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Midterm Results of Interwoven Stenting in Femoropopliteal Lesions

Elias Noory, Jonas Salm, Friederike Wagner, Ulrich Beschorner, Roaa Bollenbacher, Dirk Westermann, Thomas Zeller, Tanja Böhme*

Abstract

Background: Numerous stents have been developed for the treatment of femoropopliteal lesions. The Supera stent is a self-expanding nitinol stent composed of six helically interwoven wires with a closed-cell design. Unlike conventional laser-cut stents, its unique structure provides enhanced flexibility and radial strength.

Purpose: To evaluate patency and target lesion revascularization (TLR) after Supera stent implantation for femoropopliteal lesions in an unselected, real-world patient cohort.

Methods: This retrospective study included patients treated with a Supera stent between January 2010 and January 2016 for peripheral arterial occlusive disease of all clinical categories and a follow-up of 24 months. The primary endpoint was TLR at 12 months. Secondary endpoints included TLR at 24 months, primary patency, major amputation, changes in ankle-brachial index (ABI) and Rutherford-Becker class (RBC), and predictors of restenosis and TLR.

Results: A total of 649 patients were included; 69.8% were treated for intermittent claudication. TLR rates were 13.3% at 12 months and 23.4% at 24 months. Drug-coated balloon (DCB) use had no significant effect on TLR (p=0.20). Primary patency was 65.6% at 12 months and 43.0% at 24 months. ABI and RBC improved significantly, while the major amputation rate was 0.9% at 24 months. Longer stent length and DCB use predicted restenosis. Critical limb-threatening ischemia (CLTI) predicted TLR, whereas good runoff and lower calcification (PACSS) were protective.

Conclusion: Supera stent implantation achieved favorable acute and mid-term outcomes. Adjunctive DCB use did not reduce TLR rates.

Keywords: Peripheral Artery Disease; Femoropopliteal; Interwoven Stent

Abbreviations: ABI - ankle-brachial index; CLTI - critical limb threatening ischemia; DES - drug-eluting stent; IC - intermittent claudication; RBC - Rutherford-Becker class; SFA - superficial femoral artery; TLR - target lesion revascularization

Introduction

Endovascular therapy has become the preferred treatment option for the majority of symptomatic femoro-popliteal lesions [1]. There is a range of stents that can be used to treat femoropopliteal lesions. The vast majority of stents are fabricated using laser cutting techniques [2]. However, the Supera stent (Abbott Vascular Corporation, Santa Clara, CA, USA) consists of six helically interwoven wires and exhibits exceptional resistance to radial forces

Affiliation:

Department of Cardiology and Angiology, Medical Center - University of Freiburg, Germany

***Corresponding Author**

Tanja Böhme, Department of Cardiology and Angiology, Medical Center - University of Freiburg, Südring 15, 79189 Bad Krozingen, Germany

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resulting in widespread use of the device in particular in severely calcified lesions [3]. Previous studies have included between 53 and 470 patients with promising technical and clinical outcomes. Studies with more than 500 patients are currently lacking [4-6].

The aim of this retrospective, monocentric study is to evaluate the midterm results after femoropopliteal Supera stent implantation in a larger real-world cohort.

Methods

Consecutive patients with Supera stent placement in the femoro-popliteal segment between 2010 and 2016 were included in the study. The study was approved by the local ethics committee. Medical records were reviewed to identify baseline demographics, lesion characteristics and clinical results including ankle-brachial index (ABI), Rutherford-Becker class (RBC), duplex ultrasound and angiographic results at follow-up. Calcification was assessed by two endovascular specialists and categorized according to the PACSS (Peripheral Arterial Calcium Scoring System) [7].

Study endpoints

The primary endpoint is target lesion revascularization (TLR) at 12 months following Supera stent implantation. Secondary endpoints include technical success of the procedure, procedure-related adverse events, primary patency at 12 and 24 months, TLR at 24 months, amputation at 24 months following the index intervention, and changes in ABI and RBC at 6, 12, and 24 months.

Study Device

The Supera stent (Abbott Vascular Corporation, Santa Clara, CA, USA) is a self-expanding device designed for peripheral vascular applications. Its structure is based on six wires woven helically around each other. The stent can be selected with diameters between 4.5 and 7.5 mm and lengths ranging from 20 to 200 mm [2]. Its interwoven structure enables conformability to the vessel while maintaining high resistance to radial forces [3].

Endovascular procedure

All procedures were performed by experienced physicians. The decision regarding access site and the use of a Supera stent, in conjunction with any concomitant procedures, was left to the discretion of the physicians. The device was used in accordance with the instructions for use [8]. Post-interventional angiography was deemed necessary to document the outcome.

Statistical analysis

Continuous data are presented as means ± standard deviation, and categorical data as counts (percentages). Categorical variables were compared using the Fisher's exact test, and continuous data were compared using the student's t-test. For identification of the risk factor for loss of patency, binary logistic regression analysis was used by means of a stepwise forward variable selection procedure. For identification of the risk factor for TLR Cox analysis was performed. Following patient characteristics and treatment details were included in the analysis: Model 1: PACSS (per grade), stent length (per 10 mm), good runoff (≥2 vessels), critical limb threatening ischemia, drug-coated balloon, dialysis, additional stent. Model 2 include additional to the parameters in model 1: plain balloon angioplasty, atherectomy, lithotripsy and total occlusion. Results of the analysis are given as an odds ratio with 95% confident intervals.

Results

Six hundred and fourty-nine patients were included in this analysis. Figure 1 shows the study flow chart. Patient characteristics at baseline are given in Table 1. A large number of patients presented with claudication (Rutherford-Becker class (RBC) 1-3), n=453, 69.8%) and 196 (30.2%) presented with critical limb-threatening ischemia CLTI (RBC 4 and 5). In 65%, the lesion was occluded. The bailout stenting rate was high at 63.9%. Following DCB treatment, bailout stenting was performed in 369 cases (86%). Lesions characteristics are shown in Table 2.

