

PROFUNDOPLASTY - A SOLUTION FOR DISTAL REVASCULARIZATIONS

Bogdan TOTOLICI¹, Mircea ALEXA¹, Daniel CIURDARIU²

¹ Clinical Emergency County Hospital Arad, Romania

² Genesys Hospital Arad, Romania

ABSTRACT. The deep femoral artery is the main source of blood supply to the leg and foot when the superficial femoral artery is occluded. In this situation, the geometry of the trunk of the deep femoral artery represents a stenosis of 50 per cent interposed between the common femoral artery and the collateral circuit of the deep femoral artery. Profundoplasty indications vary depending on its use as isolated or adjunctive procedure. As an adjunctive procedure profundoplasty is performed in all cases of ischemia, including critical limb ischemia. It's essential to restore outflow when the superficial femoral is occluded. Profundoplasty is still a valuable option for patients with femoral PAD and claudication without tissue loss. It is a straightforward procedure that combines good efficacy with low complication rates. Further endovascular treatment may be facilitated. It is not useful for patients with the combination of critical ischemia and tissue loss. Profundoplasty's technical facility has the advantage over bypass surgery.

Keywords: profundoplasty, revascularization, claudication

INTRODUCTION

The deep femoral artery is the main source of blood supply to the leg and foot when the superficial femoral artery is occluded. In this situation, the geometry of the trunk of the deep femoral artery represents a stenosis of 50 per cent interposed between the common femoral artery and the collateral circuit of the deep femoral artery. Intimal thickening of only 0,5 and 1,0 mm increases this anatomic stenosis to 64 and 76 per cent, respectively. Beyond the trunk, the cross-sectional area of the deep femoral artery circuit increases at each arterial division. Any reconstruction of the deep femoral artery intended to increase its inflow must extend down to at least its first important bifurcation if it is to overcome this trunk "stenosis" and to carry out an anatomic bypass alone. This requirement explains the effectiveness of proper reconstruction of the deep femoral artery in avoiding or delaying amputation in patients with ischemic symptoms and occlusion of the superficial femoral artery who are not candidates for femur-popliteal reconstruction. In this case

the absence of high grade stenosis is not a contraindication.

ANATOMICAL ASPECTS

Typically, PFA (profound femoral artery) is the main supplier of blood to the leg and foot. In cases when the superficial femoral artery and popliteal artery are severely affected or occluded, PFA is the main collateral channel to the common iliac artery and femoral artery to the distal end. The value of PFA for the viability of ischemic leg was set and emphasized since 1961, proved to be an effective alternative to bypass (which is more laborious). Profundoplasty technique can be used as an isolated or associated with other revascularization procedures.

