

## Retrograde recanalisation of popliteal artery occlusion

### Popliteal arter tıkanıklıklarına ters yönden yeniden yol açılması

Mehmet Ali Astarcioglu, M.D., Taner Şen, M.D., Halil İbrahim Durmuş, M.D.,# Basri Amasyalı, M.D.

Department of Cardiology, Dumlupınar University Evliya Çelebi Training and Research Hospital, Kütahya

#Department of Cardiology, Mustafa Kalemli State Hospital, Kütahya

**Summary**– The increasing prevalence of critical lower limb ischemia is frequently associated with complex tibioperoneal obstructive disease and a high rate of amputation. In this article, we report our recent experience in order to highlight this valuable and underutilised technique, which proved successful in a complicated case where a conventional approach failed.

A growing number of studies have demonstrated the clinical success of endovascular treatment in patients with critical limb ischemia (CLI) due to infrapopliteal lesions.<sup>[1]</sup> Retrograde pedal access may allow for the treatment of tibial occlusive lesions when standard endovascular techniques fail.

We have recent experience using this technique with a patient with CLI (Rutherford class IV) who was not a surgical candidate for tibial bypass, demonstrating the value of this technique in such complex cases.

#### CASE REPORT

A 71-year-old man presented with a 2-year history of intermittent claudication (Rutherford class IV). After an arterial duplex study revealed popliteal occlusion, endovascular therapy was pursued. Informed consent was obtained from the patient. Digital subtraction angiography was then performed, and the popliteal artery was found to be completely occluded over 15 cm, with filling of distally via collaterals (Figure 1a). Both the tibioperoneal and posterior tibial arteries displayed proximal stenoses, with the posterior tibial artery providing dominant flow to the foot. It was de-

**Özet**– Kritik alt ekstremitte iskemisinin artan prevalansı sıklıkla kompleks tibioperoneal obstrüktif hastalık ve artan amputasyon oranları ile ilişkilidir. Bu yazıda, geleneksel yöntemlerin başarısız olduğu zor olgularda başarılı olan, az kullanılan ve değerli bir teknikle ilgili yakın zamandaki deneyimimizi aktardık.

cided to treat these lesions using balloon angioplasty via a retrograde approach.

#### Abbreviations:

ATA Anterior tibial artery  
CLI Critical limb ischemia

An antegrade access site was first secured with an 8-F contralateral sheath. Under roadmap guidance, an 18-G needle was used to puncture the anterior tibial artery (ATA) at the level of the higher dorsum of the foot. After the vessel was punctured, a 5-F introducer sheath (Merit Medical Systems, USA) was positioned. The proximal anterior tibial and popliteal lesions were then crossed from below using a 0.035 inch hydrophilic nitinol guide wire (SP Medical, Denmark) and a 4-F straight catheter (Merit Medical Systems, USA). After administering 10,000 units of heparin, the retrograde wire was snared and brought through the antegrade guide catheter (Figure 1b-d).

The procedure was then completed in a conventional manner, using an antegrade common femoral approach. Balloon angioplasty of the proximal anterior tibial and popliteal lesions was performed, using 3.5x100 mm and 5.0x120 mm balloon catheters (Boston Scientific/Medi-Tech, USA) with prolonged (3–5 min) inflations at low pressure (6 atm), respectively.

Received: March 02, 2015 Accepted: April 07, 2015

Correspondence: Dr. Mehmet Ali Astarcioglu. Zeytinlik Caddesi, Emrah Sokak, 7/20, Atalar, Kartal, İstanbul.

Tel: +90 274 - 742 31 66 e-mail: maliastarcioğlu@hotmail.com

© 2015 Turkish Society of Cardiology





The proximal ATA and tibioperoneal trunk were stented with a 3.5x28 mm zotarolimus-eluting stent (Medtronic, Brescia, Italy) to optimize results (Figure

1e). The patient's subsequent hospital stay was uneventful, with persistence of both pedal and anterior tibial pulses and immediate relief of rest pain.

Due to the complex nature of the case, an aggressive antithrombotic regime was used (aspirin 100 mg indefinitely, clopidogrel 75 mg for 6 months, and cilostazol 2x100 mg for 6 months) in order to reduce restenosis rate following discharge.

