

Clinical case
compilation

iVascular Grant 2019 Magazine

iVascular
therapies for living

10 years

ENDOVASCULAR FOUNDATION

Case 1

TASC D revascularisation on the aortic-iliac branch. A case report

Main author
Dr. Robert Amorim Gomes

Hospital, city, country
Hospital Felicio Rocho, Belo Horizonte, Brazil

Products used
iVolution, restorer, oceanus 35

Lesion location
Femoral and iliac arteries

Case presentation:

A 73-year-old female patient with high blood pressure was sent to the emergency room on 24 April, 2019 by the attending clinician for pain in her lower right limb and local cyanosis for the past 2 weeks. At the consultation, she reported chest pain, but denied the presence of trophic lesions, paraesthesia, or paresis of the lower limbs. Clinical examination revealed the absence of bilateral femoral, popliteal, or distal pulses, and no flow could be detected using a portable Doppler device. She had constant cyanosis and pallor in her right foot, bilateral coldness, but preserved sensitivity and motor function, characteristic of a Rutherford 4 critical limb ischemia (CLI) classification.

An arterial duplex ultrasound revealed occlusion of the right femoral artery along its length, no signs of blood flow, and probable occlusion of the popliteal artery and right tibial and fibular arteries. In addition, the left common femoral artery was occluded and the left femoral, popliteal, tibial, and fibular arteries had a reduced flow. The patient was hospitalised for a computed tomography (CT) scan angiography and treatment.

CT scan angiography

Revealed partial occlusion in the terminal segment of the aorta; left common iliac artery, left internal iliac, and left external iliac occlusion along their extensions; severe stenosis of the right common iliac artery but no significant stenosis of the right external iliac artery; occlusion of the right internal iliac artery and right femoral artery; 70% stenosis of the deep right femoral artery; occlusion of the right popliteal artery and anterior and posterior tibial arteries; patency of the right fibular artery; occlusion of the left common femoral artery; patency of the left superficial femoral artery and popliteal artery; and the posterior left tibial artery was patent in the proximal segment (figure 1).

Treatment

The patient was hospitalised for elective endovascular treatment of the occluded aorto-iliac segment. We gained access through the right femoral artery and positioned a 6Fr introducer sheath; angiography revealed an occluded right common iliac artery and stenosis in the right external iliac artery. The lesions were crossed with a 0.035" guidewire and internal mammary catheter in the aorta. The patient was systemically heparinised (as guided by an activated clotting time (ACT) score exceeding 200 s).

Aortography identified an occlusion of the left common iliac artery, external iliac artery, and proximal segment of the common femoral artery.

We unsuccessfully attempted to access the common femoral artery and left popliteal artery, but were able to access the right brachial artery where we positioned a 6Fr introducer sheath. Using the 90cm long sheath, we crossed the lesions in the left segment with a 0.035" guidewire and a vertebral catheter (figure 2). The lesions were dilated bilaterally with a 5 × 150 mm oceanus 35 dilatation balloon catheter and we positioned a 8 × 58 mm peripheral stent restorer on the right and a 8 × 38 mm one on the left using a kissing stent technique in the distal aorta and bilateral iliac joint (figure 3). We positioned a 8 × 150 mm self-expanding iVolution and a 8 × 60 mm one in the left segment (figure 4), with recanalisation of the left iliac axis. We also placed a 9 × 100 mm self-expanding iVolution stent in the right segment. Next, we dilated the stents with an 8 × 80 mm oceanus 35 balloon. A new angiography was done, demonstrating bilateral aortoiliac axis recanalization (figure 5).

Conclusion and case summary:

In the immediate postoperative period in the ICU an attack dose of clopidogrel was administered followed by maintenance doses of an AAS and clopidogrel. In initial postoperative period the patient reported the absence of pain, the puncture sites showed no signs of bruising, and the bilateral femoral pulses were present. She was discharged the next day without pain. At a follow-up in June 2019, the patient reported improvement in her pain levels at rest.

According to the 2007 Transatlantic Inter-Society Consensus (TASC II) guidelines, surgery is the preferred treatment for extensive (TASC II types C or D) aortoiliac occlusive disease (AIOD). However, recent studies have shown that endovascular management can be an effective first-line treatment option for these TASC II categories. This is only now possible with new pharmaceutical industry innovations such as the materials developed by iVascular that allow a high patency index in the short and medium-term, even in the presence of complex TASC II type C or D lesions.

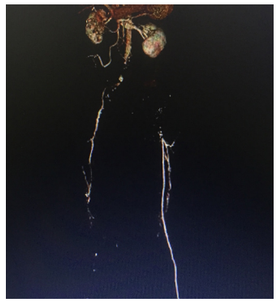


Figure 1. CT angiography of all the legs.



Figure 2. Iliac artery angiography.



Figure 3. Kissing stent technique using two restorer stents.



Figure 4. iVolution stent in the right segment.

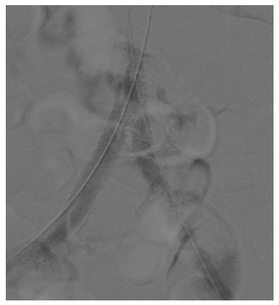


Figure 5. Final outcome after the treatment.

