CASE REPORT

Rare Vascular Surgery in Apollo Hospitals, Dhaka --Right Popletial to Dorsalis pedis Artery Anastomosis and Axillary Bi Femoral Bi Poplileal Bypass Grafting - limb salvage procedure

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Abstract

Bypass grafts to the dorsalis pedis artery provide excellent revascularization to ischemic foot. It is a durable and effective procedure for limb salvage. Axillo femoral-popliteal procedure offers a reasonable alternative in high-risk patients. We are reporting 2 cases of such procedures from Apollo hospitals, Dhaka. Right Popletial to Dorsalis pedis artery anastomosis was done in a 32 years old man. Interposition venous graft was done from the right popliteal artery to dorsalis pedis artery. Axillo-Bi Femoral-Bi Poplileal Bypass Grafting: was done in a 59 years old man. Knitted fabric strength graft was used. Both the patients were doing well in postoperative period.

Introduction

In critically ischemic foot, Dorsalis pedis artery bypass is a durable and effective procedure for limb salvage.[1] Dorsalis pedis bypass is reliable with a great chance of ischemic foot salvage over years. Saphenous vein is the preferred conduit. Good results authenticate routine use of pedal arterial reconstruction for patients with ischemic foot complications.

Extra-anatomic vascular reconstructions have been introduced as alternative procedures for the elderly or high risk patient, in whom a standard transabdominal aorto-femoral bypass would imply prohibitive perioperative morbidity or mortality.[2] As time went on and larger series of Extra-anatomic vascular reconstructions have been published, it became evident that long term results are quite satisfactory.

Case report 1

Right Popletial to Dorsalis pedis artery anastomosis:

A 32 years old non diabetic, non hypertensive heavy smoker gentleman came to our hospital with arterial occlusive disease of right lower limb with gangrene of right great and little toes. According to the patient, the problem began two years back with claudication pain. For the last eight months pain has gradually increased. Angiogram revealed both anterior and posterior tibial arteries are occluded. Operation was done on 20.04.2011. We explored the right popliteal artery and dorsalis pedis artery. Tunnelar was passed through subcutaneous tissue from popliteal artery to dorsalis pedis artery (Figure1). Saphenous vein from left leg was harvested and interposition venous graft was done from the right popliteal artery to dorsalis pedis artery (Figure 2). Dorsalis pedis artery was nicely palpable (Figure 3) and the right lower limb was warm oxygen saturation was 100% of the limb. On 27.04.2011 on 6th POD, amputation of gangrenous right great & little toe was done. With a haemo dynamically stable condition he was discharged on 30.04.2011. The patient was doing very well in the 1½ months after follow up.

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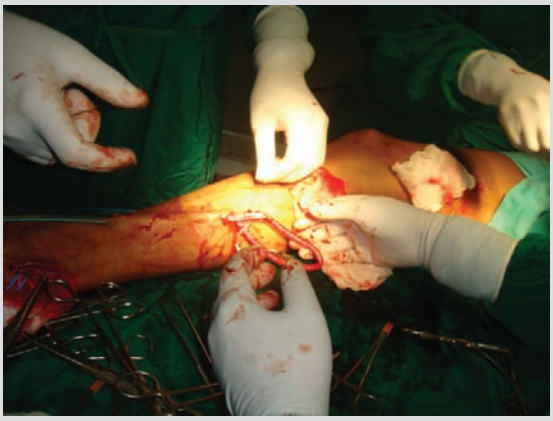

