VASCUPEDIA

MY TECHNICAL CHOICE IN THE TREATMENT OF SEVERELY CALCIFIED LESIONS OF THE SFA

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MY CRITERIA

- Age and comorbidity
- Functional status
- Prognosis
- Chronic kidney disease
- Length of the lesion
- Procedural challenges

PROCEDURAL CHALLENGES FOR SEVERELY CALCIFIED LESIONS

- Crossing
- Lumen gain
- Final treatment

CROSSING THE LESION

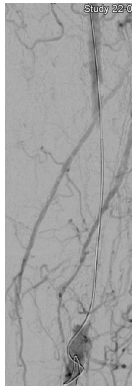
MATERIALS

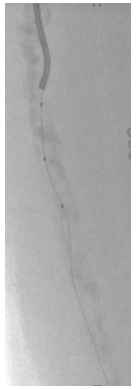
0.018/0.014 wire

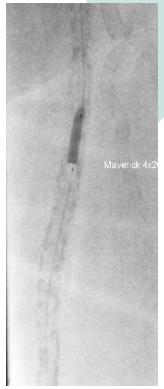
0.018/0.014 support catheter

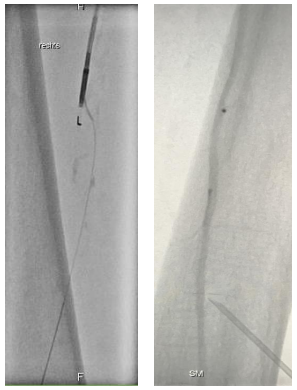
Coronary balloon catheters

Outback or retrograde puncture





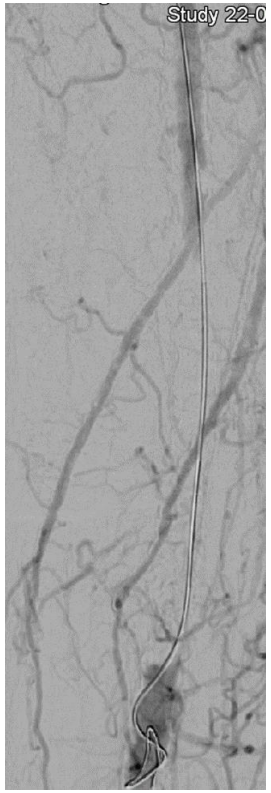




VASCUPEDIA

WIRES

- Kink resistance and shape retention capability (nitinol core)
- Crossability (hydrophilic coating)
- Steerability



My favorite one:

V18 (Boston Scientific) – 12g
Treasure 12 (Asahi) – 12g

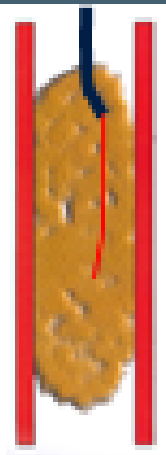
Command 0.014 (Abbott)

Astato 30 (Asahi) – 30g

VASCUPEDIA

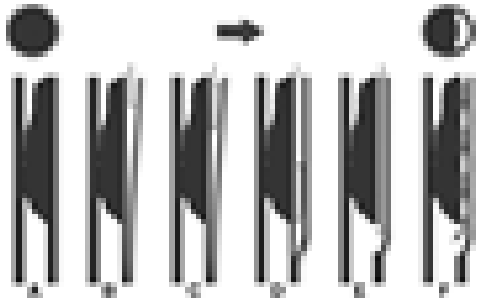
SUPPORT - RE-ENTRY CATHETERS – RETROGRADE APPROACH

Re-Direction

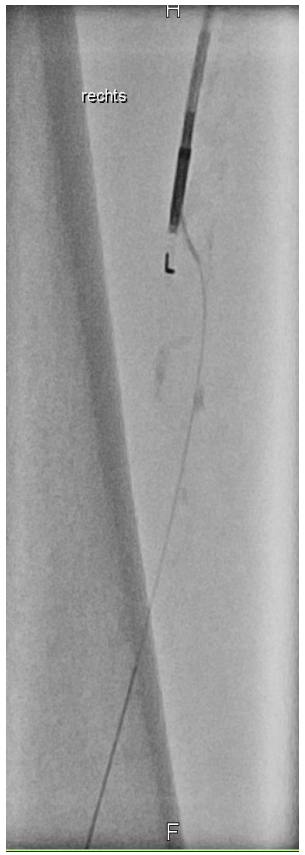


TrailBlazer (Medtronic)
Seeker (Bard)
QuickCross (Philips)

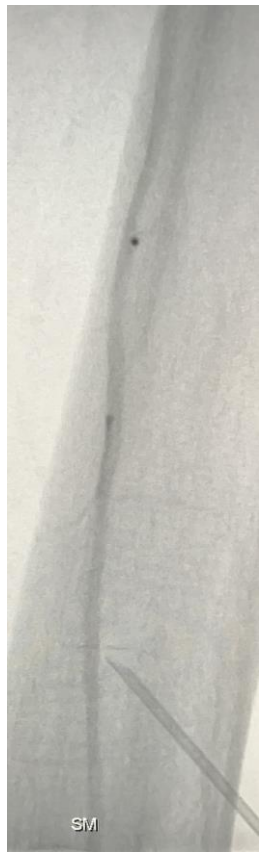
Re-Entry



Angled support catheters / Berenstein catheter



Outback (Cardinal Health)



Retrograde tibial puncture

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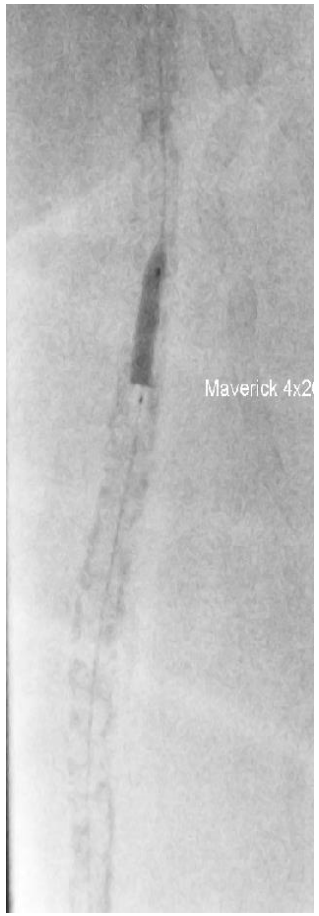
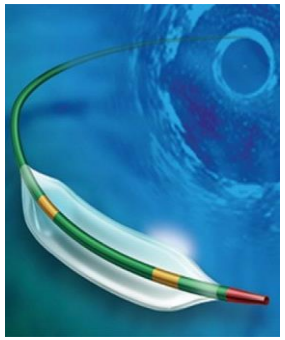
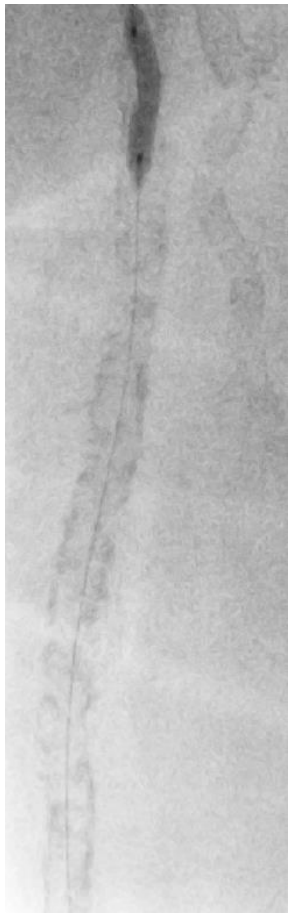
CORONARY BALLOONS





Monorail PTCA Katheter



My favorite one:

Maverick™ PTCA balloon catheter
Boston Scientific

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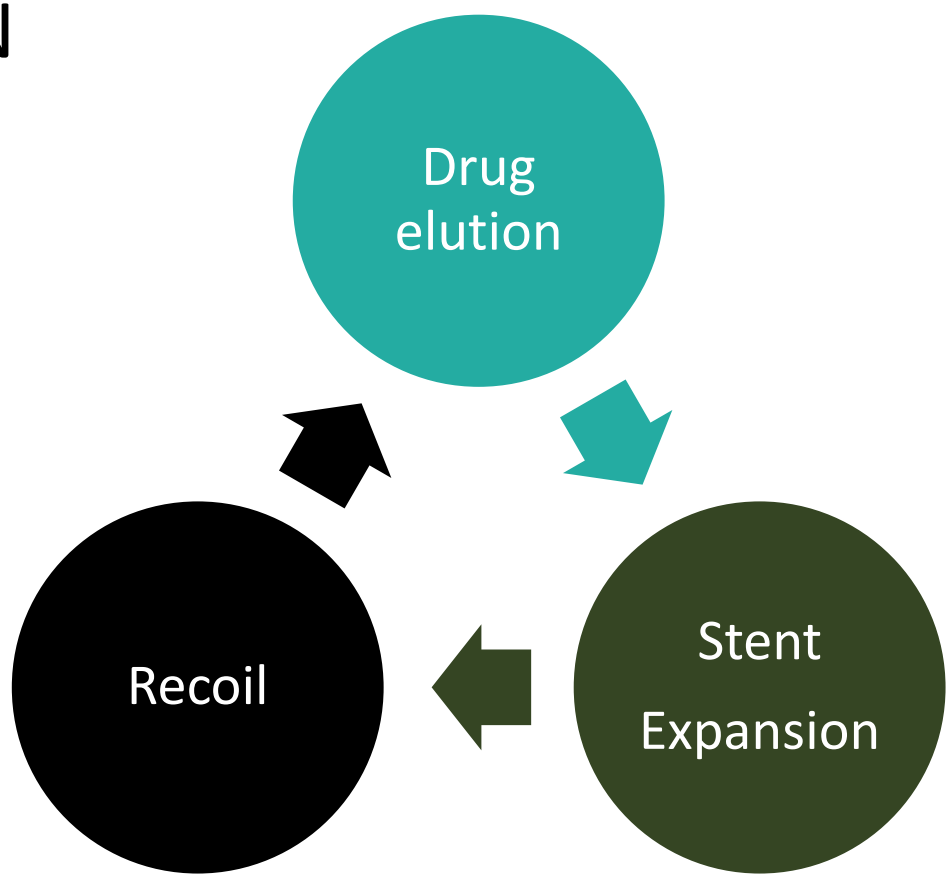
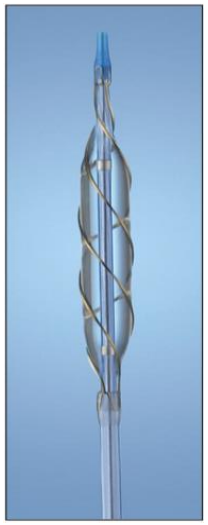
CHALLENGES IN CALCIFIED LESIONS

LUMEN GAIN & DRUG ELUTION



LUMEN GAIN

TOOLS

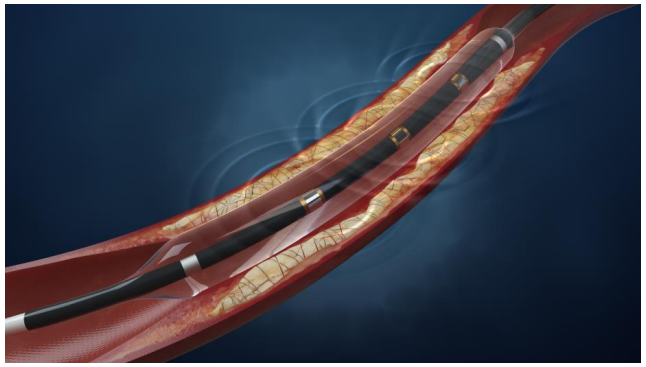


Scoring balloon

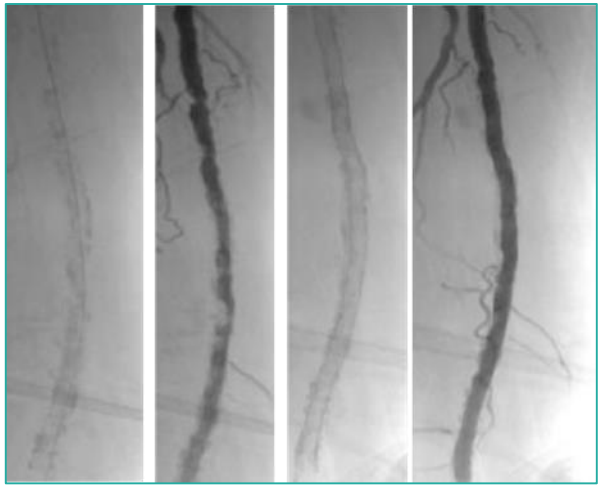
Cutting balloon

Chocolate balloon

Atherectomy



Lithoplasty



Pave & Crack

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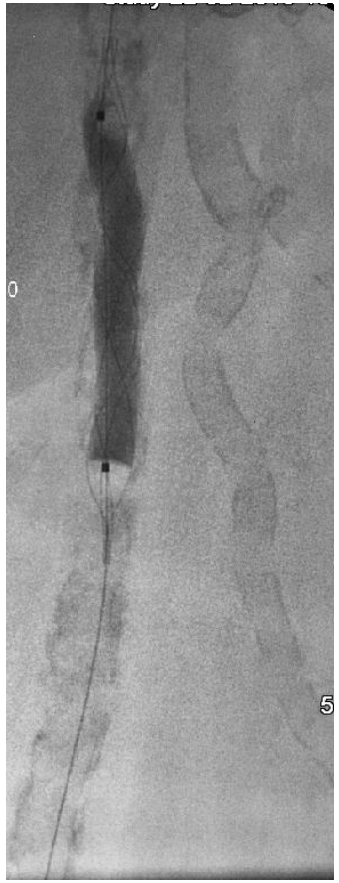
SCORING BALLOON



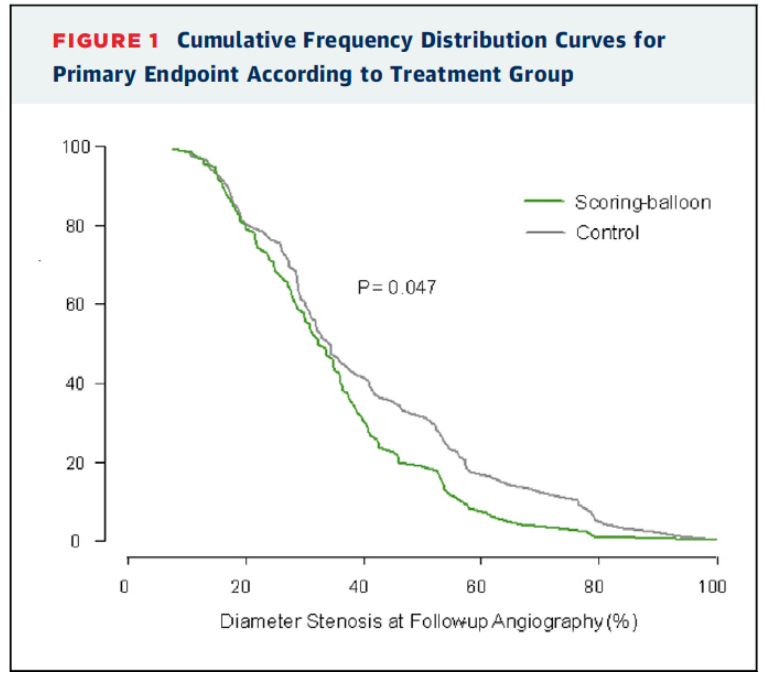
Subgroups	Total	AS alone	AS + Stent	AS + DCB
	n=124	n=46	n=40	n=38
Lesion Length (mm)	7.4	6.1	10.1	5.9
Occlusions	16.1%	2.2%	31.6%	17.5%
12 mo. primary patency	81.2%	81.5%	77.8%	83.9%

Calcification	Total	Mild	Moderate	Severe
		21.0%	34.7%	43.5%
12 mo. primary patency	81.2%	78.9%	81.3%	81.8%

AS= AngioSculpt®

- *After vessel preparation with AngioSculpt®, calcium was not a predictor for loss of patency at 12 months*[1]
- *Lesion Preparation with AngioSculpt® in calcified lesions may improve DCB results*

PANTHER Registry



Lugenbiel et al, VASA. 2017 Nov 8:1-7
Kufner et al, JACC Intv 2017;10:1332–40

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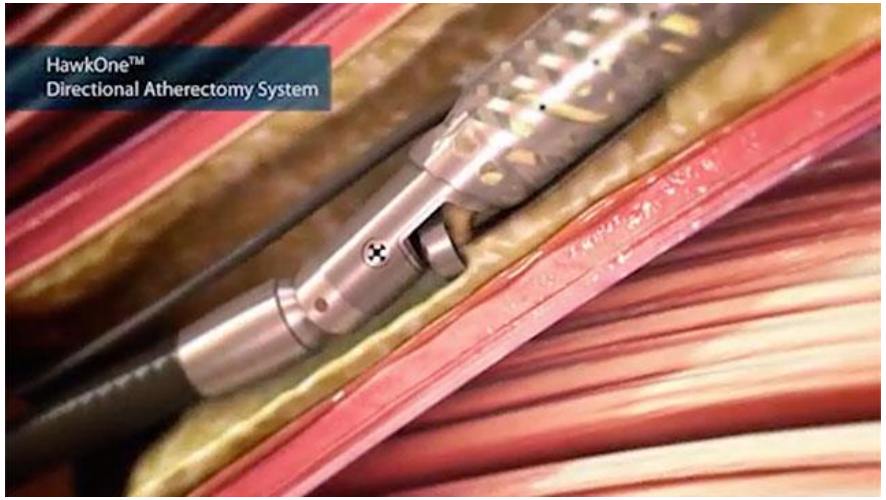
DIRECTIONAL ATHERECTOMY