Bibliography:

1. Rutherford's Vascular Surgery and Endovascular Therapy, 2-Volume Set, 9e
2. Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II) L. Norgren,a W.R. Hiatt,b J.A. Dormandy, M.R. Nehler, K.A. Harris, and F.G.R. Fowkes on behalf of the TASC II Working Group, Örebro, Sweden and Denver, Colorado.
3. Endovascular Reconstruction for Chronic Infrarenal Aortoiliac Occlusive Disease Russell J. Pepe, B.A, Priya Patel, M.D, Lauren A. Huntress, M.S, Naiem Nassiri, M.D, Founder & Director

Case 2

Difficult SFA and Popliteal revascularization

Main author
Dr. Sviatoslav Denysov

Hospital, city, country
Clinical Hospital Feofaniya Kiev, Ukraine

Products used
luminor 35, oceanus 35

Lesion location
Femoral and popliteal arteries

Case presentation:

A 78-year-old, male, heavy smoker presented with claudication (pain-free walking distance of up to 50 meters) with an evolution of one year and right leg pain. He had no renal dysfunction or diabetes mellitus. His blood pressure was 140/70.

Treatment

First, we took a contralateral approach using 6F-guided Destination® introducer to open the proximal part of the SFA. We crossed the occlusion using a 0.035" stiff wire with support from a JR 5F. We saw it appear in the subintimal space in the distal part of the SFA but were unable to cross the proximal part using an OTW oceanus 5-60 mm coaxial catheter. We performed pre-dilatation near the proximal part, but the balloon did not cross the lesion, and so we changed the guidewire to a 0.014" wire and used a 2.0–150 mm low-profile balloon to cross the proximal part.

Next, we changed the guidewire back to a 0.035" wire and performed angioplasty in the proximal and middle part of the SFA. However, we were unable to obtain intraluminal Gunter channel access due to a weak support from contralateral approach. Thus, we performed a right antegrade SFA puncture to increase the support for crossing. We gained intraluminal access using a rigid 0.035" wire with OTW oceanus 35 5–120 mm (figure 2) support in the popliteal artery with subsequent angioplasty, but were unable to gain subintimal space access to the tibioperoneal trunk.

A JR 5F was used to reinsert the guidewire into the intraluminal space which was then inserted into the anterior tibial artery. We crossed with angioplasty of the tibioperoneal trunk and popliteal artery using a 5–120 mm OTW oceanus 35 catheter. The angiogram result was good and antegrade flow was restored without flow-limiting dissections. We subsequently performed OTW tibioperoneal trunk and the popliteal artery using a OTW DCB luminor 35 5–150 mm (figure 5). In the control angiogram we detected a dissection so we implanted a stent of 5–80 mm and we performed a post-dilatation catheter using an oceanus 35 5-60 mm.

We then performed angioplasty through the left femoral artery using an OTW luminor 35–150 mm in the proximal part of the right SFA and in the common femoral artery. We got out the 6-F sheath from the right SFA making an hemostaisi and angioplasty in the same time. No bleeding from the puncture site after 3 minutes of inflation. Good angio control, left access was closed using a angioseal 6F.

Conclusion and case summary:

The patient was discharged from hospital the following day and was pain-free when walking up to 800 m. 5 hours in the Cath lab but with excellent results.



Figure 1. Angiography of the proximal part of the SFA

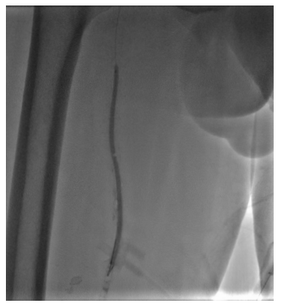


Figure 2. oceanus 35 inflated in the SFA

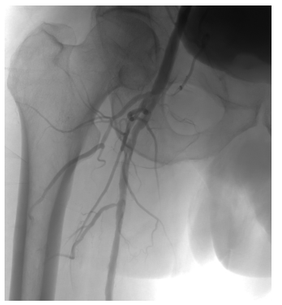


Figure 3. After oceanus 35 inflation



Figure 4. Popliteal artery angiography.



Figure 5. Popliteal artery treated with luminor 35.



Figure 6. Popliteal artery after the treatment.

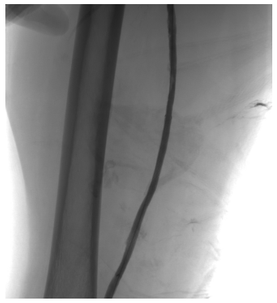


Figure 7. SFA artery after the use of luminor.

Bibliography:

1. Endovascular interventions / edited by Jose M. Wiley, Cristina Sanina, Peter Faries, Ian Del Conde, George D. Dangas, Prakash Krishnan.
2. Endovascular interventions (Wiley). Description: Hoboken, NJ: Wiley-Blackwell, 2019.

Case 3

Endovascular treatment of unilateral iliac stent oclusion after 'kissing stent' angioplasty using iVascular peripheral devices

Main author
Dr. Felipe Mavignier Pereira França

Hospital, city, country
Sociedade Portuguesa de Beneficência - Ribeirão Preto, Brazil

Products used
iVolution, restorer

Lesions location
Femoral and iliac arteries

Case presentation:

A 75-year-old man presented at our institution with intermittent claudication (with onset after 10 m) during 1 month prior which had evolved into the presence of pain at rest in his left leg the week before he was admitted. The patient had a clinical history of diabetes, ischemic heart disease, and high blood pressure but no history of smoking. A previous intervention had been performed on his iliac arteries at another institution 3 years prior, which had been documented as bilateral iliac angioplasty (a 'kissing stent'). The patient already had an optimised status for clinical treatment.

