

HYBRID TREATMENT FOR MULTILEVEL ARTERIAL OCCLUSIVE DISEASE. CASE REPORT

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ABSTRACT. Multilevel arterial disease presents a challenge to the vascular surgeons. Associated comorbidities and the usually high anesthetic risk mandate for a careful choice of the surgical indication. Hybrid interventions represent the less traumatic option possible for these patients. We present a case of a 72 years old patient who underwent both endovascular and open surgical intervention in the same time, correcting the inflow of the right iliac artery with stent placement.

KEYWORDS hybrid, multilevel arterial disease, by-pass, stenting, endovascular

INTRODUCTION

Patients with lower extremity ischemic symptoms secondary to multilevel arteriosclerotic occlusive disease represent a frequent and challenging problem for the vascular surgeon.

In the setting of concomitant iliac and infrainguinal atherosclerotic occlusive disease limb salvage or clinical improvement may require surgical reconstructions to correct both inflow and outflow levels of disease. The main concern is that such extensive procedures may result in unacceptably high morbidity and mortality rates in these typically high-risk patients.

With the rapid development of endovascular techniques, the management strategy of patients with multilevel atherosclerotic arterial occlusive disease is also evolving.

The release of the TransAtlantic Inter-Society Consensus (TASC) statement on treatment of peripheral vascular disease in 2000 and then TASC II in 2006 allowed stratification by length and morphology of lesions and reinforced the concept of treating short focal stenoses via endovascular approach and using surgical revascularization for long-segment occlusions (Christopher D. Leville et al., 2005)

In this consideration for limited iliac stenotic lesions (< 3 cm) iliac artery stenting is a means whereby multiple bypass operations can be avoided in such patients.

Therefore, the assessment of the patient’s general condition and anatomy of the diseased segments become central in deciding which approach is warranted.

The technical and initial clinical success of PTA of iliac stenosis exceeds 90% in all reports in the literature. This figure approaches 100% for focal iliac lesions (L. Norgren et al., 2006).

CASE REPORT

A 72 years old female patient presented to our department complaining of severe, sharp pain in the left foot, occurring mostly during the night. The pain was partially relieved by the dependent position of the leg. The walking capacity was very severely impaired.

The physical examination showed discoloration and dependant hyperemia of the foot, ankle and foot oedema, muscle and subcutaneous tissue atrophy of the left calf. Peripheral pulses of the left lower limb were absent at all levels (femoral, popliteal, posterior tibial and pedal)

Risk factors included the presence of hypertension, coronary artery disease, hyperlipidemia and former tobacco use.

The patient presented with the recent results of a CT-angiogram that made possible a precise evaluation of the localization and anatomy of the diseased arterial segments. It revealed a focal (< 3 cm), 90% right external iliac artery stenosis, a left external iliac artery occlusion that extended to the superficial femoral artery (SFA) and another SFA occlusion in its distal segment.

