# Drug-eluting Stent Patency at 6 Months in the Pedal Artery of a Patient with Polyarteritis Nodosa: A Case Report

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## ABSTRACT

Drug-eluting stents are largely used in coronary arteries and more recently in tibial arteries owing to their potentially better outcomes compared with bare metal stents. A patient with polyarteritis nodosa and critical limb ischemia and a dorsal foot ulcer was previously unsuccessfully treated with multiple angioplasties and subsequently underwent implantation of a drug-eluting stent in the pedal artery. At 6 months, stent patency on color Doppler ultrasound and complete healing of the foot ulcer were observed.

## ABBREVIATIONS

CLI = critical limb ischemia, DES = drug-eluting stent, DSA = digital subtraction angiography, PAN = polyarteritis nodosa

Polyarteritis nodosa (PAN) is a systemic necrotizing vasculitis that typically affects medium-sized muscular arteries, with occasional involvement of small muscular arteries, which may develop stenoses at any level (1). PAN prevalence estimates range from 2–33 per 1 million. It mainly affects middle-aged or older adults, and incidence increases with age, with a peak observed in the sixth decade of life (1). Patients with PAN have a poor quality of life because of mononeuropathies or polyneuropathies, abdominal pain from mesenteric arteritis, nausea, vomiting, melena, myalgia, muscle weakness, orchitis, and ischemic retinopathy (2). The pathogenetic mechanisms of PAN are not well understood; the thickening of the inflamed vessel wall and intimal proliferation can cause luminal narrowing, blood flow reduction, and higher thrombotic risk of the affected vessels. Patients often have cutaneous ulcers, especially in the feet, which are life-threatening and associated with morbidities (3).

The first-choice treatment of below-the-knee arterial stenosis and occlusion in diabetic and nondiabetic patients is percutaneous transluminal angioplasty (PTA), although the recurrence of stenosis and occlusion is frequent (4). Drug-eluting stents (DESs), with sirolimus or paclitaxel, are commonly used in coronary stenoses (5). DESs showed better results than bare-metal stents in the infrapopliteal arterial distribution in more recent studies, owing to a significant reduction of the local proliferative healing response leading to a better patency rate during the follow-up (6).

## CASE REPORT

Our institutional review board approved the preparation of this case report. In March 2012, a 73-year-old man was admitted to the internal medicine department 2 weeks after the appearance of a painful ulcer of the left foot secondary to critical limb ischemia (CLI). The patient received a diagnosis of PAN in 2009 on the basis of his medical history of cramping pain, edema, purpura, asymmetric sensorimotor polyneuropathy, orchitis, weight loss (5 kg in 6 mo), presence of autoantibodies (antinuclear antibody), and presence of hepatitis B virus antibodies. Fluorescein angiography revealed an ischemic area in the right retina, and several ulcers were detected on clinical examination in both lower limbs. Digital subtraction angiography (DSA) of the lower limbs performed in March 2011 showed bilateral patency of the iliac-femoral-popliteal axis and peroneal arteries, with bilateral total occlusion of the

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posterior tibial arteries and multiple stenoses and focal occlusions of both anterior tibial and pedal arteries. The patient was treated with cyclophosphamide (2 mg/kg/d) for the worsening of the skin disease and three PTAs of the left, right anterior, and posterior tibial arteries (the last one in the left leg 6 mo before admission) owing to bilateral CLI. Dual antiplatelet therapy subsequently was prescribed.

On admission, the patient's general condition was good, and vital signs were normal. A 5-cm ulcer was present on the dorsal aspect of the left foot with signs of skin infection owing to CLI. Transcutaneous carbon dioxide pressure of the left foot was 22 mm Hg, and patient-rated pain severity was 6 despite the use of analgesics, according to the scale of pain measurement (7). Radiographic examination of the left foot was negative for osteomyelitis. Culture of the ulcer was positive for methicillin-resistant *Staphylococcus aureus, Enterococcus faecalis,* and *Serratia marcescens*. antibiotic therapy was initiated using oral trimethoprim-sulfamethoxazole (1 capsule × 2/d).

With the patient's consent, preliminary diagnostic DSA was performed through a right retrograde femoral approach, which showed a left iliac-femoral-popliteal axis free from stenoses and occlusion but a complete occlusion of the posterior tibial arteries and multiple stenoses of the anterior tibial and pedal arteries (**Fig 1**) with regular patency of the distal part of the pedal artery and poor opacification of the plantar arteries through collateral vessels. Using a 5-F introducer, 55 cm long (Flexor; Cook, Inc, Bloomington, Indiana), in the left distal superficial femoral artery and local infusion of heparin (5,000 IU), all of the stenotic tracts of the anterior tibial artery were passed using a 0.014-inch, 300-cm-long guide wire (ChoICE PT; Boston Scientific, Natick, Massachusetts), and the distal part of the pedal artery was catheterized with a standard Berenstein 4-F catheter (Cordis, Inc, Warren, New Jersey). Subsequently, the distal part of the anterior tibial artery and the proximal part of the pedal artery were treated with PTA, using an angiographic balloon catheter measuring 2.5 mm in diameter × 4 cm long (**Fig 2**) (Amphirion; Invatec-Medtronic, Minneapolis, Minnesota).