Physical examination revealed the presence of all the pulses in the right leg but no palpable pulse in his left leg (the affected limb); no trophic lesions or cyanosis were present. There was a discreet coldness in his left foot and the ankle brachial pressure index was severely reduced at 0.4. Laboratory analytical tests showed Hb 15.5 g/dL, 8,800 leukocytes, platelets 189,000, serum creatinine 1.2 g/dL, BUN 41 g/dL, and fasting glucose 288 g/dL.

The electrocardiogram examination and the chest radiography showed a normal sinus rhythm with no abnormalities. Doppler ultrasonography showed a low-amplitude biphasic arterial flow in the femoropopliteal area of the left leg but distal artery flow was difficult to evaluate because of low blood flow.

Treatment

With the patient in the supine position and with spinal anaesthesia, percutaneous access was gained to the right common femoral artery with fluoroscopic guidance in our hemodynamic laboratory, and a 6F sheath was placed. A 5F diagnostic catheter (mammary catheter) was selected and was threaded up and over the aortic bifurcation followed by the administration of a therapeutic dose of heparin. A diagnostic angiography was then performed using a non-ionic contrast agent which revealed the presence of bare-metal stents in both the common iliac arteries and occlusion of the stent on the left side (figure 1). No femoral collateral filling was observed (figure 2).

We gained percutaneous access to the left common femoral artery with guidance with a portable US device, and placed a 6F sheath (figure 3). We then successfully performed a retrograde crossing of the occlusion in the left common iliac artery with a 5F diagnostic vertebral catheter and 0.035" stiff guidewire, guided by using the roadmap technique. Confirmation of intraluminal recanalisation was performed via the aortic bifurcation (figure 4).

Bilateral expandable balloon stent angioplasty was then performed using a 8.0 mm × 58 mm restorer stent in the left common iliac artery and a 8.0 mm × 38 mm restorer stent in the right common iliac artery, using the kissing stent technique (figure 5). Next, balloon angioplasty was performed (figure 6). Due to extensive dissection of the distal left common iliac artery (figure 7), an 8.0 mm × 60 mm iVolution self-expanding bare-metal stent was placed (figure 8).

The post-angioplasty angiographic results were suboptimal because there were critical stenosis of the proximal SFA (figures 9 and 10). Percutaneous antegrade access was gained to the superficial femoral artery using a portable US device, and a 6F sheath was placed. An expandable balloon stent angioplasty was then performed using a 6.0 mm × 18 mm restorer stent in the left SFA (figure 11). The final angioplasty result was good with no critical residual stenosis and good distal outflow was observed (figures 12, 13, 14, 15).

Finally, an attack dose of aspirin (200 mg) and clopidogrel (300 mg) was administered at the very end of the procedure. The clinical course of the patient was uneventful and he was discharged the following day. His ischemic pain completely resolved and his ankle-brachial-index increased to 0.88. The patient was put on treatment with 100 mg aspirin, 20 mg simvastatin, 75 mg clopidogrel, and 200 mg cilostazol per day.

Conclusion and case summary:

There are several advantages to treating CIA occlusions with an ipsilateral retrograde femoral approach, especially when a portable US device is available. An obvious advantage is the use of the CFA itself because of its useful morphological features that make it suitable for vascular access in general, including its consistent anatomy, superficial location, large calibre, and because haemostasis can easily be achieved at the puncture site by compression against the femoral head[1]. Contralateral femoral access allows contralateral CIA occlusions to be approached in order to perform the kissing stent technique.

Perhaps the greatest advantage of the femoral approach is that it avoids the use of brachial access to reach CIA occlusions via an anterograde approach. The diameter of the brachial artery is significantly smaller than that of the CFA and its use was associated with an access site-related complication rate of 6.5% in one large study[2]. The contralateral femoral approach can be difficult or even impossible in the presence of bilateral aorto-iliac stents, previous aorto-bifemoral surgical reconstruction, or heavy concentric calcification with a narrow aortic bifurcation angle[1].

Kissing CIA stents that project symmetrically upward into the terminal aorta for a variable distance are commonly used to treat obstructive aortic bifurcation lesions[3]. Such stents, especially those with a small cell size, are likely to obstruct the passage of interventional hardware from one CIA to the other through the two opposed layers of metal at the aortic bifurcation[4]. These stents can also become permanently deformed during such manoeuvres, which could lead to obstructed blood flow and stent thrombosis.

Passage of interventional hardware through an occluded stent in the CIA by taking an antegrade femoral approach is feasible and safe using the technique described here. This enables anterograde access to the iliac arteries and further on, without having to resort to brachial artery access and thus, avoiding the risks associated with this latter technique.

