

Case Report

Laceration of the Iliac Vein in a Patient with a Femoral Catheter for Hemodialysis

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Although catheters are an ideal therapeutic treatment for all patients who need hemodialysis, their placement, use may be followed by certain complications. We present a case of iliac vein lacerations in the projection of the tip of a femoral catheter for hemodialysis in a 55-year-old patient.

1. Introduction

One great benefit in the treatment of patients who require urgent hemodialysis was the discovery of the central venous catheter [1]. The ideal hemodialysis catheter should be commercially available, provide maximum protection against infection, prevent the formation of a fibrin layer, allow few episodes of thrombosis, stenosis, and malposition, and enable blood flow greater than 400 mL/min [2–5]. Clinical guidelines recommend the right jugular vein as the primary site for the placement of acute vascular access, due to its vertical propagation, which significantly reduces the risk of malposition and venous obstruction. The subclavicular vein is avoided because of possible venous stenosis. The femoral region is recommended as a last resort, but only in hospital conditions for no longer than five days, because the potentially dirty region allows greater opportunities for the development of infection [5]. However, there are different experiences, and a significant number of patients use a femoral vein catheter for hemodialysis [6, 7].

2. Case Report

Patient MG, a 55-year-old man, was hospitalized in the Center of Nephrology and Dialysis, Kragujevac Clinical Center, Serbia. He was in the terminal stage of renal failure, as a complication of a malignancy in the bladder and fre-

quent episodes of acute infection and retention. The patient was referred to our center for creation of vascular access through a central venous catheter in the right jugular vein. After inspection of the observed infections in output positions of the central venous catheter, it was decided that the catheter should be removed. The same day an unsuccessful attempt at catheterization of the right femoral vein was made by the first author, R. V. Stolic. On admission, laboratory tests were done according to the degree of renal failure. The patient had severe anemia but did not require therapy or blood derivatives. Other biochemical parameters did not show a significant metabolic imbalance. Subjective and objective findings indicated a stable condition with chronic renal failure, an adequate laboratory profile, and satisfactory hemodynamic status. One day after admission a central venous catheter for hemodialysis was placed by the emergency radiologist in the left femoral vein with left percutaneous nephrostomy after verifying ureterohydronephrosis. On the eighth day after admission, R. V. Stolic successfully created an arteriovenous fistula in the forearm of his left hand. In the afternoon the patient felt severe pain in the left lumbar region, with a worsening general condition, marked hemodynamic instability and falling blood values with optimal coagulation parameters. Emergency consultations were undertaken by a urologist and surgeon, and additional imaging tests were performed. Ultrasound examination of the urinary tract and abdominal computerized tomography



FIGURE 1: Hematoma diameter 80 × 55 mm (solid line), a small amount of perirenal fluid (interrupted line), liquid content in the level pararenal space.

revealed the existence of a collection in the left retroperitoneal space. The clinical picture continued to deteriorate, with cardiorespiratory failure, so the patient was intubated, reanimated, and attached to an artificial ventilation system with intensive monitoring. Urgent treatment was provided to establish hemodynamic stability using blood products, sympathomimetics, and infusion fluids. After intensive therapy, spontaneous breathing returned together with a normal state of consciousness, normalized blood pressure, a pulse rate of 90 per minute, and oxygen saturation 100% during continuous therapy with an oxygen flow of 6 liters per minute.

On establishment of hemodynamic stability, the patient was extubated, separated from the respirator, and breathed spontaneously. Ultrasound examination and further observation confirmed the presence of the collection in the retroperitoneal space. Repeated computed tomography scans with contrast in the left kidney, in the subcapsular spaces, revealed a contusion zone with a large hematoma of diameter 80 × 55 mm and perirenal adipose tissue of increased density containing a small amount of liquid. A larger amount of fluid (hematoma) was observed in the level pararenal space (Figure 1). On the third day after deterioration of his general condition, the patient underwent arteriography, where the contrast medium revealed extravasation from the left external iliac vein (Figure 2). After a consultative review by vascular surgeons, it was decided to employ surgical treatment, regardless of the high risk and uncertain outcome of the surgery. Under general anesthesia on the fifth day after hypovolemic shock, with maximal precautions including autologous transfusion, the patient underwent a surgical procedure. A laceration of the wall of the external iliac vein was found at the level of the catheter tip, which had been placed in the left femoral vein. After surgical treatment and suture, (Figure 3) the patient was transferred to the Department of Nephrology in a stable condition.