Acute outcomes

Procedure technical success (residual target lesion stenosis <30%) was achieved in 643 (99.1%) patients. Eighteen (2.8%) procedure-related adverse events occurred, including two (11.1%) distal embolization, one pseudoaneurysm at the target lesion (5.6%), and one (5.6%) case of a perforation. Access site complications occurred in 13 (3.1%) patients, including six (33.3%) pseudoaneurysms, six av-fistula, and

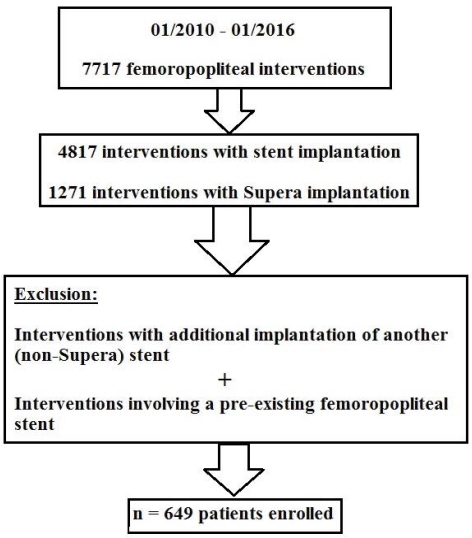


Figure 1: The study flow chart.

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one (0.8%) bleeding. All but one complication could be treated endovascularly or conservatively. Open surgical repair of the pseudoaneurysm at the access site was required in one (5.6%) patient. One patient developed cerebral ischemia during the procedure. The target limb means ABI values increased from 0.57±0.35 at baseline to 0.99±0.42 at discharge (p<0.0001; Table 3).

Table 1: Baseline characteristics.

Baseline Characteristics	Total
	n=649
Age, yrs	73±9
Male sex	447 (68.9)
Hypertension	578 (89.1)
Diabetes mellitus	267 (41.1)
Hyperlipidemia	526 (81.1)
Smoker	144 (22.2)
Former Smoker	245 (37.8)
Coronary heart disease	294 (45.3)
Stroke	6 (0.9)
Dialysis	23 (3.5)
Claudicatio intermittens	453(69.8)
Critical limb threatening ischaemia	196 (30.2)

Values are n (%) or mean±SD

Mid-term outcomes

Within 24 months, reintervention was recorded in 152 patients (23.4%). Within the first 6 months after the index intervention, 34 study participants underwent TLR (5.2%). Twelve months after the intervention, the TLR was recorded in a total number of 86 patients (13.3%), which corresponds to 56.58% of patients undergoing a re-intervention. Consequently, more than half of the total 152 re-interventions were performed within the first year following the initial intervention. The TLR rate was significantly lower among patients with claudication, among those with good outflow, and when stenosis was treated instead of occlusion (Figure 2). The use of a DCB does not significantly affect the TLR (p=0.20) (Figure 3). The lesion length of 150 mm or more also showed no significant difference with regard to TLR (p=0.72) (Supplement Figure S1). There is a trend toward lower TLR rates with increasing calcification severity (p=0.056) (Supplement Figure S2). Six months after the intervention, follow-up data was available for 395 patients, of whom 339 (85.82%) were found to be free of restenosis of the target lesion. After 12 months, data was available for 357 patients, of whom 65.55% were found to have no restenosis of more than 50%. Twenty-four months after the index procedure, follow-up data was available for 307 study participants, of whom 43% were found to be free of lesions in the treated vessel segment. Multivariate logistic regression analysis (Table 4 and 5) identified stent length (per 10 mm) as predictor for restenosis. The use of DCBs was also a predictor of restenosis. Preventive for a restenosis was plain old balloon

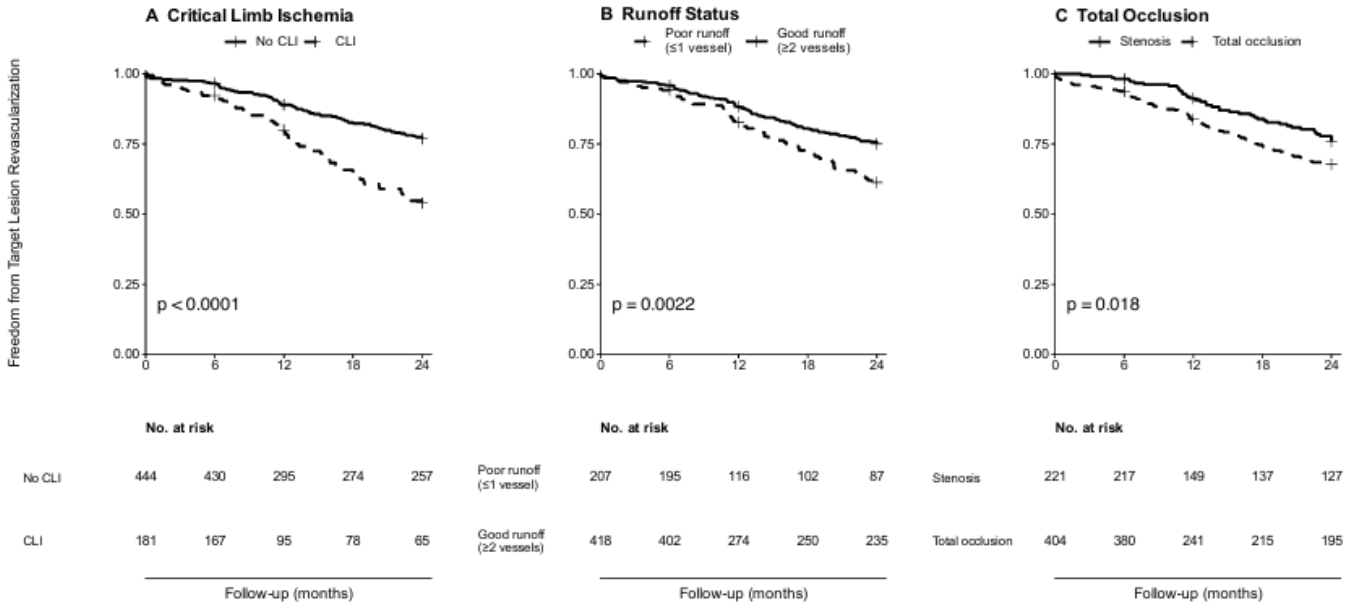


Figure 2: A) Kaplan-Meier curve stratified to patients with critical limb threatening ischaemia (CLTI) versus patients with intermittent claudication regarding freedom from TLR. B) Kaplan-Meier curve stratified to poor runoff (≤ 1vessel) versus patients with good runoff (≥ 2 vessels) regarding freedom from TLR. C) Kaplan-Meier curve stratified to patients with stenosis versus patients with occlusion regarding freedom from TLR.

