Title

The Impact of Concomitant Proximal Carotid Interventions on Revascularization and Outcomes

Journal

Journal of Vascular Surgery, 79(6)

ISSN

0741-5214

Authors

Lin, Chung-Fu

Thandra, Sneha

Ho, Casey

et al.

Publication Date

2024-06-01

DOI

10.1016/j.jvs.2024.03.211

Peer reviewed

Table. Primary patient characteristics and interventions for intermittent claudication (IC) pre- and post-appropriate use criteria (*AUC*)

Characteristics	Pre-AUC	Post-AUC	Change, %	*P*-value
PVI, n ()	n = 7969	n = 7923		
Age >80 years	1099 (12.0)	868 (12.9)	7.5	.08
Severe claudication	6108 (66.6)	4835 (72.0)	8.1	**< .001**
Impaired ambulation	978 (10.7)	5963 (11.2)	4.7	.28
Current smoking	3816 (41.6)	2732 (40.7)	−2.2	.26
OMT preoperative	6359 (69.3)	4641 (69.1)	−0.3	.82
OMT postoperative	7311 (79.7)	5571 (83.0)	4.1	**< .001**
Endovascular interventions				
Aortoiliac TASC C/D	872 (9.5)	424 (6.3)	−33.7	**< .001**
CFA	313 (3.4)	350 (5.2)	52.9	**< .001**
Femoropopliteal TASC C/D	528 (5.8)	302 (4.5)	−22.4	**< .001**
Isolated infrapopliteal	319 (3.5)	381 (5.7)	62.9	**< .001**
Medical history				
CHF	1171 (12.8)	1016 (15.1)	18.0	**< .001**
CAD	3018 (32.9)	2254 (33.6)	2.1	.38
COPD	2597 (28.3)	1845 (27.5)	−2.8	.26
Diabetes	3687 (40.2)	2648 (39.4)	−2.0	.35
Obesity	3072 (33.5)	2177 (32.4)	−3.3	.17
Dialysis/transplant	250 (2.7)	131 (2.0)	−25.9	**.002**
Creatinine >1.8 mg/dL	354 (4.0)	277 (4.1)	2.5	.41
Suprainguinal bypass	n = 1846	n = 506		
Impaired ambulation	292 (15.8)	99 (19.6)	24.1	.05
Open extra-anatomic	681 (36.9)	176 (34.8)	−5.7	.4
Axillary origin	178 (9.6)	35 (6.9)	−28.1	.07
Femoral origin	503 (27.3)	141 (27.9)	2.2	.78
Infrainguinal bypass	n = 2699	n = 781		
Infrapopliteal bypass	1906 (70.6)	560 (71.7)	1.6	.6
Non-SSGSV	1472 (54.5)	458 (58.6)	7.5	.05

CAD, Coronary artery disease; *CFA*, common femoral artery; *CHF*, chronic heart failure; *COPD*, chronic obstructive pulmonary disease; *OMT*, optimal medical therapy corresponding to being on an antiplatelet with a statin; *PVI*, peripheral vascular intervention; *SSGSV*, single-segment great saphenous vein; *TASC C/D*, Trans-Atlantic Inter-Society Consensus Document on Management of Peripheral Arterial Disease grade C and grade D lesions.
Boldface *P* values indicate statistical significance.
Data are presented as number (%).
Pre-AUC corresponds to time January 2018 to December 2019, and post-AUC to May 2022 to December 2023.

IP113

The Impact of Concomitant Proximal Carotid Interventions on Revascularization and Outcomes

Chung-Fu Lin,[1] Sneha Thandra,[2] Casey Ho,■ Nadin Elsayed,[3] Sina Zarrintan,[4] Mahmoud Malas,[5] Ann Gaffey[6]. [1]Georgetown University School of Medicine, Washington, DC; [2]University of California San Diego School of Medicine, La Jolla, CA; [3]Center for Learning and Excellence in Vascular and Endovascular Research, University of California San Diego, La Jolla, CA; [4]Division of Vascular & Endovascular Surgery, Department of Surgery, University of California San Diego, San Diego, CA; [5]Division of Vascular and Endovascular Surgery, University of California San Diego, La Jolla, CA; [6]University of California San Diego School of Medicine, La Jolla, CA

Objectives: Atherosclerotic stenosis at the carotid bifurcation and ipsilateral proximal common carotid artery (CCA) is an uncommon cerebrovascular condition. There has not been a standard approach for this multilevel condition. We aim to examine the postoperative outcome following ipsilateral proximal endovascular (IPE) intervention with carotid endarterectomy (CEA + IPE), transfemoral carotid artery stenting (TFCAS + IPE), and transcarotid artery revascularization (TCAR + IPE).