Medtronic

Case of a severely calcified lesion treated by directional atherectomy (HawkOne, Medtronic)

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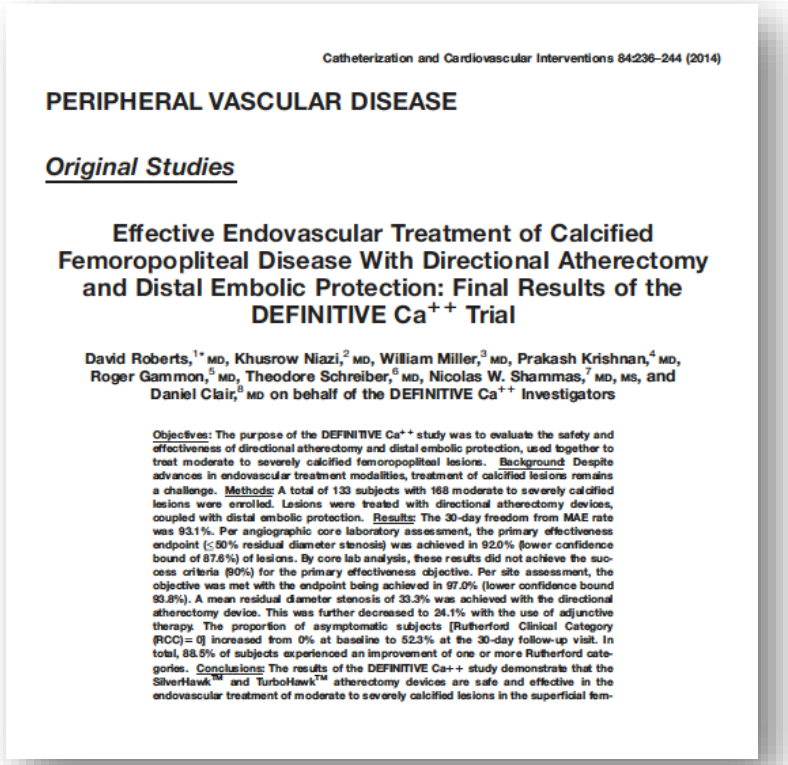
DIRECTIONAL ATHERECTOMY

DEFINITIVE CA^{++} TRIAL



Catheterization and Cardiovascular Interventions 84:236–244 (2014)

PERIPHERAL VASCULAR DISEASE

Original Studies

Effective Endovascular Treatment of Calcified Femoropopliteal Disease With Directional Atherectomy and Distal Embolic Protection: Final Results of the DEFINITIVE Ca^{++} Trial

David Roberts,[1]* MD, Khusrow Niazi,[2] MD, William Miller,[3] MD, Prakash Krishnan,[4] MD, Roger Gammon,[5] MD, Theodore Schreiber,[6] MD, Nicolas W. Shammas,[7] MD, MS, and Daniel Clair,[8] MD on behalf of the DEFINITIVE Ca^{++} Investigators

Objectives: The purpose of the DEFINITIVE Ca^{++} study was to evaluate the safety and effectiveness of directional atherectomy and distal embolic protection, used together to treat moderate to severely calcified femoropopliteal lesions. Background: Despite advances in endovascular treatment modalities, treatment of calcified lesions remains a challenge. Methods: A total of 133 subjects with 168 moderate to severely calcified lesions were enrolled. Lesions were treated with directional atherectomy devices, coupled with distal embolic protection. Results: The 30-day freedom from MAE rate was 93.1%. Per angiographic core laboratory assessment, the primary effectiveness endpoint (≤50% residual diameter stenosis) was achieved in 92.0% (lower confidence bound of 87.6%) of lesions. By core lab analysis, these results did not achieve the success criteria (90%) for the primary effectiveness objective. Per site assessment, the objective was met with the endpoint being achieved in 97.0% (lower confidence bound 93.8%). A mean residual diameter stenosis of 33.3% was achieved with the directional atherectomy device. This was further decreased to 24.1% with the use of adjunctive therapy. The proportion of asymptomatic subjects [Rutherford Clinical Category (RCC) = 0] increased from 0% at baseline to 52.3% at the 30-day follow-up visit. In total, 88.5% of subjects experienced an improvement of one or more Rutherford categories. Conclusions: The results of the DEFINITIVE Ca++ study demonstrate that the SilverHawk™ and TurboHawk™ atherectomy devices are safe and effective in the endovascular treatment of moderate to severely calcified lesions in the superficial fem-

TABLE IV. Procedure Characteristics

Procedure characteristic	Mean ± SD or % (n N^{-1})
Total procedure time (min)	74.2 ± 28.4 (133)
Total fluoroscopy time (min)	21.1 ± 9.7 (132)
Total contrast administered (cm^3)	182.3 ± 72.4 (132)
Visible debris in filter device	88.4% (122/138)
Adjunctive therapy	53.8% (91/169)
Adjunctive (bail-out) stenting	4.1% (7/169)
Preservation of run-off (per angiographic core lab)	98.3% (113/115)

TABLE V. Summary of Major Adverse Events

Major adverse event	% of Subjects (no. of events)
Total	6.9% (9/131) [9]
Death	0.0% (0/131) [0]
Acute myocardial infarction	0.8% (1/131) [1]
Dissection, target vessel (C)	0.0% (0/131) [0]
Dissection, target vessel (grade D or greater)	0.8% (1/131) [1]
Vessel clinical perforation, target vessel	2.3% (3/131) [3]
Pseudoaneurysm, target vessel	0.0% (0/131) [0]
Thrombosis, target vessel	0.8% (1/131) [1]
Distal embolism	2.3% (3/131) [3]
Amputation, above metatarsal line	0.0% (0/131) [0]
Clinically driven TVR	0.0% (0/131) [0]

Primary effectiveness 92%

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DIRECTIONAL ATHERECTOMY

ADDITIONAL EVIDENCE

Cardiovasc Intervent Radiol (2014) 37:1165–1170
DOI 10.1007/s00270-014-0884-3

CIRSE

CLINICAL INVESTIGATION — ARTERIAL INTERVENTIONS

Three-Year Results After Directional Atherectomy of Calcified Stenotic Lesions of the Superficial Femoral Artery

P. Minko · A. Buecker · S. Jaeger · M. Katoh

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Abstract
Objective To investigate the 3-year outcome of patients with peripheral arterial disease (PAD) and heavily calcified stenotic lesions of the superficial femoral artery after directional atherectomy.
Materials and Methods Fifty-three patients (mean age 67 ± 10 years; 18 females, 35 males, TASC B and C, mean lesion length 7.9 ± 3.5 cm) with PAD (Rutherford 2–6) were enrolled into this prospective monocentric study. In total, 59 calcified lesions of the superficial femoral artery were treated with the Silverhawk atherectomy device (Covidien, Plymouth, MN, USA). Patients were followed-up for 36 months with a 6-month interval to perform clinical re-evaluation, including measurement of maximum walking distance and ankle–brachial index (ABI) as well as duplex-sonography.
Results The primary success rate of the procedure was 92 %. In five cases (8 %), additional balloon-PTA and/or stent-PTA was necessary. Procedure-related embolization occurred in seven cases (12 %), which were all successfully treated by aspiration. The primary patency rate after 3 years was 55 %. Median Rutherford score decreased significantly from 5 to 0 after 36 months ($p < 0.001$). At the same time, the ABI increased from 0.65 to 1.12 (not significant). The limb-salvage rate after 3 years was 87 %.
Conclusion In this subgroup of patients with POD and calcified stenotic lesions, atherectomy was successfully applied to decrease the plaque burden. Results after 3 years showed a significant decrease of Rutherford score with persistent improvement of ABI and reasonable patency rate.

Keywords Peripheral arterial disease · Directional atherectomy · Calcification · Long-term results · Superficial femoral artery

Introduction

Atherectomy and percutaneous removal of obstructive plaque material was first described in 1985 [1]. Since then different kinds of atherectomy techniques, such as rotational, orbital, directional, or even laser-based atherectomy procedures, have been developed [2]. Directional atherectomy can be performed using the Silverhawk catheter (Covidien, Plymouth, MN, USA), which was introduced in 2003. This catheter allows debulking of atherosclerotic plaque material and targeted treatment of excentric stenoses [3, 4]. Short- and mid-term results with respect to vessel patency after directional atherectomy of femoropopliteal lesions using the Silverhawk catheter are promising [2, 5]. However, only a few data available regarding the treatment of calcified lesions are [3, 6, 7].

