

What are the consequences of failed endo in CLI?

CONFERENCES ET ACTIVITÉS EN CHIRURGIE VASCULAIRE
CONTROVERSIES & UPDATES
IN VASCULAR SURGERY
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Disclosure

Speaker name: Ross Milner, MD

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- I have the following potential conflicts of interest to report:
- Consulting: Medtronic; WL Gore
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company
- Other(s)
- I do not have any potential conflict of interest

Background

- Infra-inguinal occlusive disease has traditionally been treated with open revascularization
- With the advent of percutaneous angioplasty and stenting there has been a paradigm shift in treatment strategies

Textbook Therapy

- Exercise Program
- Smoking cessation
- Operate for disabling claudication that prevents people from working

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- Operate for disabling complication that prevents people from working

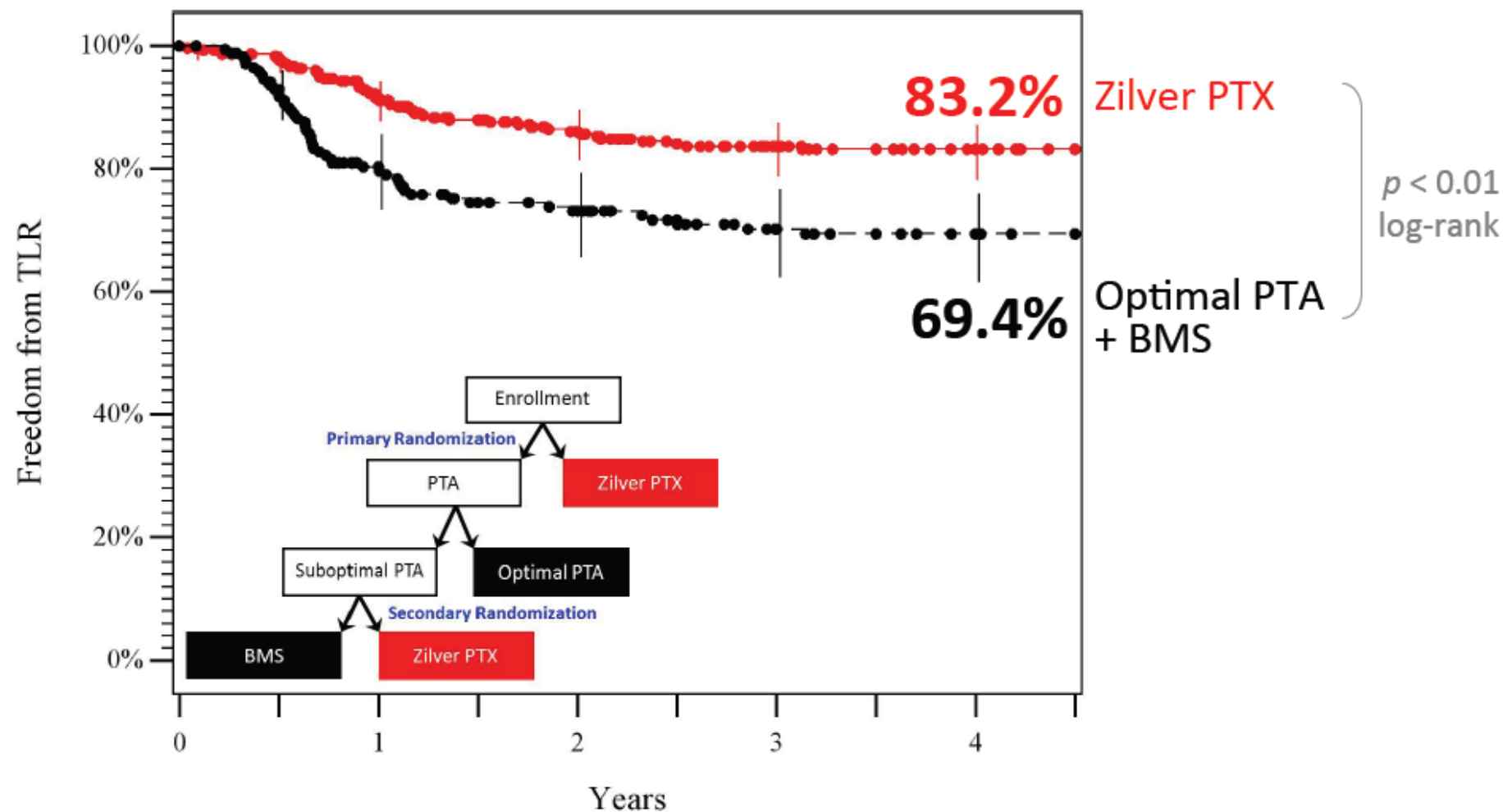
- Nationwide, several hundred percent increase in endovascular procedures and decrease in bypass grafting
- Goodney et al. reported over a 10-year period a three-fold increase in endovascular procedures along with a concomitant decrease in bypass surgery of 42%
- Percutaneous angioplasty and stenting has become the treatment for many infrainguinal occlusive lesions