Methods: A retrospective review of patients undergoing concomitant proximal lesion intervention with CEA + IPE, TFCAS + IPE, and TCAR + IPE in the Vascular Quality Initiative database between 2016 and 2023 was performed. The primary outcome was in-hospital major adverse cardiac events (MACE), including stroke, death, and myocardial infarction (MI). Secondary outcome was extended length of stay (eLOS). Logistic regression models were used for multivariate analyses, adjusting for potential confounders. Variable selected using stepwise regression and clinically relevant variables were in the final models.

Results: Our study included 843 (61.6%) CEA + IPE, 297 (21.7%) TFCAS + IPE, and 228 (16.7%) TCAR + IPE. TCAR patients were more likely to have history of stroke, greater than 80% ipsilateral carotid stenosis, diabetes, coronary artery disease (CAD), and chronic kidney disease (CKD) compared with CEA + IPE and TFCAS + IPE. When compared with CEA + IPE, both TCAR + IPE and TFCAS + IPE exhibited no difference in combined stroke/death/MI (adjusted odds ratio [aOR], 0.48; 95% confidence interval [CI], 0.20-1.10; $P = .08$), (aOR, 1.08; 95% CI, 0.58-1.98; $P = .81$), in stroke (aOR, 1.07; 95% CI, 0.42-2.72; $P = .9$), (aOR, 1.36; 95% CI, 0.59-3.16; $P = .473$), or in death (aOR, 0.49; 95% CI, 0.11-2.22; $P = .35$), (aOR, 0.78; 95% CI, 0.25-2.43; $P = .67$), respectively. However, there was a significant decrease eLOS (aOR, 0.59; 95% CI, 0.43-0.82; $P = .002$), (aOR, 0.42; 95% CI, 0.31-0.59; $P < .001$) in TCAR + IPE and TFCAS + IPE compared with CEA + IPE. Furthermore, TCAR + IPE and TFCAS + IPE had similar combined stroke/death/MI (aOR, 0.43; 95% CI, 0.17-1.10; $P = .078$) and risk of eLOS (aOR, 1.4; 95% CI, 0.91-2.19; $P = .12$) (Table I).

Conclusions: There is no significant difference observed in the risk of MACE in CEA + IPE, TFCAS + IPE, and TCAR + IPE. However, endovascular techniques were associated with shorter hospital stay. Notably, a trend towards reduction in MACE was observed in TCAR + IPE compared with CEA + IPE and TFCAS + IPE, suggesting a promising minimally invasive approach. Further research is needed to establish a standard approach to this multilevel condition.

Table. Multivariate outcomes for carotid endarterectomy (*CEA*) + ipsilateral proximal endovascular intervention (*IPE*), transfemoral carotid artery stenting (*TFCAS*) + IPE, and transcarotid artery revascularization (*TCAR*) + IPE

	TFCAS vs CEA + IPE		TCAR vs CEA + IPE		TCAR vs TFCAS	
In-hospital	aOR (95% CI)	*P*-value	aOR (95% CI)	*P*-value	aOR (95% CI)	*P*-value
Stroke/death/MI	1.08 (0.58-1.98)	.814	0.48 (0.20-1.10)	.083	0.43 (0.17-1.10)	.078
Stroke/death	1.15 (0.56-2.38)	.703	0.72 (0.30-1.70)	.447	0.68 (0.25-1.84)	.452
Stroke	1.36 (0.59-3.16)	.473	1.07 (0.42-2.72)	.9	0.85 (0.29-2.51)	.764
Death	0.78 (0.25-2.43)	.667	0.49 (0.11-2.22)	.354	0.64 (0.12-3.57)	.612
MI	0.73 (0.27-1.99)	.538	0.15 (0.02-1.11)	.064	0.17 (0.02-1.46)	.105
eLOS	0.42 (0.31-0.59)	**<.001**	0.59 (0.43-0.82)	**.002**	1.4 (0.91-2.19)	.12

aOR, Adjusted odds ratio; *CI*, confidence interval; *MI*, myocardial infarction; *eLOS*, extended length of stay.
Boldface *P* indicates statistical significance.

Author Disclosures: N. Elsayed: Nothing to Disclose; **A. Gaffey:** Nothing to Disclose; **C. Ho:** Nothing to Disclose; **C. Lin:** Nothing to Disclose; **M. Malas:** Nothing to Disclose; **S. Thandra:** Nothing to Disclose; **S. Zarrintan:** Nothing to Disclose.

IP115

Endovascular Management of Severe Peripheral Artery Disease Isolated to the Popliteal Artery Shows Comparable Outcomes Regardless of Treatment Modality

Matthew Auda,[■] Molly Ratner,[■] Heepeel Chang,[1] William Johnson,[■] Jeffrey J. Siracuse,[2] Saadat Shariff,[■] Glenn Jacobowitz,[■] Caron Rockman,[■] Karan Garg[■]. [1]Westchester Medical Center / New York Medical College, NY; [2]Boston University, Boston, MA

Objectives: Although the use of endovascular intervention for peripheral artery disease (PAD) has expanded in recent years, there remains relatively few studies focusing on the endovascular treatment of isolated popliteal artery occlusive disease. The popliteal artery presents a particular challenge for endovascular interventions due to the constant flexion at the knee. We sought to assess the outcomes for endovascular management of isolated popliteal artery occlusive disease based on type of intervention performed.

