

Chapter 8

OVERVIEW OF ENDOVASCULAR TREATMENT FOR LOWER EXTREMITY PERIPHERAL ARTERY DISEASE

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Introduction

Atherosclerosis is a systemic disease of the vessels causing luminal focal or diffuse narrowing as a result of the accumulation of lipid and fibrous material between the intimal and medial layers of the artery. Atherosclerosis of the noncardiac vessels is defined as peripheral artery disease (PAD). PAD remains a significant health problem across the globe, also it is the third most common manifestation of cardiovascular disease, following occlusive coronary artery disease and stroke (1,2). PAD is extremely common, particularly in the elderly patients (3), with the elderly population expected to increase 22% by the year 2040. The overall prevalence of lower extremity PAD varies widely depending upon the population studied, but is estimated to be approximately 13 percent of adults older than 55 years (4). Although gold standard therapy is conventional surgery when revascularization is needed, the endovascular treatment has become the mainstay of treatment in recent years.

Clinical Presentations

PAD represents a spectrum from asymptomatic stenosis to limb-threatening ischemia. Claudication, which is defined as reproducible ischemic muscle pain, is one of the most common manifestations of PAD caused by atherosclerosis. Claudication occurs during physical activity and is relieved after a short rest. Pain develops because of inadequate blood flow. Although symptoms are most frequently localized to the calf, the thigh or buttocks may also be affected. The location of the pain in patients with PAD is determined by the anatomic location of the arterial lesions. PAD is most common in the distal superficial femoral artery, a location that corresponds to claudication in the calf muscle area. When atherosclerosis is distributed throughout the aortoiliac area, thigh and buttock muscle claudication predominates. When claudication is used as an indicator, it is estimated that 2% of the population aged 40-60 years and 6% of the population older than 70 years are affected. Predicted all-cause mortality for PAD patients with claudication is approximately 30% at 5 years of follow-up, 50% at 10 years, and 70% at 15 years (5).

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Endovascular Treatment in Femoro-Popliteal Occlusions

The most common location (> 70%) for PAD is the femoropopliteal segment (16). In contrast to the aorto-iliac lesions the femoropopliteal arteries represent a unique challenge for endovascular revascularization. Usually, these lesions found to have diffuse, calcific often occlusive atherosclerosis which is likely related to both its length and location (17). In addition, endovascular treatment of the femoropopliteal region is more difficult because this region is mobile and exposed to many external forces. There is no surgical or endovascular therapy indication in asymptomatic patients, however numerous treatment modalities for symptomatic femoropopliteal lesions are currently available (PTA, drug-coated PTA, stenting, atherectomy), with various degrees of technical success and limited long-term data. Percutaneous trans-luminal angioplasty though effective for shorter (<5 cm) non-calcified lesions, fails when lesions are longer, calcified and more complex. Moreover, drug-coated balloon angioplasty with or without atherectomy has become first choice in femoropopliteal lesions nowadays. A multicentric data about primary stenting for TASC C & D femoropopliteal lesions was published by Brouillet in 2018. According to their study, early in-stent thrombosis was observed as 3.4 percent. The 6 and 12 months primary patency rates were 85.2±2. and 67±3.%, respectively. The 12-month in-stent thrombosis and restenosis rates were 19.6% and 13.9% and also the stent fracture rate was presented as 10.2% (18). However, Katsogridakis and co-workers published a systematic meta-analysis regarding drug-eluting stents (DES) and they concluded that the short-term outcomes of DES for TASC C & D femoro-popliteal lesions are encouraging (19).

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