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Lower Extremity Bypass for Critical Limb Ischemia Decreases Major Adverse Limb Events With Equivalent Cardiac Risk Compared to Endovascular Intervention

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Abstract

Objective—Lower extremity bypass (LEB) has traditionally been the gold standard in the treatment of critical limb ischemia (CLI). Infrainguinal endovascular intervention (IEI) has become more commonly performed than LEB but comparative outcomes are limited. We sought to compare rates of Major Adverse Limb Events (MALE) and Major Adverse Cardiovascular Events (MACE) after LEB and EI in a propensity score matched, national cohort of patients with CLI.

Methods—The National Surgical Quality Improvement Program (NSQIP) Vascular Targeted Files (2011–2014) for LEB and IEI were merged. CLI patients were identified by ischemic rest pain and/or tissue loss. Patients were matched on a 1:1 basis for propensity to undergo LEB or IEI. Primary outcomes were 30-day MALE and MACE. Within the propensity matched cohort multivariate logistic regression was used to identify independent predictors of MALE and MACE.

Results—A total of 13,294 LEB and IEI were identified with 8,066 cases performed for CLI. Propensity matching identified 3,848 cases (1,924 per group). There were no differences in preoperative variables between the propensity matched LEB and IEI groups (all P>.05). At 30 days, rates of MALE were significantly lower in the LEB group (9.2% LEB vs IEI 12.2%, P=.003). On multivariate logistic regression, bypass with single segment saphenous vein vs IEI (OR 0.7 [0.54, 0.92], P=.01), and bypass with alternative conduit (prosthetic/spliced vein/composite) vs IEI (OR 0.7 [0.56, 0.98], P=.04), antiplatelet therapy (OR 0.8 [0.58, 1.00], P=.049), and statin therapy (OR 0.8 [0.62, 0.99], P=.04) were protective against MALE while infrageniculate intervention (OR 1.4 [1.09, 1.72], P=.01) and a history of prior bypass of the same arterial segment (OR 1.8 [1.41, 2.41], P<.0001) were predictive. Rates of 30-day MACE were not significantly

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different (4.9% LEB vs 3.7% IEI, P=.07) between the groups. Independent predictors of MACE included age (OR 1.02 [1.01, 1.04], P=.01), steroid use (OR 1.8 [1.08, 2.99], P=.03), congestive heart failure (OR 1.7 [1.00,1.96], P=.02), beta-blocker use (OR 1.6 [1.09, 1.43], P=.01), dialysis (OR 2.3 [1.55,3.45], P<.0001), totally dependent functional status (OR 3.1 [1.25, 7.58], P=.02), and suboptimal conduit for LEB compared to IEI (OR 1.6 [1.08, 2.36], P=.02).

Conclusions—Within this large, propensity-matched, national cohort, LEB predicted lower risk-adjusted 30-day MALE compared to IEI. Furthermore, there was no difference in 30-day MACE between the groups despite higher inherent risk with open surgical procedures. Therefore, the present study supports the effectiveness and primacy of LEB for revascularization in CLI.

MESH/Keywords

Critical Limb Ischemia; Peripheral Vascular; Endovascular; Bypass

Introduction

Lower extremity bypass (LEB) has traditionally been the gold standard in the treatment of critical limb ischemia (CLI).[1, 2] Over the past two decades, infrainguinal endovascular intervention (IEI) has gained widespread acceptance and is now more commonly performed than LEB.[3, 4] Intuitively, IEI should have the advantage of lower procedural risk in the complex critical limb population with multiple medical comorbidities.[2, 5] However, data directly comparing LEB and IEI remains sparse. In addition, in many studies the heterogeneity of patients included and procedures performed along with a lack of standardization in the outcomes reported have rendered careful comparison of LEB and IEI for CLI difficult.[2, 6–8]

The Society for Vascular Surgery (SVS) Objective Performance Goals (OPGs) provide standardized metrics for expected outcomes after lower extremity revascularization which allow for comparison of LEB and IEI in the CLI population.[9] Included among the most important OPG outcomes are Major Adverse Limb Events (MALE) and Major Adverse Cardiovascular Events (MACE). There is very little data examining MALE and MACE after IEI. Furthermore, there are few direct comparisons of LEB and IEI utilizing these important endpoints, especially in a nationally representative dataset.

The National Surgical Quality Improvement Program (NSQIP) provides a national sampling of cases with 30-day follow-up.[10] The recently developed Vascular Targeted modules have been added to the existing annual participant use file (PUF) since 2011, providing additional vascular specific variables and outcomes including limb and cardiovascular events.[11] The primary purpose of this study was to compare rates of MALE and MACE after LEB and IEI in a propensity-matched, national cohort of patients with CLI.