Figures

Bibliography:

1. Grenon S.M., Reilly L.M., Ramaiah V.G. Technical endovascular highlights for crossing the difficult aortic bifurcation. J Vasc Surg. 2011;54:893–896.
2. Alvarez-Tostado J.A., Moise M.A., Bena J.F. The brachial artery: a critical access for endovascular procedures. J Vasc Surg. 2009;49:378–385.
3. Houston J.G., Bhat R., Ross R. Long-term results after placement of aortic bifurcation selfexpanding stents: 10 year mortality, stent restenosis, and distal disease progression. Cardiovasc Intervent Radiol. 2007;30:42–47.
4. Kirsch D., Lopera J., Zhong Q. In vitro evaluation of side-branch creation in metal stents by balloon dilatation. J Appl Res. 2003;3:380–387.

Case 3

Figures

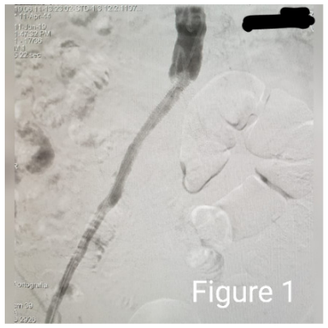


Figure 1. Angiography showing the left iliac occlusion.

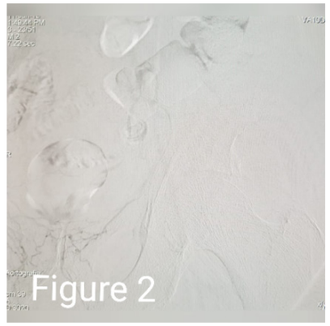


Figure 2. No blood flow in the femoral artery

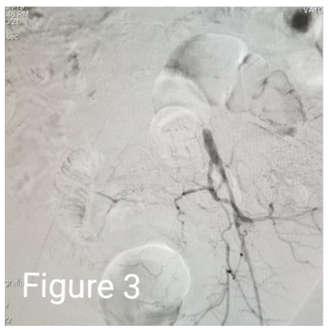


Figure 3. Angiography of the left common femoral artery.

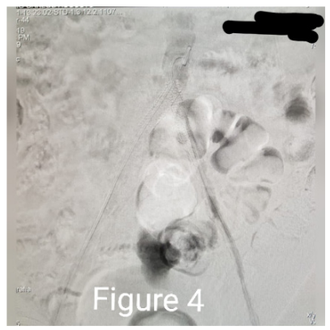


Figure 4. Recanalitzation in the aortic bifurcation.

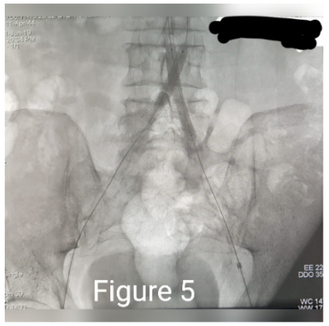


Figure 5. Kissing stent technique with restorer.

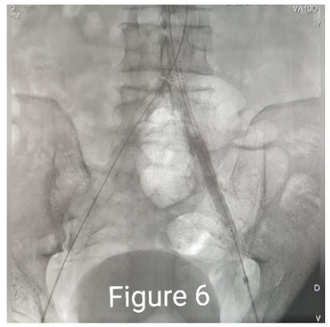


Figure 6. Balloon angioplasty.

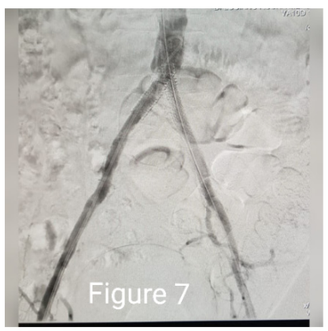


Figure 7. Dissection in the common iliac.

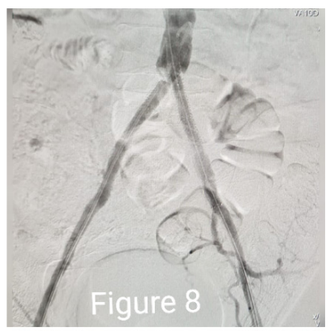


Figure 8. iVolution placed in the common iliac artery.

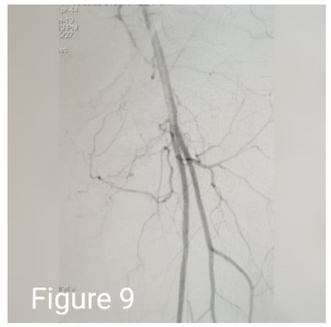


Figure 9. SFA with critical stenosis.

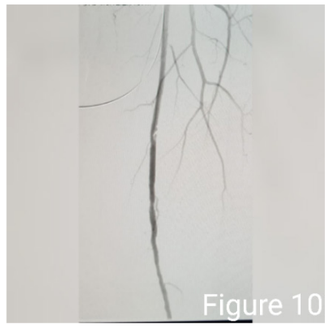


Figure 10. SFA with critical stenosis.

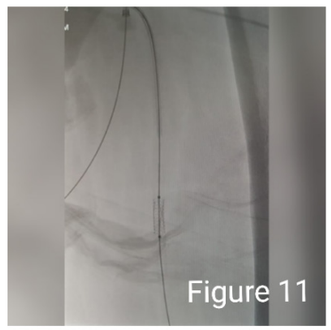


Figure 11. SFA treatment with restorer balloon expandable stent.