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Table 2: Lesion and Index Procedure Characteristics.

Lesion and Index Procedure Characteristics	Total (n=649)
Primary intervention	486 (74.9)
Reintervention	163 (25.1)
Recanalization	422 (65)
Superficial femoral artery	239 (36.8)
Popliteal artery	248 (38.2)
Femoropopliteal arteries	162 (25)
Additional treatment	
Plain old balloon angioplasty	527 (81.2)
Drug coated balloon angioplasty	429 (66.1)
Additional stent angioplasty	159 (24.5)
Atherectomy	23 (3.5)
Rotational thrombectomy	83 (12.8)
Lysis	7 (1.1)
Supera diameter (mm)	
Mean (SD)	5.58 (0.6)
Median [Min, Max]	5.5 [4.0, 7.5]
<5	10 (1.5)
5-5.5	376 (57.9)
6	163 (25.1
6.5	94 (14.5)
>6.5	6 (0.9)
Supera length (mm)	
Mean (SD)	109 (89.1)
Median [Min, Max]	80 [20, 920]

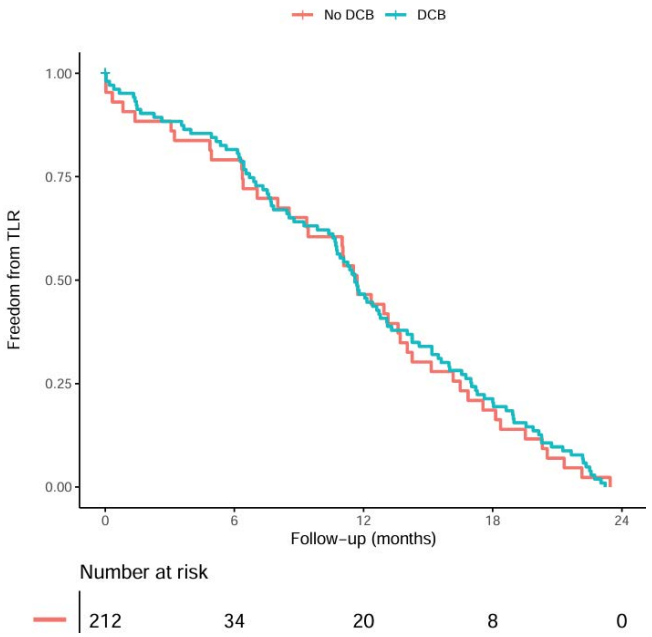


Figure 3: Kaplan-Meier curve stratified to treatment with drug-coated balloon angioplasty (DCB) versus no-DCB regarding freedom from target lesion revascularization (TLR).

Table 3: Clinical course.

		p- value
ABI baseline (n=412)	0.57±0.34	-
ABI discharge (n=596)	0.99±0.37	<0.001
ABI 6 months (n=227)	0.96±0.42	<0.001
ABI 12 months (n=230)	0.96±0.38	<0.001
ABI 24 months (n=176)	0.89±0.40	<0.001
RBC baseline (n=649)	3.2±1.2	-
RBC 6 months (n=227)	1.45 ± 1.75	<0.001
RBC 12 months (n=230)	1.70 ± 1.74	<0.001
RBC 24 months (n=177)	1.68 ± 1.60	<0,001

Values are mean±SD, ABI – ankle-brachial-index, RBC – Rutherford-Becker class

Table 4: Univariable Logistic Regression for 12M Restenosis.

Variable	OR (95% CI)	P value
PACSS (per grade)	0.89 (0.78–1.03)	0.12
Stent length (per 10 mm)	1.04 (1.01–1.07)	0.004
Good runoff (≥2 vessels)	0.63 (0.40–1.00)	0.052
Critical limb ischemia	1.71 (1.04–2.79)	0.033
Drug-coated balloon	1.86 (1.17–3.03)	0.01
Dialysis	1.09 (0.28–3.68)	0.892
Additional stent	1.19 (0.70–1.98)	0.515
Plain balloon angioplasty	0.37 (0.21–0.63)	0
Atherectomy	2.95 (0.83–11.72)	0.099
Lithotripsy	0.57 (0.16–1.66)	0.337
Total occlusion	2.07 (1.30–3.36)	0.003

Table 5: Multivariable Logistic Regression - Model 1 vs Model 2.