The angiographic control examination showed the resolution of the proximal stenoses of the anterior tibial artery, even though the pedal artery was still stenotic with insufficient distal perfusion. A balloon-expandable DES was placed in the pedal artery at the same level as the remnant stenosis (Biolimus A9 eluting coronary stent, 2.5 mm in diameter × 2.4 cm long; Nobori; Terumo, Tokyo, Japan). The balloon was inflated to 21 atm to ensure the full expansion of the stent. DSA performed at the end of the procedure showed the regular stent expansion and patency (**Fig 3**) with complete resolution of the stenosis and consequent significant improvement of the arterial circulation (**Fig 4**).

A color Doppler ultrasound examination performed a day later showed regular DES patency. Transcutaneous carbon dioxide pressure had improved from 22 to 40 mm Hg, and the patient was discharged with the following therapeutic plan: dual antiplatelet therapy for 6 months (acetylsalicylic acid, 100 mg/d, and clopidogrel, 75 mg/d), trimethoprim-sulfamethoxazole, antihypertensive drugs,

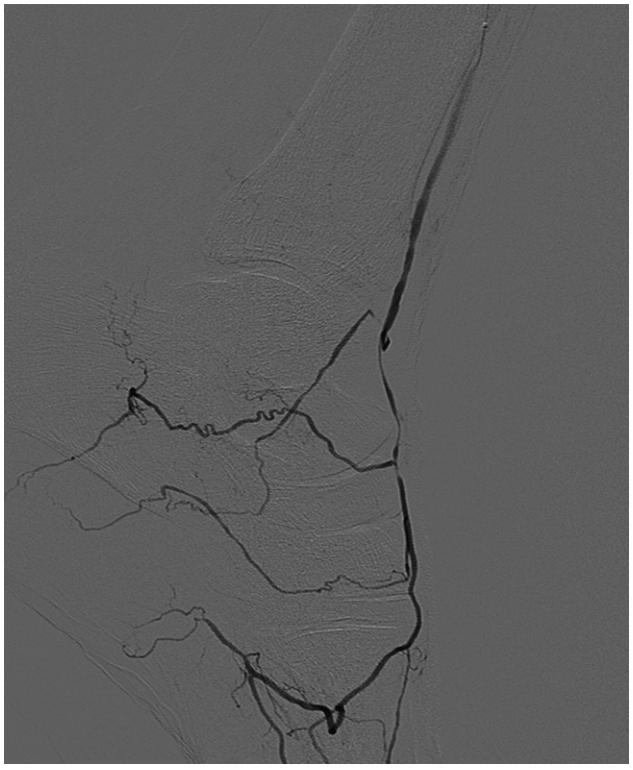

**Figure 1.** Preliminary diagnostic DSA shows a hemodynamically significant stenosis of the pedal artery.

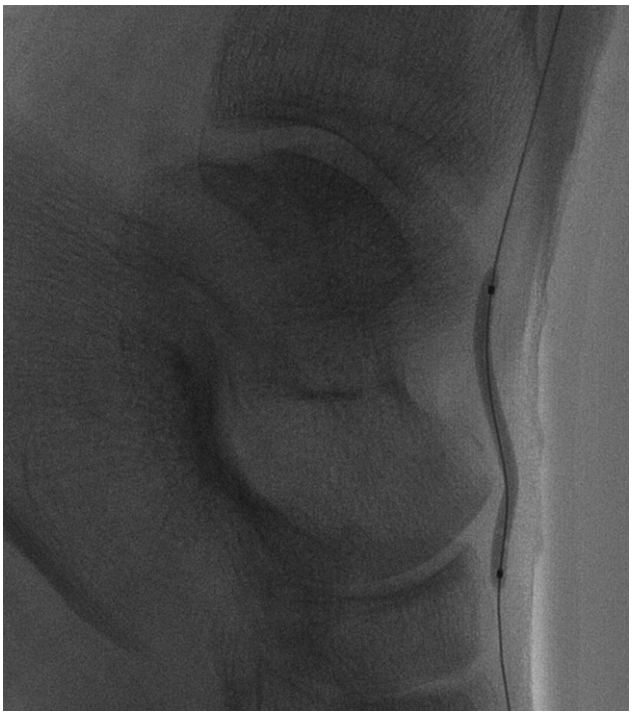

**Figure 2.** PTA using a balloon measuring 2.5 mm in diameter × 4 cm long was performed.

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