## DISCUSSION

The growing prevalence of CLI, has increased the demand for minimally invasive therapies.<sup>[2]</sup> CLI is associated with poor prognosis, with only approximately 50% of patients surviving without major amputation after 1 year. The success rate of recanalization of infrapopliteal stenoses is significantly lower in cases with occlusion, ranging from 60%–80%, due to the inability to pass the occlusion with the guide wire.<sup>[3]</sup>

As previously described in the literature, a retrograde recanalization attempt using a transpedale access approach may increase the success rate of limb salvage for below-the-knee occlusions.<sup>[4–6]</sup> In previous reports, lesions have been crossed with 0.014”–0.018” guide wires retrograde, with the wire then captured in the femoral artery and PTA completed via antegrade approach. This case study yielded contrasting results, producing a higher rate of success by using 0.035” hydrophilic wires to cross heavily-calcified lesions.

Cilostazol is approved for treatment of intermittent claudication in peripheral vascular disease.<sup>[7]</sup> The use of cilostazol following percutaneous coronary intervention has been proven to reduce angiographic restenosis rates and improve clinical outcomes.<sup>[7]</sup> Although sufficient data is not presently available, we treated all complex interventions in this study—especially below-the-knee—with a triple antithrombotic therapy, including cilostazol. Encouragingly, recent trials focusing on patients with either diabetes or long lesions have found that cilostazol in combination with dual antiplatelet therapy achieves a significant reduction of late lumen loss.<sup>[8]</sup> However, further trials are needed to confirm these findings.

In conclusion, our findings demonstrate the benefits of this underused technique, particularly in complicated cases.

**Conflict-of-interest issues regarding the authorship or article: None declared.**

## REFERENCES

1. Bosiers M, Hart JP, Deloose K, Verbist J, Peeters P. Endovascular therapy as the primary approach for limb salvage in patients with critical limb ischemia: experience with 443 infrapopliteal procedures. *Vascular* 2006;14:63–9. [CrossRef](#)
2. Faglia E, Dalla Paola L, Clerici G, Clerissi J, Graziani L, Fusaro M, et al. Peripheral angioplasty as the first-choice revascularization procedure in diabetic patients with critical limb ischemia: prospective study of 993 consecutive patients hospitalized and followed between 1999 and 2003. *Eur J Vasc Endovasc Surg* 2005;29:620–7. [CrossRef](#)
3. Söder HK, Manninen HI, Jaakkola P, Matsi PJ, Räsänen HT, Kaukanen E, et al. Prospective trial of infrapopliteal artery balloon angioplasty for critical limb ischemia: angiographic and clinical results. *J Vasc Interv Radiol* 2000;11:1021–31.
4. Fusaro M, Tashani A, Mollichelli N, Medda M, Inglese L, Biondi-Zoccai GG. Retrograde pedal artery access for below-the-knee percutaneous revascularisation. *J Cardiovasc Med (Hagerstown)* 2007;8:216–8. [CrossRef](#)
5. Fusaro M, Dalla Paola L, Biondi-Zoccai GG. Retrograde posterior tibial artery access for below-the-knee percutaneous revascularization by means of sheathless approach and double wire technique. *Minerva Cardioangiol* 2006;54:773–7.
6. Fusaro M, Tashani A, Mollichelli N, Medda M, Inglese L, Biondi-Zoccai GG. Retrograde pedal artery access for below-the-knee percutaneous revascularisation. *J Cardiovasc Med (Hagerstown)* 2007;8:216–8. [CrossRef](#)
7. Biondi-Zoccai GG, Lotrionte M, Anselmino M, Moretti C, Agostoni P, Testa L, et al. Systematic review and meta-analysis of randomized clinical trials appraising the impact of cilostazol after percutaneous coronary intervention. *Am Heart J* 2008;155:1081–9. [CrossRef](#)
8. Soga Y, Yokoi H, Kawasaki T, Nakashima H, Tsurugida M, Hikichi Y, et al. Efficacy of cilostazol after endovascular therapy for femoropopliteal artery disease in patients with intermittent claudication. *J Am Coll Cardiol* 2009;53:48–53. [CrossRef](#)

**Key words:** Angioplasty, balloon; arterial occlusive diseases; ischemia/therapy; popliteal artery/radiography.

**Anahtar sözcükler:** Anjiyoplasti, balon; arteryel tıkaçıcı hastalık; iskemi/tedavi; popliteal arter/radyografi.