Model	Variable	OR (95% CI)	P value
Model 1	PACSS (per grade)	0.89 (0.77–1.04)	0.138
Model 1	Stent length (per 10 mm)	1.05 (1.02–1.08)	0.001
Model 1	Good runoff (≥2 vessels)	0.66 (0.40–1.08)	0.096
Model 1	Critical limb ischemia	1.47 (0.87–2.49)	0.15
Model 1	Drug-coated balloon	1.91 (1.17–3.20)	0.011
Model 1	Dialysis	0.94 (0.22–3.43)	0.923
Model 1	Additional stent	1.09 (0.63–1.86)	0.766
Model 2	PACSS (per grade)	0.97 (0.83–1.14)	0.735
Model 2	Stent length (per 10 mm)	1.04 (1.01–1.08)	0.005
Model 2	Good runoff (≥2 vessels)	0.67 (0.41–1.12)	0.127
Model 2	Critical limb ischemia	1.23 (0.71–2.12)	0.449
Model 2	Drug-coated balloon	1.54 (0.91–2.62)	0.112
Model 2	Dialysis	0.98 (0.22–3.80)	0.974
Model 2	Additional stent	1.14 (0.64–1.99)	0.651
Model 2	Plain balloon angioplasty	0.36 (0.19–0.68)	0.002
Model 2	Atherectomy	3.48 (0.87–15.33)	0.081
Model 2	Lithotripsy	0.55 (0.14–1.78)	0.348
Model 2	Total occlusion	1.60 (0.93–2.77)	0.091

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angioplasty. Cox analysis (Table 6 and 7) identified CLTI as predictor for TLR. Preventive for TLR was a good run-off and the degree of calcification ((PACSS (per grade)). Forest-Plots are shown in Table Supplement Figure S3 and S4. RBC and ABI values improved significantly from preintervention to all follow-up time points for the overall and sub-cohorts (Table 3). Within 24 months, 6 patients (0.9%) required major amputation, 5 of whom had CLTI prior to the intervention. Among the 25 patients (3.9) undergoing minor amputation, 23 had pre-existing CLTI.

Table 6: Univariable Cox Regression for TLR.

Variable	OR (95% CI)	P value
PACSS (per grade)	0.88 (0.79–0.98)	0.025
Stent length (per 10 mm)	1.01 (0.99–1.03)	0.17
Good runoff (≥2 vessels)	0.60 (0.44–0.84)	0.002
Critical limb ischemia	2.27 (1.64–3.15)	0
Drug-coated balloon	1.25 (0.89–1.78)	0.202
Dialysis	1.84 (0.90–3.74)	0.094
Additional stent	1.44 (1.00–2.06)	0.048
Plain balloon angioplasty	0.64 (0.44–0.93)	0.02
Atherectomy	1.56 (0.69–3.53)	0.291
Lithotripsy	0.64 (0.31–1.31)	0.219
Total occlusion	1.53 (1.07–2.18)	0.019

Table 7: Multivariable Cox Regression – Model 1 vs Model 2.

Model	Variable	OR (995% CI)	P value
Model 1	PACSS (per grade)	0.88 (0.79–0.98)	0.024
Model 1	Stent length (per 10 mm)	1.01 (0.99–1.03)	0.172
Model 1	Good runoff (≥2 vessels)	0.69 (0.50–0.96)	0.026
Model 1	Critical limb ischemia	1.98 (1.40–2.80)	0
Model 1	Drug-coated balloon	1.15 (0.81–1.64)	0.436
Model 1	Dialysis	1.44 (0.68–3.07)	0.342
Model 1	Additional stent	1.22 (0.84–1.78)	0.296
Model 2	PACSS (per grade)	0.91 (0.81–1.02)	0.097
Model 2	Stent length (per 10 mm)	1.01 (0.99–1.03)	0.32
Model 2	Good runoff (≥2 vessels)	0.70 (0.50–0.97)	0.033
Model 2	Critical limb ischemia	1.93 (1.36–2.75)	0
Model 2	Drug-coated balloon	1.04 (0.72–1.51)	0.838
Model 2	Dialysis	1.49 (0.66–3.36)	0.334
Model 2	Additional stent	1.24 (0.84–1.82)	0.271
Model 2	Plain balloon angioplasty	0.74 (0.49–1.11)	0.144
Model 2	Atherectomy	2.09 (0.93–4.74)	0.076
Model 2	Lithotripsy	0.75 (0.38–1.50)	0.42
Model 2	Total occlusion	1.28 (0.87–1.87)	0.214

Discussion

The Supera stent has been well evaluated for the treatment of femoropopliteal lesions. The present analysis is one of the largest real-world studies to date to assess the safety, technical, and clinical outcomes of patients with femoropopliteal lesions treated with the Supera stent.

Within the first 12 months following the index intervention, 13.3% of patients underwent TLR. At 24 months, the cumulative TLR rate had increased to 23.4%. Werner et al. [6] published a study based on data from 470 patients investigating the efficacy and durability of the Supera stent for the treatment of complex femoropopliteal lesions. In the cohort reported by Werner et al., the proportion of patients with CLTI was lower than in the present study (18.2% vs. 30.2%). Furthermore, restenotic lesions were treated less frequently (13.3% vs. 25.1%), and the proportion of recanalization procedures was also lower (52.6% vs. 65.0%). In the study by Werner et al., the TLR rate was 11.2% at 12 months and 21.0% at 24 months. Thus, the TLR rates were comparable to that in the present study.

Myint et al. [9] conducted a retrospective analysis of 97 patients treated with the Supera stent for de novo femoropopliteal occlusive disease. The proportion of recanalization procedures was lower than in the present study (43% vs. 65%), as was the proportion of patients with CLTI (30% vs. 45%). Nevertheless, the 12-month TLR rate was comparable to that observed in the present study (12.4%). As the follow-up period in the study by Myint et al. [9] did not extend to 24 months, no comparison of the 2-year TLR rate is possible. In the study by Guzzardi et al. [10], 99 patients underwent endovascular recanalization followed by implantation of the Supera stent in the femoropopliteal segment. Compared with the present study, a smaller proportion of interventions was performed for vascular occlusions (41.9% vs. 65.0%). Guzzardi et al. showed lower TLR rates, with reintervention rates of 7.3% and 8.5% at 12 and 24 months, respectively.

In this study, primary patency was 65% at 12 months and declined to 43% at 24 months. These rates are slightly lower than those reported in comparable studies. Werner et al. [6] reported primary patency rates of 83.3% after 12 months and 72.8% after two years. The differences in patient characteristics have already been discussed. In a study by Guzzardi et al. [10], primary patency rates were 83.10% and 74.3% after 12 and 24 months.

