

Weapons in the Jungle of Femoro-Popliteal Lesions

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Abstract

Best treatment for Superficial Femoral Artery (SFA) lesions is still the subject of some controversies in the literature. The paper offers a brief overview of all the techniques currently available for the treatment of SFA lesions.

Keywords: Superficial femoral artery; Endovascular; Directional atherectomy

Description

Historically, Superficial Femoral Artery (SFA) lesions have been successfully treated using open surgical approach. A matter of debate has been about the best graft to be used: veins seem good options for below the knee district, synthetic graft should be used for above the knee region. However poor reported primary and assisted patency rates justify the need for a therapy with good procedural success, limited invasiveness and improved long-term outcomes. An increasing number of patients actually undergo endovascular treatment as a first line therapy for lesions in the femoro-popliteal district, for both intermittent claudication and critical limb ischemia. TASC II guidelines in fact showed that in short lesion (type A and B) endovascular treatment performs better than open surgery [1]. Abstention to surgery also could be an option in selected cases, with lifestyle education and exercise training program associated to medical treatment for claudicant patients. According to TASC guidelines [1], only Cilostazol and Pentoxifylline have been approved by FDA to improve walking distance in patients with intermittent claudication. Other proposed medical therapies, such as propionyl-L-carnitine, are still under investigation.

In patients with clinical limb ischemia, parenteral administration of PGE-1 or iloprost for 7 to 28 days may be considered to reduce ischemic pain and facilitate ulcer healing, but its efficacy is likely to be limited to a small percentage of patients.

Best interventional treatment for SFA lesions however is still the subject of some controversies. In particular, the great topic is about the routinely use of stent versus simple PTA in this district. It appears quite impossible to define which treatment is the best as data emerging from literature lacks of consensus. Making a comparison among different studies seems to be difficult, so the conclusions must be interpreted in the context of the individual studies [2]. Differences could be detected regarding selection criteria of patients involved (TASC A and B versus TASC C and D, claudication versus critical limb ischemia). Peripheral flow and runoff are essential for good patency of treated districts according to some authors, while they are not in some other studies [3]. Last, different endpoints are considered for evaluation of outcomes, for example limb salvage, primary patency and clinical improvement or ABI improvement. For these reasons, primary and secondary patency rates as well as restenosis rates among these studies are not easily comparable.

Some help may come from conclusions reported by a recent Cochrane review: stenting placement is associated with a higher immediate success rate, but not with a statistically significant improvement of primary patency rate at middle/long term follow-up [4].

Moreover, eventual occlusion of the stent leads almost inevitably to bypass surgery, on the otherside SFA reocclusion after simple PTA can be addressed with a redo PTA.

So routinely stenting has to be discouraged and reserved selectively in cases of important vessel recoiling, recanalization of total occlusion, dissection and hard calcification.

The use of covered stent has also been advocated for the treatment of SFA lesion. Lammer and Coll [5] performed a prospective randomized multi-center study comparing 141 patients with symptomatic peripheral arterial disease who were assigned to treatment with heparin-bonded, covered stents (Viabahn 72 patients) or bare medical stents (BMS, 69 patients) for complex femoro-popliteal lesions. They demonstrated significant clinical and patency benefits for heparin-bonded covered stents compared with BMS in lesions ≥ 20 cm and for all lesions in the treating-per-protocol analysis, however in the intention-to-treat analysis for all lesions the difference was not significant. Moreover, the main concern about the use of stent-graft is the coverage of important collateral vessels arising from the SFA, which can lead to an irreversible ischemia in case of graft failure.

Non-inferiority of endovascular techniques versus traditional surgery in short lesions (TASC A and B) is an irrefutable statement arising from literature, however new technologies are needed to improve long term patency rates. For these reasons, in last year's new devices and innovative technologies have evolved, making endovascular treatment of TASC II type C and D lesion (long lesion) feasible as well. Devices already in use for coronaric district, such as Drug Eluting Stents (DES), Drug Eluting Balloons (DEB) and Directional Atherectomy (DA) are now used for peripheral vessels.

According to early studies DES and DEB in the peripheral district don't show similar results as for coronaric district. However, Zeller and Coll [6] in a recent retrospective dual center study evaluated the performance of DEB and DES in long (≥ 10 cm) femoropopliteal lesions in 228 patients. They concluded that DEB and DES performed equally well in the endovascular treatment of these lesions and better than traditional endovascular treatment.

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DA is associated to early and middle term outcomes which are similar to those of percutaneous angioplasty alone. DA offers some possible advantages, such as plaque excision and gradual and progressive increasing of vessel diameter. It may be an alternative tool to avoid stent placement.

The device gets on along the vessel; at the distal end of the catheter a rotating inner blade provides to plaque excision and a reservoir captures debris from the plaque. Early studies reported a procedural success in 98% of cases, with a complication rate of 5% and a patency rate of 80% at 6 months [7].

In our Institution, DA using SilverHawk and TurboHawk has been used since 2011 on 46 SFA lesions in 34 patients who were mainly affected by critical limb ischemia (76.5%). Primary patency at 3 years was 44% with a 97% rate of limb salvage.

Siderbars and Coll [8] evaluated distal embolization following DA, which could compromise a good runoff. To avoid peripheral embolization, the use of Embolic Protection Devices (EPDs) such as filter has been proposed, in particular the longer the lesion to be treated, the more is the needing to use EPDs. However symptomatic embolization is less frequent than asymptomatic embolization, which usually can be revealed by Doppler Ultrasound. Authors conclude that asymptomatic embolizations are more frequent than symptomatic; however they don't imply an impoverishment of peripheral runoff.

Promising clinical and technical results in recently published prospective studies reporting on DA-assisted angioplasty in femoro-popliteal lesions have been compared to results of Subintimal Angioplasty (SIA). According to Indes and Coll [9], SIA appeared superior to atherectomy for the treatment of lower extremity occlusive disease. In this study, however, TASC C and D lesion are treated, but we know that DA is not appropriated for this kind of lesions.

Again, the conclusions must be interpreted in the context of the individual studies and randomized prospective controlled trials are needed, to help unravel this maze of vines.

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