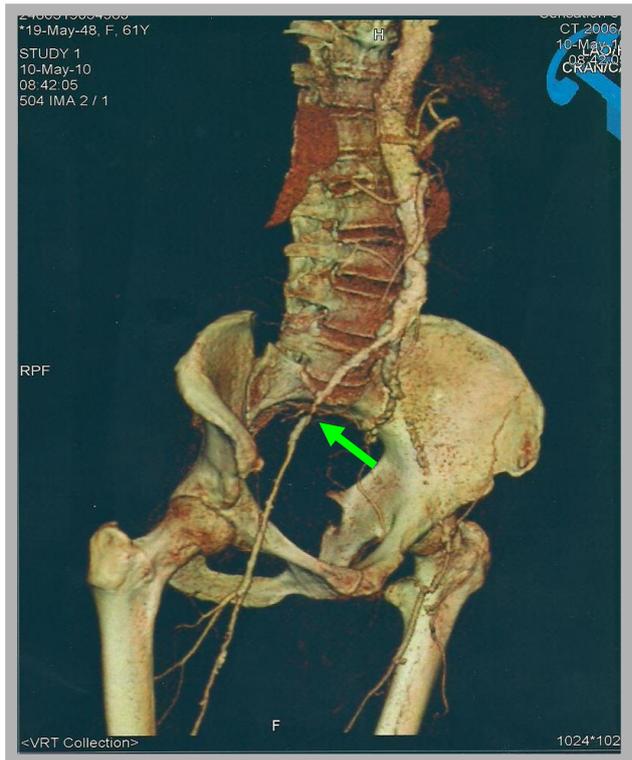
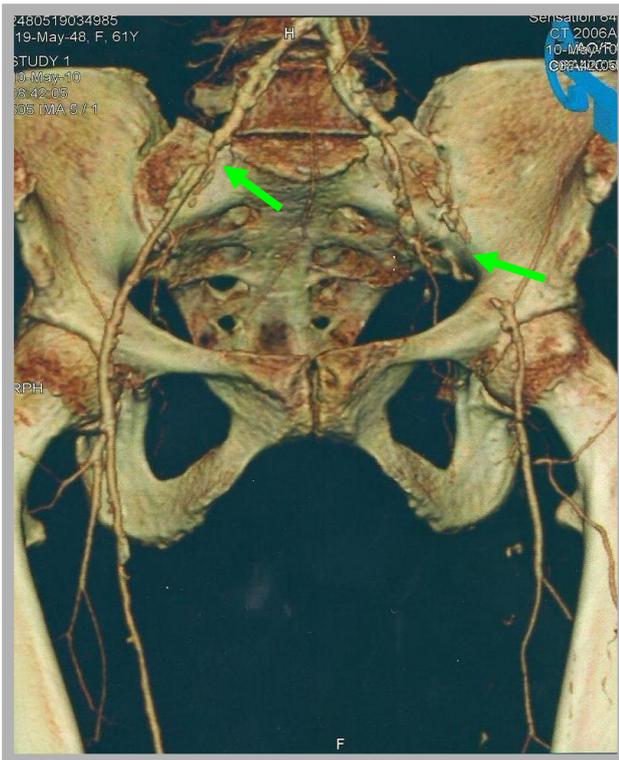


Fig.1 – CT-angiogram that reveal a focal (< 3 cm), 90% right external iliac artery stenosis and a left external iliac artery occlusion that extends to the superficial femoral artery (SFA)

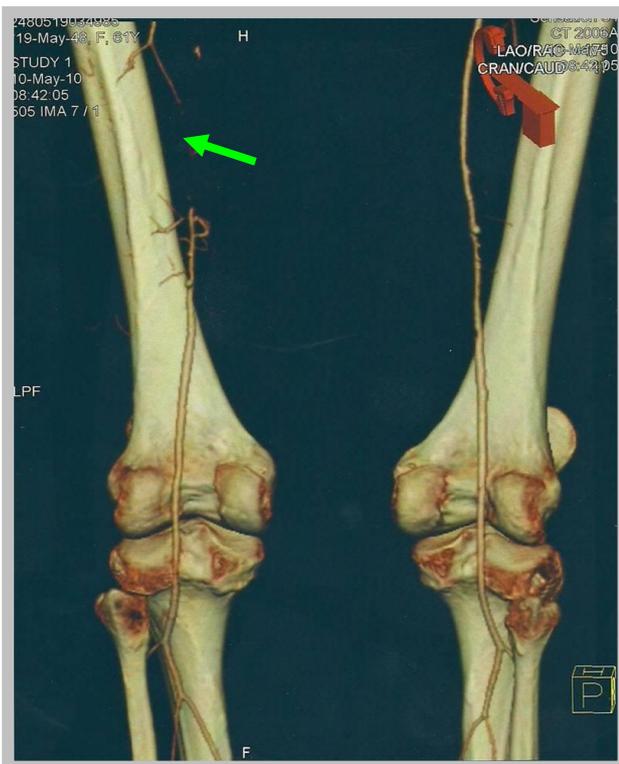


Fig. 2 – CT-angiogram that reveal a distal SFA occlusion

The treatment strategy was established based on the TASC II recommendations. We treated the focal right external iliac stenosis by endovascular ballon angioplasty (PTA) and stent placement after which we performed a sequential femoro-femoral and femoro-popliteal by-pass surgery to treat the significant occlusive disease in the contralateral iliac and

superficial femoral artery. Inflow for this crossover graft was based on the dilated and stented right iliac artery.

