

Successful slow-dose infusion of thrombolytic therapy in a patient with stent thrombosis in the left common iliac artery

Sol ana iliyak arterde stent trombozu olan bir olguda başarılı yavaş doz trombolitik infüzyonu

Barış Kılıçaslan, M.D., Fahriye Vatansever, M.D., Cem Nazlı, M.D., Oktay Ergene, M.D.

Department of Cardiology, Atatürk Training and Research Hospital, İzmir

Subacute thrombosis of the peripheral stents is a rare but serious complication. A 55-year-old-man presented with a complaint of claudication in the left lower extremity of a two-year history. A weak left femoral artery pulse was elicited, but pulses in the left popliteal artery, tibialis anterior artery, and dorsalis pedis artery were absent. Upon detection of a critical stenosis (90%) in the mid portion of the left common iliac artery by peripheral arteriography, a self-expandable stent was implanted in the stenotic region. Four weeks after the procedure, he presented with severe pain in his left leg. Peripheral arteriography revealed total occlusion of the left main iliac artery due to stent thrombosis. Thrombolytic therapy with streptokinase was administered with a bolus dose of 250,000 IU followed by a slow infusion of 100,000 IU/hour for 24 hours. Angiography performed three days after the thrombolytic infusion demonstrated a patent left common iliac artery with no residual stenosis. To our knowledge, the use of a slow-infusion regime of thrombolytic therapy has not been reported previously.

Key words: Atherosclerosis; femoral artery/pathology; iliac artery/pathology; intermittent claudication; peripheral vascular diseases; streptokinase/therapeutic use; thrombolytic therapy/methods.

Subacute thrombosis of the peripheral stents is a rare but serious complication. Urgent selective intra-arterial thrombolytic therapy (as a bolus dose) has been reported to be an effective initial therapy for this complication. However, the use of slow-infusion thrombolytic therapy has not been reported previously.

CASE REPORT

A 55-year-old-man presented with a complaint of claudication in the left lower extremity of a two-year history. He had been using antihypertensive medica-

Periferik arteriyel stentlerde görülen subakut tromboz nadir, fakat önemli bir komplikasyondur. Elli beş yaşında erkek hasta, sol alt ekstremitesinde iki yıldır var olan geçici topallama yakınmasıyla başvurdu. Hastanın sol femoral arter nabızı zayıf bulundu; sol popliteal arter, tibialis anterior arter ve dorsalis pedis arterde nabız alınamadı. Periferik arteriyografide, sol ana iliyak arter orta bölümünde kritik darlık (%90) saptanması üzerine, darlık alanına kendiliğinden genişleyebilir stent yerleştirildi. İşlemden dört hafta sonra, hasta sol ayağında şiddetli ağrı yakınmasıyla tekrar başvurdu. Periferik arteriyografide, sol ana iliyak arterin stent trombozu nedeniyle tamamen tıkalı olduğu görüldü. Streptokinazla trombolitik tedaviye başlandı ve 250,000 İU bolus dozunun ardından 100,000 İU/saat olacak şekilde 24 saat süreyle yavaş doz infüzyon uygulandı. Trombolitik infüzyonundan üç gün sonra yapılan anjiyografide sol ana iliyak arterin açık olduğu ve darlık kalmadığı görüldü. Bildiğimiz kadarıyla, bu tür olgularda yavaş doz intravenöz infüzyon ile trombolitik tedavi uygulaması bildirilmemiştir.

Anahtar sözcükler: Ateroskleroz; femoral arter/patoloji; iliyak arter/patoloji; geçici topallama; periferik vasküler hastalık; streptokinaz/terapötik kullanım; trombolitik tedavi/yöntem.

tion (quinapril 20 mg daily) for five years and had been smoking for 25 years.

Physical examination showed a weak left femoral artery pulse and absence of pulses in the left popliteal artery, tibialis anterior artery, and dorsalis pedis artery. A transthoracic echocardiogram demonstrated mild myocardial hypokinesia in the left ventricular anterior wall and ejection fraction was calculated as 52% by the area-length method. Coronary angiography revealed noncritical coro-

Received: August 15, 2006 Accepted: October 11, 2006

Correspondence: Dr. Barış Kılıçaslan, 274/5 Sok. No:19/29 35030 Bornova İzmir.
Tel: 0232 - 342 97 20 Faks: 0232 - 425 52 21 e-mail: kilicaslanbaris@yahoo.com

nary plaques in the left anterior descending (LAD) and circumflex arteries. Bilateral peripheral arteriography revealed critical stenosis (90%) in the mid portion of the left common iliac artery (Fig. 1a). A self-expandable stent (6.0x44 mm, Jostent; Jomed, Helsingborg, Sweden) was implanted in the stenotic region of the left main iliac artery without any residual stenosis (Fig. 1b). On the following day, he was discharged from hospital with medical therapy of aspirin 100 mg 1x1, quinapril 20 mg 1x1, and

atorvastatin 20 mg 1x1. Four weeks after the procedure, he presented with severe pain in his left leg. On physical examination, pulses were absent in the left femoral artery, popliteal artery, dorsalis pedis and tibialis posterior arteries, but there was no pallor or necrosis in the left lower extremity. Bilateral peripheral arteriography revealed total occlusion of the left main iliac artery due to stent thrombosis (Fig. 1c). He claimed he had used his medications regularly since his previous discharge. Thrombolytic



Figure 1. (A) Arteriography before stenting showing left common iliac artery stenosis. (B) Stent in the left common iliac artery. (C) Stent thrombosis. (D) Patent left common iliac artery after thrombolytic therapy.

therapy with streptokinase was administered with a bolus dose of 250,000 IU followed by a slow infusion of 100,000 IU/hour for 24 hours. During thrombolytic therapy, his pain regressed gradually and all of the left lower extremity pulses became palpable. A control angiography performed three days after the thrombolytic infusion demonstrated a patent left common iliac artery with no residual stenosis (Fig. 1d).