Selected Studies



4-Year Freedom from TLR

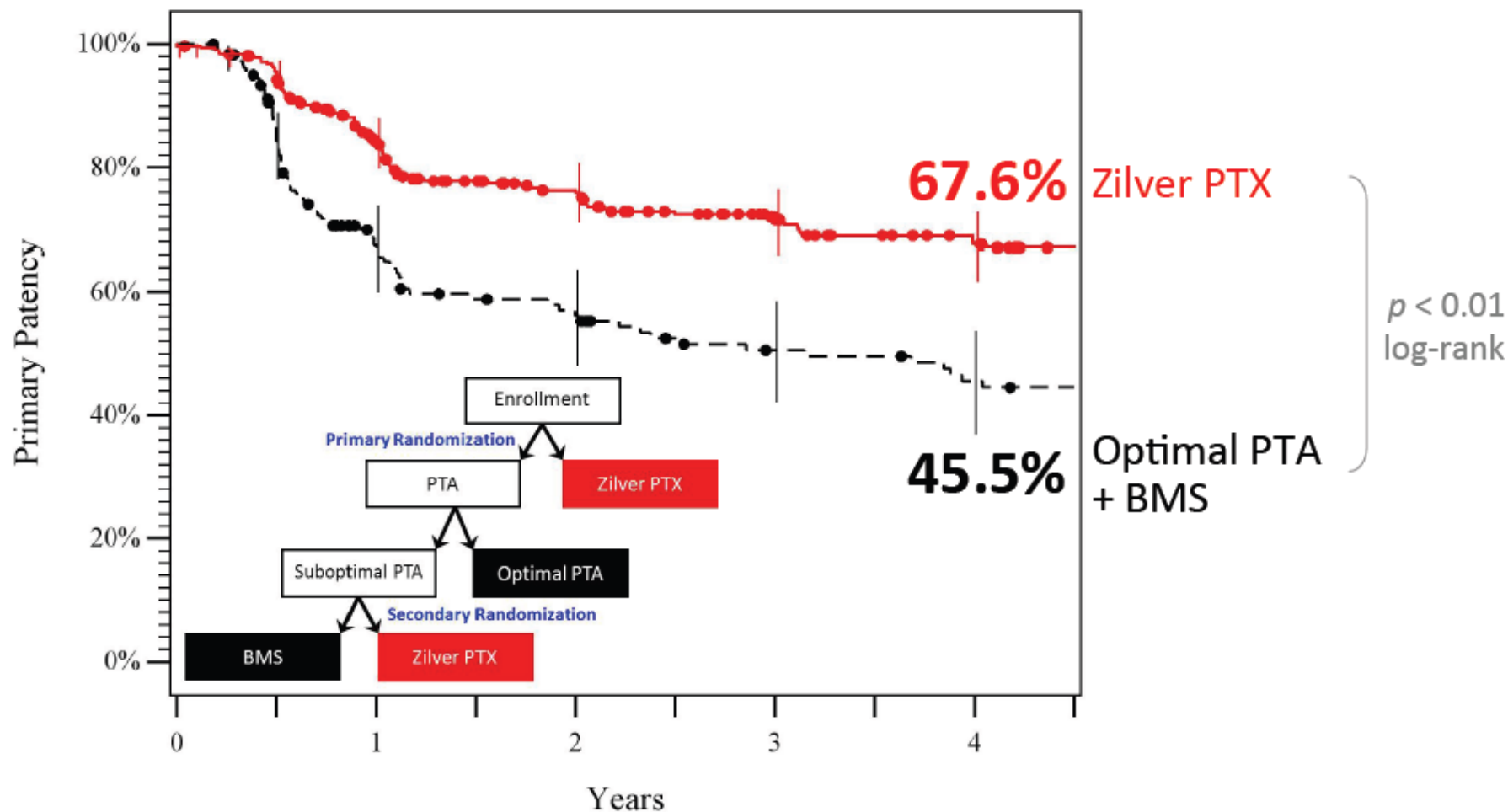
Zilver PTX vs. Standard Care – Drug Effect



45% reduction in reintervention rate due to the drug

4-Year Primary Patency (PSVR < 2.0)

Zilver PTX vs. Standard Care – Drug Effect





Definitive LE

- 800 patients at 47 centers
- Primary patency of 78% at 12 months
- No difference between diabetics and non-diabetics
- 95% amputation-free survival in critical limb ischemia patients



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Clinical outcomes and implications of failed infrainguinal endovascular stents

Ilia Gur, MD, William Lee, MD, Gabriel Akopian, MD, Vincent L. Rowe, MD, Fred A. Weaver, MD, and Steven G. Katz, MD *Pasadena and Los Angeles, Calif* (*J Vasc Surg* 2011;53:658-67.)

***Conclusions:* Following primary stenting of the superficial femoral artery (SFA) and popliteal artery, lesions classified as TASC C or D are more likely to fail with occlusion, lose run-off vessels, and alter the site of subsequent open operation than their TASC A and B counterparts. Although these complications are infrequent, they may negatively impact later attempts at revascularization,...**

From the Peripheral Vascular Surgery Society

Failed superficial femoral artery intervention for advanced infrainguinal occlusive disease has a significant negative impact on limb salvage

Omar Al-Nouri, DO,^a Monika Krezalek, BS,^a Richard Hershberger, MD,^b Pegge Halandras, MD,^b Andrew Gassman, MD,^a Bernadette Aulivola, MD,^b and Ross Milner, MD,^b *Maywood, Ill*

Objective: Endovascular treatment of superficial femoral artery (SFA) lesions is a well-established practice. The repercussions of failed SFA interventions are unclear. Our goal was to review the efficacy of SFA stenting and define negative effects of its failure.

Methods: A retrospective chart review was conducted from January 2007 to January 2010 that identified 42 limbs in 39 patients that underwent SFA stenting. Follow-up ankle-brachial index and a duplex ultrasound scan was performed at routine intervals.

