

Alternative treatment approach to late graft occlusion of femoropopliteal artery: subintimal tracking and stenting to occluded native artery via transpedal pathway

Ersan Tatli, Mehmet Bulent Vatan, Murat Aksoy, Yusuf Can

Department of Cardiology, Sakarya University School of Medicine, Sakarya, Turkey

Postępy Kardiologii Interwencyjnej 2014; 10, 4 (38): 298–300
DOI: 10.5114/pwki.2014.46774

Abstract

There are various options for the treatment of occluded femoropopliteal (fem-pop) bypass graft. Although surgical revision is the gold standard, it is also associated with higher rates of complications such as nerve injury, wound and graft infection, and bleeding. In this case report we present the case of fem-pop in graft occlusion in which percutaneous angioplasty and stenting was performed to the occluded native fem-pop artery via transpedal pathway. With this case we tried to emphasise that percutaneous intervention to the native artery could be an alternative to surgical treatment.

Key words: femoropopliteal artery, occlusion, graft, transpedal pathway, stent.

Case report

A 59-year-old male patient had hypertension, diabetes mellitus, and a history of coronary bypass graft operation. Four years ago femoral-popliteal bypass surgery to bilaterally total occluded superficial femoral artery was performed. Peripheral angiography was performed due to ongoing severe (Rutherford class 3) claudication under medical treatment with cilostazol and clopidogrel. Angiography revealed that bilaterally the grafts were proximally occluded, the native external iliac artery was occluded before giving the superficial femoral artery branch, and the proximal part of the occlusion site could not be seen clearly (Figures 1 A, B). Primarily, intervention to right leg was planned. Magnetic resonance imaging revealed the distal arterial bed was patent, and intervention was planned via the transpedal pathway.

A 6 Fr radial sheath (Merit) was inserted to left brachial artery. A 5 Fr 125 cm HH1 (Merit) catheter and an AndraTec 0.035 inch – 180 cm hydrophilic guide wire was advanced to the abdominal aorta. The hydrophilic guide wire was changed to stiff wire (0.035 inch – 260 cm, Lokum, Amplatz/Andratec), a 6.5 Fr 90 cm angled sheathless catheter was advanced over the Amplatz wire, and afterwards transpedal puncture was performed. A 6 Fr radial sheath (Merit-Prelude) was inserted to the pos-

teriortibial artery (Figure 1 C). A 5 Fr STS catheter was advanced from the posterior tibial artery, and an unsuccessful attempt was made to penetrate the distal cap by Treasure Floppy Guide Wire.

Afterwards, we managed to cross by subintimal tracking with a 0.035–260 cm stiff body guidewire. After making sure that we were in the true lumen by tip injection, the guidewire was changed to a Treasure Floppy Guide Wire (Figures 2 A, B). We tried to enter the guiding catheter advanced from the brachial artery in a retrograde manner, but we were unable to do this. The guidewire was caught with 15 mm AndraSnare and externalisation was established. A Minnie micro 150 cm (VSI) catheter was advanced to the posteriotibial artery over the externalised guidewire. The guidewire was pulled back and the Treasure 0.018 guidewire was advanced in an antegrade manner. A 4.0 mm × 60 mm balloon was advanced in an antegrade direction and predilatation was performed (Figure 2 C). 7.0 mm × 210 mm, 6 mm × 40 mm self-expandable Polaris (Qualimed) stents were deployed successfully (Figures 3 A, B).

Discussion

To the best of our knowledge, our patient, who had late femoropopliteal graft occlusion and who was treat-

Corresponding author:

Ersan Tatli MD, Department of Cardiology, Sakarya University, School of Medicine, Karaagac MH, 22050 Karaagac, Sakarya, Turkey, phone: +90 2842362182, e-mail: ersantatli@yahoo.com

Received: 7.07.2014, **accepted:** 29.09.2014.