Treatment of calcified lesions is difficult and often responsible for a poor response to balloon dilatation due to acute vessel recoil and frequent flow-limiting dissections requiring stent implantation [6, 7]. In contrast, stent implantation in heavily calcified lesions may lead to

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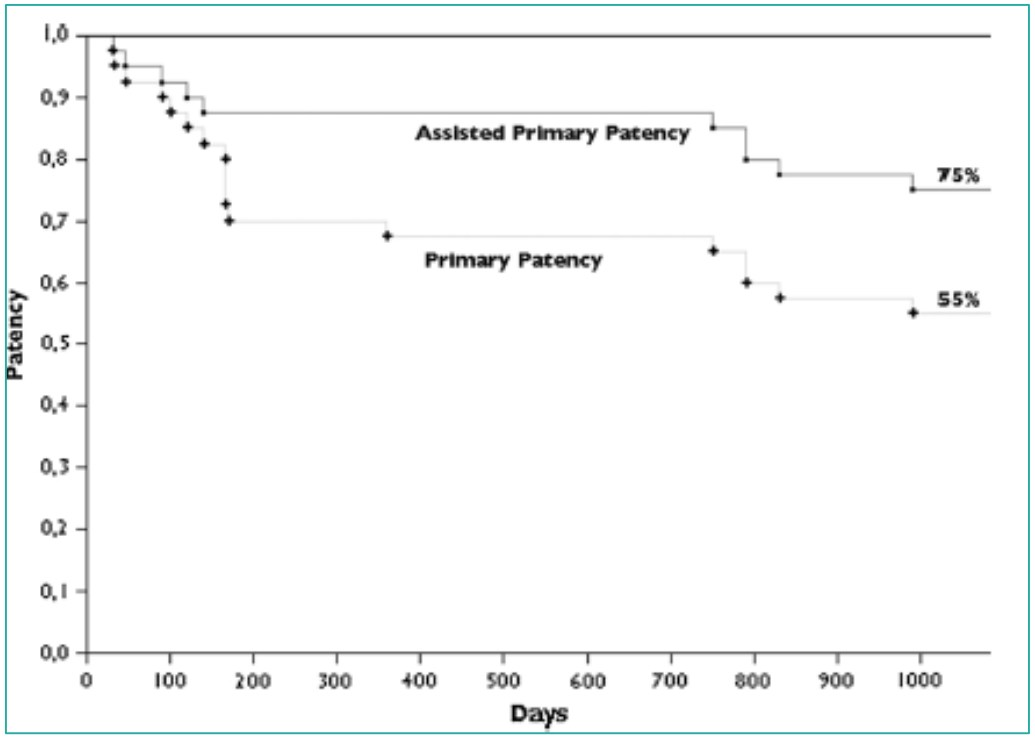
Department of Diagnostic and Interventional Radiology, HELIOS Clinic, Krefeld, Germany

Springer



Minko et al, Cardiovasc Intervent Radiol (2014) 37:1165–1170

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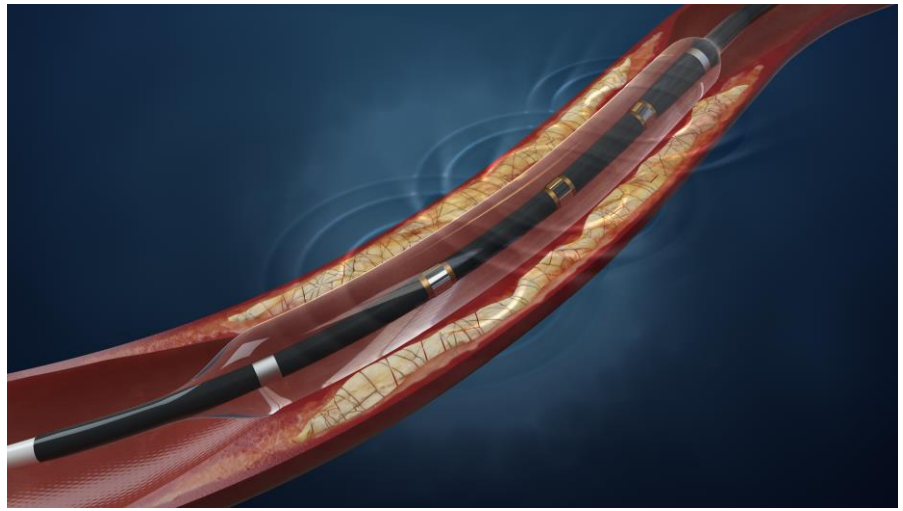
LITHOPLASTY



Schockwave IVL Catheter, Schockwave Medical, Inc

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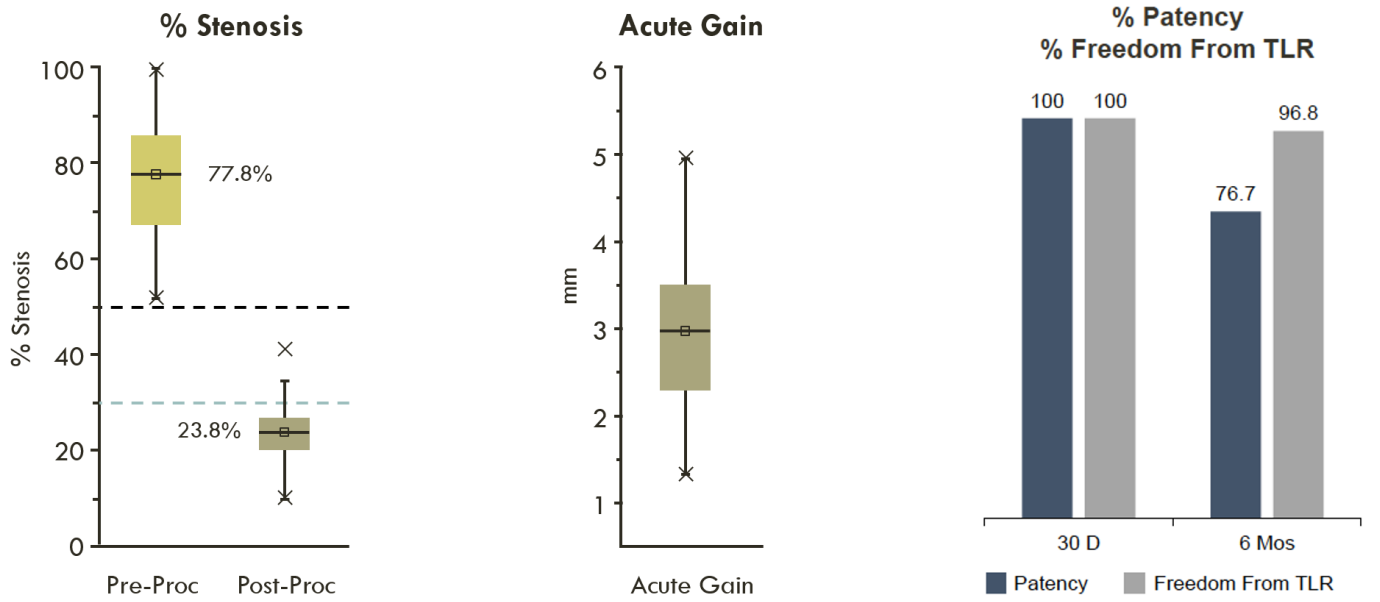
LITHOPLASTY

EVIDENCE



Effectiveness Summary:

- **100% procedural success with a 24% residual stenosis and only 1 stent placed**
- **Compelling 6 month results in a challenging lesion cohort**

DISRUPT PAD trials I & II

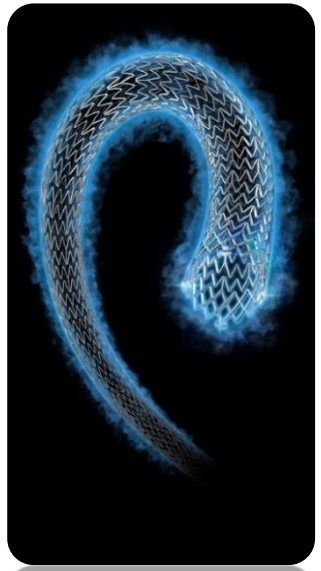
PREVENTION OF RESTENOSIS – FINAL TREATMENT

TOOLS

Bare-metal stent

Drug-coated balloon

Covered stent



Drug-eluting/coated stent

BARE METAL STENTS

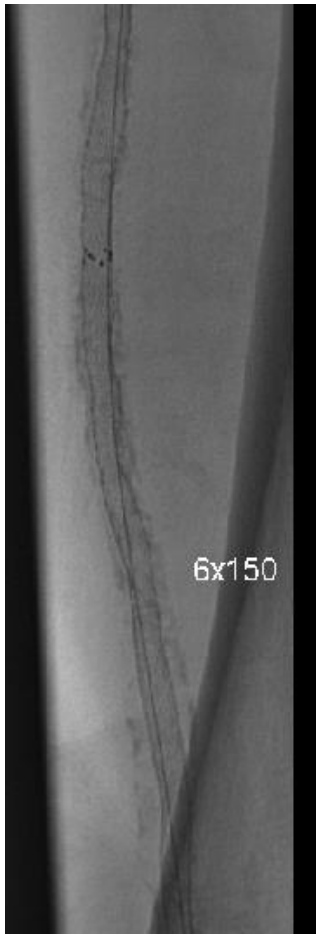


TABLE II. Effects of Patient Characteristics on Outcomes—Univariable Models

	primary patency			TLR		
Patient characteristic	Parameter estimate	Standard error	*P*-value	Parameter estimate	Standard error	*P*-value
Age (per 10 year)	0.194	0.072	0.007	−0.167	0.09	0.063
Male	0.265	0.153	0.085	−0.408	0.192	0.034
Diabetes	−0.155	0.148	0.295	0.035	0.19	0.856
Hypertension	0.630	0.211	0.003	−0.150	0.269	0.577
Hyperlipidemia	0.335	0.199	0.092	−0.270	0.235	0.251
Ever Smoker	−0.320	0.173	0.065	0.268	0.222	0.227
Current Smoker	−0.383	0.206	0.063	0.670	0.266	0.012
Rutherford	0.019	0.124	0.876	0.036	0.155	0.812
ABI	1.499	0.423	<.001	−1.490	0.529	0.005
Lesion length (per 10mm)	−0.094	0.016	<.001	0.075	0.023	0.001
Stenosis (per 10%)	−0.023	0.040	0.565	−0.021	0.044	0.640
Calcification	0.107	0.137	0.436	−0.141	0.172	0.412