Results: Mean patient age was 68 years (range, 43-88 years); there were 22 men (56%) and 17 women (44%). Intervention indication was claudication in 15 patients (36%), rest pain in seven patients (17%), and tissue loss in 19 patients (45%). There were 15 patients (36%) with TransAtlantic Inter-Society Consensus (TASC) A, nine patients (21%) with TASC B, five patients (12%) with TASC C, and 13 patients (31%) with TASC D lesions. The majority of lesions intervened on were the first attempt at revascularization. Three stents (7.7%) occluded within 30 days. One-year primary, primary-assisted, and secondary patency rates were 24%, 44%, and 51%, respectively. Limb salvage was 93% during follow-up. Seventeen interventions failed (40%) at 1 year. Of these, seven patients (41%) developed claudication, seven patients (41%) developed ischemic rest pain, and three patients (18%) were asymptomatic. During follow-up, three patients (7.7%) required bypass and three patients (7.7%) major amputation, one after failed bypass. All limbs requiring bypass or amputation had TASC C/D lesions. Thirty-day and 1-year mortality was 2.6% and 10.3%, respectively.

Conclusions: Interventions performed for TASC C/D lesions are more likely to fail and more likely to lead to bypass or amputation. Interventions performed for TASC C/D lesions that fail have a negative impact on limb salvage. This should be considered when performing stenting of advanced SFA lesions. (*J Vasc Surg* 2012;56:106-12.)

Introduction

- Despite technical success with stenting of advanced SFA lesions (TASC C/D), little is known about the negative effects of a failed SFA intervention

Methods

- Retrospective review of SFA stenting at Loyola University Medical Center and Hines VAMC from 2007-2010
- N = 42 limbs in 39 patients
- Primary endpoint: Patency
 - One-year primary, primary-assisted and secondary patency rates
- Secondary endpoints: Death, amputation-free survival, limb salvage rates

Demographics

- Male: 22/39 (56%)
- Female: 17/39 (44%)
- Mean age: 68 years (range 43-88)
- Mean BMI: 27.02 kg/m² (range 20-47)

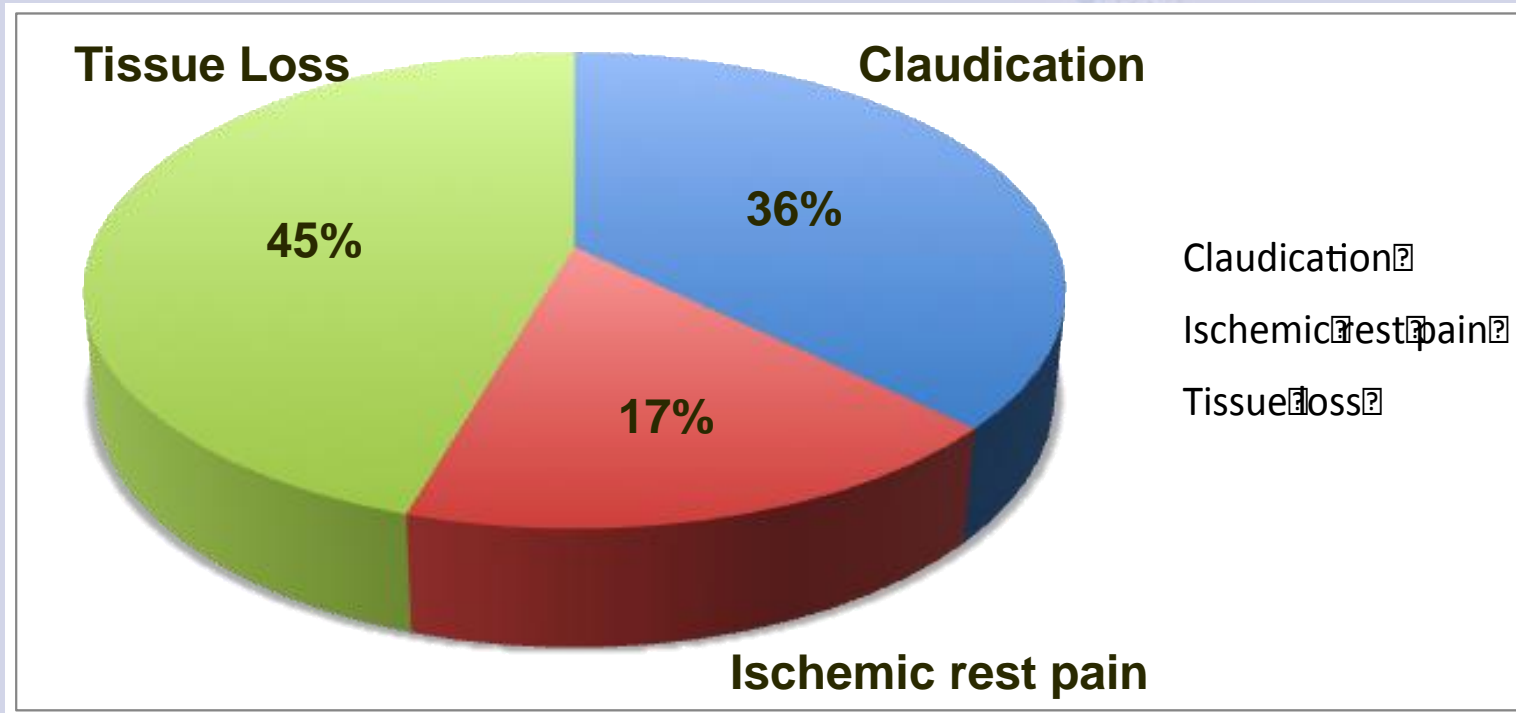
<i>Risk Factors</i>	<i>Number of patients (n=39)</i>	<i>Percentage</i>
Coronary artery disease	19	49%
Myocardial infarction	9	23%
Hypertension	36	92%
Diabetes	19	49%
Hypercholesterolemia	29	74%
End-stage renal disease	6	15%
Warfarin anticoagulation	5	11%
Smoking history	30	77%

