

UC San Diego

UC San Diego Previously Published Works

Title

The Impact of Obesity on Outcomes of Infrainguinal Bypass vs Endovascular Therapy in Patients With Peripheral Artery Disease

Permalink

<https://escholarship.org/uc/item/88c4f9rr>

Journal

Journal of Vascular Surgery, 79(6)

ISSN

0741-5214

Authors

Kricfalusi, Mikayla

Hamouda, Mohammed

Abdelkarim, Ahmed

et al.

Publication Date

2024-06-01

DOI

10.1016/j.jvs.2024.03.365

Peer reviewed

Table. Continued.

	A1C improved (n = 110)	A1C worsened (n = 72)	P value
Great toe	25 (23)	23 (32)	1.00
Forefoot	16 (11)	10 (10)	1.00
Heel	33 (23)	16 (16)	.26
Infection present	77 (70)	46 (64)	.42
Interval factors			
Revascularization during wound course	33 (30)	24 (33)	.74
Average interval change in A1C (average ± SD)	1.30 ± 1.18	0.89 ± 0.76	.06
Outcomes			
Healed without major amputation	87 (79)	59 (82)	.71
Healed by 90 days	24 (22)	9 (13)	.12
Healed by 6 months	39 (35)	33 (46)	.17
Average weeks until healed	45.4 ± 51.8	41.0 ± 47.2	.56
Incidence amputation (any)	49 (45)	21 (29)	.04
Incidence major amputation	11 (10)	2 (3)	.08
One-year all-cause mortality	5 (5)	3 (4)	1.00

for covariates, no significant odds ratios related to A1C improvement were found regarding wound healing (OR, 0.5; 95% CI, 0.2-1.5), any amputation (OR, 2.6; 95% CI, 1.0-6.8), major amputation (OR, 9.3; 95% CI, 0.9-97.6), or 1-year mortality (OR, 0.9; 95% CI, 0.1-5.4). Wounds took on average around 44 weeks to heal regardless of A1C change.

Conclusions: In our population of diabetic patients with foot wounds and concomitant PAD, improved A1C was not found to independently associate with significantly different odds for wound healing, amputation, or mortality as compared to worsened A1C over wound course, suggesting that A1C cannot be used as a biomarker to predict favorable outcomes in this patient population.

Author Disclosures: J. M. Dittman: Nothing to Disclose; B. H. Douglas: Nothing to Disclose; G. J. Harris: Nothing to Disclose; M. H. Nguyen: Nothing to Disclose; G. Tang: Nothing to Disclose.

PC094



The Impact of Obesity on Outcomes of Infringuinal Bypass vs Endovascular Therapy in Patients With Peripheral Artery Disease

Mikayla Kricfalusi,¹ Mohammed Hamouda,² Ahmed Abdelkarim,³ Alik Farber,⁴ Mahmoud Malas.⁵ ¹California University of Science and Medicine, San Marcos, CA; ²Center for Learning and Excellence in Vascular and Endovascular Surgery (CLEVER), Department of Surgery, Division of Vascular and Endovascular Surgery, UC San Diego, San Diego; ³Center for Learning and Excellence in Vascular and Endovascular Surgery (CLEVER), Department of Surgery, Division of Vascular and Endovascular Surgery, UC San Diego, San Diego, CA; ⁴Boston Medical Center, Weston, MA; ⁵Division of Vascular and Endovascular Surgery, University of California San Diego, San Diego, CA

Objectives: Obese patients have higher rates of cardiovascular disease and associated risk factors, but lower rates of peripheral artery disease (PAD) and better outcomes following revascularization. This results in an obesity paradox, where obese patients have the lowest risk of adverse outcomes following treatment, while underweight and morbidly obese patients are at the highest risk. No previous studies have compared outcomes of endovascular vs open bypass within each body mass index (BMI) group. Our study aims to help stratify the risk of interventions (peripheral vascular intervention [PVI] or infringuinal bypass [IIB]) for patients depending on BMI.

Methods: The Vascular Quality Initiative database was queried for patients presenting with claudication or critical limb ischemia undergoing PVI or IIB (using great saphenous vein) from 2012 to 2023. Patients were

Table I. In-hospital and 30-day mortality following IIB vs PVI by BMI

	Underweight (BMI <18.5 kg/m ²)				
	Univariable			Multivariable	
	IIB N (%)	PVI N (%)	P value	IIB vs PVI OR (95% CI)	P value
In-hospital death	7 (1.3%)	67 (1.7%)	.548	1.04 (0.44,2.47)	.923
Death in 30 days	18 (3.4%)	174 (4.4%)	.309	1.00 (0.55,1.83)	1.000
	Normal weight (BMI, 18.5-24.9 kg/m ²)				
	Univariable			Multivariable	
	IIB N (%)	PVI N (%)	P value	IIB vs PVI OR (95% CI)	P value
In-hospital death	51 (1.1%)	361 (1.2%)	.762	1.40 (1.02,1.91)	.036
Death in 30 days	87 (1.9%)	879 (2.9%)	< .001	0.98 (0.78,1.23)	.870
	Overweight (BMI, 25-29.9 kg/m ²)				
	Univariable			Multivariable	
	IIB N (%)	PVI N (%)	P value	IIB vs PVI OR (95% CI)	P value
In-hospital death	46 (0.9%)	346 (1.0%)	.847	1.35 (0.95,1.90)	.093
Death in 30 days	91 (1.9%)	790 (2.3%)	.112	1.23 (0.94,1.61)	1.137