Figure 1: Saphenous vein is passed through subcutaneous tunnel

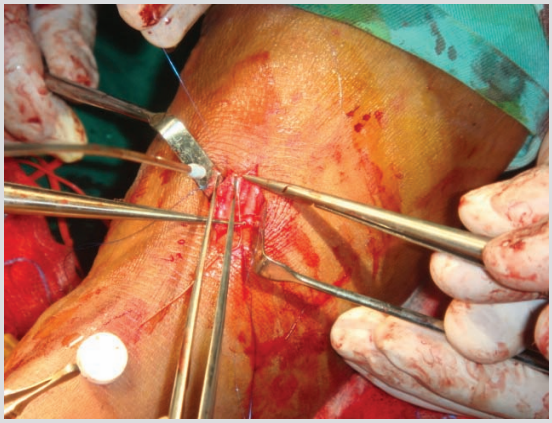

Figure 2: Anastomosis with dorsalis pedis artery

Figure 3: 5th postoperative day with good pulsation in dorsalis pedis artery

Case report 2

Axillo-Bi Femoral-Bi Poplileal Bypass Grafting as limb salvage procedure:A 59 years old, hypertensive, diabetic, dyslipidaemic gentleman who is a smoker got admitted with severe pain on both lower limbs for 2 months. His CABG was done in 2007. He had history of coronary stenting. He was also suffering from acute left ventricular failure at the time of admission which was treated conservatively in CCU. Ejection fraction was low (35%). Angiogram showed atherosclerotic lesion in iliac arteries and femoral arteries.

Operation was done on 03.05.2011. Left Axillary artery, both femoral arteries and popliteal arteries were explored. Subcutaneous tunnel was done through left mid axillary line (Figure 4) to both femoral arteries and popliteal arteries (Figure 5). Knitted fabric strength graft (6cm x 40 mm), and (7cm x 40 mm) was anastomosed from Left Axillary artery to both femoral arteries and popliteal arteries (Axillo-Bi Femoral-Bi Poplileal Bypass Grafting) (Figure 6).

The post operative period was uneventful. The patient was doing well in his 2 months postoperative follow up.

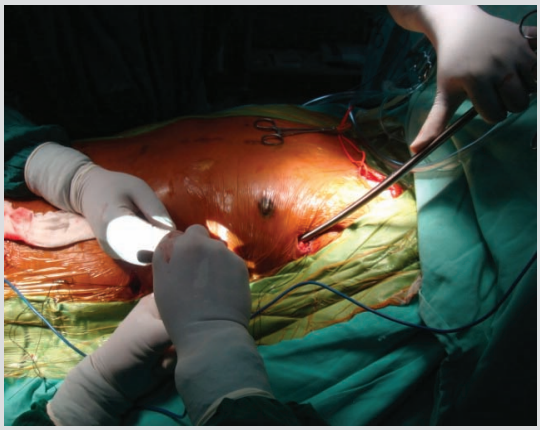

Figure 4: Subcutaneous tunneling is done through left mid axillary line

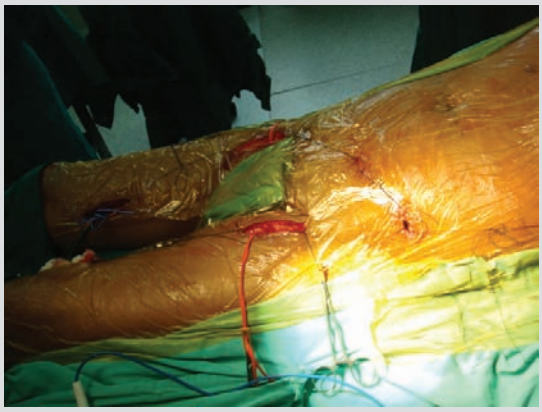

Figure 5: Both femoral arteries and popliteal arteries are exposed and connected by subcutaneous tunnel

