Successful Endovascular Treatment with the Phoenix Atherectomy System in Patients with Chronic Limb Ischemia. A Series of 29 Consecutive Patients.

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Background:
Endovascular atherectomy has emerged as a novel technique for plaque removal in peripheral artery disease (PAD), offering the benefits of tissue removal as performed by surgical endarterectomy and of minimally invasive, percutaneous treatment. Thus, with endovascular atherectomy plaque is removed rather than pressed against the arterial wall, which provides luminal gain without barotrauma, decreasing the risk of dissection and neointimal hyperplasia. The Phoenix atherectomy system (Philips Volcano) recently received FDA approval for peripheral use and is available in sizes ranging from 1.8 to 2.2 mm for the treatment of femoropopliteal and below-the-knee lesions.

Methods:
We present 29 consecutive patients with chronic limb ischemia due to atherosclerotic PAD who underwent Phoenix atherectomy, combined with balloon angioplasty with or without stent placement. Safety aspects in terms of vessel injury, thromboembolism and access site complications as well as the acute angiographic success and clinical success at 4 weeks of follow-up were systematically analysed.

Results:
Twenty-nine consecutive patients were treated with a mean age of 77±5yrs. Ten patients (34%) were male, 16 (55%) had diabetes mellitus. Six patients had intermittent claudication, 8 ischemic rest pain without ulcerations and the remaining 15 had ischemic ulcerations (mean Rutherford class=4.5±1.0). Twenty-four of 29 (83%) patients exhibited moderate or severe calcification of the lesions which subsequently underwent atherectomy. Mean lesion calcification was 3.2±1.1 by the proposed Peripheral Arterial Calcium Scoring System (PACSS score; calcification grades 0 to 4). Four patients (14%) had TASC B lesions, while the remaining 25 (86%) patients exhibited TASC C or D lesions.
Atherectomy was performed in femoropopliteal arteries in 23 patients and in below-the-knee arteries in 7 patients. Device success was recorded in all 29 patients (100%) without vascular complications, such as vessel dissection, perforation or thromboembolic occlusion. Atherectomy was combined with drug coated balloon (DCB) angioplasty in all 23 patients with femoropopliteal disease. Additional stent placement was performed in only 2 of 23 (9%) patients. The mean ankle-brachial index (ABI) was 0.5±0.1 prior to treatment and increased to 0.9±0.1 after treatment (p<0.001). No major amputations and one minor amputation was recorded at 4 weeks of clinical follow-up. Target vessel revascularization was performed in 1 of 29 patients due to extensive dissection after DCB, which required additional stent placement. Representative images of 2 patients who underwent atherectomy and DCB can be appreciated in the two Figures besides.

Conclusion:
Atherectomy using the Phoenix catheter system in combination with DCB angioplasty is safe and successful for the treatment of complex femoropopliteal and below-the-knee lesions. Larger studies with longer follow-up duration are now warranted.

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