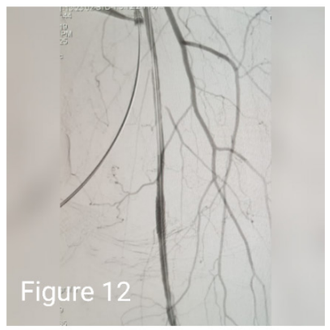


Figure 12. SFA after the treatment with restorer.

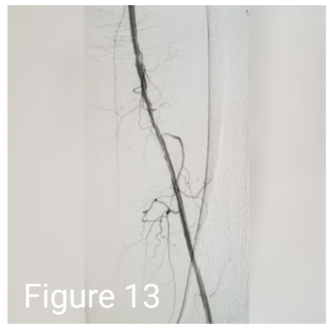


Figure 13. Angiographic control after the treatment.

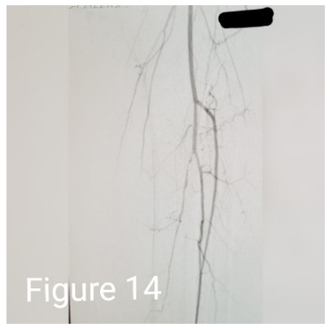


Figure 14. Angiographic control after the treatment.

Case 4

Multiple PTAs in a heavily-diseased SFA and PA in a young patient

Main author
Dr. Marko Svencbir

Hospital, city, country
University Clinical Centre Ljubljana, Grobelno, Slovenia

Products used
luminor 18, oceanus 18

Lesion location
Femoral and popliteal arteries

Case presentation:

A 44-year old female patient was admitted to our outpatient hospital for a planned right SFA and right femoropopliteal segment PTA. She suffered from peripheral arterial occlusive disease (PAOD) and had undergone several angioplasties as well as bilateral below-the-knee amputations (last performed on 15/12/2017). She presented pain in both legs, even at rest, which was more pronounced on the right side. She also had chronic ischemic wounds on her remaining right leg which was not healing properly.

In terms of associated diseases, she suffered from type-1 diabetes mellitus, diabetic neuropathy and retinopathy, kidney failure requiring haemodialysis, ischemic heart disease, renal anaemia (she suffered STEMI, and had had kidney transplantation and explanation of the transplanted kidney). She had a left transjugular haemodialysis port and a right transjugular therapeutic port. She was allergic to penicillin and glucagon and was a non-smoker.

Current therapy: insulin, dual antibiotic therapy, LMWH therapy, dual antiplatelet therapy, PPI therapy, and antihypertensive drug therapy.

Status at admission: orientated, cardiorespiratory compensated, BP: 108/80 mmHg, pulse: 67/min. Weak femoral pulses were present on both sides upon palpitation and distal pulses were not palpable.

Treatment

Taking a left femoral retrograde approach, we crossed to the contralateral side using a 4Fr introducer. Angiography showed a subtotal narrowed right SFA and PA (figure 1) as well as occlusion in the distal third of the left SFA. The arteries below the knee were closed on both sides (figure 2) . We successfully recanalised the long occlusion in the right side of the SFA. We also pre-dilated the entire femoropopliteal segment and narrowed SFA, starting with a 3 mm balloon (oceanus 18). Then we dilated the right SFA with a 4 mm diameter DCB (luminor 18) and the PA (to the joint incision) and the rest of SFA with 4 mm balloon (oceanus 18) (figure 4). During the procedure the patient received 3,000 IU of heparin intra-arterially.

A control angiography showed good flow through in the right SFA and PA and extensive collateral flow below the knee (figure 5 and 6). The procedure was free of complications and the patient showed complete manual haemostasis at the time of discharge from our ward.

Conclusion and case summary:

Performing this procedure was technically difficult because the diseased segment of the SFA and PA was extensive. It was also a very delicate procedure due to the seriousness of the patient's comorbidities and her age. The guidance and skill of an experienced interventional radiologist was required, especially to recanalise the long diseased SFA segment. In our experience, the pre-dilatation of lesions with smaller balloons is crucial in order to avoid damaging heavily-diseased vessels.

We used a DCB (luminor 18) on the most diseased part of the SFA (a site which had had multiple prior PTAs and repeated occlusions) given that paclitaxel-coated balloons have shown antiproliferative efficacy in the treatment and prevention of restenosis.

The follow-up results obtained in the angiology clinic were very good: the patient remained pain free one month after the procedure and three out of four of her chronic ulcers had already healed. The patient was scheduled for a computed tomography angiography (CTA) scan 3 months after this procedure (on a day she was scheduled for haemodialysis), where more data will be gathered regarding the patency of the SFA and PA of the right lower extremity.

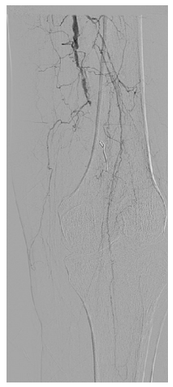


Figure 1. Narrowed SFA.

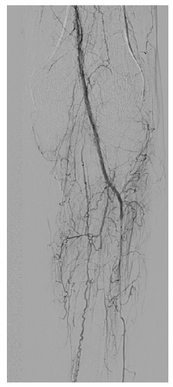


Figure 2. Narrowed PA.



Figure 3. luminor treating the SFA.