Methods: The Vascular Qualitative Initiative (VQI) database was queried for patients with isolated popliteal artery occlusive disease who underwent endovascular intervention since 2011. Patients were excluded from analysis if they did not have Medicare FFS entitlement, had a history of prior intervention in the ipsilateral limb, or had vessels treated in addition to the popliteal artery. Patients were stratified into groups based on their initial presenting symptom (claudication vs chronic limb-threatening ischemia [CLTI]) and were analyzed by endovascular procedure performed (plain old balloon angioplasty [POBA] vs POBA with adjunctive stent/atherectomy). The primary outcome was major amputation-free survival.

Results: Since 2011, a total of 2016 patients met criteria for analysis who underwent endovascular intervention for isolated popliteal artery occlusive disease. Among patients with claudication, the amputation-free survival rate was significantly higher at 1 year and 3 years for patients treated with adjunctive stent/atherectomy compared with POBA (1 year: 94.2% vs 88.9%; $P = .03$; 3 years: 83.0% vs 76.6%; $P = .04$). However, multivariable analysis showed that use of adjunctive stent/atherectomy was not independently associated with improved amputation-free survival (adjusted HR, 0.74; 95% CI, 0.48-1.16; $P = .19$). In the CLTI group, amputation-free survival rates were not significantly different for patients treated with adjunctive stent/atherectomy compared to POBA (1 year: 65% vs 64.6%; $P = .78$; 3 years: 47.1% vs 42.6%; $P = .30$). Reintervention rates were not statistically different in either the claudication or CLTI groups, nor by choice of intervention.

Conclusions: Our results suggest that across all patients with isolated popliteal artery occlusive disease, amputation-free survival rates were comparable regardless of endovascular treatment modality. Amputation-free survival for patients presenting with claudication was favorable and were driven primarily by mortality. Reintervention rates were similar across all patients and regardless of choice of treatment modality. This study underscores the clinical challenge of treating isolated popliteal artery occlusive disease and demonstrates that adjunctive modalities may be a reasonable option in the setting of complex lesions.

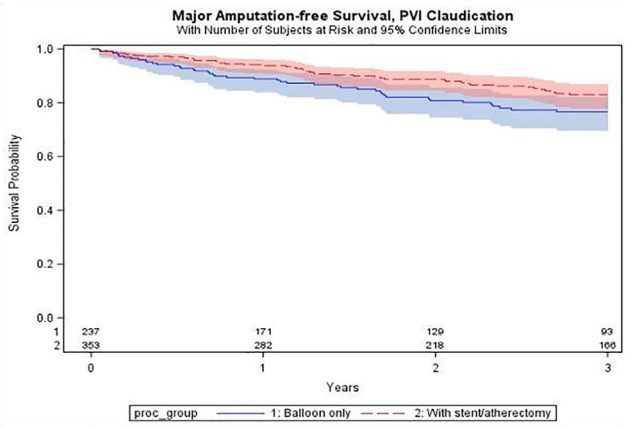

Fig 1. Kaplan-Meier curve for major amputation-free survival in the claudication group.

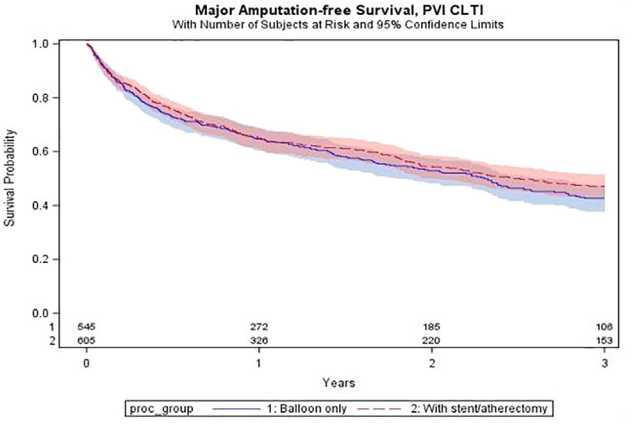

Fig 2. Kaplan-Meier curve for major amputation-free survival in the chronic limb-threatening ischemia (CLTI) group.

Author Disclosures: M. Auda: Nothing to Disclose; **H. Chang:** Nothing to Disclose; **K. Garg:** Nothing to Disclose; **G. Jacobowitz:** Nothing to Disclose; **W. Johnson:** Nothing to Disclose; **M. Ratner:** Nothing to Disclose; **C. Rockman:** Nothing to Disclose; **S. Shariff:** Nothing to Disclose; **J. J. Siracuse:** Nothing to Disclose.