Lesion Characteristics

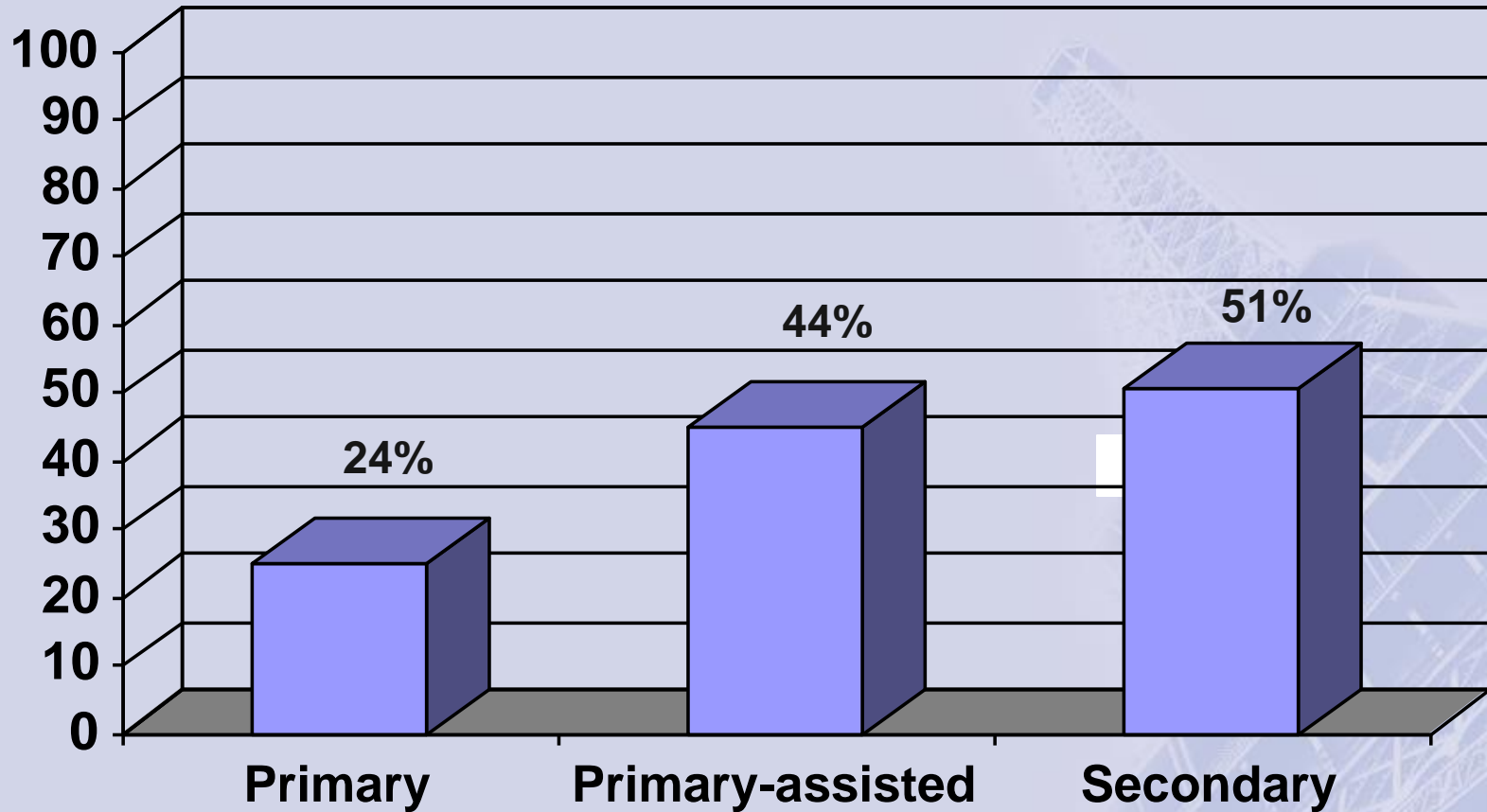
- TASC A: 15 (36%)
- TASC B: 9 (21%)
- TASC C: 5 (12%)
- TASC D: 13 (31%)
- Patent peroneal artery:
35/42 limbs (83%)

Lesion type	Description
A	Single stenosis ≤ 10 cm in length Single occlusion ≤ 5 cm in length
B	Multiple lesions (stenoses or occlusions), each ≤ 5 cm Single stenosis or occlusion ≤ 15 cm not involving the infrageniculate popliteal artery Single or multiple lesions in the absence of continuous tibial vessels to improve inflow for a distal bypass Heavily calcified occlusion ≤ 5 cm in length Single popliteal stenosis
C	Multiple stenoses or occlusions totaling >15 cm with or without heavy calcification Recurrent stenoses or occlusions that need treatment after two endovascular interventions
D	Chronic total occlusions of CFA or SFA (>20 cm, involving the popliteal artery) Chronic total occlusion of popliteal artery and proximal trifurcation vessels