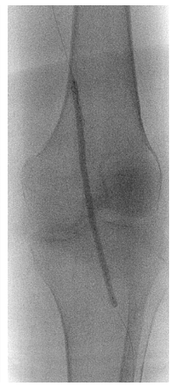


Figure 4. Angioplasty with oceanus in the PA.

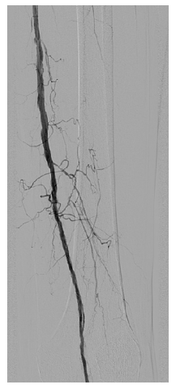


Figure 5. Control angiography.



Figure 6. Control angiography.

Bibliography:

1. McCarthy RJ, Neary W, Roobottom C, Tottle A, Ashley S. Shortterm results of femoropopliteal subintimal angioplasty. Br J Surg 2000; 87: 1361–1365.
2. Katsanos K., Spiliopoulos S., Kitrou P., Krokidis M., Karnabatidis D.(2018) Risk of death following application of paclitaxel-coated balloons and stents in the femoropopliteal artery of the leg: a systematic review and meta-analysis of randomized controlled trials. J Am Heart Assoc 7:e011245.
3. Micari A., Brodmann M., Keirse K., et al.(2018) Drug-coated balloon treatment of femoropopliteal lesions for patients with intermittent claudication and ischemic rest pain: 2-year results from the IN.PACT Global Study. J Am Coll Cardiol Intv 11:945–953.
4. Iida O., Soga Y., Urasawa K., et al.(2019) Drug-coated balloon versus uncoated percutaneoustransluminal angioplasty for the treatment of atherosclerotic lesions in the superficial femoral and proximal popliteal artery: 2-year results of the MDT-2113 SFA Japan randomized trial. Catheter Cardiovasc Interv 93:664–672.

Case 5

Left superficial femoral artery angioplasty

Main author
Dr. Rokas Gircius

Hospital, city, country
Vilnius University Hospital Santaros Clinics, Vilnius, Lithuania

Products used
iVolution

Lesions location
Femoral arteries

Case presentation:

A 64-year-old female patient presented in January 2019 with chronic ischemia (Rutherford grade 2–3) in both lower limbs. CTA was performed on 17 January, 2019 and show SFA occlusions in the middle segments on both sides (figure 1). The patient was lost to follow up for almost a year but reappeared in late 2019.

Treatment

A successful angioplasty was performed on 5 December, 2019. An antegrade puncture of the left CFA was performed, following injection of 5000 IU of heparin. After attempts with multiple intraluminal wires, it was impossible to cross the heavily calcified lesion present and so, a subintimal route was chosen. After a successful re-entry into a true lumen (distally to the lesion), a balloon angioplasty was performed with a 4 × 200 mm balloon, and then the segment was stented with 7 × 200 mm and 7 × 150 mm iVolution self-expanding stents (figure 4-5). Post-dilation was performed with a 5 × 40 mm balloon and a puncture site closure device was applied. Subsequently, 15,000 IU/24 h of heparin was infused alongside a single initial dose of 300 mg clopidogrel followed by the prescription of 60 days of clopidogrel (75 mg/day) therapy.

Conclusion and case summary:

After the procedure, the patient reported relief of the pain. We recommended the patient also consider SFA treatment on the right side.



Figure 1. CTA showing occlusions on both sides.

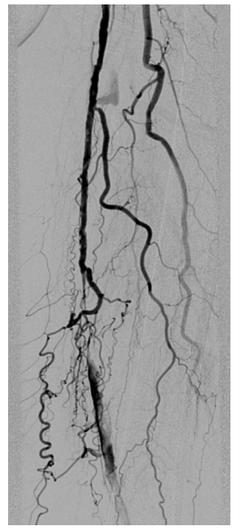


Figure 2. Left SFA angiography.

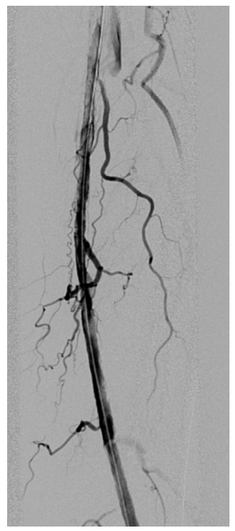


Figure 3. After the angioplasty.

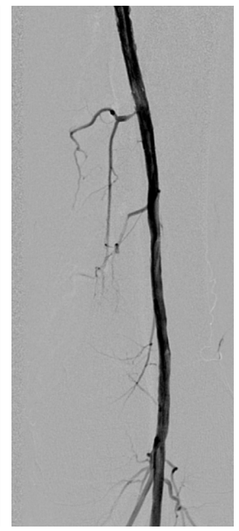


Figure 4. After iVolution stent placement.

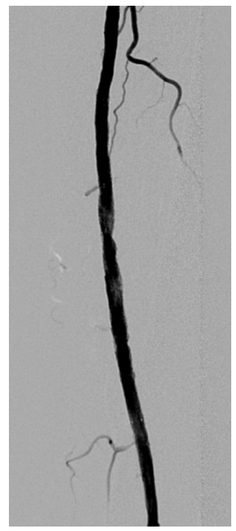


Figure 5. After iVolution stent placement.