Rocha-Singh et al. Catheterization and Cardiovascular Interventions 89:1250–1256 (2017)

Calcification is not a risk factor for patency loss or TLR

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BARE METAL STENTS

Results of primary stent therapy for femoropopliteal peripheral arterial disease at 7 years

Konstantinos Stavroulakis, MD, Giovanni Torsello, MD, PhD, Ayad Manal, MD, Arne Schwindt, MD, Christiane Hericks, MA, Arne Stachmann, MA, Eva Schönefeld, MD, *and* Theodosios Bisdas, MD, PhD, *Münster, Germany*

ABSTRACT

Objective: Primary stenting is a well-established treatment option for femoropopliteal arterial disease. However, there is a paucity of data concerning the performance of this modality at ≥5 years. This study evaluated the long-term clinical and radiologic outcomes of primary stent therapy in patients with femoropopliteal arterial disease.

Methods: A prospective data collection and analysis was conducted in patients undergoing primary stent placement in femoropopliteal lesions between September 2006 and September 2007. The EverFlex (Medtronic/Covidien, Plymouth, Minn) bare-metal stent was used. The primary outcome of this study was the primary patency rate. Secondary outcomes were secondary patency rate, amputation-free-survival (AFS), and freedom from target lesion revascularization (TLR). A Cox regression analysis identified risk factors for the primary and the secondary measure outcomes.

Results: Included were 89 patients (102 stents). The prevalence of critical limb ischemia was 34% (n = 30). The initial angiography revealed a TransAtlantic Inter-Society Consensus for the Management of Peripheral Arterial Disease C/D lesion in 31 patients (35%). Occlusions were present in 49 patients (55%) and the mean lesion length was 116 ± 33 mm. Popliteal artery disease was present in 39 treated limbs (35%). The primary patency rate at 1, 3, 5, and 7 years was 73%, 64%, 47%, and 33% respectively. At 7 years, secondary patency rate was 67%, freedom from TLR was 47%, and the AFS was 73%. Cox regression analysis revealed a decreased AFS among diabetic patients (hazard ratio [HR], 2.6; 95% confidence interval [CI], 1.08-6.28; $P = .03$), whereas secondary endovascular interventions showed a protective effect for AFS (HR, 0.14; 95% CI, 0.03-0.65; $P = .01$). Popliteal artery disease was identified as independent risk factor for secondary interventions (HR, 2.07; 95% CI, 1.05-4.06; $P = .04$) and TLR (HR, 1.99; 95% CI, 1.03-3.83; $P = .04$). Critical limb ischemia was associated with an increased incidence of surgical conversion owing to endovascular treatment failure (HR, 5.46; 95% CI, 2.44-12.17; $P < .001$).

Conclusions: This study found primary stenting was associated with acceptable clinical and radiologic long-term outcomes. Diabetes was associated with poor AFS, and popliteal artery involvement correlated with an increased need for reinterventions. AFS was better among patients undergoing secondary procedures. (J Vasc Surg 2016;64:1696-702.)

Calcification did not affect primary patency rate

Table II. Preoperative angiographic findings with respect to Rutherford class

Angiographic findings[a]	Rutherford class 3 (IC)	4 (CLI)	5 (CLI)	*P* value
Total No.	58 (66)	14 (16)	16 (18)	
TASC II A/B lesions	42 (72)	9 (64)	7 (44)	.036
TASC II C/D lesions	16 (28)	5 (36)	9 (56)	
Occlusion	24 (41)	10 (71)	13 (81)	.002
Popliteal involvement	22 (38)	11 (79)	6 (38)	.019
P2/P3 involvement[b]	9 (16)	7 (50)	4 (25)	.021
Lesion length, mm	120 (100-140)	118 (100-140)	123 (80-220)	.965
Calcification	40 (69)	9 (64)	11 (69)	.943
Mild Ca^{2+}	13 (22)	3 (21)	4 (25)	.969
Moderate Ca^{2+}	18 (31)	4 (29)	4 (25)	.893
Severe Ca^{2+}	9 (16)	2 (15)	3 (19)	.950
Runoff vessels				
One	22 (38)	7 (50)	8 (50)	.554
Two	25 (43)	3 (21)	6 (38)	.325
Three	11 (19)	4 (29)	2 (12)	.535

CLI, Critical limb ischemia; *IC*, intermittent claudication; *TASC II*, TransAtlantic Inter-Society Consensus for the Management of Peripheral Arterial Disease.
[a]Categoric data are presented as number (%) and continuous data as median (interquartile range).
[b]P2 is the popliteal artery segment between the proximal part of patella and the center of knee joint space, and P3 is the segment between the knee joint space and the origin of the anterior tibial artery.

0.90-3.5; $P = .09$) affected PPR. The presence of distal popliteal artery disease (HR, 0.79; 95% CI, 0.26-2.41; $P = .68$), moderate or severe calcification (HR, 1.2; 95% CI, 0.6-2.45; $P = .49$), and lesion length >120 mm (HR, 1.4; 95% CI, 0.75-2.80; $P = .26$) did not affect PPR. The number of runoff

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INTERWOVEN NITINOL STENTS

TABLE IIIa. Baseline Angiographic Findings—ITT, Single Stented Subjects

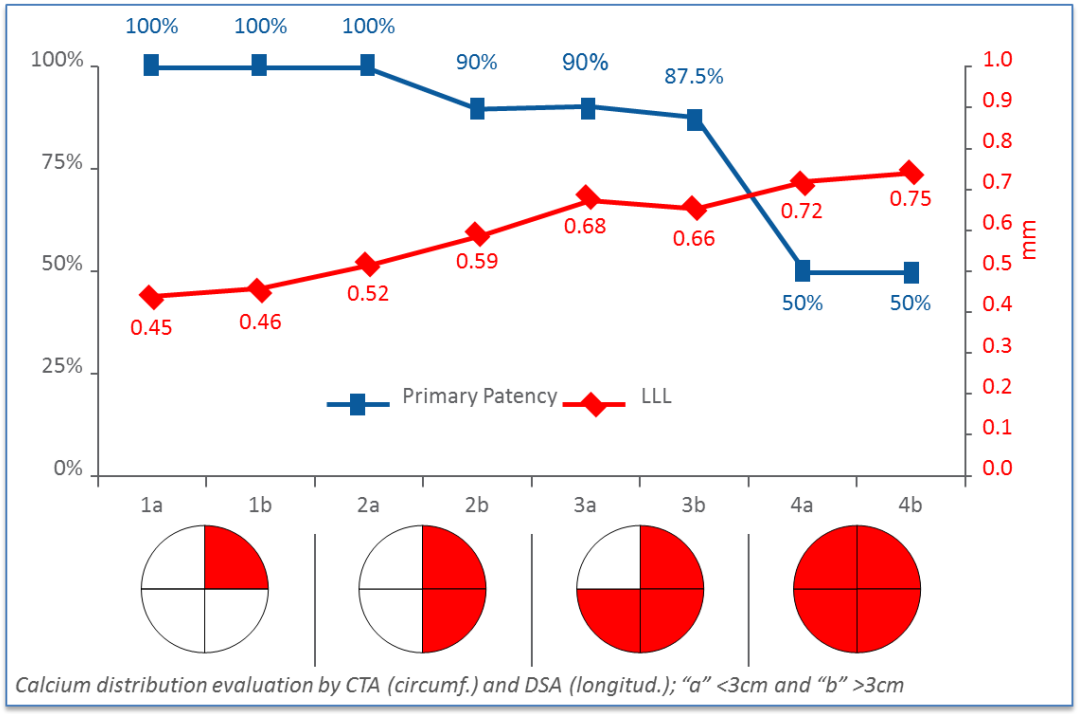
Lesion Characteristics	Nominal (−10% to 10%) (*N* of patients = 84, *N* of segments = 84)	Compressed (< −20%) (*N* of patients = 10, *N* of segments = 10)	Minimal compression (−20% to −10%) (*N* of patients = 23, *N* of segments = 23)	Minimal elongation (10–20%) (*N* of patients = 44, *N* of segments = 44)	Moderate elongation (20–40%) (*N* of patients = 44, *N* of segments = 44)	Severe Elongation (>40%) (*N* of patients = 31, *N* of segments = 31)
Lesion Length, mm						
Mean±SD (N)	76.62 ± 35.82 (84)	60.94 ± 27.12 (10)	73.98 ± 31.89 (23)	76.04 ± 36.56 (43)	69.41 ± 39.83 (44)	81.92 ± 53.13 (31)
Calcification, Any1						
Mild	21.4% (18/84)	20.0% (2/10)	17.4% (4/23)	25.0% (11/44)	34.1% (15/44)	35.5% (11/31)
Moderate	27.4% (23/84)	40.0% (4/10)	34.8% (8/23)	38.6% (17/44)	22.7% (10/44)	32.3% (10/31)
Severe	51.2% (43/84)	40.0% (4/10)	47.8% (11/23)	36.4% (16/44)	43.2% (19/44)	32.3% (10/31)
Total Occlusion (Per Patient)	29.8% (25/84)	30.0% (3/10)	17.4% (4/23)	25.0% (11/44)	20.5% (9/44)	19.4% (6/31)