Indication for Intervention

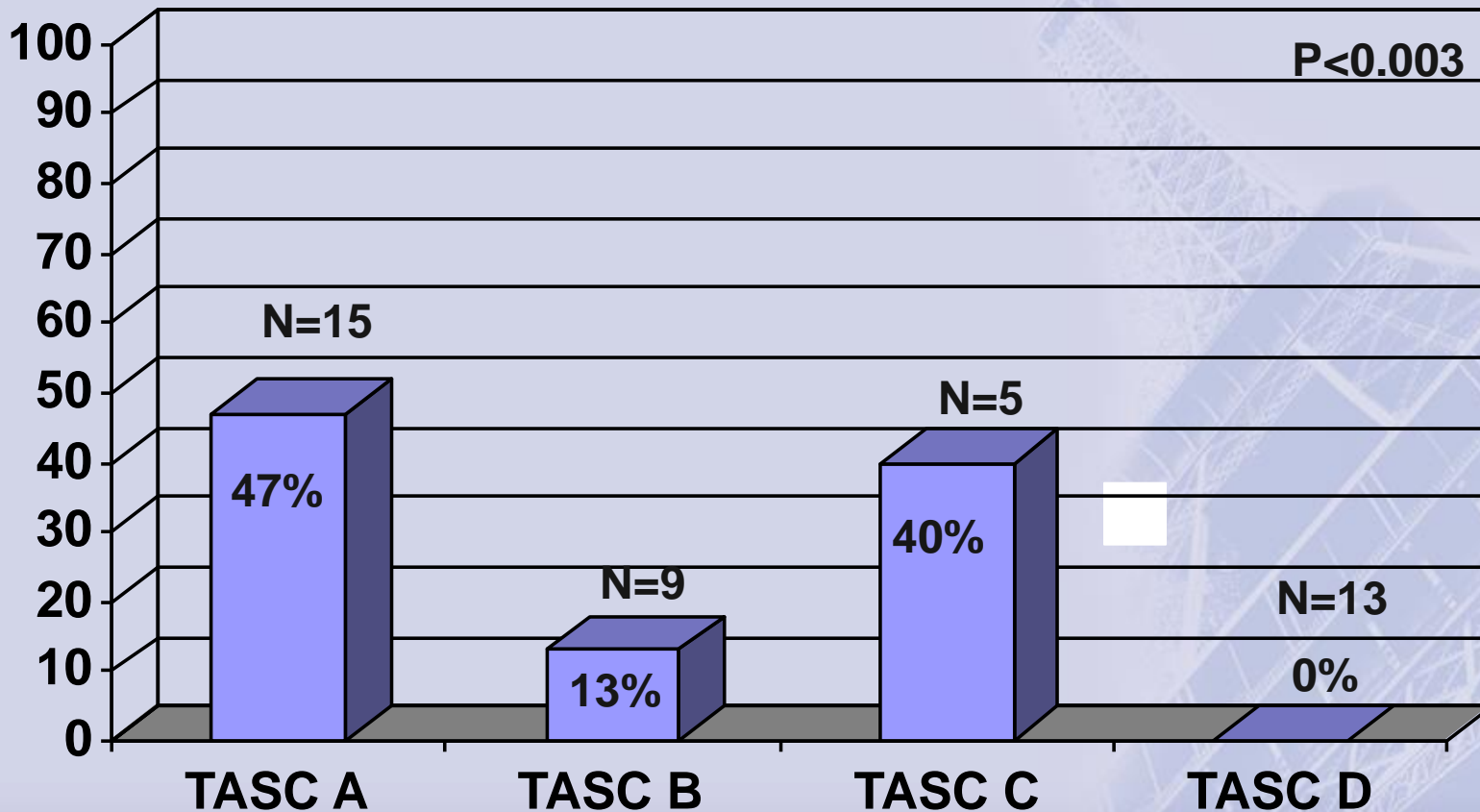


1-Year Overall Patency



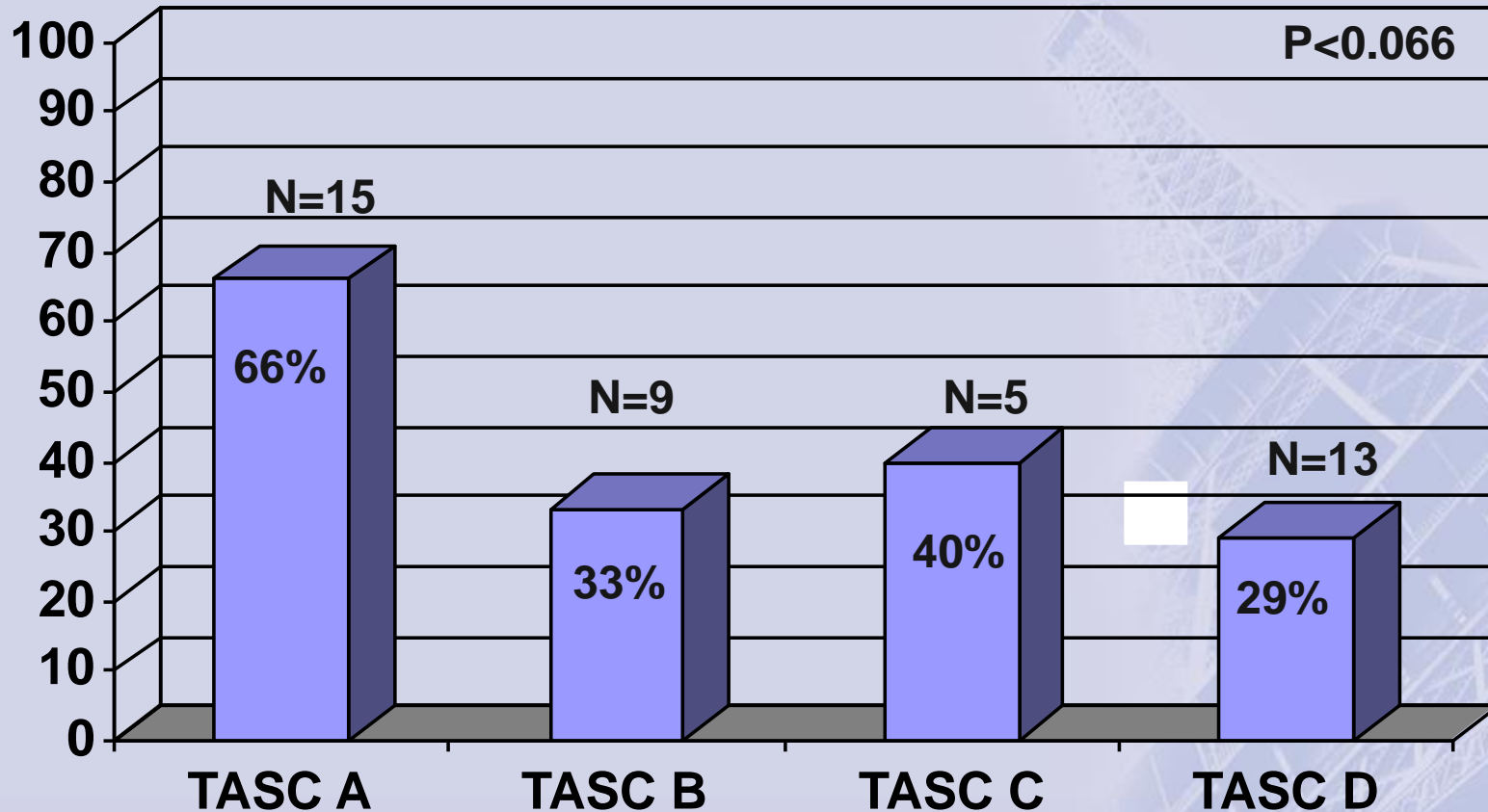
TASC Classification

1-Year Primary Patency



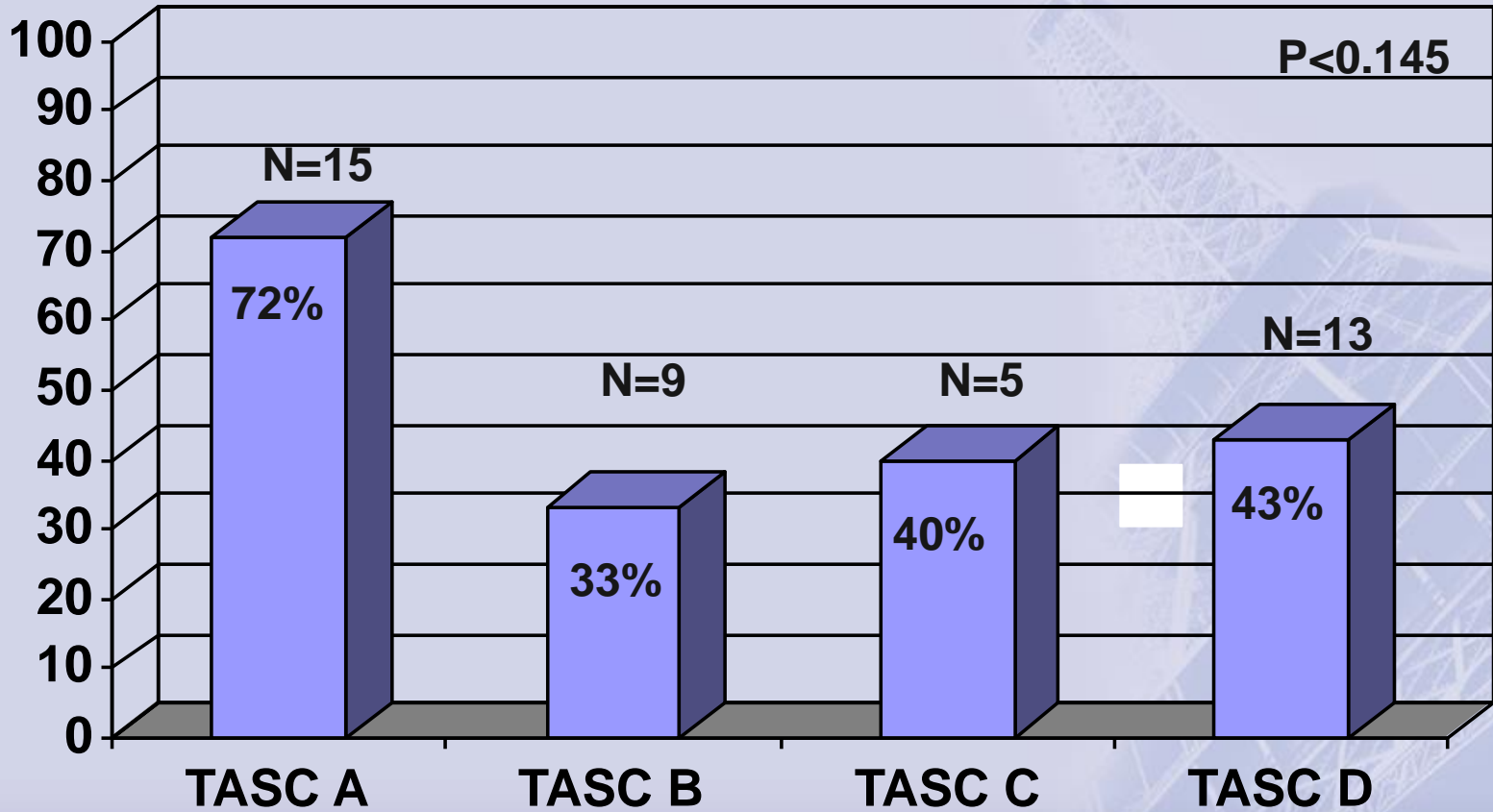
TASC Classification

1-Year Primary-Assisted Patency



TASC Classification

1-Year Secondary Patency



Results

- 17 Failed Interventions
 - 7 (17%) Developed claudication
 - 7 (17%) Developed Ischemic rest pain
 - 3 (7%) Remained asymptomatic