Bibliography:

1. Society for Vascular Surgery (SVS), European Society for Vascular Surgery (ESVS), and World Federation of Vascular Societies (WFVS): Global vascular guidelines on the management of chronic limb-threatening ischemia (2019) Schillinger M, Sabeti S, Loewe C, et al. Balloon angioplasty versus implantation of nitinol stents in the superficial femoral artery. N Engl J Med 2006; 354:1879.
2. Davaine JM, Quérat J, Guyomarch B, et al. Primary stenting of TASC C and D femoropopliteal lesions: results of the STELLA register at 30 months. Ann Vasc Surg 2014; 28:1686.

Case 6

Critical ischaemia rescue in a patient managed with plastic and orthopaedic surgery

Main author
Dr. Davidson Osorio Lozano

Hospital, city, country
San José de Buga Hospital. Guadalajara de Buga, Colombia

Products used
luminor 14m, luminor 18

Lesion location
Infrapopliteal arteries

Case presentation:

A 68-year-old woman, with diabetes, hypertension, dyslipidemia, with a right pre-tibial ulcer that was debrided up to 4 times by orthopedics. An intermittent negative pressure system (VAC) was applied in the context of an initial superinfection and poor outcome after each surgical intervention. She was referred to plastic surgery, which in turn requested a consultation with vascular surgery due to the large expanse of the bloodied area and destruction of the debrided bed (wound).

After 7 days of hospital admission, an interconsultation was made by vascular surgery, observing the absence of infrapopliteal pulses in the lower right limb and a large deep recently debrided ulcer wound, partial exposure of tendons and poorly perfused ischemic margins with distal capillary refill greater than 3 seconds .

A selective angiography of the lower right limb was performed, which showed multiple stenoses of the three infrapopliteal distal axes, occlusion of posterior fibular and tibial arteries in the middle third of the leg (figure 1 and 2).

Treatment

Posterior tibial rechanneling was performed up to the middle third of the leg with a luminor 18 of 2x120mm and of the anterior tibial up to the plantar arches using luminor 14m of 2x150mm (figure 3 and 4) with restoration of patency of the plantar arch, all the anterior tibia, with recovery of pedal pulse. Difficult maneuver due to fragility of the distal arteries and their tortuousness.

After all this, the case was discussed with the orthopedic and plastic surgery departments to provide feedback on the good results, and suggest them that an initial assessment should be made by vascular surgery prior to any aesthetic or reconstruction surgery, with the aim of increasing the possibilities of salvaging the critical ischemia limbs. After this intervention, the diabetic foot group of the Fundación Hospital San José de Buga started, and is still in development.

Conclusion and assessment of the case:

Occlusive disease in the infrapopliteal arteries is typically presented by patients suffering from diabetes type 1 or 2 and can also affect the infrainguinal sector.

As a fundamental basis on limb salvage, direct and pulsatile arterial flow must be re-established in the majority of arteries and to the most distal region possible, using rechanneling and revascularization techniques with low profile endovascular material.

The follow-up of the revascularised limb with Doppler arterial ultrasound is essential, with the aim of identifying the arterial re-stenosis typical of diabetic arterial disease and resolving them as soon as possible.

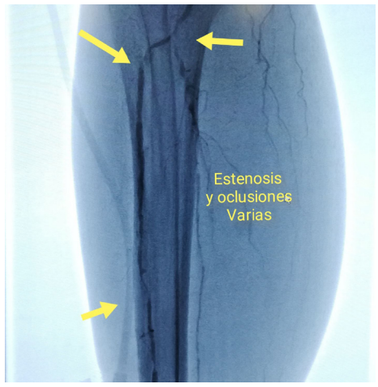


Figure 1. Angiography with several stenosis and oclusions.

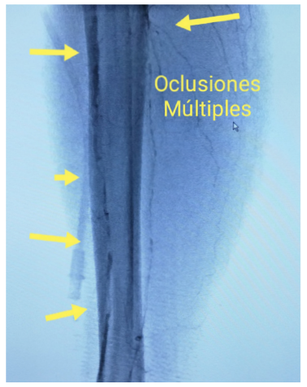


Figure 2. Angiography with several oclusions.

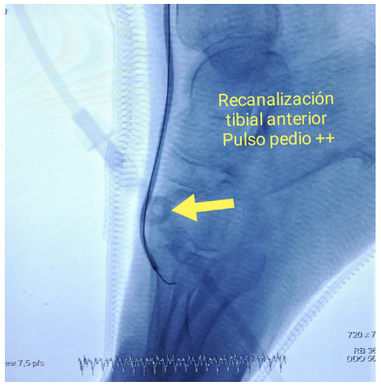


Figure 3. Recanalitzation with luminor.



Figure 4. Recanalitzation with luminor.

Bibliography:

1. Jude EB, Oyibo SO, Chalmers N, Boulton AJ. Peripheral arterial disease in diabetic and nondiabetic patients: a comparison of severity and outcome. Diabetes Care. 2001;24(8I):1433–1437. doi: 10.2337/diacare.24.8.1433. [PubMed]
2. Criqui MH, Aboyans V. Epidemiology of peripheral artery disease. Circ Res. 2015;116(9I):1509–1526. doi: 10.1161/CIRCRESAHA.116.303849.
3. Fowkes FG, Rudan D, Rudan I, Aboyans V, Denenberg JO, McDermott MM, Norman PE, Sampson UK, Williams LJ, Mensah GA, et al. Comparison of global estimates of prevalence and risk factors for periph.

