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Anastomotic Rupture at the Site of Polytetrafluoroethylene (PTFE) and Distal Vein Cuff of Femoropopliteal Bypass. Two Case Reports

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ABSTRACT

Two female patients, 63 and 78 years of age, underwent femoropopliteal bypass with polytetrafluoroethylene (PTFE) graft and distal vein cuff. They developed graft occlusion due to false aneurysm at the site of vein cuff during one and eight weeks after surgery, respectively. Improper suture technique or weak vein wall might lead to suture disruption leading to false aneurysm as presented in this article.

INTRODUCTION

Autogenous vein remains the conduit of choice for infrainguinal bypass grafting and prosthetic grafts have been considered as an unacceptable alternative for femorodistal procedures. In recent years, in patients with unavailable autogenous vein, the use of distal vein cuff at the distal anastomotic site of an infrapopliteal polytetrafluoroethylene (PTFE) graft has been suggested (2-4,6,7) . Apart from sudden graft occlusion, which is not an unexpected event in patients with infrainguinal prosthetic grafts, complications directly related to the distal vein collar are very rare. Here we describe two cases with rupture and false aneurysm at the anastomotic site between PTFE and vein cuff following femoropopliteal bypass grafting.

Case 1

A 63-year old female with diabetes mellitus and coronary artery heart disease underwent below knee- femoropopliteal bypass due to critical lower limb ischaemia with large ischaemic wound on forefoot. She had an uneventful postoperative period and the wound healed after split skin transplantation. Duplex scanning performed one month after surgery demonstrated patent graft with normal findings. Two months later she was admitted to the emergency department due to acute onset of pain in the popliteal fossa and a pulsating mass. She underwent immediate exploration which revealed a 4 x 4 cm large false aneurysm due to rupture at the suture line between PTFE graft and the vein collar and graft occlusion. After graft thrombectomy, a new vein cuff was sutured to the PTFE graft and the vein was reanastomosed to the popliteal artery. The graft was occluded during the first postoperative week and we abstained from redoing surgery due to extensive atherosclerotic changes in the lower leg and absence of integrity of foot circulation. Two weeks later, the patient underwent lower leg amputation.

Case 2

A 78-year old female with type II diabetes mellitus, essential hypertension, mild angina pectoris and critical lower limb ischaemia underwent below knee- femoropopliteal bypass grafting with PTFE and distal vein cuff. She had uneventful postoperative recovery and 10 days after surgery at discharge duplex scanning demonstrated patent graft without stenotic lesions. One week after discharge, she was admitted to the emergency department due to clinical signs of acute graft occlusion. Surgical exploration revealed graft occlusion due to thrombosed false aneurysm at the site of the PTFE-vein cuff anastomosis. After excision of the false aneurysm and the vein cuff, successful graft thrombectomy was performed with Fogarty catheter. A new distal vein

cuff was created from short saphenous vein which was anastomosed to the PTFE graft and to the previous arteriotomy site on the distal popliteal artery. Two weeks after surgery at discharge, duplex scanning demonstrated patent graft. She was free of symptoms one year after surgery with duplex verified patent graft.

DISCUSSION

Neointimal hyperplasia at the site of the distal anastomosis of infrainguinal PTFE grafts is believed to be the result of compliance mismatch between the native artery and the PTFE graft causing graft occlusion (1). Vein cuff interposition has been proposed to overcome this complication (3). A recent randomized trial comparing infrainguinal PTFE bypass grafting with and without vein interposition cuff at the distal anastomosis demonstrated significantly better patency rates with distal vein cuff in limbs with below knee- femoropopliteal and -femorotibial bypasses (6). The protective effect of a vein cuff at the below knee- popliteal artery appeared to be mainly in terms of initial 30 days patency rate, suggesting that the advantage may be mainly technical. There was little evidence of a protective effect beyond this time. However, in another study there was no significant difference in the incidence of early graft failure. The beneficial effect of distal vein cuff started after six months (7).

Although it is technically easier to perform distal anastomosis with vein cuff compared to direct anastomosis of PTFE grafts to the infrapopliteal arteries, the construction of the vein cuff requires along anastomotic suture line on the PTFE graft site and in the vein cuff itself, irrespective of the technique. Improper suture technique and weak vein wall especially at the site of anastomosis might lead to suture disruption leading to false aneurysm as presented in this article. The length of the PTFE graft in the second case presented in this report was judged to be short at the time of hyperextension of the

leg which might be the reason of rupture of the anastomosis three weeks after surgery. Although there has been a growing experience with infrainguinal bypass procedures with PTFE grafts and distal vein collars', the late complications directly related to vein cuffs have not been systematically studied. Clearly, complications related to the cuff seem to be very rare. Between 1992 and 1999, we have performed 69 infrainguinal reconstructions with PTFE grafts and distal vein cuff and noticed two anastomotic ruptures. Regularly performed duplex scanning in the postoperative period might contribute for better understanding of graft failures in theses cases. The role of duplex scanning with respect to improving patency rates of infrapopliteal PTFE grafts with distal vein cuff remains controversial and prospective randomized studies are needed.

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