CLASSIFICATION OF PROFUNDOPLASTIES

Proximal - when it extends to the second perforant of PFA

Extended - you pass the second perforant of PFA

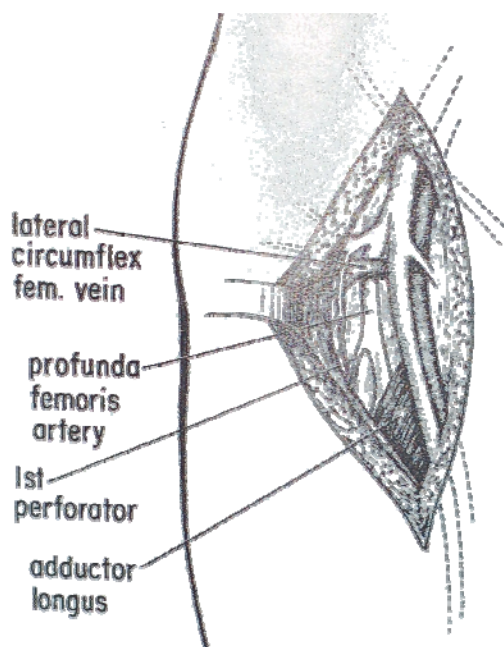


Fig. 1 Cases of EHP and No EHP

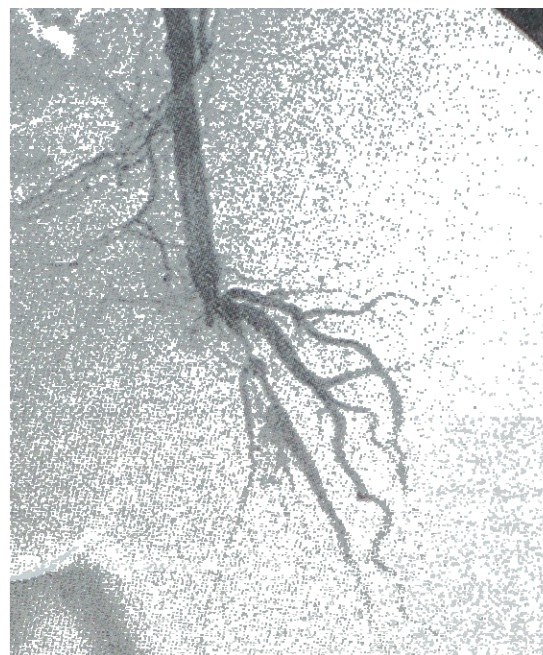


Fig. 2 Cases of genital cancer

PROFUNDOPLASTY INDICATIONS

- Profundoplasty indications vary depending on its use as isolated or adjunctive procedure.
- As an adjunctive procedure is performed in all cases of ischemia, including critical limb ischemia.
- It's essential to restore outflow when the superficial femoral is occluded.
- The success of profundoplasty is assured by the existence of a significant injury to the abundant collateral AFP and popliteal artery and tibial branches.
- Even patients with critical ischemia benefit from revascularization with profundoplasty, when other options are unsuitable (safena vein absent, the clinical condition does not allow an extended process).

OPERATIVE TECHNIQUE

The approach of the artery (PFA) is performed through a vertical incision in the femoral tripod trigonal Scarpa and aims entirely (FCA, SFA, PFA).

The gain of control on all colaterals.

Heparinization 3000 - 5000 IU.

Arteriotomy started on the AFC to prevent damage to the posterior wall of AFP and continued until it meets the normal arterial wall.

Profundoplasty is frequently done with a patch without endarterectomy.

Endarterectomy on the PFA is extremely difficult and risky due to the fragility of the arterial wall and that is to be avoided.

The patch can be used autogenous (vein) or adaptive (Dacron, PTFE).

Fixing patch is made from two continuous surjet monofilament wire ends.

THE EXPERIENCE OF SURGERY CLINIC OF ARAD CLINICAL EMERGENCY COUNTY HOSPITAL

We practiced this technique since 2001, from the moment of establishment of vascular surgery department.

During 2001-2009 we conducted a total of 143 profundoplasties, a group with a mean age of 58 years (range 47-82 years) with a male / female rate of 3 / 1.

From total number of profundoplasties, only 10 were isolated, the rest being done adjunctive to bypass.

