

## Complication of Hemodialysis Access (Pseudoaneurysm): a Case Report

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**Abstract-** The number of patients with end-stage renal disease has steadily increased and improvements in hemodialysis techniques have lead to extended life expectancy. Pseudoaneurysm is a relatively rare complication of autogenous vascular access. We have reported a case in which an anastomotic pseudoaneurysm developed in a patient on hemodialysis treatment.

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### Introduction

The number of patients with end-stage renal disease has steadily increased and improvements in hemodialysis techniques have lead to extended life expectancy (1). The creation and maintenance of hemoaccess occupies a significant portion of most vascular and general surgery practices (2). Pseudoaneurysm is a relatively rare complication of autogenous vascular access in patients on hemodialysis treatment and comes from a needle puncture. Pseudoaneurysm incidence is documented to be 2% to 10% of dialysis access grafts (1). We have reported a case in which an anastomotic pseudoaneurysm developed in a patient on hemodialysis treatment.

### Case Report

A 56-year-old woman presented with swelling, pain and bleeding in the left antecubital region. She had been on hemodialysis for 4 years due to end-stage renal disease. She had autogenous arteriovenous fistula between the brachial artery and the cephalic vein in the left upper arm 4 years prior at another institute. The patient had been on hemodialysis treatments for 3.5 years with an arteriovenous fistula. She developed swelling and pain over 30 days and bleeding 2 days in the antecubital region. On physical examination, there was a pulsatile mass and skin ulcer in the left antecubital region (Figure 1). A murmur was detected on auscultation. A radial pulse was palpable. Doppler

examination revealed a feature in consistent with pseudoaneurysm (5 × 4 cm).



Figure 1. Photograph of the pseudoaneurysm

A medial longitudinal incision was made along the bicipital groove under local anesthesia with sedation. The brachial artery was controlled above the aneurysm sac. No infection was observed. When the aneurismal sac was opened longitudinally, the aneurysm sac had separated from the brachial artery (Figures 2 and 3).



Figure 2. Operative view, the brachial artery was controlled above the pseudoaneurysm sac

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Figure 3. Operative view, white arrow shows clot in pseudoaneurysm

Distal backflow was optimal. The defect in the brachial artery was repaired primarily and the distal end of the vein was ligated. The radial pulse was palpable postoperatively. A new arteriovenous fistula was created on the right antecubital region.

## Discussion

Improvements in hemodialysis techniques have led to extended life expectancy (3). Autogenous arteriovenous fistula has considered a gold standard for long-term hemodialysis access. An arteriovenous fistula between the radial artery and the cephalic vein should be the primary choice for hemodialysis (1). Arteriovenous fistula may involve with some complications such as prolonged bleeding, dilatation, infection, steal, swelling, thrombosis, stenosis, and pseudoaneurysm (3-6).

Pseudoaneurysm is a relatively rare complication of autogenous Arteriovenous fistula (5). The incidence of Pseudoaneurysm is predicted to be 2% to 10% of dialysis access grafts (5,7). Pseudoaneurysms most commonly originate from needle punctures. Repeated puncture of the graft may results in pseudoaneurysm (4). Usage of large needles or poor and traumatic puncture techniques can cause the formation of pseudoaneurysms in the native vascular graft (7).

Diagnosis of pseudoaneurysm was confirmed by Doppler examination for our patient. 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 (8). The 2000 K/DOQI Guidelines recommend surgical repair if the integrity of the overlying skin is compromised (8). The traditional treatment of a clinically significant pseudoaneurysm is surgical ligation or resection of the hemodialysis access (8,9).

The presenting signs and symptoms of false aneurysms may include neuropathy and venous

thrombosis from pressure on an adjacent nerve and veins. Rupture of the false aneurysm, infection, hemorrhage, and distal vascular insufficiency are other possible consequence (6).

Surgical correction of graft pseudoaneurysms is recommended based on the high incidence of complications, such as rupture, thrombosis and infection. The most common and dangerous complication of the pseudoaneurysm is rupture and life-threatening hemorrhage. If they grow to an appreciable size, they can become painful and erode through the skin, resulting in hemorrhage (10).

In conclusion, pseudoaneurysm of hemodialysis access may be encountered as a rare complication of autogenous vascular access; thus every physician should attend to it.

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