

## Chapter 3

# ATHERECTOMY FOR LOWER EXTREMITY INTERVENTION: WHY, WHEN, AND WHICH DEVICE?

Orhan RODOPLU<sup>1</sup>

### INTRODUCTION:

Peripheral artery disease (PAD) is the clinical term commonly used to describe stenotic or occlusive lesions in lower extremity arteries due to atherosclerotic or thromboembolic disease. Data from the National Health and Nutrition Examination Survey (1999 to 2004) estimate a prevalence of 5.9% in patients >40 years of age, corresponding to ~7.1 million affected individuals in the U.S. (Pande & et al.,2011) and >200 million people worldwide. Despite aggressive risk factor therapies and recent improvements in medical management of atherosclerotic disease with statins and antiplatelet agents, patients with PAD frequently require invasive procedures to improve claudication symptoms and to prevent tissue loss in those with critical limb ischemia (CLI).(Golomb, Dang & Criqui, 2006)

Endovascular technological advances have made a minimally invasive percutaneous approach the treatment of choice in the initial management of the majority of symptomatic patients over the traditional surgical approach. However, the presence of severe vascular calcification, particularly in the infrainguinal vasculature, presents a significant procedural challenge to current endovascular strategies. Due to a lack of large randomized, prospective trials with independent core laboratory adjudication of device-related acute and late events, operators have used different approaches to treat femoropopliteal or infrapopliteal disease. Percutaneous transluminal angioplasty (PTA) or balloon angioplasty has been traditionally used for treatment of focal lesions. However, early elastic recoil, frequent dissections, and poor primary and secondary patency rates for long lesions, with 40-50% of cases requiring bail-out stenting, limit balloon angioplasty of “severely” calcified lesions, despite the high procedural success rates. Although the use of the last generation self-expanding nitinol stents may be an effective treatment for focal lesions, with high acute procedural success rates, restenosis rates can be as high as 10-40% at six to 24 months, and stent fractures may

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<sup>1</sup> MD, Private Yalova Hospital, orhanrodoplu@yahoo.com.tr

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