Case 7

Angioplasty of complex popliteal and below the knee arteries

Main author
Dr. Rogerio Akira Yokoyama

Hospital, city, country
Hospital Evangélico Mackenzie de Curitiba, Curitiba, Brazil

Products used
iVolution

Lesion location
Popliteal and infrapopliteal arteries

Case presentation:

Here we describe the case of an 81-year-old Caucasian male with left leg CLI (critical limb ischemia) who was admitted to our hospital. He had a clinical history of dyslipidemia, hypertension, and hypothyroidism, and was treated with acetyl salicylic acid, bisoprolol, levothyroxine, and simvastatin. His surgical history referred to a laryngeal papilloma excision carried out the year before the admission. Prior to this surgery the patient had been a smoker with a more than 20 pack year habit. The patient referred ischemic rest pain in his left leg that had started 6 days prior. He did not have any ischemic ulcers or gangrene, although he previously had left leg claudication with onset at 200 m.

Physical examination revealed femoral, popliteal, and posterior tibial right leg pulses and only a left leg femoral pulse. His left and right leg ABI was 0.4 and 1.0, respectively. Laboratory tests were requested and showed no abnormalities. To program the revascularisation of the limb we opted for a CT scan that showed occlusion at the popliteal artery with a distal flow in the fibular (17.3 cm) and posterior tibial artery (23.2 cm) (figure 1). Because of the patient's age and possible complications related to a distal artery bypass, endovascular treatment was chosen.

Treatment

A local anaesthesia (1% lidocaine) was administered to the left groin. We used an ipsilateral antegrade percutaneous approach with a 6Fr sheath access to the common femoral artery. A bolus of 5000 IU of unfractionated heparin was administered intra-arterially, and then a hydrophilic, 0.035" guidewire with a J tip and a directional 5Fr angle-tapered directional catheter (Berenstein) were successfully advanced through the occlusion.

The re-entry points were through the fibular artery and posterior tibial artery. The diameter of the arteries was measured with Horos software and we chose the balloon size according to the computed tomography (CT) scan data. We chose three OTW balloons (5 × 150 mm, 4 × 60 mm, and 3 × 150 mm) to dilate the popliteal, tibiofibular trunk, and fibular artery. After the angioplasty, the arteriographic control images showed dissection and recoil and we opted to use two iVolution self-expanding stents (6 × 150 mm and 5 × 100 mm) in the popliteal artery. Control images showed improvement of the lesions after placement of the stents.

Conclusion and case summary

There were no postoperative events and the patient's symptoms improved. Physical examination showed femoral, popliteal, and posterior tibial pulses and an ABI of 1.0. The patient was discharged on the second postoperative day with treatment with dual antithrombotic therapy (ASA and clopidogrel) and cilostazol. Because of the joint line stent implantation, we advised the patient to avoid large and prolonged knee flexions. At the 1-month follow-up the patient was still asymptomatic and the physical examination showed femoral, popliteal, and posterior tibial pulses with an ABI of 1.0.

Because femoropopliteal TASC II C or D-classified complex lesions have a high incidence of stent fractures in the first year, we scheduled a knee x-ray to evaluate possible stent fractures. Despite this potential problem, the clinical impact was not large and endovascular reintervention was possible. In this case we observed that an endovascular approach in an elderly patient allowed an increased recovery speed and lower rate of bypass-related complications. In addition, in this case, the presence of the stent does not preclude the possibility of carrying out a possible future bypass, if necessary.

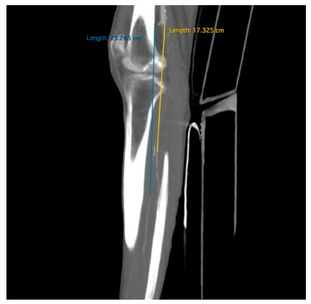


Figure 1. CT scan.


Figure 2. Popliteal artery angiography.


Figure 3. Tibial artery angiography.


Figure 4. Popliteal artery after balloon angioplasty.


Figure 5.


Figure 6. After iVolution placement.

Bibliography:

1. Jaff MR, White CJ, Hiatt WR, et al. An Update on Methods for Revascularization and Expansion of the TASC Lesion Classification to Include Below-the-Knee Arteries: A Supplement to the Inter- Society Consensus for the Management of Peripheral Arterial Disease (TASC II): The TASC Steering Comittee(.). Ann Vasc Dis. 2015;8(4):343–357. doi:10.3400/avd.tasc.15-01000
2. Garg K, Kaszubski PA, Moridzadeh R, et al. Endovascular-first approach is not associated with worse amputation-free survival in appropriately selected patients with critical limb ischemia. Journal of vascular surgery. 2014;59(2):392–399
3. Incidence and the clinical impact of stent fractures after primary stenting for TASC C and D femoropopliteal lesions at 1 year Davaine J.M., Querat J., Guyomarch B., Brennan M.A., Costargent A., Chaillou P., Patra P., Goueffic Y. (2013) European Journal of Vascular and Endovascular Surgery, 46 (2) , pp. 201-212.

Notes

iVascular Grant

grant.ivascular.global

ENDOVASCULAR FOUNDATION

Endovascularfoundation.org

iVascular® therapies for living | 10 years

www.ivascular.global