Chan et al. [11] evaluated the medium-term outcomes of 315 patients treated with the Supera stent for femoropopliteal disease. The proportion of recanalization procedures was substantially lower than in the present study (34% vs. 65%). Primary patency rates were 80.5% at 12 months and 73.8% at 24 months, both of which were higher than those observed

in the present study. The primary patency rates reported in the STELLA SUPERA trial [12] were comparable to those observed in the previously mentioned studies, reaching 85.3% at 12 months and 77.9% at 24 months.

Two studies evaluated patency following Supera stent implantation in the popliteal segment. Goltz et al. [13] analyzed outcomes in 40 patients, whereas San Norberto et al. [14] included 46 patients. While the proportion of recanalization procedures was higher in the study by Goltz et al. than in the present study (87.5% vs. 65.0%), it was lower in the cohort reported by San Norberto et al. (42% vs. 65.0%). Goltz et al. reported a primary patency rate of 68.4% at 12 months, which was comparable to that observed in the present study, whereas San Norberto et al. reported primary patency rates of 89.6% at 12 months and 72.0% at 24 months. In general, direct comparison between studies is challenging due to differences in lesion location, outflow status, and other baseline characteristics. In addition, retrospective analyses such as the present study are often limited by smaller follow-up datasets compared with prospective trials. At the respective follow-up time points, duplex ultrasonography was available for only approximately half of the patients included in the present study. This may have introduced a selection bias, as patients with symptoms and potentially underlying residual stenosis may have been more likely to undergo follow-up evaluation than asymptomatic patients. With more comprehensive follow-up, the results might more closely approximate those reported in the studies discussed above.

Multivariate logistic regression analysis (Table 5) identified stent length (per 10 mm) as predictor for restenosis.

Guzzardi et al. [10] investigated primary patency according to stent length. The highest patency rates were observed in the group with stent lengths <10 cm (85.7%, 78.5%, and 57.1% at 12, 24, and 36 months, respectively). However, in the intermediate-length group (10–18 cm), patency rates were lower (71.4%, 65.7%, and 51.4%) than those observed in the >18 cm group (87.5%, 72.4%, and 68.9%, respectively). Nevertheless, given the overall sample size of 99 patients and the resulting small subgroup numbers, the robustness of these findings is limited.

Other studies have demonstrated an association between stent length and the development of restenosis. In the study by Ko et al. [15], femoropopliteal lesions were treated either with long-segment stenting (n = 66) or spot stenting (n = 59). A trend toward higher primary patency (86.1% vs. 72.7%, P = 0.158) and TLR-free survival (94.2% vs. 82.5%, P = 0.120) was observed following spot stenting. In addition, total stent length was identified as a predictor of restenosis (hazard ratio [HR] 1.01, 95% confidence interval [CI] 1.00–1.01, P = 0.011). A retrospective analysis [16] comparing spot stenting (n = 129 limbs; stented length 10.3 ± 3.6 cm) with long stenting (n = 67 limbs; stented length 24.6 ± 8.7 cm) following subintimal recanalization also demonstrated superior patency and lower TLR rates after spot stenting. The adjusted primary patency rates at 1 and 2 years were 87% and 77%, respectively, in the spot stenting group, compared with 56% and 47% in the long stenting group. Similarly, adjusted TLR-free survival rates at 1 and 2 years were significantly higher in the spot stenting group than in the long stenting group (91% and 84% vs. 61% and 52%, respectively; $p < 0.001$). Consistent with these findings, long stenting emerged as an independent predictor of restenosis in the present study (HR 2.0).

The use of DCBs was also a predictor of restenosis. One possible explanation could be that the DCB was used in cases that were perhaps more complex to begin with, or where the primary outcome was not favorable. The Supera stent was used as a bailout option overall, particularly following DCB. However, the use of drug-eluting balloons does not have a positive effect, which can be explained by the high degree of calcification in the lesions typically treated with a Supera stent. Calcium significantly affects the drug absorption [17].

Cox analysis (Table 7) identified CLTI as predictor for TLR. The presence of CLTI is a well-established predictor of adverse outcomes following femoropopliteal endovascular intervention. In a Korean registry [18] including 1,924 patients, the CLTI subgroup (n = 812) exhibited higher rates of TLR, amputation, and restenosis, as well as an increased incidence of major adverse limb events. All-cause mortality was also more frequent in patients with CLTI. A large American/Canadian analysis [19], including 46,770 patients from the United States and 3,467 patients from Canada, evaluated endovascular and surgical treatments for peripheral artery disease (PAD) and identified CLTI as the strongest predictor of index limb amputation and mortality at 12 months.

Preventive for TLR was a good run-off and the degree of calcification ((PACSS (per grade)). Poor tibial runoff has been identified as an important predictor of adverse outcomes following femoropopliteal endovascular intervention, including reduced primary patency, increased restenosis, higher rates of TLR, and impaired limb salvage [20,21].

Boufi et al. [22] likewise observed a protective effect of calcification and suggested potential mechanisms, including a potentially attenuated inflammatory response following endovascular therapy, as well as a possible reduction in the development of neointimal hyperplasia and restenosis.

The importance of optimal predilation prior to Supera stent implantation is supported by the protective effect of POBA against restenosis observed in the Cox regression analysis. According to the instructions for use [8], pre-dilation is recommended, and the selected balloon diameter

should be equal to or larger than the intended stent diameter. Lithotripsy appears to have a protective effect against restenosis and TLR, which may be explained by improved stent expansion following vessel preparation. However, the present study is not sufficiently powered to definitively confirm this association.

In this study, the major amputation rate was 0.9% and the minor amputation rate was 3.9% at 24 months. Previous studies have also reported low amputation rates. In the study by Werner et al. [6], the major amputation rate was likewise 0.9%, consistent with the present study. The minor amputation rate was slightly lower (1.5%) than in the present study, despite a somewhat higher proportion of patients with CLTI. In this study, the majority (90.3%) of patients who underwent amputation had CLTI prior to intervention. In the study by Chan et al. [11], six major amputations were performed within the first six months after the index intervention, and three additional amputations occurred after more than six months. The overall amputation rate was therefore 2.9% of the total study population. No distinction was made between minor and major amputations.

