Initial Experience of Complex Peripheral Bypass Surgery at Dhulikhel Hospital, Kathmandu University Hospital

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ABSTRACT
Peripheral arterial disease is seemingly silent yet is a major public health problem with limb threatening and life threatening consequences. This condition can initially be asymptomatic and gradually may progress to intermittent claudication and finally to critical ischemia. When conservative management is not sufficient and there is option of surgical management, peripheral bypass surgery is an established modality of treatment of peripheral arterial disease. We present our initial cases of peripheral arterial bypass surgery all of which are technically demanding surgeries. All the cases have resulted into limb salvage until current follow-up.

KEY WORDS
Claudication, critical ischemia, peripheral arterial bypass, peripheral arterial disease

INTRODUCTION
Peripheral arterial disease is seemingly silent yet is a major public health problem with limb threatening and life threatening consequences. Commonly underrecognised and untreated in this part of the world, peripheral arterial disease can have strong association with cardiovascular morbidity and mortality. This condition can initially be asymptomatic and gradually may progress to intermittent claudication and finally to critical ischemia. In this case conservative treatment is no option and most often surgical treatment is the only way to salvage the limb. Peripheral bypass surgery is a highly demanding procedure both in resource and in surgical skills and should be performed in specialized centers. We present our first experiences of complex bypass surgery.

Seven consecutive patients with severe PAD were treated in our hospital. Every patient underwent diagnostic modalities according to the recommendations of the vascular society guidelines. Following clinical examination, Doppler/duplex ultrasonography (Siemens Acuson P300) was performed and CT angiogram (Phillips 64 Slice) was performed.

CASE SERIES
Between May 2016 to November 2017, seven cases of peripheral bypass surgery were performed at Dhulikhel Hospital. Summary of the cases are presented in Table 1.
DISCUSSION

Peripheral arterial bypass surgery is established surgical treatment modality for disease conditions of peripheral artery where by the diseased segment of artery is rerouted by prosthetic or autologus grafts. This is the ultimate management option so as to salvage the limb to maximum extent. Conditions requiring peripheral arterial bypass surgery are peripheral arterial disease (commonly due to atherosclerosis), arterial trauma not amenable...
for end to end anastomosis. In case of Buerger’s disease, however medical management is the common modality of treatment.\textsuperscript{3,4} Hypercholesterolaemia, diabetes and smoking are the most important risk factors for peripheral arterial disease.\textsuperscript{5} Preoperatively, in addition to clinical examination the diagnosis is confirmed by Doppler ultrasonography, CT angiogram or MR angiogram to delineate the site and nature of obstruction. For every bypass, there are three major components as donor site vessel, graft and recipient site vessel. Nature of anastomosis can be end to end, end to side. In terms of graft, it can be autologous as reversed saphenous vein, or prosthetic grafts as Poly Tetra Fluoro Ethylene (PTFE) or Dacron conduits.\textsuperscript{6,7} In some cases, veins and prosthetic grafts are sewn together to form composite grafts.\textsuperscript{8} Regarding different peripheral bypass, it depends on site and nature of obstruction. Some of the common bypass are femoro-femoral (Crossover) bypass, femoro-popliteal bypass and popliteal-crural bypass. Amongst all of these, popliteal-crural bypass are the most difficult ones whereby distal anastomosis sites can be on posterior tibial, anterior tibial or fibular arteries. In terms of location of the graft in situ the grafts can be in anatomical (interposition) or extra-anatomical location. In many of the cases, more than one peripheral bypass need to be performed for the same patient. In case of stenosis of vessel segment, patchplasty may also be needed.

In relation to the cases mentioned above, all the cases inevitably will have limb loss if proper surgical interventions had not been done. In the first case, due to disease in bilateral lower limb and also in multiple segments, surgical plan was even more difficult and staged bypass had to be done in terms of patch pla due to disease in bilateral lower limb and also in multiple segments, surgical plan was even more difficult and staged bypass had to be done in terms of patch plasty, femorofemoral (crossover) bypass as well as right femoro-popliteal bypass. Postoperatively, he had excellent flow as well as function outcome in distal limb. In second case, due to severe disease in P3 segment of popliteal artery, more desired option of femoropopliteal bypass could not be done and crural bypass had to be done instead. In third case, we were extremely surprised to see hypoplastic nature of arteries especially in popliteal artery and crural bypass had to be done with extreme caution and difficulty. In fourth case, due to severe damage to long segment of popliteal artery with lacerated distal part of transacted popliteal artery, P1 to crural bypass had to be done. In fifth case, the diseased right external iliac artery has been bypassed by use of Dacron graft connecting right femoral artery and left femoral artery. Postoperatively, triphasic flow pattern has been achieved even in right lower limb arteries. In the sixth case, diseased superficial femoral artery has been bypassed using Dacron patch from common femoral artery to P1 segment of popliteal artery. The seventh case had avulsion of right PTA following trauma which has been reconstructed using reversed saphenous vein interposition graft of length 7 cm.

In all the seven cases, good distal flow could be achieved and our ultimate goal of limb salvage could be achieved. Despite resource and skills demanding, due to very good functional outcome to patients, peripheral bypass surgery should be know-how of a skilled vascular surgeon and should be provided for by every tertiary vascular center.

REFERENCES


