Brachial Artery Aneurysm with “Blue Finger Syndrome” After Ligation of an Arterio-Venous Fistula

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INTRODUCTION

As early as the 18th century, arterial dilatation and large brachial artery aneurysms have been described following arteriovenous (AV) fistula ligation. Studies from Rubanyi et al. have shown that high blood flow triggers the release of relaxing substances from endothelial cells which leads to dilatation of the artery receiving high flow. According to Buglister et al., arterial dilatation is locally mediated by these relaxing substances. In addition, longstanding high flow leads to transverse tears in the internal elastic membrane which can cause proximal progression the dilatation from the site of the fistula. Other studies suggest that immunosuppression with corticosteroids may promote the development of arterial aneurysms. The combination of these factors presents a unique situation in renal transplant patients with AV fistulas. We describe a corticosteroid, immunosuppressed, renal transplant patient with pandilatation of his brachial arterial following ligation of a brachial cephalic AV fistula.

CASE REPORT

A 47-year-old male was admitted to our hospital with a chief complaint of pain and discoloration of the distal fingernip tips on his right hand. The patient had a past medical history significant for polycystic kidney disease resulting in renal failure. He underwent a right upper extremity AV fistula creation and received hemodialysis for 15 months. The patient later received a cadiac vein transplant and began receiving immunosuppressive therapy with Prograf and prednisone. Soon after, the patient noticed swelling in the area on his right hand. The patient had a past medical history of future thrombotic events. Intraoperatively, the aneurysmal brachial artery was resected with ligation of its branches and was sent to pathology. A harvested non-reversed greater saphenous vein was used for bypass. Postoperatively the patient recovered well, although he has not experienced complete resolution of cyanosis in the right hand. Histologic examination showed myxomatous degenerative changes and an adherent partially dissecting thrombus.

DISCUSSION

Aneurysm formation is defined as the dilatation of a blood vessel >50% of the normal expected diameter and this dilatation includes all three layers of the arterial wall. In men, an aneurysm of the brachial artery will measure >6.15-7.2 mm; for women 5.25-6.45 mm. An arterial duplex was obtained and showed the proximal brachial arterial blood flow throughout. All other branches of the brachial artery were normal. After thorough discussion, the decision was made for the patient to undergo operative management for prevention of future thrombotic events. Intraoperatively, the aneurysmal brachial artery was resected with ligation of its branches and was sent to pathology. A harvested non-reversed greater saphenous vein was used for bypass. Postoperatively the patient recovered well, although he has not experienced complete resolution of cyanosis in the right hand. Histologic examination showed myxomatous degenerative changes and an adherent partially dissecting thrombus.

FIG. 1. Patient presenting with blue finger syndrome.

FIG. 2. Intraoperative images showing proximal and distal control and also ligation of branches.

FIG. 3. From pathology: showing vessel lumen and total length of arterial aneurysm.

References