ilíaca externa recanalizada. Comentamos os detalhes da técnica utilizada, suas vantagens e desvantagens.

Palavras-chave: Cateterismo venoso central, diálise renal, veia ilíaca, radiologia intervencionista.

Introduction

Venous catheters as vascular access for dialytic treatment are applied in patients who need hemodialysis but do not have an arteriovenous fistula as definitive access.[1-3]

In case of an acute renal failure, short-term catheters can be used, since there is possibility of a fast reestablishment of renal function.[1-3] In case there is no expectation of renal function improvement, tunneled catheters are implanted. Short-term catheters can also be used in patients with chronic renal failure, in which the creation of an arteriovenous fistula is not possible, or when it is necessary to wait until the fistula is developed.[1]

The internal jugular or subclavian veins are commonly used. Femoral veins can also be used, but their use is associated with the possibility of lower limb venous thrombosis, higher morbidity and mortality rates in relation to the upper limb, and also to a higher incidence of infection.[4-6] Translumbar inferior vena cava and transhepatic access are usually exception accesses.[4-6]

Case description

A 53-year-old male patient, diabetic, hypertensive and with chronic renal failure in hemodialysis was admitted at the emergency room complaining of abdominal discomfort, vomiting, nausea and state of mental confusion. The patient had previous history of venous catheters in the cervical region and femoral veins. There was an arteriovenous fistula with palpable thrill and large edema in the right upper limb. The fistula was always punctured successfully, but there was never effective flow in the hemodialysis machine. Doppler ultrasound showed bilateral occlusion of the internal jugular vein, subclavian vein and femoral vein. At admittance, he had a short-term catheter in the right common femoral vein, but it was not functioning. He had been without hemodialysis for 6 days.

Initially, the catheter position observed in radioscopy suggested that it had perforated the external iliac vein. Injection of contrast confirmed suspicion, showing contrast extravasation into the retroperitoneum.

Due to the urgent need of performing hemodialysis, choice was for a tunneled catheter insertion, and then study the right subclavian vein occlusion for possible angioplasty.

The primary conduct would be start thrombolysis of the right iliac vein so that a tunneled catheter could be later inserted; however, due to the venous perforation, such conduct was discarded. The short-term catheter was gradually pulled back until returning to the venous lumen. The right position was confirmed by contrast injection, which also showed occlusion of the right external iliac vein with drainage of the common femoral vein into the enlarged pelvic collateral vein, which, in turn, drained into the external iliac vein. The area of right external iliac vein was transposed using a 0.035'' hydrophilic guide wire, and the short-term catheter was advanced until the right common iliac vein. Phlebography was then performed, showing patency of this vein and of the inferior vena cava, with no images suggesting thrombi inside it. At this moment, one alternative would be to insert the tunneled catheter through this access, but this alternative was rejected due to the possibility of displacing thrombi into the inferior vena cava and because the catheter, for being flexible, could not cross the occlusion area when inserted in the *peel-away sheath*..

The short-term catheter was removed over the guide wire and an 8F sheath was inserted in its place. Then, a selective catheterization of the left common iliac vein was performed, using hydrophilic guide wire and Cobra 2 5F catheter (Figure 1). Retrograde phlebography showed patent left common and external iliac veins, but the external iliac vein had irregular walls, suggesting recanalization after previous thrombosis. The left common femoral vein was occluded. Presence of intense calcification in the patient's arteries clearly showed the location of the left external iliac artery. This anatomical mark of calcifications and the resource of *roadmap* were used to puncture the external iliac vein and insert the hydrophilic guide wire until the inferior vena cava. Proper dilators were used to dilate the access. The hydrophilic guide wire that was inserted in the inferior vena cava was replaced by an Amplatz SuperStiff guide wire with the support of the Cobra 2 catheter. A 45-cm-long Permcath® catheter was then inserted. A higher contralateral incision than the puncture site was performed as an attempt to move the catheter exteriorization site even further in the inguinal region (Figure 2). Radioscopic control showed that the catheter tip was placed at the L2 level. There was presence of good flow in both catheter pathways, which were filled with heparin solution. After the procedure, the patient was immediately referred to the hemodialysis unit, performing the session uneventfully.

Figure 1 - Sheath in the right common femoral vein and Cobra 2 catheter inserted in the left external iliac vein, which was used to replace a hydrophilic guide wire by a 0.035" Amplatz guide wire

Figure 2 - Final aspect of tunneled catheter insertion in the left external iliac vein

Discussion

The initial conduct in this case (before the radioscopic examination) would be to recanalize the occluded iliac vein using recombinant tissue plasminogen (rt-PA) and then implant the tunneled catheter. However, presence of venous perforation contraindicated thrombolysis. Another important fact was the urgent need of hemodialysis. The patient could not wait 12 hours or more, which is usually the time required for thrombolysis. For that reason, use of the external iliac vein was a good option, since translumbar puncture of the inferior vena cava would not be necessary, a procedure that was the second option for this case.

Although puncture of the external iliac vein is a higher puncture and has a higher risk of bleeding for the retroperitoneum, presence of calcifications in the external iliac artery and use of *roadmap* made the procedure easier, obtaining success in the first attempt. A more lateral exteriorization of the catheter through subcutaneous tunnels aimed at reducing the chances of infection usually associated with the inguinal region.

In our opinion, combined use of radioscopy and anatomical parameters allowed for a safe puncture of the external iliac vein. "Blind" puncture of this vein should not be encouraged, due to the possibility of complications that are hard to solve, especially in an uremic patient. When the external iliac vein is chosen for puncture, catheter insertion should ideally be guided by Doppler ultrasound.[7]

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