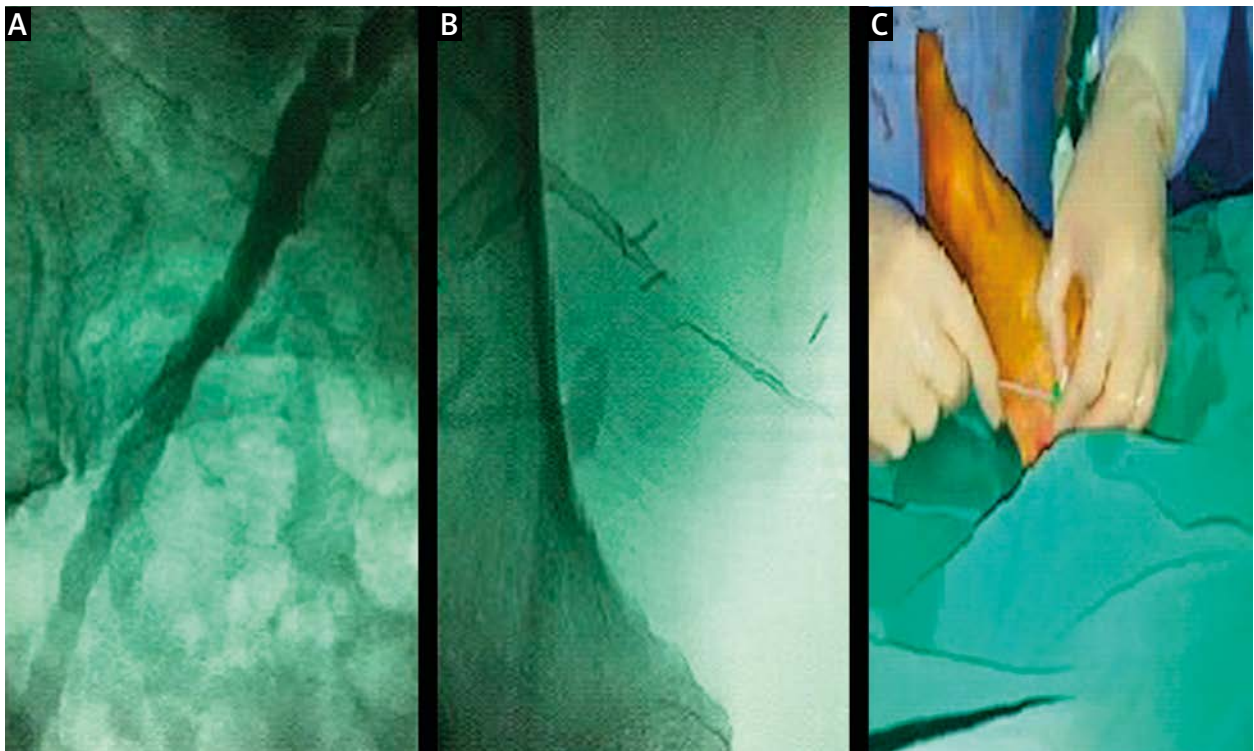


Figure 1. **A, B** – Angiography from the left brachial artery revealed that right femoropopliteal bypass grafts were proximally occluded, native external iliac artery was occluded before giving superficial femoral artery branch, and the proximal part of the occlusion site could not be seen clearly. **C** – 6 Fr radial sheath was inserted to posteriortibial artery

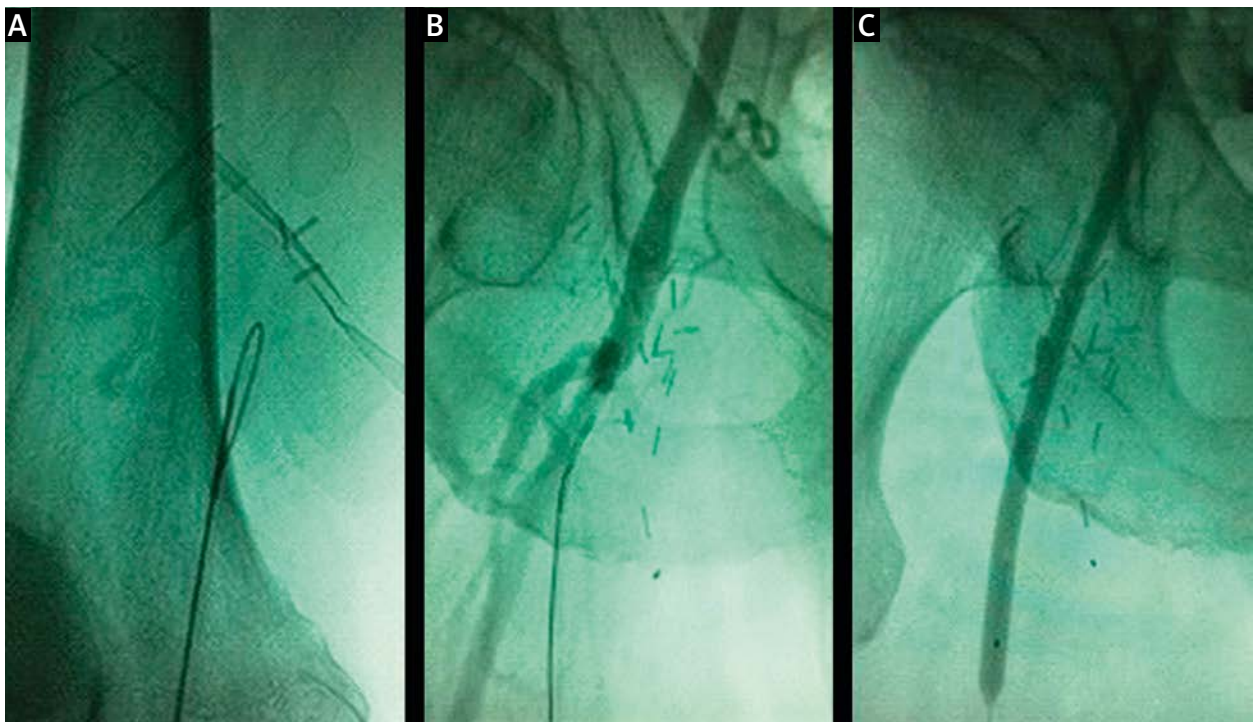


Figure 2. **A, B** – Angiography from the right tibial posterior artery demonstrated subintimal tracking and re-entry to true lumen of the superficial femoral artery. **C** – Angiography shows successful balloon angioplasty

