A Pseudoaneurysm Complication of An Arteriovenous Access Dialysis Graft In The Lower Extremity

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Citation

Abstract
Pseudoaneurysm is a rare complication of synthetic vascular prostheses in hemodialysis patients. Rupture and life-threatening hemorrhage are the most common and dangerous complications of the pseudoaneurysm.

In this study, under the light of the current literature, we aimed to present our case of successful repair of pseudoaneurysm occurred at the arteriovenous hemodialysis access graft placed between right common femoral artery and great saphenous vein 6 months ago.

Ultrasound is useful in the evaluation of other graft or fistula abnormalities, such as pseudoaneurysm. The traditional repair of a clinically significant hemodialysis graft pseudoaneurysm is its surgical ligation or resection and it must be followed by insertion of a new interposition graft segment.

INTRODUCTION
The number of patients with end-stage renal disease has steadily increased(1). Improvements in hemodialysis techniques have lead to extended life expectancy. Thus, many patients require secondary and occasionally tertiary access procedures. In this situation, an arteriovenous bridge graft, usually with PTFE, continues to be a reasonable alternative form of hemodialysis access(1,2). The creation and maintenance of hemoaccess occupies a significant portion of most vascular and general surgery practices(3). Pseudoaneurysm is a relatively rare complication of synthetic vascular prostheses in patients on hemodialysis treatment and comes from a needle puncture. Anastomotic pseudoaneurysm is also rare(1). Pseudoaneurysm incidence is documented to be 2% to 10% of dialysis access graft(1).

CASE PRESENTATION
A 51-year-old man presented with swelling and pain in the right femoral region. He had been on hemodialysis for 3 years due to end-stage renal disease. The patient had been on hemodialysis treatments for 6 months with an arteriovenous graft between femoral artery and saphenous vein in the right lower arm. On physical examination, there was a pulsatile mass in the right femoral region. A murmur was detected on auscultation. Doppler examination revealed a feature in consistent with pseudoaneurysm. The size of pseudoaneurysm was 13 × 8 cm(Figure 1).

Figure 1
Figure 1

A longitudinal incision was made under general anesthesia and the pseudoaneurysm sac was explored(Figure 2).
The right common femoral artery was controlled above the aneurysm sac. No infection was observed. When the aneurysmal sac was opened, the PTFE graft had separated from the femoral artery and thrombosed (Figure 3). Distal backflow was optimal.

There was a destructed segment of 6 to 7 centimeters in length at the native common femoral artery including the ostium of the deep femoral artery. The defect in the femoral artery was repaired secondarily with the interposition of a 8mm ringed polytetrafluoroethylene (PTFE) graft binding common and superficial femoral artery. In same session we performed a bypass procedure to deep femoral artery from this 8mm PTFE graft with a 6mm PTFE graft in an end-to-side fashion (Figure 4).

The distal arterial pulses were palpable postoperatively. He didn't have additional problem and he was discharged home with surgical success and without any complications at 6th day.

DISCUSSION

In the management of end-stage renal disease vascular access may be achieved by a catheter, a native arteriovenous fistula, or a prosthetic graft. An arteriovenous fistula between the radial artery and the cephalic vein should be the primary choice for hemodialysis (1). When superficial veins may not be suitable for an arteriovenous fistula because they have already been used for repeated arteriovenous fistula procedures, an alternative is an arteriovenous graft using polytetrafluoroethylene (PTFE) to bridge between arteries and veins. However, PTFE grafts can lead to some complications, such as bleeding, dilatation, infection, pseudoaneurysm, seroma, steal, swelling, stenosis, or thrombosis (1,2). The development of a hemodialysis graft–related pseudoaneurysm is a multifactorial pathological process (1). Repeated needle cannulation may cause disruption and
fragmentation of the PTFE graft material. This is particularly true if the sites of cannulation are not uniformly distributed along the entire length of the hemodialysis graft (e). 

Diagnosis of pseudoaneurysm was confirmed by Doppler examination for our patient. Duplex scan can correctly define the exact nature and extension of the aneurysm, permitting the differentiation from hematomas, seromas, lymphocele and abscess (e).

Progressive enlargement of a pseudoaneurysm can interfere with needle cannulation or lead to secondary complications including breakdown of the overlying skin, spontaneous bleeding, and rupture (e). The 2000 K/DOQI Guidelines recommend surgical repair if the size of the pseudoaneurysm limits the available cannulation sites or if the integrity of the overlying skin is compromised (e). The traditional treatment of a clinically significant pseudoaneurysm is surgical ligation or resection of the hemodialysis graft followed by insertion of a new interposition graft segment (e).

In conclusion; lower extremity AV dialysis access are associated with multiple complications and should probably be placed only if significant patient morbidity can be accepted and justified (e). Careful attention to technical detail is required, and avoidance of several diagnostic pitfalls is necessary (e). The traditional repair of hemodialysis graft pseudoaneurysms has been to surgically replace that segment of involved PTFE graft material or autogenous vein (e).

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