Results

Event	TASC A (N=15)	TASC B (N=9)	TASC C (N=5)	TASC D (N=13)
Stent failure	5	4	3	5
Loss of run-off vessels	0	0	0	2
Open revascularization	0	0	1	2
Major amputation	0	0	2	1

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Results

- Mortality during follow-up: 6/39 (15.4%)
 - TASC A: 2 patients
 - TASC B: 0 patients
 - TASC C: 2 patients
 - TASC D: 2 patients
- Mortality:
 - 2 sepsis
 - 1 hospice
 - 1 septic shock secondary to fulminant liver failure
 - 1 urosepsis
 - 1 MI

Conclusions

- SFA stenting performed for TASC C/D lesions: *more likely to fail and lead to bypass or amputation more than TASC A/B*
- SFA stenting performed for TASC C/D lesions: *negative impact on limb salvage if stent occludes*

Conclusions

- Patent peroneal artery did not increase likelihood of SFA stent patency
- Smoking has a negative impact on stent success
 - 13/17 (76%) of failed SFA interventions were in current smokers ($P < 0.05$)

Thank You



FACTORS TO CONSIDER WHEN DETERMINING BEST TREATMENT

- Short term vs long term fix?
- Facility utilized?
- Cost of repeat interventions?
- Co-morbidities of the patient?
- Quality of the conduit available?
- Expertise of the surgeon or vascular intervention list? (Who has the most complete toolbox?)

Some Questions

- How do you treat younger patients with TASC C/D disease?
- When is the right time to proceed to bypass?
- Is “endovascular first” always the right choice?

Conclusions

- TASC A/B can be safely treated

Conclusions

- TASC A/B can be safely treated
- TASC C/D is technically feasible

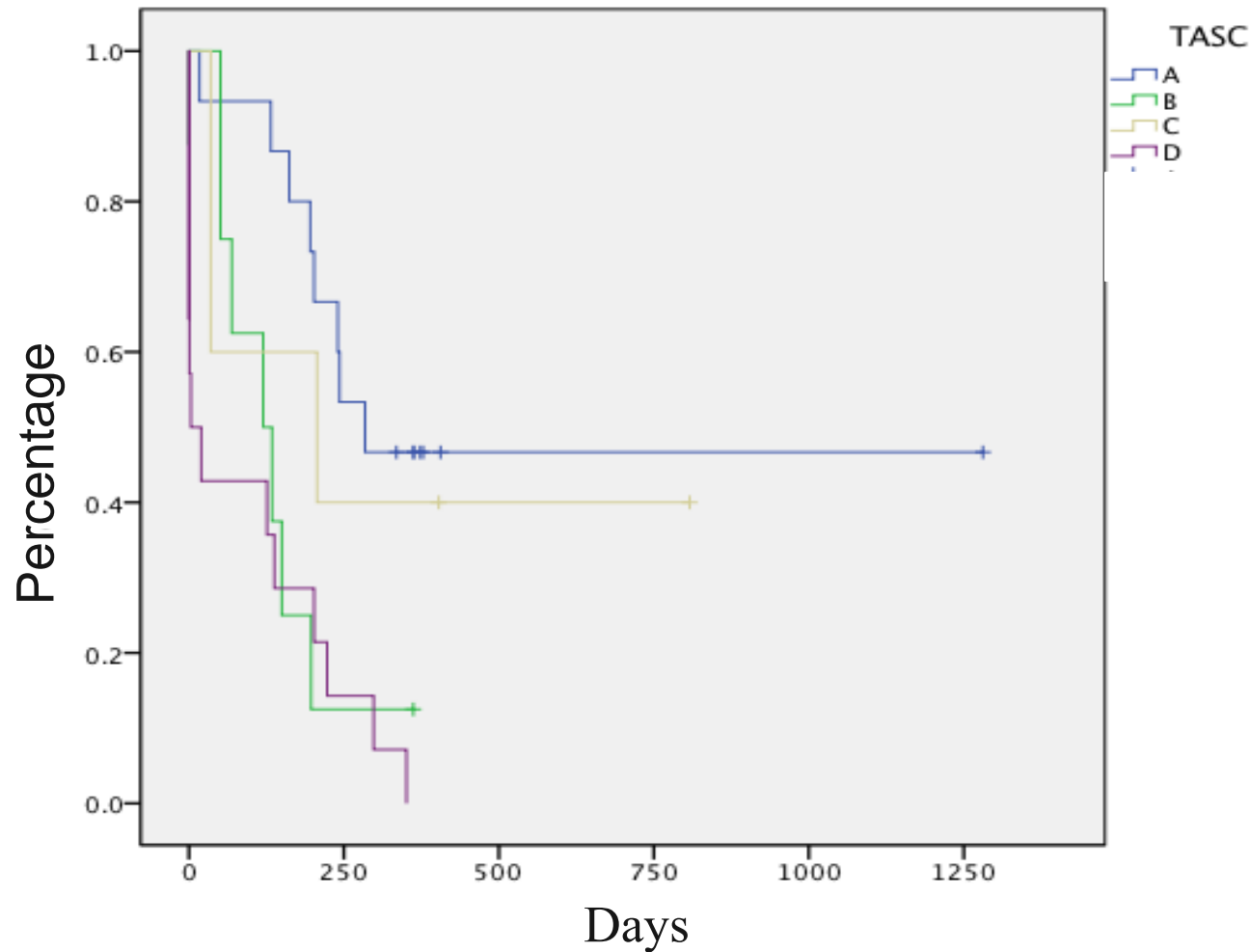
Conclusions

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- TASC C/D is technically feasible
- Failure of TASC C/D interventions may compromise future bypass success