The endovascular procedure was performed in the angiography suite of our center by an interventional radiologist. The preoperative arteriography performed by means of an ipsilateral femoral approach revealed a

1 cm long 90% right external iliac stenosis. The endovascular repair consisted in PTA followed by a self expandable nitinol stent placement. A completion

contrast injection was performed to assure a satisfactory morphologic result of PTA and stenting.

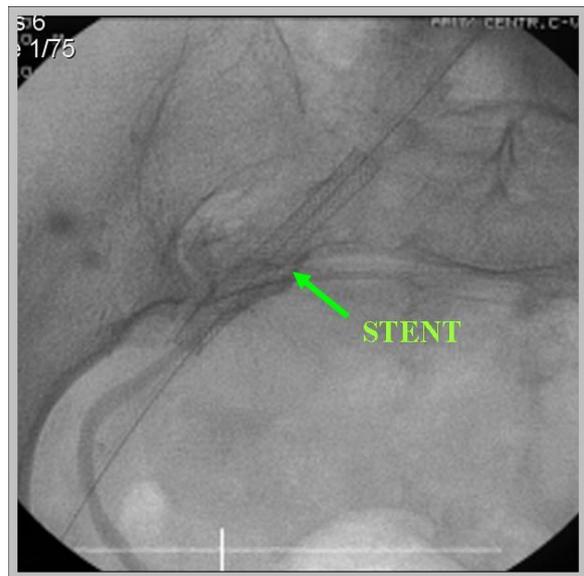


Fig. 3, 4 - Angiographic image of the right iliac stenosis and stent placement

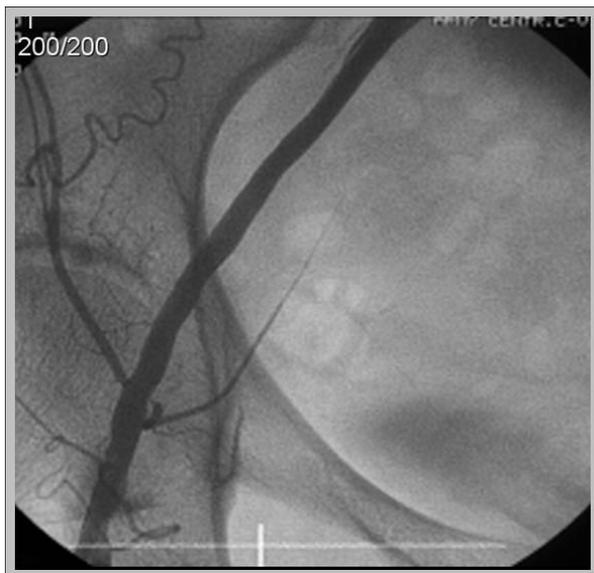


Fig. 5 - Completion angiography showing the restoration of normal blood flow.

The technical success of the procedure was proven by the presence of a palpable pulse distal to the surgical reconstruction, at the left posterior-tibial artery, along with the amelioration of the symptomatology. The patient had an uneventful postoperative course and was discharged 4 days after surgery with anticoagulant, antiagregant and antibiotic treatment.

DISCUSSIONS

The endovascular treatment of iliac occlusive disease has evolved over the last two decades. Balloon angioplasty and stent technology, along with endovascular techniques and imaging, have improved significantly. This has led to the preferential endovascular treatment of iliac stenosis with balloon angioplasty and stent placement. Technical success is achieved in almost all of the cases with a neglectable rate of postinterventional morbidity.