The single-center retrospective study by Loureiro et al. [23] aimed to evaluate the efficacy and safety of femoropopliteal Supera stent implantation. Seventy-nine patients were enrolled, the majority of whom had CLTI (91.7%). The proportion of popliteal lesions (12.7%) was lower than in the present study (38.2%). The amputation rate was 8.9% and 13.4% at 12 and 24 months, respectively. This comparatively higher amputation rate can be attributed to the high proportion of CLTI patients. As in other studies that have examined the Supera Stent, the present study also demonstrated a significant improvement in ABI and RBC during the follow-up period [6,11]

Limitation

This is a retrospective study even if the data was collected from a prospective database including consecutive patients. Furthermore, this study does not include a control group that would allow for a comparison to other stents.

Conclusion

Interwoven stent implantation in femoro-popliteal lesions in a all-comers patient population confirms former promising acute and mid-term results in large patient cohort. The use of DCBs shows no additional effect concerning TLR rates in this study.

References

1. Hirsch AT, Haskal ZJ, Hertzer NR, et al. ACC/AHA 2005 guidelines for the management of patients with peripheral arterial disease (lower extremity, renal, mesenteric, and abdominal aortic): executive summary. A collaborative report from the American Association for Vascular Surgery/Society for Vascular Surgery, Society for Cardiovascular Angiography and Interventions, Society for Vascular Medicine and Biology, Society of Interventional Radiology, and the ACC/AHA Task Force on Practice Guidelines. J Am Coll Cardiol 47 (2006): 1239-1312.
2. Amendt K, Sigl M. Stenting der peripheren Arterien. CardioVasc (2018): 48-54.
3. Abbott Vascular Corporation. Supera® Peripheral Stent System. Santa Clara, CA, USA: Abbott Vascular Corporation.
4. Brescia AA, Wickers BM, Correa JC, et al. Stenting of femoropopliteal lesions using interwoven nitinol stents. J Vasc Surg 61 (2015): 1472-1478.
5. Haine A, Schmid MJ, Schindewolf M, et al. Comparison between interwoven nitinol and drug eluting stents for endovascular treatment of femoropopliteal artery disease. Eur J Vasc Endovasc Surg 58 (2019): 865-873.
6. Werner M, Paetzold A, Banning-Eichenseer U, et al. Treatment of complex atherosclerotic femoropopliteal artery disease with a self-expanding interwoven nitinol stent: midterm results from the Leipzig SUPERA 500 registry. EuroIntervention 10 (2014): 861-868.
7. Rocha-Singh KJ, Zeller T, Jaff MR. Peripheral arterial calcification: prevalence, mechanism, detection, and clinical implications. Catheter Cardiovasc Interv 83 (2014): E212-E220.
8. Myint M, Schouten O, Bourke V, et al. A real-world experience with the Supera interwoven nitinol stent in femoropopliteal arteries: midterm patency results and failure analysis. J Endovasc Ther 23 (2016): 433-441.
9. Guzzardi G, Spinazzola A, Cangiano G, et al. Endovascular treatment of femoro-popliteal disease with the Supera stent: results of a multicenter study. J Public Health Res 11 (2022): jphr-2021.
10. Chan YC, Cheng SW, Cheung GC. A midterm analysis of patients who received femoropopliteal helical interwoven nitinol stents. J Vasc Surg 71 (2020): 2048-2055.
11. Nasr B, Gouailler F, Marret O, et al. Treatment of long femoropopliteal lesions with self-expanding interwoven nitinol stent: 24 month outcomes of the STELLA-SUPERA trial. J Endovasc Ther 30 (2023): 98-105.
12. Goltz JP, Ritter CO, Kellersmann R, et al. Endovascular treatment of popliteal artery segments P1 and P2 in patients with critical limb ischemia: initial experience using a helical nitinol stent with increased radial force. J Endovasc Ther 19 (2012): 450-456.

13. San Norberto EM, Flota CM, Fidalgo-Domingos L, et al. Real-world results of Supera stent implantation for popliteal artery atherosclerotic lesions: 3-year outcome. Ann Vasc Surg 62 (2020): 397-405.

14. Ko YG, Ahn CM, Rha SW, et al. Comparison of spot versus long stenting for femoropopliteal artery disease. Ann Vasc Surg 58 (2019): 101-107.

15. Hong SJ, Ko YG, Shin DH, et al. Outcomes of spot stenting versus long stenting after intentional subintimal approach for long chronic total occlusions of the femoropopliteal artery. JACC Cardiovasc Interv 8 (2015): 472-480.

16. Fanelli F, Cannavale A, Gazzetti M, et al. Calcium burden assessment and impact on drug-eluting balloons in peripheral arterial disease. Cardiovasc Intervent Radiol 37 (2014): 898-907.

17. Park S, Sinurat MRMP, Rha SW, et al. Two-year clinical outcomes of critical limb-threatening ischemia versus claudication after femoropopliteal endovascular therapy: an analysis from K-VIS ELLA Registry. J Clin Med 14 (2025): 8919.

18. Li B, Rizkallah P, Eisenberg N, et al. Rates of intervention for claudication versus chronic limb-threatening ischemia in Canada and United States. Ann Vasc Surg 82 (2022): 131-143.

19. Hiramori S, Soga Y, Tomoi Y, et al. Impact of runoff grade after endovascular therapy for femoropopliteal lesions. J Vasc Surg 59 (2014): 720-727.

20. Rigatelli G, Zuin M, Dell'Avvocata F, et al. Impact of number of run-off vessels on interwoven nitinol mesh stents patency in the femoropopliteal segment. J Geriatr Cardiol 17 (2020): 561-565.

