



CLINICAL IMAGE

Unusual Presentation of an Access-Induced Steal Syndrome in a Chronic Hemodialysis Patient

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A 77-year-old male presented to our hospital with a two week history of worsening ulcerations on the dorsum of his left hand (Figure 1a). No deficit in sensory or motor function was detected. The patient suffered from end-stage renal disease and was treated with hemodialysis via a tunnelled catheter in the right jugular vein. Five months before, a left brachio basilic arteriovenous fistula (AVF) had been created. At presentation, the blood flow in the left brachial artery was 900 ml per minute. Pulse oximetry of the left hand while breathing ambient air showed a reduced oxygen saturation (92% versus 95% on the right hand) with a small and weak pulse wave form that normalized during manual occlusion of the AVF. The diagnosis of hemodialysis access-induced distal ischemia (HAIDI) was made. In order to improve the hand perfusion and to preserve the AVF, the arterial inflow was proximalised [1] by interposing a PTFE prosthesis (Venaflo® II, 4/7 mm, Bard, Tempe, AZ, USA) between the left axillary artery and the arterialized basilic vein. One week after the procedure pain, redness and edema of the hand had disappeared with granulation tissue forming in the ulcers (Figure 1b). Two weeks later the patient returned to the hospital with an acute thrombosis of the AVF. The skin of the left hand showed further healing (Figure 1c). The patient refused thrombectomy of the fistula.

The creation of an AVF leads to profound blood flow changes in the arm, primarily due to the low vascular resistance of the venous outflow. Usually, the distal perfusion of the hand is maintained by increased cardiac output, arterial vasodilation and formation of arterial collaterals. The clinical spectrum of HAIDI, also referred to as dialysis access-associated steal syndrome (DASS), is broad and ranges from cool fingers to necrosis of the hand. A clinical classification system has been established and can help to guide the management [2]. Risk factors for HAIDI are a proximal anastomosis, older age, female gender, diabetes mellitus, peripheral vascular disease, coronary heart disease and high access blood flow [2,3]. The true incidence of HAIDI is unknown. Access-induced ischemia requiring intervention develops in 3-4% of patients with an AVF [4,5]. Available treatment options include percutaneous angioplasty of arterial stenoses, venous banding, distal revascularization-interval ligation (DRIL), revision using distal inflow (RUDI) or proximalization of arterial inflow (PAI) [1,4,5]. In most cases access-induced ischemia symptoms can be cured with preservation of the AVF using one of these techniques. Access ligation is reserved for refractory cases.



A



B



C

Figure 1: Left hand of the dialysis patient (a) before, (b) one week after proximalization of arterial inflow, and (c) three weeks after surgery with acute thrombotic fistula occlusion.

References

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