



Hybrid Revascularization in the Treatment of Aorto Iliac and Femoral Occlusive Disease

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Short Communication

Endovascular procedures have been widely growing in recent years and, in spite of the actual indications of the international society guidelines, have become the first choice also for aortoiliac TASC II C/D lesions because of excellent results in terms of low perioperative mortality and morbidity rates and of good long-term primary and secondary patency [1,2].

In patients with critical limb ischemia due to severe iliac and femoral occlusive disease hybrid interventions have emerged as a common method of revascularization. In particular patients with multilevel occlusive disease and high surgical risk may benefit from a minimally invasive combine surgical and endovascular approach. In these cases femoral endarterectomy alone would be an inadequate procedure and would have a high risk of acute thrombosis due to poor inflow. Also, isolated endovascular aortoiliac revascularization may have a poor outcome in term of patency in the presence of critical common or bifurcation femoral artery occlusive disease.

On the other hand, a relatively low-risk common femoral endarterectomy followed by aortoiliac stenting may restore both inflow and outflow at multiple levels, maintaining favorable patency and limb salvage rates without the need for a complex open surgical procedure (Figure 1-4).

Typically the surgical reconstruction is the first step. The ipsilateral femoral bifurcation is exposed via a longitudinal incision in the groin. The common femoral artery is opened through a longitudinal arteriotomy and endarterectomy is performed to remove the occluding plaque. Reconstruction of the common femoral artery and bifurcation is usually completed using a patch (autogenous saphenous vein, synthetic or biologic material) or an interposition synthetic graft, depending on the length of the treated segment.

An appropriate vascular access is imperative to proceed to a successful endovascular aortoiliac recanalization. Depending on the anatomy and the extent of disease, access options most commonly include a combination of left brachial and bilateral femoral arterial access. Left brachial access can be used as a primary access site for treatment or as a supplement to femoral access. The femoral artery sheath, usually 8 Fr, is positioned in the reconstructed artery through direct puncture of the patch. Firstly, an aortogram via a contralateral crossover approach is obtained in the distal aorta. Once the ipsilateral common, external, and internal iliac arteries are assessed, a catheter is advanced across the aortic carrefour through the contralateral iliac axis in an antegrade fashion

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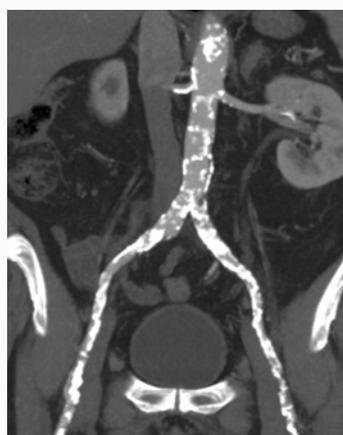


Figure 1: CT scan demonstrates the multiple occlusions and stenosis at left iliac and common femoral arteries.

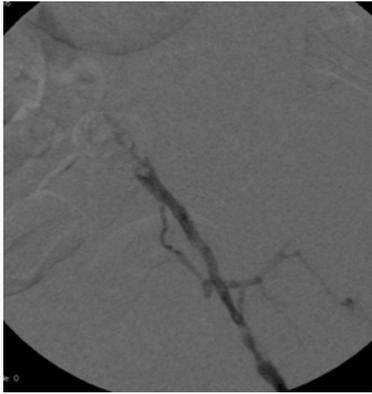


Figure 2: Angiogram after left common femoral artery endarterectomy.



Figure 3: Angiogram after crossing the iliac lesions.

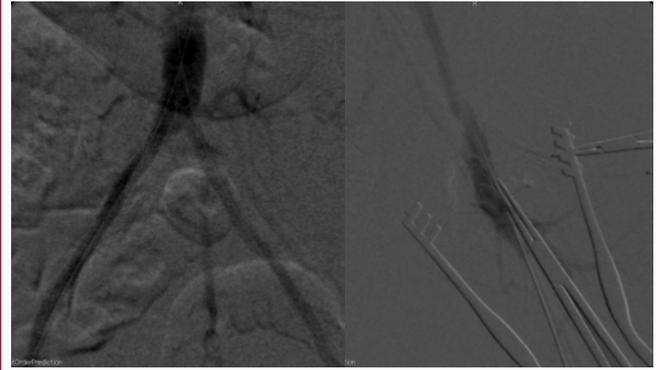


Figure 4: Completion angiography after kissing stent and iliac stenting.

and positioned with its tip proximal to the target lesion. Whenever possible, direct retrograde ipsilateral approach was used through the reconstructed femoral artery. Alternatively, the left brachial approach with an antegrade recanalization from the above provides a better pushability in complex lesions involving the distal aorta. The simplest method of recanalization consists in the use of a hydrophilic guidewire with a support catheter into intraluminal or subintimal space. In case of subintimal recanalization the confirmation of re-entry into the true lumen is mandatory before placing a stiff wire in the iliac axis for subsequent stenting. If the disease extends into the distal external iliac artery, stents in our opinion should be positioned up to the proximal portion of the patch, ideally without extension into the common femoral artery.

As regard the choice of the stent, emerging reports are demonstrating the non-inferiority and potential advantages of covered stents compared to bare metal stents in the treatment of aortoiliac occlusive disease. The COBEST trial [3] outlines the benefits of stent graft use in the aortoiliac district because these lesions are sometimes very tough to cross and there is always an imminent risk of intraprocedural complications like flow limiting dissection, perforation or embolization. The use of covered stents allows to prevent these complications. In case of bilateral iliac axis occlusive disease, covered stent-grafts are usually placed in a “kissing-stent” configuration and simultaneously inflated.

In the last years different solutions of hybrid revascularization are emerging. Covered Endovascular Reconstruction of Aortic Bifurcation (CERAB technique [4]) is a new approach for extensive

aortoiliac occlusive disease using three covered balloon expandable stents to reconstruct the aortic bifurcation. This configuration simulates a neo-bifurcation avoiding hemodynamic and pathological changes in combination with the benefits of covered stents. The aortoiliac bifurcation can also be reconstructed using the AFX unibody aortoiliac stent-graft [5], originally designed for aneurysm exclusion, via an open femoral artery approach. This technique has several potential advantages, preserving the aortic bifurcation and avoiding limb competition in the distal aorta. It also allows for future endovascular interventions and protects against potentially fatal aortoiliac rupture in heavily calcified lesions.

Hybrid interventions have become an effective option for limb salvage in patients with multilevel arterial occlusive disease and could be considered as the first choice. Technical success and short- and long-term limb salvage outcomes have been shown to be as effective as open surgical reconstruction for severe iliac and femoral occlusive disease offering the safety and feasibility of a single-stage therapy without adding surgical risks. Moreover, patients who suffer also from infrainguinal occlusive disease will have significant improvement of their symptoms with treatment of their inflow lesions and may no longer require additional interventions. Anatomical arterial features remain the main limitation for hybrid revascularization. An accurate preoperative study with CT scan is mandatory in order to identify heavy calcified lesions that still need traditional repair.

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