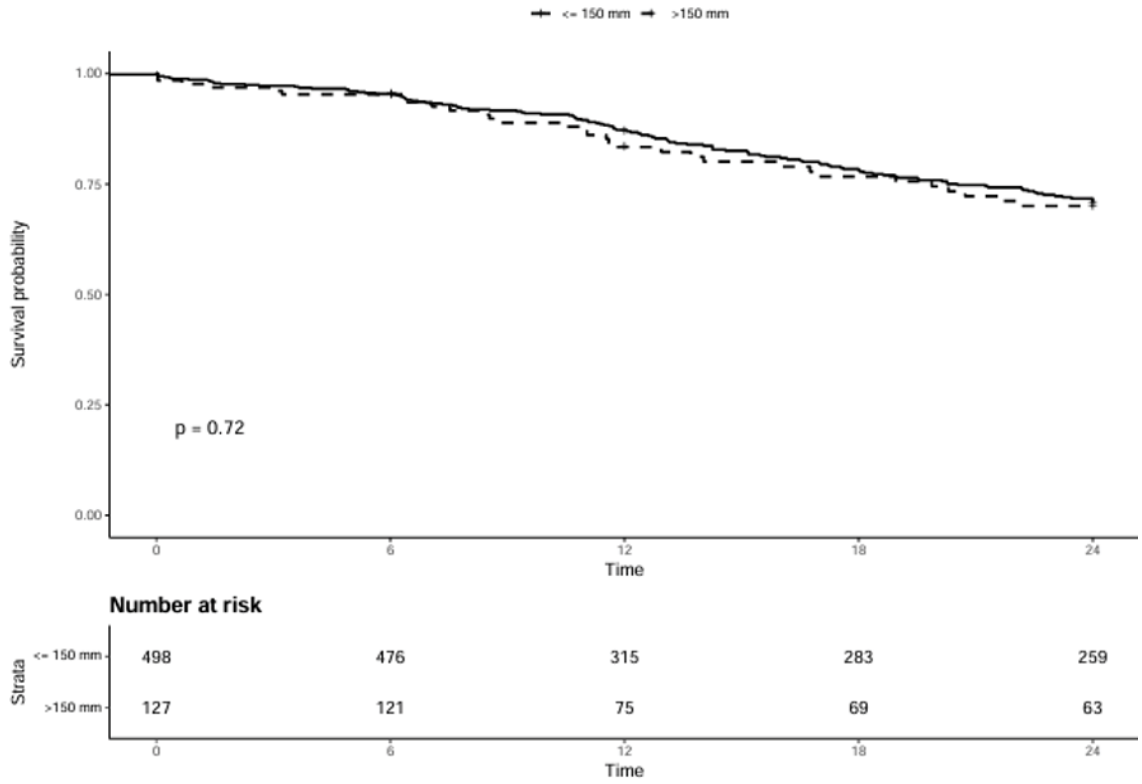
21. Boufi M, Ejargue M, Gaye M, et al. Systematic review and meta-analysis of endovascular versus open repair for common femoral artery atherosclerosis treatment. J Vasc Surg 73 (2021): 1445-1455.

22. Loureiro L, Pinelo A, Veterano C, et al. Navigating complexity: the Supera's triumph in femoropopliteal lesions. Vascular 33 (2025): 1274-1281.