Patients with calcification defined via angiographic core lab as severe with at least 1 cm of calcification noted on two sides of the artery (72.4% of the cohort) did not have a decrease in CD-TLR rates. At 3 years, freedom from CD-TLR was 87.6%.

Garcia et al, Catheterization and Cardiovascular Interventions 89:1259–1267 (2017)

VASCUPEDIA

DRUG-COATED BALLOONS IN CALCIFIED LESIONS



Calcium distribution evaluation by CTA (circumf.) and DSA (longitud.); "a" <3cm and "b" >3cm

Fanelli et al. Cardiovasc Intervent Radiol. 2014 Aug;37(4):898-907

Clinical Investigation

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SAGE

Drug-Eluting Balloon Therapy for Femoropopliteal Occlusive Disease: Predictors of Outcome With a Special Emphasis on Calcium

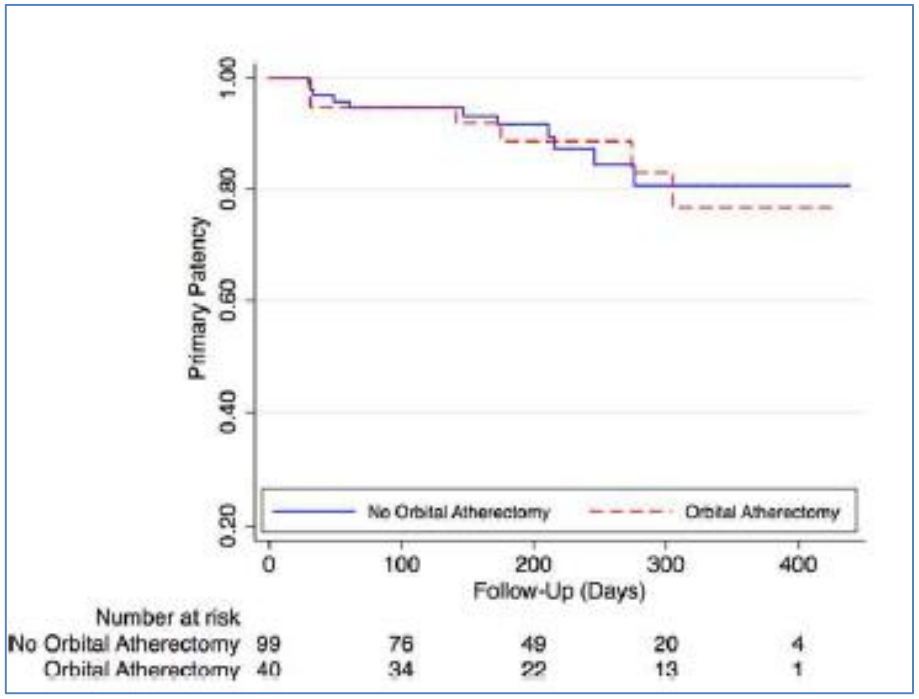
Gunnar Tepe, MD[1], Ulrich Beschorner, MD[2], Charlotte Ruether, MD[1], Imma Fischer, PhD[3], Peter Pfaffinger, MD[1], Elias Noory, MD[2], and Thomas Zeller, MD[2]

- Retrospective analysis of 91 patients[2]
- Analysed at 6M post DEB
- Lesion calcification analysed by core labs (PACSS score + angiographic calcium score)
- Severity of lesion calcification is associated with LLL after treatment with DCB.
- **Author conclusion: "One possible approach to overcome this limitation might be plaque modification or removal prior to DEB usage"**

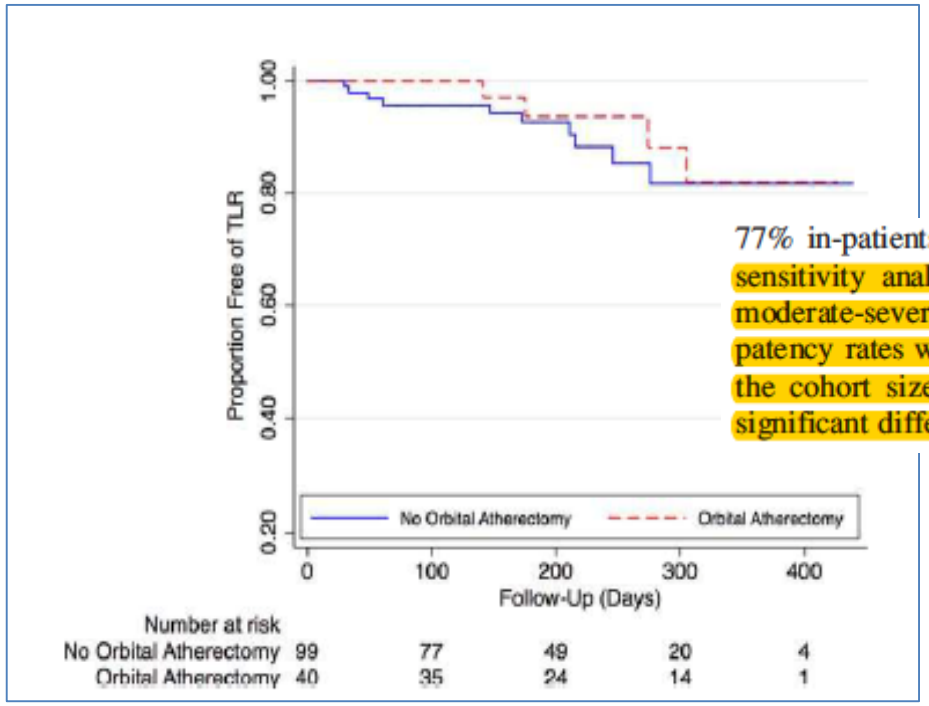
VASCUPEDIA

ORBITAL ATHERECTOMY + DCB VS DCB

Freedom from TLR



12 M Primary Patency



77% in-patients treated with DCB + OA ($P = 0.8$). In a sensitivity analysis limited to only those patients with moderate-severe calcification, there was no difference in patency rates with OA + DCB vs. DCB alone, although the cohort sizes were likely underpowered to detect a significant difference in outcomes.

Foley et al. Catheterization and Cardiovascular Interventions 89:1078–1085 (2017)

VASCUPEDIA

DIRECTIONAL ATHERECTOMY + DCB (DAART)