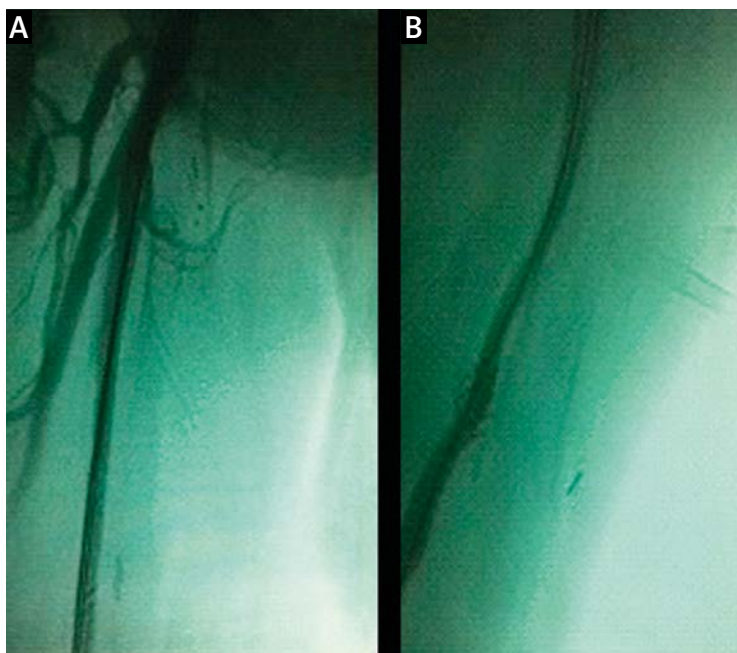


Figure 3. A, B – An angiogram obtained from the catheter placed in the brachial artery showed complete recanalisation of the native femoropopliteal artery with angioplasty and stenting

ed with subintimal tracking and stenting via transpedal pathway, is the first published case in the literature.

Fem-pop bypass grafts occlude for a variety of reasons, including technical errors, intimal hyperplasia, and progression of atherosclerosis. Classically, graft failure is divided into three phases including early (0 to 30 days), intermediate (30 days to 2 years), and late (2 or more years). Early failure is generally regarded as technical failure. Intermediate failure may be related to young age, hypercoagulable state, redo bypass, critical limb ischaemia, smoking, or inflammation. Late failure is thought to be related to progression of atherosclerosis, including natural progression of compromised in-flow of distal run-off vessels, as in our case [1].

There have been various treatment strategies to manage occluded bypass grafts. Several treatment strategies of stenosis of fem-pop bypass graft have been proposed, including surgical revision orthrombectomy, balloon angioplasty, catheter-based thrombolysis, and repeat bypass grafting. Surgical revision of the occluded bypass grafts is generally considered the gold standard treatment and provides superior patency when compared to endovascular treatment. However, surgical revision of the occluded bypass grafts is associated with higher rates of nerve injury, wound and graft infection, bleeding, longer procedure time, increased pain, and longer duration of hospitalisation [2].

Endovascular therapy is commonly associated with lower complication rates than surgical treatments and is often performed in poplitealortibial artery lesions to improve lower limb blood flow. Carlson *et al.* [3] revealed a primary patency rate of 62.7% at 1 year, and 58.2% at 2 years only

with minor complications with 4% of haematoma using balloon angioplasty. Eisenberg *et al.* [4] revealed acceptable assisted primary patency rates for balloon angioplasty of 58% in 42 patients with peri-anastomotic stenoses.

However, percutaneous angioplasty had also been performed on the occluded fem-pop grafts in both studies. We performed differently percutaneous angioplasty and stenting to the occluded native fem-pop artery via transpedal way. With this case we tried to emphasise that percutaneous intervention to native arteries could be an alternative to surgical treatment.

Conclusions

Percutaneous angioplasty and stenting to the native fem-pop artery via retrograde transpedal pathway provides a reliable and effective option in patients without clear proximal stump and with good distal trifurcation and with graft restenosis.

References

1. Monahan TS, Owens CD. Risk factors for lower-extremity vein graft failure. *Semin Vasc Surg* 2009; 22: 216-26.
2. Veith FJ, Gupta SK, Ascer E, et al. Six-year prospective multicenter randomized comparison of autologous saphenous vein and expanded polytetrafluoroethylene grafts in infrainguinal arterial reconstructions. *J Vasc Surg* 1986; 3: 104-14.
3. Carlson GA, Hoballah JJ, Sharp WJ, et al. Balloon angioplasty as a treatment of failing infrainguinal autologous vein bypass grafts. *J Vasc Surg* 2004; 39: 421-6.
4. Eisenberg JA, Calligaro KD, Kolakowski S, et al. Is balloon angioplasty of peri-anastomotic stenoses of failing peripheral arterial by passes worth while? *Vasc Endovasc Surg* 2009; 43: 346-51.