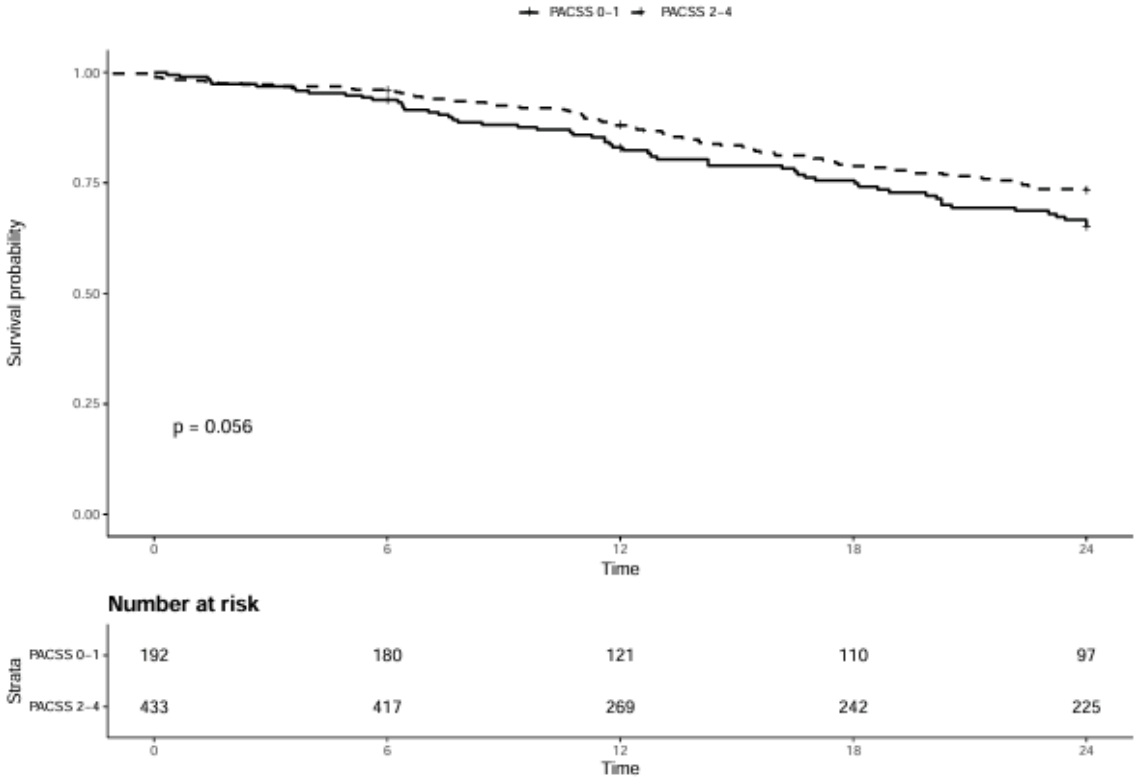
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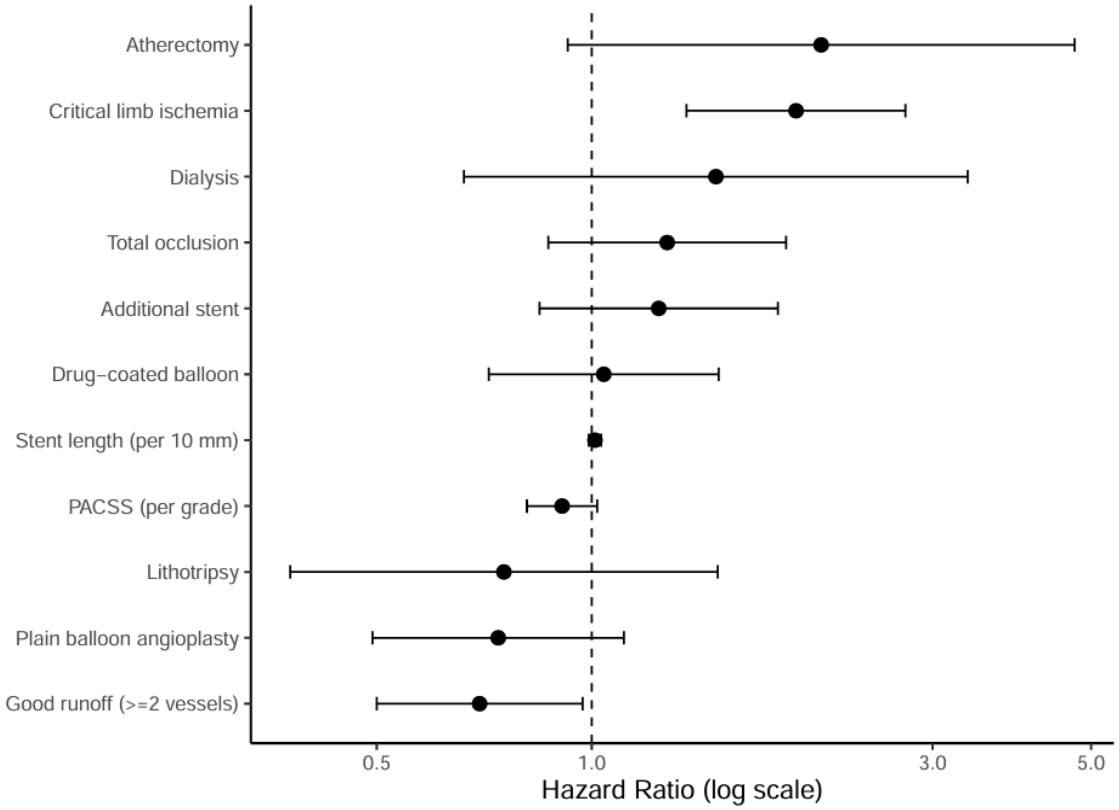


Supplementary Figure 1: Kaplan-Meier curve stratified to lesion length of up 150 mm or more than 150 mm regarding freedom from target lesion revascularization (TLR).

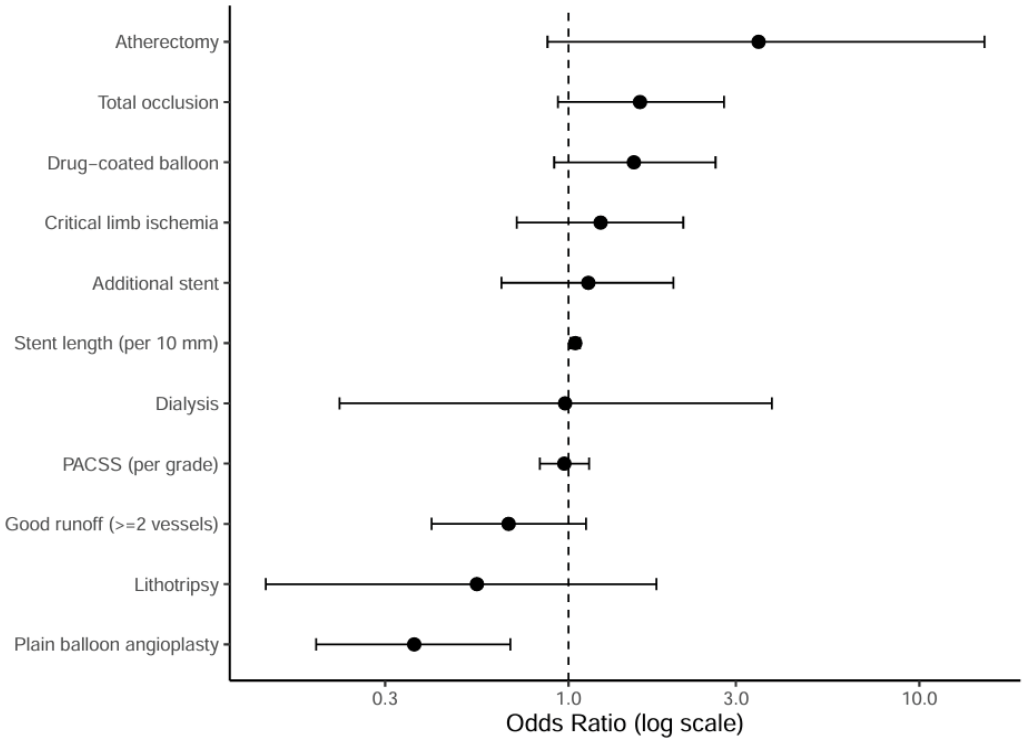


Supplementary Figure 2: Kaplan-Meier curve stratified to PACSS 0 -1 or PACSS 2 -4 regarding freedom from target lesion revascularization (TLR); PACSS: Peripheral Arterial Calcium Scoring System.

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Supplementary Figure 3: Multivariable Predictors of TLR.



Supplementary Figure 4: Multivariable Predictors of 12M Restenosis.