Severely calcified lesions

Mean lesion length: 11.5 cm

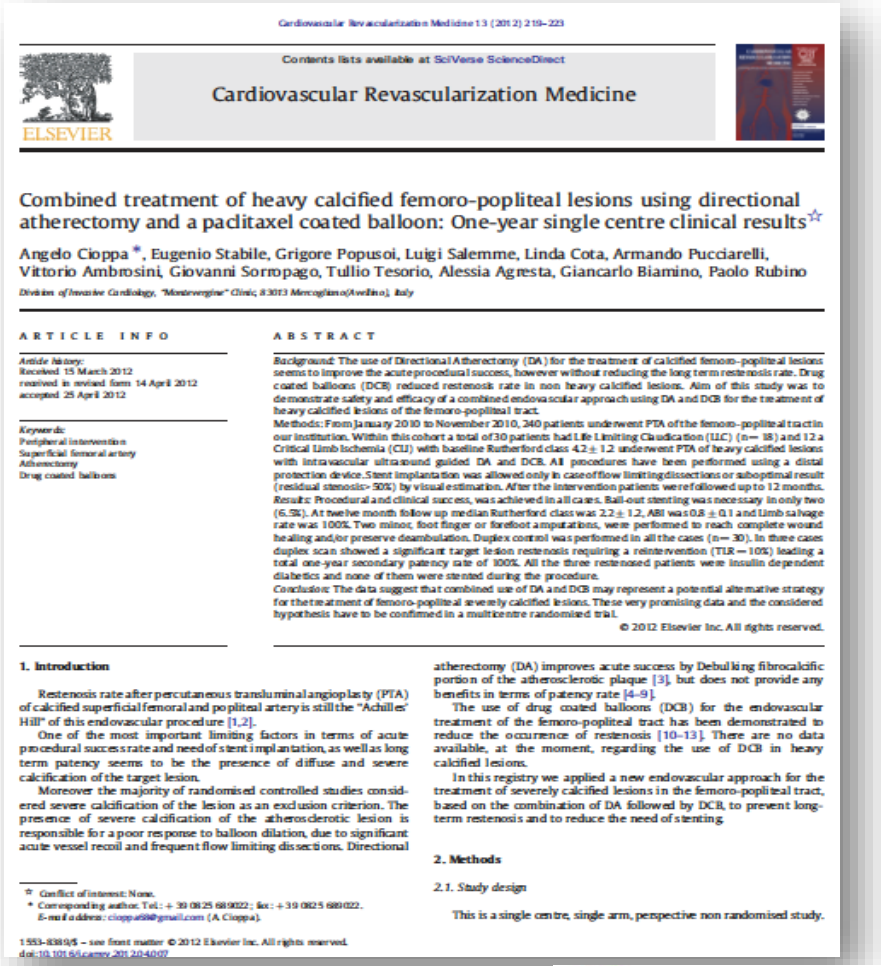
CTOs: 13 %

Bailout Stent: 6.7 %

12 M PPR: 90 %

12 M TLR: 10 %

Amputation rate: 0 %



Cardiovascular Revascularization Medicine 13 (2012) 219–223

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Cardiovascular Revascularization Medicine

Combined treatment of heavy calcified femoro-popliteal lesions using directional atherectomy and a paclitaxel coated balloon: One-year single centre clinical results☆

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ABSTRACT

Background: The use of Directional Atherectomy (DA) for the treatment of calcified femoro-popliteal lesions seems to improve the acute procedural success, however without reducing the long term restenosis rate. Drug coated balloons (DCB) reduced restenosis rate in non heavy calcified lesions. Aim of this study was to demonstrate safety and efficacy of a combined endovascular approach using DA and DCB for the treatment of heavy calcified lesions of the femoro-popliteal tract.

Methods: From January 2010 to November 2010, 240 patients underwent PTA of the femoro-popliteal tract in our institution. Within this cohort a total of 30 patients had Life Limiting Claudication (LLC) (n= 18) and 12 a Critical Limb Ischemia (CLI) with baseline Rutherford class 4.2 ± 1.2 underwent PTA of heavy calcified lesions with intravascular ultrasound guided DA and DCB. All procedures have been performed using a distal protection device. Stent implantation was allowed only in case of flow limiting dissections or suboptimal result (residual stenosis> 50%) by visual estimation. After the intervention patients were followed up to 12 months.

Results: Procedural and clinical success, was achieved in all cases. Bail-out stenting was necessary in only two (6.5%). At twelve month follow up median Rutherford class was 2.2 ± 1.2, ABI was 0.8 ± 0.1 and Limb salvage rate was 100%. Two minor, foot finger or forefoot amputations, were performed to reach complete wound healing and/or preserve deambulation. Duplex control was performed in all the cases (n= 30). In three cases duplex scan showed a significant target lesion restenosis requiring a reintervention (TLR = 10%) leading a total one-year secondary patency rate of 100%. All the three restenosed patients were insulin dependent diabetics and none of them were stented during the procedure.

Conclusion: The data suggest that combined use of DA and DCB may represent a potential alternative strategy for the treatment of femoro-popliteal severely calcified lesions. These very promising data and the considered hypothesis have to be confirmed in a multicentre randomized trial.

1. Introduction

Restenosis rate after percutaneous transluminal angioplasty (PTA) of calcified superficial femoral and popliteal artery is still the "Achilles' Hill" of this endovascular procedure [1,2].

One of the most important limiting factors in terms of acute procedural success rate and need of stent implantation, as well as long term patency seems to be the presence of diffuse and severe calcification of the target lesion.

Moreover the majority of randomised controlled studies considered severe calcification of the lesion as an exclusion criterion. The presence of severe calcification of the atherosclerotic lesion is responsible for a poor response to balloon dilation, due to significant acute vessel recoil and frequent flow limiting dissections. Directional atherectomy (DA) improves acute success by Debulking fibrocalcific portion of the atherosclerotic plaque [3], but does not provide any benefits in terms of patency rate [4–9].

The use of drug coated balloons (DCB) for the endovascular treatment of the femoro-popliteal tract has been demonstrated to reduce the occurrence of restenosis [10–13]. There are no data available, at the moment, regarding the use of DCB in heavy calcified lesions.

In this registry we applied a new endovascular approach for the treatment of severely calcified lesions in the femoro-popliteal tract, based on the combination of DA followed by DCB, to prevent long-term restenosis and to reduce the need of stenting.

2. Methods

2.1. Study design

This is a single centre, single arm, perspective non randomised study.

☆ Conflict of interest: None.

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VASCUPEDIA

DEFINITIVE AR TRIAL

Baseline Lesion Characteristics

Per Core Lab

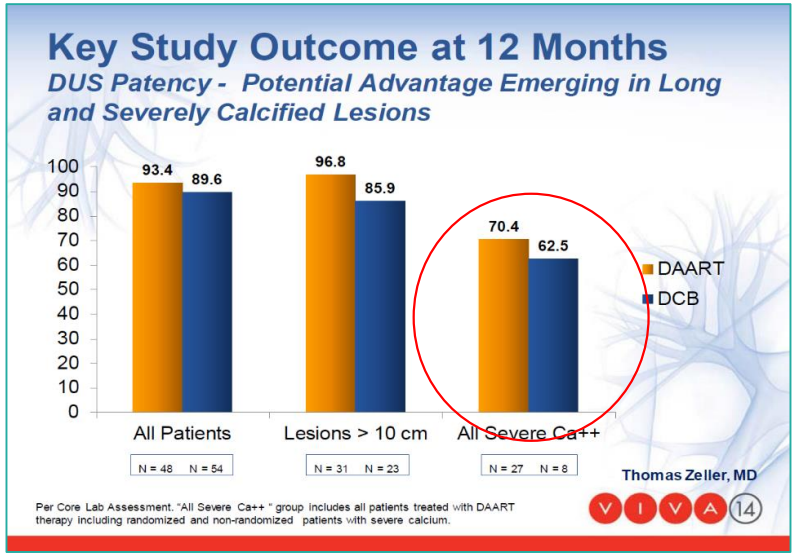
Baseline Characteristics	DAART (N= 48)	DCB (N = 54)	*p*-Value*	DAART Severe Ca++ Arm (N=19)
Lesion Length (cm)	11.2	9.7	0.05	11.9
Diameter Stenosis	82%	85%	0.35	88%
Reference vessel diameter (mm)	4.9	4.9	0.48	5.1
Minimum lumen diameter (mm)	1.0	0.8	0.34	0.7
Calcification	70.8%	74.1%	0.82	94.7%
Severe calcification	25.0%	18.5%	0.48	89.5%