DISCUSSION

Atherosclerosis is the major cause of lower extremity peripheral artery diseases. Risk factors for atherosclerosis such as cigarette smoking, diabetes, dyslipidemia, hypertension, and hyperhomocysteinemia may increase the likelihood of developing lower extremity peripheral artery diseases.

Lower extremity peripheral artery disease is a common syndrome that affects a large proportion of the adult population worldwide.^[1,2]

Despite high short-term success rates of both endovascular and surgical revascularization procedures, the possibility of recurrence remains lifelong. Early revascularization interventions is preferred for recurrent hemodynamic compromise, because delay in detection or treatment can lead to higher morbidity and poorer outcome.^[3-6]

The results of percutaneous transluminal angioplasty (PTA) and stent implantation in individuals with claudication depend on anatomic and clinical factors. Durability of patency after PTA is greatest for lesions in the common iliac artery and decreases distally and with increasing length of the stenosis/occlusion, and in the presence of multiple and diffuse lesions, poor-quality runoff, diabetes, renal failure, and smoking.^[7,8]

Randomized controlled trials and registry reports indicate that thrombolytic therapy may be used as an effective initial therapy in acute limb ischemia.^[3,9,10] Randomized trials and case series suggest that the use of intra-arterial thrombolytic therapy for acute limb ischemia is reasonably effective and comparable to surgery. The advantage of thrombolytic therapy is that it offers a low-risk alternative to open surgery in complex patients with severe comorbidities. Other advantages of immediate angiography in patients with acute limb ischemia include delineation of the limb arterial anatomy with visualization of both inflow and runoff vessels. Finally, thrombolytic therapy has the advantage, compared with surgical embolectomy, of

clearing intra-arterial thrombus from the distal runoff vessels, thereby potentially enhancing long-term patency.^[3,11]

In all previous studies, thrombolytic therapy was administered intra-arterially as a bolus dose. In this case, we administered thrombolytic therapy as a slow-dose intravenous infusion and had a successful outcome. In centers not having a catheter laboratory, this type of slow-dose intravenous infusion may be used as an emergency therapy for early limb salvage. It may also provide a time bridge for the patient before undergoing to arteriography or a possible revascularization procedure. However, more experience and further studies are needed for the universal use of this therapy.

REFERENCES

1. Criqui MH, Denenberg JO, Langer RD, Fronck A. The epidemiology of peripheral arterial disease: importance of identifying the population at risk. *Vasc Med* 1997;2:221-6.
2. Murabito JM, D'Agostino RB, Silbershatz H, Wilson WF. Intermittent claudication. A risk profile from The Framingham Heart Study. *Circulation* 1997;96:44-9.
3. Hirsch AT, Haskal ZJ, Hertzner NR, Bakal CW, Creager MA, Halperin JL, et al. ACC/AHA 2005 guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic). *J Am Coll Cardiol* 2006;47:1239-312.
4. Bartlett ST, Olinde AJ, Flinn WR, McCarthy WJ 3rd, Fahey VA, Bergan JJ, et al. The reoperative potential of infrainguinal bypass: long-term limb and patient survival. *J Vasc Surg* 1987;5:170-9.
5. Belkin M, Donaldson MC, Whittemore AD, Polak JF, Grassi CJ, Harrington DP, et al. Observations on the use of thrombolytic agents for thrombotic occlusion of infrainguinal vein grafts. *J Vasc Surg* 1990;11:289-94.
6. Brewster DC, LaSalle AJ, Robison JG, Strayhorn EC, Darling RC. Femoropopliteal graft failures. Clinical consequences and success of secondary reconstructions. *Arch Surg* 1983;118:1043-7.
7. Johnston KW, Rae M, Hogg-Johnston SA, Colapinto RF, Walker PM, Baird RJ, et al. 5-year results of a prospective study of percutaneous transluminal angioplasty. *Ann Surg* 1987;206:403-13.
8. Stokes KR, Strunk HM, Campbell DR, Gibbons GW, Wheeler HG, Clouse ME. Five-year results of iliac and femoropopliteal angioplasty in diabetic patients. *Radiology* 1990;174(3 Pt 2):977-82.
9. Diffin DC, Kandarpa K. Assessment of peripheral intra-arterial thrombolysis versus surgical revascularization in acute lower-limb ischemia: a review of limb-

- salvage and mortality statistics. *J Vasc Interv Radiol* 1996;7:57-63.
10. Results of a prospective randomized trial evaluating surgery versus thrombolysis for ischemia of the lower extremity. The STILE trial. *Ann Surg* 1994; 220:251-66.
11. Dormandy JA, Rutherford RB. Management of peripheral arterial disease (PAD). TASC Working Group. TransAtlantic Inter-Society Consensus (TASC). *J Vasc Surg* 2000;31(1 Pt 2):S1-S296.