Iliac PTA/stenting has high rates of patency, and, more importantly, there is a significant improvement in functional outcome for the individual patient. (Christopher D. Leville et al., 2005)

Becker et al. found 5-year patency rate of 72% in an analysis of 2697 cases from the literature, noting a better patency of 79% in claudicants. (Becker GJ et al., 1989) Rutherford and Durham found a similar 5-

year patency of 70%. A recent study reported a primary patency of 74% (primary assisted patency of 81%) 8 years after stent placement suggesting durability of patency of iliac artery stenting. (Murphy TP et al., 2004) Factors negatively affecting the patency of such interventions include quality of run-off vessels, severity of ischemia and length of diseased segments. Female gender has also been suggested to decrease patency of external iliac artery stents.

Infrainguinal bypass procedures need to arise from a patent and uncompromised inflow artery although the actual level (common femoral artery versus superficial femoral or popliteal artery) does not correlate with patency. If the infrainguinal bypass is constructed following an inflow procedure, patency is improved by making the proximal anastomosis to a native artery (in the case of iliac stenting) rather than the inflow graft (usually limb of aorto-bifemoral bypass). (Lam E et al., 2004)

Regarding the material used for the infrainguinal by-passes, the five-year assisted patency rates in grafts constructed with vein approach 60% and those constructed with prosthetic material are usually

less than 35%. (L. Norgren et al., 2006)

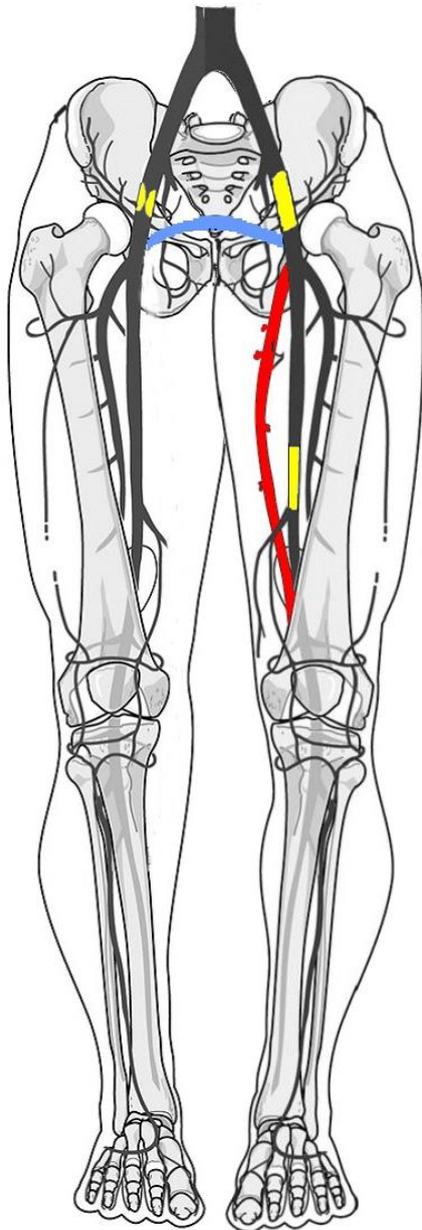


Fig. 6 - Surgical interventions performed

CONCLUSIONS

The treatment of iliac artery occlusion can be accomplished via endovascular means with little morbidity and with acceptable patency and limb salvage rates. The TASC stratification is an important tool in allowing us to assess the extent of lesion morphology, but extensive lesions do not preclude successful endovascular treatment. The fate of the limb is dictated by the infrainguinal disease that is often present in patients with complex iliac occlusions. We believe that endovascular attempts should be exhausted before attempting open surgical repair of iliac occlusions.

We must await further studies and experiences before a more aggressive application of PTA / stenting as first intention treatment of more widespread iliac disease (TASC B, TASC C) before an infrainguinal surgery.

AUTHOR CONTRIBUTION

All authors have contributed equally to the present work.

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