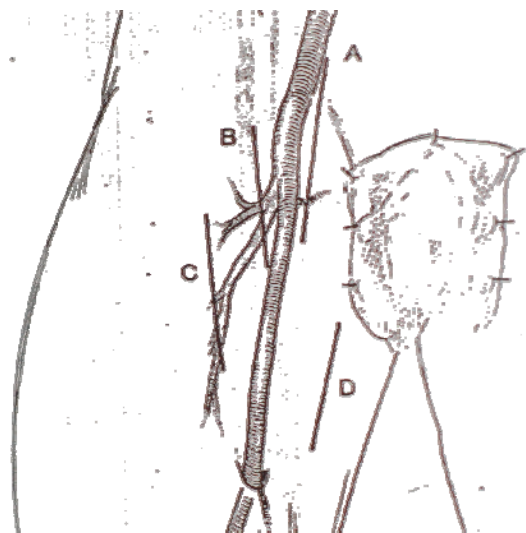


Fig. 3 Approach areas of the femoral artery and its branches

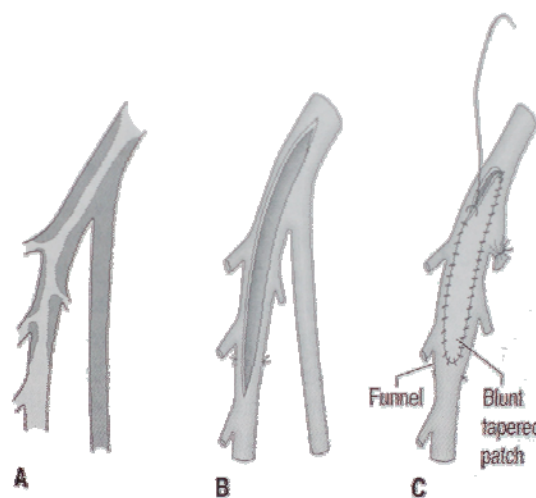


Fig. 4 Operative stages

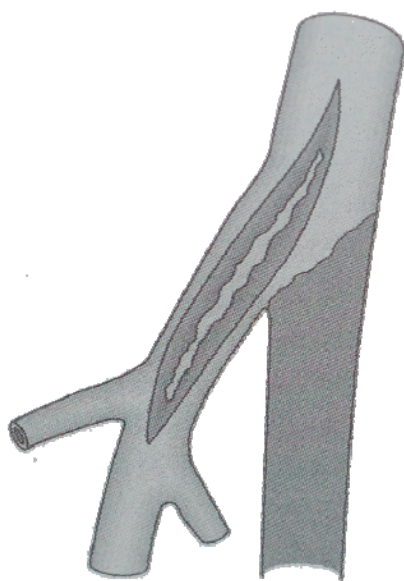


Fig. 5 Adjuvant profundoplasty A

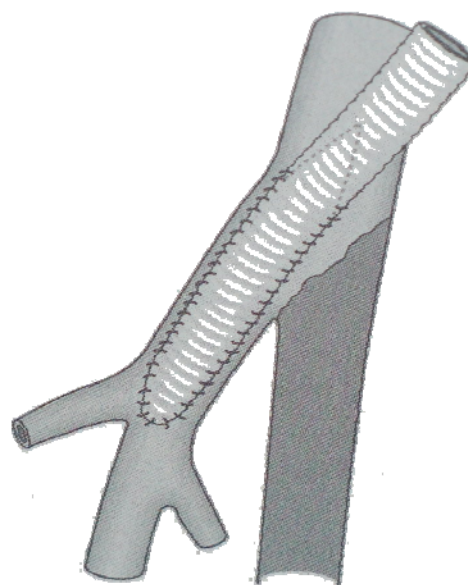


Fig. 6 Adjuvant profundoplasty B

We used the venous patch (from internal safena) in 8 cases of isolated profundoplasties.

From total number of profundoplasties only four required extended technique, in the rest being enough the proximity technique. Postoperative results were evaluated by clinical parameters (pain, claudication, skin temperature, distal lesions heal) and paraclinical (systolic pressure index

measurement - preoperative versus postoperative systolic pressure index SPI).

The results of this method were excellent in all patients obtaining short-term clinical improvement in pain, healing of trophic lesions. SPI postoperative measurement showed an increase in its average of 0.4 to 0.5.

Long-term results are inconclusive because of insufficient cooperation with the patients.

CLINICAL CASE

Female, 58 years, heavy smokers (two packs a day for 30 years), presents the phenomena of critical limb ischemia with the evolution of four months left.

Angiography revealed a typical case of left superficial femoral and left femoral deep origin occlusion; proximal arterial flow of contralateral limb artery was very good.

We performed an extra-anatomic femoro-femoral bypass with vein (with inverted internal safena) with proximal profundoplasty adjuvant.



Fig. 7 Intraoperative aspects A

CONCLUSIONS

Profundoplasty is still a valuable option for patients with femoral PAD and claudication without tissue loss.

It is a straightforward procedure that combines good efficacy with low complication rates.

Further endovascular treatment may be facilitated.

It is not useful for patients with the combination of critical ischemia and tissue loss.

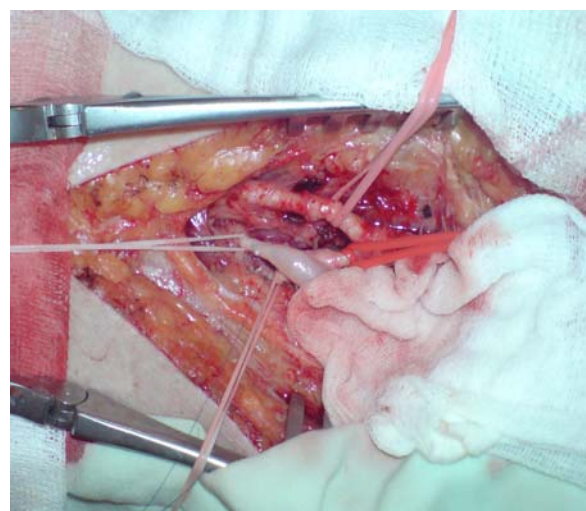


Fig. 8 Intraoperative aspects B

Profundoplasty's technical facility has the advantage over bypass surgery.

May benefit from revascularization even patients with serious pathology associated (cancer, severe heart failure, severe respiratory disorders, etc.).

REFERENCES

- Khawaja HA, Omotoso PO, Bifurcated Dacron patch for simultaneous superficial femoroplasty and profundoplasty: a case report, *J Med Case Reports*. 2009 Nov 24;3:9294.
- Debus ES, Lohrenz C, Diener H, Winkler MS, Larena-Avellaneda A, Surgical reconstructions in peripheral arterial occlusive disease, *Vasa*. 2009 Nov;38(4):317-33.

- Ballotta E, Gruppo M, Mazzalai F, Da Giau G, Common femoral artery endarterectomy for occlusive disease: an 8-year single-center prospective study, *Surgery*. 2010 Feb;147(2):268-74. Epub 2009 Oct 13.

- Chiesa R, Marone EM, Tshomba Y, Logaldo D, Castellano R, Melissano G, Aortobifemoral bypass grafting using expanded polytetrafluoroethylene stretch grafts in patients with occlusive atherosclerotic disease, *Ann Vasc Surg*. 2009 Nov-Dec;23(6):764-9. Epub 2009 Jun 21.