Obese (BMI, 30-39.9 kg/m ²)					
	Univariable			Multivariable	
	IIB N (%) 3721 (10.8%)	PVI N (%) 30,660 (89.2%)	P value	IIB vs PVI OR (95% CI)	P value
In-hospital death	47 (1.26%)	297 (0.97%)	.088	1.97 (1.44,2.70)	<.001
Death in 30 days	60 (1.6%)	610 (2.0%)	.116	0.68 (0.47,0.99)	.046
Morbidly obese (BMI, 40-49.9 kg/m ²)					
	Univariable			Multivariable	
	IIB N (%) 436 (8.3%)	PVI N (%) 4808 (91.7%)	P value	IIB vs PVI OR (95% CI)	P value
In-hospital death	6 (1.4%)	39 (0.8%)	.221	2.47 (0.92,6.67)	.074
Death in 30 days	11 (2.5%)	85 (1.8%)	.260	2.21 (1.05,4.65)	.037

BMI, Body mass index; *IIB*, infrainguinal bypass; *OR*, odds ratio; *PVI*, peripheral vascular intervention. Outcomes are adjusted for patient demographics, comorbidities, medications, and prior procedures. Reference = PVI. Significance level 0.05.

Table II. One-year mortality following IIB vs PVI by BMI

	Univariable			Multivariable	
	IIB N (%)	PVI N (%)	P value	IIB vs PVI HR (95% CI)	P value
Underweight (BMI <18.5 kg/m ²)	542 (11.6%)	3961 (88.3%)			
	84 (16.0%)	817 (20.6%)	.014	0.83 (0.63-1.09)	.171
Normal weight (BMI, 18.5-24.9 kg/m ²)	4559 (12.9%)	30,848 (87.1%)			
	503 (11.0%)	5,002 (15.2%)	<.001	0.80 (0.72-0.87)	<.001
Overweight (BMI, 25-29.9 kg/m ²)	4684 (12.1%)	34,186 (87.9%)			
	453 (9.7%)	4567 (13.4%)	<.001	0.87 (0.80-0.97)	.010
Obese (BMI, 30-39.9 kg/m ²)	3721 (10.8%)	30,660 (89.2%)			
	314 (8.4%)	3703 (12.1%)	<.001	0.85 (0.75-0.96)	.008
Morbidly obese (BMI, 40-49.9 kg/m ²)	436 (8.3%)	4808 (91.7%)			
	44 (10.1%)	613 (12.8%)	.108	0.94 (0.65-1.35)	.736

BMI, Body mass index; *IIB*, infrainguinal bypass; *OR*, odds ratio; *PVI*, peripheral vascular intervention. Outcomes are adjusted for patient demographics, comorbidities, medications, and prior procedures. Reference = PVI. Significance level 0.05.

stratified into five groups based on BMI: underweight (BMI ≤18.5 kg/m²), normal weight (BMI, 18.5-24.9 kg/m²), overweight (BMI, 25-29.9 kg/m²), obese (BMI, 30-39.9 kg/m²), and morbidly obese (BMI, 40-49.9 kg/m²). Multivariable logistic regression analysis compared in-hospital and 30-day mortality for IIB vs PVI within each BMI group. Cox regression and Log Rank test analyzed 1-year mortality.

Results: A total of 117,588 patients met the study criteria, including 4485 underweight (3.8%), 35,407 normal weight (30.1%), 38,870 overweight (33.1%), 34,381 obese (29.2%), and 5244 morbidly obese (4.5%) patients. There was no difference in mortality between PVI and IIB among underweight patients; however, IIB was associated with 40% increase in in-hospital mortality (OR, 1.4; 95% CI, 1.02-1.91; *P* = .036), in normal weight patients and double the odds of in-hospital mortality (OR, 1.97; 95% CI, 1.44-2.70; *P* < .001) in obese and morbidly obese patients (OR, 2.21; 95% CI, 1.05-4.65; *P* = .037), compared to PVI (Table I). Bypass was associated with lower risk of 1-year mortality among the normal weight (HR, 0.80; 95% CI, 0.72-0.87; *P* < .001), overweight (HR, 0.87; 95% CI, 0.80-0.97; *P* = .010), and obese patients (HR, 0.85; 95% CI, 0.75-0.96; *P* = .008), compared to PVI. Among morbidly obese patients, there was no significant difference in 1-year survival (Table II).

Conclusions: This large national study shows significant differences in postoperative and 1-year mortality between PVI and IIB depending on patient BMI. For normal weight and obese patients, PVI was associated

with decreased in-hospital mortality; however, IIB patients had better 1-year survival for all BMI groups but the underweight and morbidly obese. This suggests a long-term survival benefit following IIB compared to PVI, except for patients otherwise at a higher risk of mortality regardless of procedure choice.

Author Disclosures: **A. Abdelkarim:** Nothing to Disclose; **A. Farber:** BiogenCell, DialysisX, iThera, LeMaitre, Novo Nordisk Foundation, Sanifit; **M. Hamouda:** Nothing to Disclose; **M. Kricfalusi:** Nothing to Disclose; **M. Malas:** Nothing to Disclose.

PC096



Diabetes and Claudication: Reduced Pain Perception; Worse Walking Impairment, and Quality of Life

Ali Hani Hakim,¹ Yuqian Tian,¹ Matthew A. Fuglestad,² Julian Kim,¹ Holly Despiegelaere,¹ Zhen Zhu,¹ Ray Mitchell,¹ George Casale,¹ Iraklis Pipinos,³ Pooneh Bagheri,¹ ¹University of Nebraska Medical Center, Omaha, NE; ²University of Nebraska Medical Center, Omaha, NE; ³University of Nebraska Medical Center, Omaha, NE

Objectives: The effects of diabetes in patients with peripheral artery disease (PAD) who present with claudication are poorly defined. Given