Ruptured Pseudoaneurysm of a Brachiocephalic Arterio-Venous Fistula for Hemodialysis Access – a Case Report

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Introduction

NKF-KDOQI guidelines stated that a surgical created fistula delivers a flow rate to dialyzer adequate for the dialysis prescription, has a long use-life, and has a low rate complication, thus making it the closest to being an ideal hemodialysis access. Although the risk for complication in AVF is less than other vascular access, it is not without complications. Pseudoaneurysm is a relatively rare, poorly defined complication of autogenous vascular access in patients on hemodialysis treatment. It is sometimes overlooked, yet could jeopardized patient’s life for its thin vessel wall makes it prone to infection and rupture.

Case Illustration

A 39-year-old Asian Man with history of congestive heart failure (CHF), pleural effusion, atherosclerotic aorta, and end-stage renal disease (ESRD) on hemodialysis through a left arm brachiocephalic AV fistula (AVF) created approximately three months ago presented with massive bleeding from his AVF’s rupture while undergoing hemodialysis through a tunneled cuffed venous catheter inserted in the right femoral vein.

![Brachiocephalic AVF for hemodialysis access-before bleeding]

About 1 hour and 20 minutes into dialysis, a sudden massive bleeding occurred from his AVF. A pressure dressing was immediately applied to the bleeding site and the hemodialysis treatment was stopped, then consulted to a vascular surgeon. His blood pressure was 100/60 mmHg, pulse 110 bpm, regular, respiratory rate 28, temperature 36.5°C. He was conscious, pale, complaining of generalized weakness and there was an area of aneurysmal dilatation of the AVF with a pinpoint are of bleeding which had largely stopped with pressure.

Lab results:

Hgb 5.7 gm/dL, Hct 21.8%, WBC 14.9 x10³/μL, platelets 194 x10³/μL, clotting time 10', bleeding time 3', no PTT nor PT levels were evaluated.

3 months ago
• started regular dialysis with CDL access
• left brachiocephalical AVF was created

18 days ago
AVF was mature and accessible for dialysis

3 days ago
a hemodialysis procedure via AVF was forced to stop after only two hours due to blood clotting, no enlargement was detected, he was prescribed an antiplatelet drug for his clot

D-day pre-dialysis

dialysis nurses observed swelling and dilatation of his AVF without sign and history of bleeding from the cannulation site. The nurses described a bulging, shining and paper-thin skin area near the cannulation site. The nurses then consulted to Nephrologist and was asked to use the femoral catheter instead.

D-day post bleeding
• he was transfused with 2 units of packed red cells and prepared for surgery. An emergency explorative surgery observed a pseudoaneurysm and thrombosis of the AV fistula; the access was unsalvageable.

2 days post bleeding
• he went on uncomplicated dialysis through his femoral catheter.

4 days post bleeding
• he was referred to advanced hospital for further examination and treatment.

Conclusion:

Brachial artery pseudoaneurysm is a rare complication of hemodialysis therapy and mostly associated with inadvertent needle punctures. Early diagnostic is essential for avoiding further vascular complications and the risk of losing hemodialysis access. Nephrologists and dialysis nurses must be aware of the signs and symptoms of pseudoaneurysm thus early treatment could be done to prevent life-threatening bleeding from rupture and salvage the vascular access.