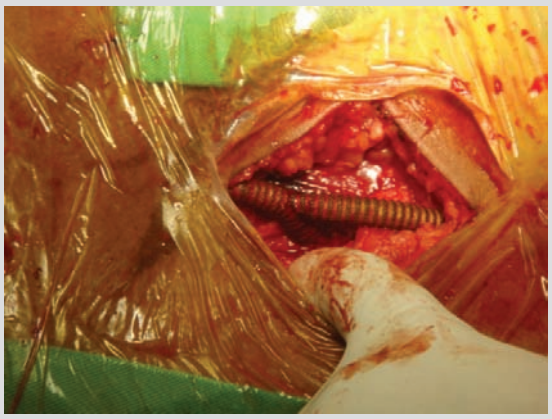

Figure 6: Graft to femoral artery and popliteal artery

Discussion

Pedal bypass provides durable and effective limb salvage for ischemic foot lesions. Saphenous vein is the preferred conduit when available. Short vein grafts from distal inflow sites are possible. These results justify the routine use of pedal arterial reconstruction for patients with ischemic foot complications.[3] Bypass grafts to the dorsalis pedis artery provide substantial perfusion to the foot such that the resulting limb salvage and healing rates for revascularized limb is excellent. Frank B et al had history of four hundred and two patients underwent explo ration for bypass, all procedures were performed with vein. Inflow was taken from the common femoral artery in 34%, popliteal arteries in 60%, a previously placed graft in 5%, and a tibial artery in 1%. Actuarial primary and secondary patency and limb salvage rates were 68%, 82%, and 87%, respectively, at 5 years' follow-up. The actuarial patient survival rate was 57% at 5 years. Dorsalis pedis arterial bypass is an effective limb salvage procedure with long-term durability comparable to distal vein grafts placed into more proximal arteries.[4] Bypass grafts to the dorsalis pedis artery provide excellent revascularisation to ischemic foot.

In “extra-anatomic bypass” grafts they pass through a different anatomic pathway than do the natural blood vessels they replace. These grafts are devised to circumvent complex problems when conventional vascular procedures are not possible or are too hazardous to perform. Extra-anatomic bypass grafts are an accepted technique with known patency rates. Quality nursing care plays a significant role in successful patient outcome.

Axillo femoral-popliteal procedure offers a reasonable alternative in high-risk patients. Since neither the thoracic nor the abdominal cavity is violated when performing the operation, the procedure usually does not interfere with the patient's ability to breathe, cough, or take oral feedings, which is particularly important in patients who are poor candidates for major surgery. Axillo femoral bypass is an acceptable alternative to AOFB in properly selected high-risk patients with critical lower extremity ischemia who would likely not tolerate the more durable AOFB.[5]

Cumulative graft patency of approximately 70 percent at five years has been obtained with this procedure.

These results are inferior to those for aorto-femoral bypass. Thus, axillofemoral bypass grafting is usually reserved for high-risk patients with limb threatening ischemia.[6]

In a 12 year study performed by Division of Vascular Surgery, Montefiore Medical Center, New York, axillopopliteal bypass grafting were done in 50 patients with 6 mm polytetrafluoroethylene grafts for limb salvage who were at high risk for limb loss. Overall 1, 3, and 5 year cumulative primary graft patency rates were 58%, 45%, and 40%, respectively. Comparable limb salvage rates were 83%, 68%, and 58%. Three-year patency rate for sequential axillofemoral-popliteal grafts was 74%. These results show that axillopopliteal bypass grafting is justified when other standard operations are not possible in patients who are in imminent danger of limb loss, and that every possible effort should be made to use the common or deep femoral artery as part of a sequential axillofemoral-popliteal procedure.[7]

Department of Vascular Surgery, Utrecht University Medical Center, Utrecht, The Netherlands showed results of all axillopopliteal bypass reconstructions over an 11-year period which was analyzed. Thirty axillo-popliteal bypass grafts were performed on 24 patients (mean age 67 years). The primary patency after 1 year was 64%. The secondary patency after 1 year was 77%. Limb salvage after 1 year was 84%. We conclude that extra-anatomical axillopopliteal bypass is a valuable therapeutic option for limb salvage in this specific patient population.[8]

Conclusion

Dorsalis Pedis artery bypass provides effective limb salvage of ischemic foot lesions for long time. Popliteal-distal artery bypass is a favorable revascularisation procedure with critical limb ischemia. Axillofemoral-popliteal bypass is generally used as a final attempt to save limb. Both procedures are being performed in many centers with good patency and salvage rates.

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