3. Discussion

Central venous catheters have been not only an important factor in hemodialysis procedures but also an important parameter predictive of morbidity and mortality [8]. Complications with hemodialysis catheters must be quickly

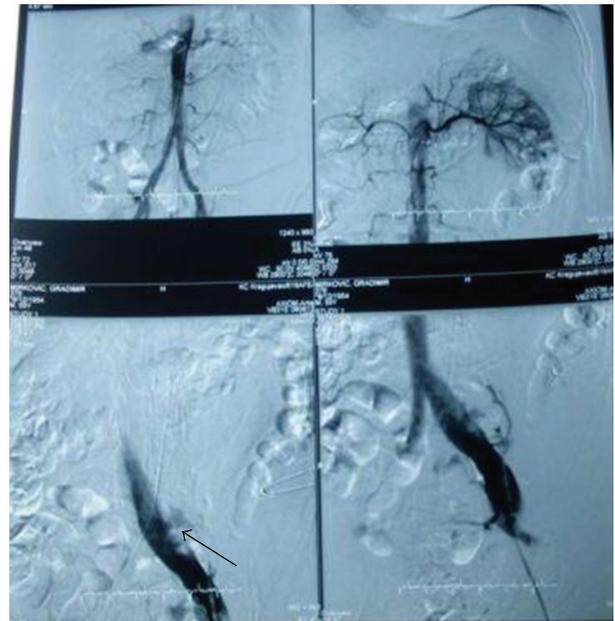


FIGURE 2: Extravasation of contrast (black arrow) from the iliac vein.

identified because of the serious consequences that can occur. The incidence of complications with femoral hemodialysis catheter was reported to be 0.2%. Massive retroperitoneal hemorrhage was associated with femoral vein cannulation [9]. In the United States about 5 million catheters are sold each year for different applications. The experience of doctors who perform catheter placement is crucial. Namely, a doctor who places less than 50 catheters has a far higher relative number of complications. Also, if in three attempts the doctor fails to catheterize a patient, he should seek help from other colleagues [10]. That was one reason why we gave up further attempts to introduce a catheter into the right femoral vein of our patient. It is believed that femoral vein catheterization carries the lowest risk of complications, but, a significant decrease in hemoglobin level after placing a catheter in the femoral vein, even with no clinical and hemodynamic parameters, may indicate the formation of a retroperitoneal hematoma [11], which in our case led

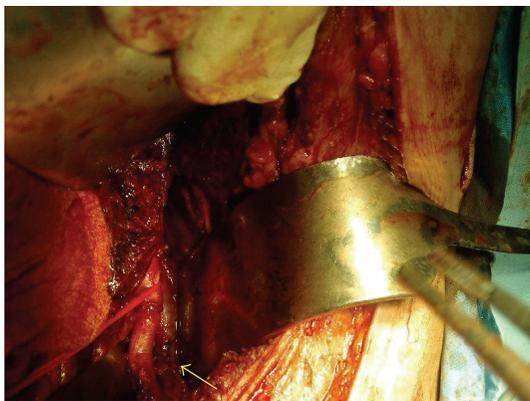


FIGURE 3: Sutured wall of the iliac vein (arrow).

to hypovolemic shock and cardiorespiratory failure. The most important prerequisite for detecting complications after central venous catheterization is the experience of doctors. The highest rate of complications was found in the subgroup of patients who required emergency placement of venous catheters. Catheter malposition can cause very serious complications, such as vascular erosion or perforation. On the other hand, a correctly placed catheter can be intentionally or unintentionally manipulated by the patient himself [12]. In our case the dilemma of how the injury occurred remains, that is, whether the iliac vein laceration was due to traumatic effects from the tip of the implanted catheter for hemodialysis or not. This raises the question of implementation of a full dialysis dose with heparinization without a serious circulatory failure during dialysis therapy. One can only assume that in this situation the tip of the catheter could make some sort of patch on lacerated surface veins, due to the negative pressure created by the ultrafiltration gradient. Regardless of the overall dilemma, it is important that the injured vessel wall was treated surgically after timely diagnostic evaluation.

In our case we wish to point out the different possibilities of complications that can arise during placement, manipulation, and the use of central venous catheters for hemodialysis. Laceration of the venous wall, built during the placement and use of catheters for hemodialysis, is a rare complication in which a little thought. Timely diagnosis and treatment was successfully completed in our patient.

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