Conclusions

- TASC A/B can be safely treated
- TASC C/D is technically feasible
- Failure of TASC C/D interventions may compromise future bypass success
- Will DES or DEB technology alter these failure modes

Primary Patency by TASC Classification



Prior failed ipsilateral percutaneous endovascular intervention in patients with critical limb ischemia predicts poor outcome after lower extremity bypass

Brian W. Nolan, MD, MS, Randall R. De Martino, MD, David H. Stone, MD, Andres Schanzer, MD, Philip P. Goodney, MD, MS, Daniel W. Walsh, MD, and Jack L. Cronenwett, MD, for the Vascular Study Group of New England, Lebanon, NH; and Worcester, Mass (J Vasc Surg 2011;54:730-6.)

In conclusion, while it is well known that a prior failed ipsilateral infrainguinal bypass is a negative predictor for future LEB success, this study demonstrates that a prior failed infrainguinal ipsilateral PVI has a similar negative prognostic effect on subsequent LEB. While we are unable to definitely prove causation, prior failed ipsilateral PVI is associated with 1-year major amputation or graft occlusion in the same manner that other established factors such as dialysis dependence, synthetic conduit and distal target arteries are. While some patients may benefit from an initial PVI, those who are eligible for either procedure may benefit from bypass given our findings and those of the BASIL trial.

Primary stenting of the superficial femoral and popliteal artery

David D. Dearing, MD, Kaushal R. Patel, MD, John M. Compoginis, MD, Mary A. Kamel, BA, Fred A. Weaver, MD, and Steven G. Katz, MD, *Los Angeles and Pasadena, Caliph* (J Vasc Surg 2009;50:542-8.)

We aggressively pursue catheter based intervention using a policy of selective but liberal stenting in patients with TASC A and B lesions and in many patients with TASC C disease. Percutaneous treatment of TASC D lesions is now reserved for patients with multiple medical comorbidities or those with inadequate conduit for surgical bypass. We would also be more likely to employ angioplasty and selective stenting in patients with TASC D disease whose indication for intervention is healing of an ulcer or digital amputation since they may not require as durable a reconstruction as patients with claudication or ischemic rest pain.

Surgical and endovascular revision of infrainguinal vein bypass grafts: Analysis of midterm outcomes from the PREVENT III trial

Scott A. Berceci, MD, PhD, Nathanael D. Hevelone, MPH, Stuart R. Lipsitz, PhD, Dennis F. Bandyk, MD, Alexander W. Clowes, MD, Gregory L. Moneta, MD, and Michael S. Conte, MD,
Gainesville and Tampa, Fla; Boston, Mass; Seattle, Wash; and Portland, Ore
(*J Vasc Surg* 2007;46:1173-9.)

In summary, open surgical revision of infrainguinal vein grafts provides an increased freedom from further reinterventions or major amputation; however, early success rates for endovascular procedures were similar, particularly for nonoccluded grafts. With time, endovascular revisions require an increasing number of reinterventions and manifest higher rates of failure. These data support the critical importance of continued ultrasound surveillance after vein graft revisions.

Ten Years After Arterial Bypass Surgery for Claudication: Venous Bypass is the Primary Procedure for TASC C and D Lesions

Thomas Eugster • Regula Marti • Lorenz Gurke • Peter Stierli, (World J Surg (2011) 35:2328–2331)

Conclusion: Infrainguinal venous bypass for severe IC has excellent long-term results. Our results are strong arguments against the liberal use of stenting long lesions of the femoropopliteal artery. Venous bypass remains the primary procedure for TASC C and D lesions in claudicants.

Percutaneous angioplasty and stenting of the superficial femoral artery

Scott M. Surowiec, MD, Mark G. Davies, MD, PhD, Shirley W. Eberly, MS, Jeffrey M. Rhodes, MD, Karl A. Illig, MD, Cynthia K. Shortell, MD, David E. Lee, MD, David L. Waldman, MD, PhD, and Richard M. Green, MD, *Rochester, NY* (*J Vasc Surg* 2005;41:269-78.)

Our patency data do suggest that for patients with TASC A and B lesions, endoluminal therapy appears to be the method of choice. For patients with TASC C and D lesions, open bypass provides superior patency and must be given first consideration. Factors that might make one select endoluminal therapy for TASC C and D lesions include infection at the proposed bypass site, medical comorbidities that preclude open operation, or lack of autogenous vein and below-knee reconstruction required.

Angioplasty and Primary Stenting of High-grade, Long-segment Superficial Femoral Artery Disease: Is It Worthwhile?

*Stephen W.K. Cheng, MS, FRCS, FACS, Albert C.W. Ting, MBBS, FRCS, and
Pei Ho, MBBS, FRCS, Hong Icong, China (Ann Vasc Surg 2003; 17: 430-437)*

Overall cumulative primary patency rates at 12, 24, and 48 months were 56%, 35%, and 22%, and secondary patency rates were 69%, 47%, and 37%, respectively. A stented segment length >10 cm and procedure in claudicants incurred an inferior patency rate. Treatment of high-grade SFA lesions with angioplasty and primary stenting results in lower long-term patency rate than those with surgery, but combined with secondary interventions this treatment option may be an acceptable alternative in selected patients with critical ischemia. Femoropopliteal bypass remains the procedure of choice.

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