Patients and Methods

The NSQIP Vascular Targeted PUF (2011–2014) for both lower extremity open and lower extremity endovascular were merged to obtain a representative national dataset. Details on the accruement methods and validity of the ACS-NSQIP have been well documented

previously.[10–12] CLI patients were defined as having an indication for revascularization of ischemic rest pain and/or tissue loss. All procedures for claudication or asymptomatic peripheral vascular disease, as well as emergencies were excluded. To account for potential confounders, specifically nonrandom allocation to LEB or IEI, patients were matched on a 1:1 basis for propensity to undergo LEB or IEI using all preoperative factors captured within the dataset including vascular specific variables.[13]

The primary outcomes were MALE and MACE within 30 days. MALE was defined as either untreated loss of patency of the revascularization, re-intervention on the revascularized segment, or major amputation (above or below knee) of the revascularized limb. MACE was defined as stroke, myocardial infarction (MI), or death. Secondary outcomes included component outcomes of untreated loss of patency of the revascularization, re-intervention on the revascularization, major amputation, stroke, MI, and death. Appropriate parametric and nonparametric statistical tests were used, including Chi Square, student t-test and Man Whitney- U test to compare LEB and IEI cases.

Within the propensity matched cohort multivariate logistic regression was then used to identify independent, predictors of MALE, MACE and Major Amputation. The decision was made *a priori* to include the most significant predictors from univariate analysis up to a total of one predictor for every ten events in the model. Statistical significance was set to a α of 0.05. All statistical analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC). The University of Virginia Institutional Review Board exempted all studies using the deidentified NSQIP dataset.

Results

A total of 13,294 LEB and IEI were identified in the 2011–2014 NSQIP Vascular Targeted modules. There were 8,066 cases performed for CLI, of which 5,131 (63.6%) were LEB while 2,935 (36.4%) were IEI. At baseline these groups had significant differences in most preoperative characteristics including incidence of tissue loss (58.2% LEB vs. 66.8% IEI, P<.0001) and infrageniculate revascularization (46.2% LEB vs. 28.4% IEI, P<.0001) (Supplemental Table I). A total of 3,848 cases (1,924 LEB and 1,924 IEI) were matched for propensity to undergo LEB versus EI. The median age of our matched cohort was 69 and 58.8% were male. There were no significant differences in preoperative variables between the propensity matched LEB and IEI groups (Table I). There were 2,736 (71.1%) supragenicular revascularizations and 1,112 (28.9%) infrageniculate revascularizations (Table II).

At 30 days, MALE was significantly lower in the LEB group (9.2% LEB vs. 12.2% IEI, P=.003; Table III). This was driven primarily by a significantly higher rate of amputation in the IEI group (4.2% LEB vs. 6.8% IEI, P=.0003). However, there was a higher rate of untreated loss of patency in the LEB group (2.7% LEB vs. 1.7% IEI, P=.03) and no difference in reintervention (4.8% LEB vs. 5.5% IEI, P=.38). On multivariate logistic regression, independent predictors of MALE (Table IV) included infrageniculate intervention (OR 1.4, P=.01) and a history of prior bypass a history of prior bypass in the same arterial segment (OR1.8, P<.0001). Antiplatelet therapy (OR 0.8, P=.049), statin therapy (OR 0.8, P=.04),

bypass with single segment saphenous vein vs. IEI (OR 0.7, P=.01), and bypass with alternative conduit (prosthetic/spliced vein/composite) vs. IEI (OR 0.7, P=.04) were protective against MALE (c-statistic=.658). Independent predictors of 30-day ipsilateral major amputation (Table V) included black race (OR 1.6, P=.003), dialysis dependence (OR 1.8, P=.001), and a history of prior bypass in the same arterial segment (OR1.8, P=.001). Antiplatelet therapy (OR 0.7, P=.049), and bypass with single segment saphenous vein vs IEI (OR 0.5, P=.001) were protective against amputation (c-statistic=.702).

MACE at 30 days was not significantly different (4.9% LEB vs 3.7% EI, P=.07) between the groups (Table III). Each component of MACE was similarly equivalent including rates of MI/stroke (2.8% LEB vs 2.1% EI, P=.14) and 30-day mortality (2.9% LEB vs 2.1% EI, P=.15) were not different between groups. On multivariate logistic regression independent predictors of 30-day MACE (Table VI) included age (OR 1.02, P=.01), steroid use (OR 1.8, P=.03), congestive heart failure (OR 1.7, P=.02), beta-blocker use (OR 1.6, P=.01), dialysis dependence (OR 2.3, P<.0001), totally dependent functional status (OR 3.1, P=.02), and suboptimal conduit for LEB compared to IEI (OR 1.6, P=.02) (c-statistic=.712).