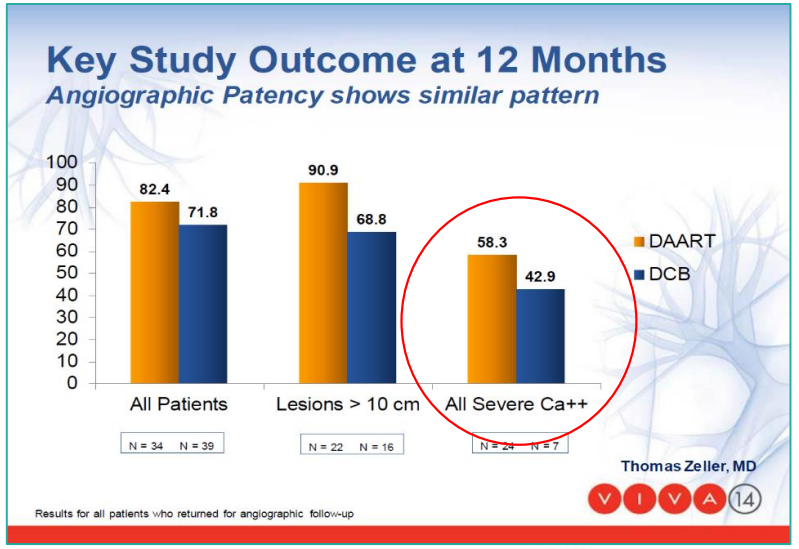
Thomas Zeller, MD

VIVA 14

* *p*-value for DAART and DCB groups

Zeller et al. Circ Cardiovasc Interv 2017 Sep;10(9). pii: e004848





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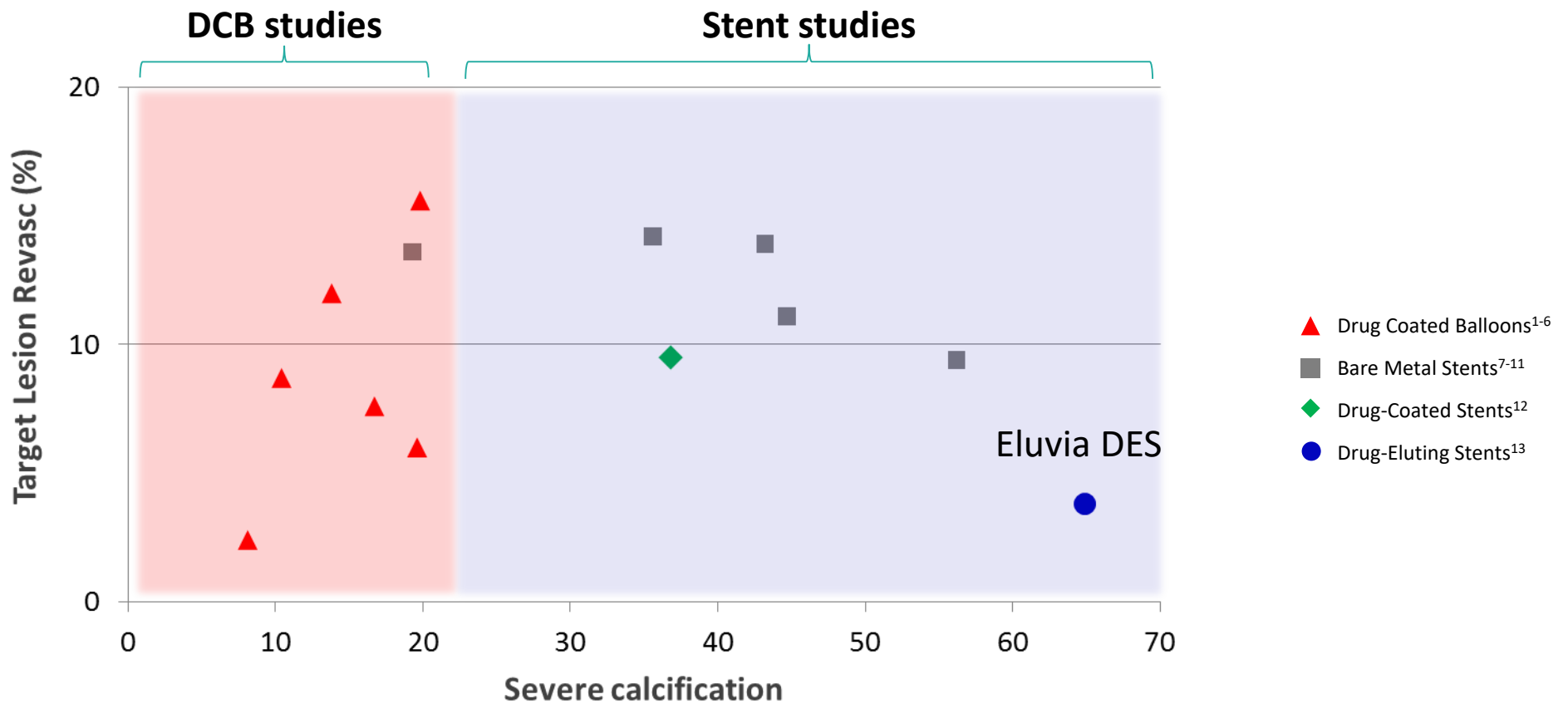
DRUG-ELUTING STENTS



[1]Micari A Et al. J Am Coll Cardiol Intv 2012; [2]Tepe G et al. Circulation 2015; [3]Zeller T et al. J Endovasc Therapy 2014; [4]Schroeder H et al. Catheter Cardiovasc Interv 2015; [5]Laird J. Endovacsular Today Feb 2015; [6]Ansel G. TCT 2015; [7]Matsumura et al. J of Vasc Surg. Jul 2013; [8-9]www.accessdata.fda.gov; [10]www.endovascularmagazine.eu 2013; [11]Powell, R. Charing Cross 2015; [12]Dake MD et al. Circ Cardiovasc Interv 2011; [13] Müller-Hülsbeck, S. VIVA 2015.

VASCUPEDIA

‚PAVE AND CRACK‘ TECHNIQUE

Clinical Investigation

JOURNAL OF ENDOVASCULAR THERAPY

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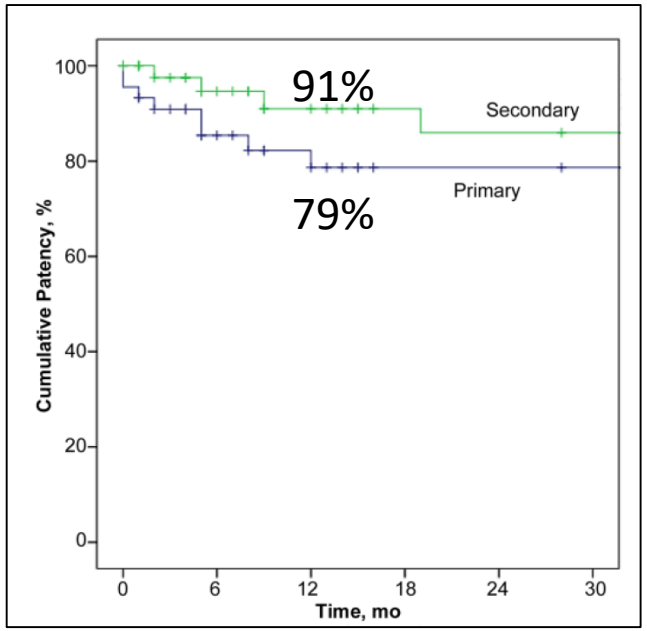
DOI: 10.1177/1526602818763352
www.jevt.org
SAGE

Endovascular Treatment of Severely Calcified Femoropopliteal Lesions Using the "Pave-and-Crack" Technique: Technical Description and 12-Month Results

Marina Dias-Neto, MD/MSc[1,2], Manuela Matschuck, MD[3], Yvonne Bausback, MD[3], Ursula Banning-Eichenseher, PhD[3], Sabine Steiner, MD, MSc[3], Daniela Branzan, MD[4], Holger Staab, MD[4], Ramon L. Varcoe, MBBS, MS, FRACS, PhD[5,6], Dierk Scheinert, MD, PhD[3], and Andrej Schmidt, MD, PhD[3]

Calcification (PACSS)	
1	3/64 (5)
2	2/64 (3)
3	19/64 (30)
4	40/64 (62)
Severe calcification[b]	40/66 (61)

Use of high pressure or cutting balloon	23/65 (35)
Perforation	39/66 (59)
Viabahn cumulative length, cm	16.5±8.7 (n=51)
Viabahn maximum diameter, mm	
5	2/67 (3)
6	34/67 (51)
7	28/67 (42)
8	3/67 (5)
SUPERA cumulative length, cm	22.9±12.0 (n=51)
SUPERA maximum diameter, mm	
5	32/67 (48)
6	34/67 (51)
7	1/67 (2)



Technique:

1. Local anesthesia in the surrounding issues of the SFA lesion
2. PTA
3. Angiographic control and confirmation of the residual stenosis
4. Deployment of a Viabahn endoprosthesis and aggresive dilatation with a high-pressure balloon catheter
5. Angiographic control and relining with Supera stents

J Endovasc Ther. 2018 Mar 1:1526602818763352.

VASCUPEDIA

MY TECHNICAL CHOICE IN SEVERE CALCIUM IN THE SFA

In fit patients:

LEAVE NOTHING BEHIND - STRATEGY

- **DAART + DCB**
  - LONG LESIONS
  - NORMAL RENAL FUNCTION
  - CLAUDICANTS
- **LITHOPLASTY + DCB**
  - SHORT LESIONS
  - CHRONIC KIDNEY DISEASE
  - CLI + CLAUDICANTS
- **IF STENT NECESSARY, THEN:**
  - DRUG-ELUTING STENT

In multimorbid patients:

LEAVE DIRECTLY A STENT BEHIND

- **PTA ± SCORING BALLOON**
  - **RECOIL < 30% ?**

    BARE METAL or DRUG-ELUTING STENTS
  - **RECOIL < 30% in the popliteal artery**

    SUPERA STENT
  - **RECOIL > 30%**

    VIABAHN + HIGH-PRESSURE BALLOON CATHETER ± SUPERA

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QUESTIONS TO VASCUPEDIANS

- What is your technical choice in severely calcified lesions?
- Which of the new technologies are available in your cath lab?
- Do you use DCBs in calcified lesions?
- Which kind of study would be helpful in your daily practice regarding calcified lesions in the SFA?

VASCUPEDIA