Can Vascular Access During Hemodialysis Cause Extremity Loss?

**Hemodiyaliz Sırasında Damar Girişimi Ekstremite Kaybına Neden Olabilir mi?**

**ABSTRACT**

There is always the possibility of complications of vascular access in patients with hemodialysis. The pseudoaneurysm related with accidental arterial puncture is one of the most important complications in patients with hemodialysis and it can cause severe clinic manifestations that may go all the way to limb loss. We describe a 78-year-old woman undergoing regular dialysis treatment with renal failure. The patient had severe left arm pain starting suddenly after hemodialysis, with rapidly progressing cyanosis, and compartment syndrome caused by brachial artery pseudoaneurysm. Urgent surgical procedure was performed. The pseudoaneurysm was successfully repaired, left arm arterial circulation reestablished, and fasciotomy performed on the left arm for compartment syndrome. In the second session, debridement was performed and dermal graft applied to the necrotic lesions. The patient was discharged with full recovery within 2 months following the treatment. In this case, we emphasize that vascular access during hemodialysis has some complications that can even cause extremity loss..

**KEY WORDS:** Renal dialysis, Aneurysm, False, Complications, Blood circulation

**ÖZ**


**ANAHTAR SÖZCÜKLER:** Böbrek diyalizi, Anevrizma, Yalancı, Komplikasyonlar, Kan dolaşımı

**INTRODUCTION**

Hemodialysis is the most common method used in patients with chronic renal failure. Application of hemodialysis seems to be a simple intervention. Long-term vascular access, which can cause various complications in the vascular bed, is mandatory in patient with hemodialysis (1). However, the vascular access complications are a frequent cause of hospitalization in chronic hemodialysis patients (2). Repetitive vascular access during hemodialysis stresses vascular structures and can lead to pseudoaneurysm formations and circulation disorders in tissues (1,2). Native vascular grafts are more resistant than synthetic grafts for interventions such as recurrent cannulations. However, permanent applications can cause deterioration even in the endothelial integrity of a native vascular graft (1-3). Pseudoaneurysm is one of the most important complication that can cause
problems ranging from limb loss to life-threatening conditions and should be controlled immediately for these kinds of risks (2,4). In this study, we aimed to present a case with extremity-threatening pseudoaneurysm that causing vascular access during hemodialysis.

CASE REPORT

A 78-year old female patient with a side-to-side radiocephalic AVF at the left antecubital region had been under hemodialysis for 2 years due to end stage chronic renal failure. The patient was admitted to another center for a complaint of painful mass in the left antecubital fossa that appeared after hemodialysis and the patient was referred to our clinic for cyanotic ulcer lesion and compartment syndrome in the left arm three days after the hemodialysis. On physical examination, bullous lesions, severe edema and necrotic ulcers were observed in the left upper limb (Figure 1 A,B). The color doppler ultrasound revealed 50x70x100 mm antecubital hematoma that surrounding the pulsatile pseudoaneurysm 27x41x56 mm in size in the left antecubital area, and an intact arteriovenous (AV) fistula tract in the distal radiocephalic region. Urgent surgery was performed. The left radiocephalic AV fistula tract was ligated and left brachial pseudoaneurysm repair and fasciotomy were performed by the cardiovascular and plastic surgery collaboration. After the surgical approach, the necrotic and bullous ulcers were debrided and peripheral vasodilator treatment was given during the clinical follow up period. The cyanotic appearance of the left upper limb recovered immediately after the surgery. The fasciotomy was repaired primarily and dermal graft implantation was performed on the antecubital necrotic area in the second session. The patient was discharged after the two months follow up period. There was no limb loss and no additional problem was detected eighth months after the operation (Figure 2 A,B).
DISCUSSION

The number of patients with end-stage renal failure has been increasing each year (5). The best treatment for renal failure is kidney transplant but patients are obliged to undergo hemodialysis due to lack of transplant donors; (6). Currently, AV fistulas are the gold standard vascular access for hemodialysis. These patients are dependent on regular and continuous vascular intervention to continue their treatment. The professionalism and experience of dialysis staff are also as important as surgical techniques in this regard (5-7).

Most of the complications related to vascular access after hemodialysis are related with failure of hemostasis at the puncture sites in a reasonable. This situation may manifest as external bleeding, hematoma, or pseudoaneurysm (8,9). Pseudoaneurysm is an important complication of AV fistulas that can cause problems ranging from bleeding to life-threatening conditions. The incidence of pseudoaneurysm is estimated at 2% to 10% of venous access grafts (9,10). It is more common in prosthetic grafts than in autogenous access. This complication may also occur in every needle puncture during routine hemodialysis. Since, pseudoaneurysm is located often at the puncture site, determination of the vascular puncture site is crucial to prevent vascular access complications. (9). In our case, there was direct puncture to brachial artery, which rapidly enlarged and lead to the compartment syndrome, instead of an arteriovenous fistula.

There are various treatment strategies in pseudoaneurysm management. A small puncture site pseudoaneurysm may usually resolve conservatively. Surgical intervention may be necessary if it is enlarging or acutely expanding. Anastomotic pseudoaneurysms almost always require intervention (9). Ultrasound-guided compression repair, percutaneous injection of thrombin, endovascular covered stent exclusion, aneurysmectomy and surgical repair are various treatment options (11,12). Moszkowicz and his colleagues (4) reported their brachial artery pseudoaneurysm cases. They used various treatment methods and according to their report only one patient had limb loss ( 4th & 5th digits). However, surgical interventions are preferable in case of compartment syndrome causing extremity ischemia, as in our case.

To sum up, creating vascular access is a crucial intervention for the hemodialysis patient. Regular and continuous vascular interventions can be safely performed by experienced staff. We think that education of the hemodialysis staff is vital to prevention of vascular access problems. Prevention is more important than treatment.

REFERENCES