Discussion

Within this large, propensity-matched, national cohort, IEI was associated with higher 30-day MALE compared to LEB. The increased MALE was driven by a higher rate of amputation in the IEI group. Further risk adjustment with multivariate regression demonstrates that LEB independently reduced the risk of MALE compared to IEI, regardless of whether the conduit was single segment saphenous or alternative/prosthetic conduit. Importantly, there was no difference in 30-day MACE between the matched cohorts for LEB and IEI.

As expected, patients selected for IEI have many baseline differences compared to those undergoing LEB in this national cohort. Due to the theoretical procedural risk reduction with IEI, patients with higher surgical risk preferentially undergo IEI.[5, 14] Additionally, there is a growing body of literature supporting an “Endo First” approach suggesting CLI patients amenable to IEI should first undergo endovascular therapy before progressing to LEB.[15] For these reasons, a direct comparison of outcomes between IEI and LEB is difficult. The NSQIP dataset provides an outstanding opportunity for this assessment with a national sample of patients and validated 30-day outcomes that enable comparison of MALE and MACE.[1, 16] Using a well described statistical method of propensity score matching, we identified a subset of patients with equal likelihood to undergo LEB or IEI to compare outcomes between similar patients.[17]

This study demonstrated lower rates of 30-day MALE in the LEB group compared to patients undergoing IEI. These finding are supported by the multicenter study of 460 CLI patients from Soga et al suggesting similar rates of major adverse events overall but lower MALE in the open revascularization group.[8] Furthermore, the recent BASIL trial demonstrated IEI resulted increased early failure compared to LEB.[18] Importantly, multivariate regression analysis demonstrated LEB with either single segment saphenous vein vs. IEI (OR 0.7, P=.01) or alternative/prosthetic conduit vs. IEI (OR 0.7, P=.04)

independently reduced the rates of short-term MALE. These data suggest that a patient should not necessarily undergo IEI only because they do not have ideal conduit (single segment saphenous). Furthermore, additional research is needed on patients undergoing LEB with alternative/prosthetic conduit since they were excluded from recent SVS OPGs and there is data to support they have worse long-term outcomes.[1, 9]

Many of the independent predictors of 30-day MALE and amputation in the multivariate analyses were non-modifiable patient level risk factors including ESRD, SIRS/Sepsis, weight loss, ASA and race which have been previously demonstrated.[9, 11, 14, 19] However, we demonstrate preoperative statin (OR 0.8, P=.04) and antiplatelet (OR 0.8, P=.049) therapy both independently reduce the risk of 30-day MALE. Similarly, preoperative antiplatelet therapy (OR 0.7, P=.049) independently reduces the risk of 30-day amputation. These findings are supported by practice guidelines as well as a study by Aiello et al evaluating 646 patients undergoing revascularization for CLI.[20] While revascularization remains a cornerstone of management for CLI, proven medical therapies allow for optimal outcomes in this complex patient population. A 2005 analysis of PREVENT III clinical trial data suggests there is room for improvement in this area as many patients undergoing revascularization for infrainguinal CLI were not on appropriate antithrombotic and/or lipid lowering medical therapy preoperatively.[21, 5, 22]

There are a number of limb specific factors identified that independently increase the risk of MALE including revascularization of infrageniculate segments, which are typically smaller vessels with higher risk of failure.[3, 7, 23] Additionally, prior bypass of the currently treated segment increases risk of MALE, demonstrating the poor prognosis for redo interventions as previously reported.[22] While these variables represent non-modifiable risk factors, it is critical to adjust for these elements when examining outcomes and counseling patients. Interestingly, prior endovascular intervention on the treated segment did not have an independent effect on outcome in our model. These finding suggest an “Endo First” approach is not necessarily harmful for later interventions, although the higher rate of amputation with IEI requires high vigilance with this strategy. Additionally, delaying optimal therapy with LEB may present additional risks that are not captured in this analysis of 30-day outcomes. Further prospective studies are needed to determine the long-term impact of an “Endo First” approach for management of CLI.

There was no statistical difference in MACE or either component outcome with LEB compared to IEI, despite the higher risk inherent in LEB with general anesthesia. After further adjusting for preoperative risk factors, suboptimal conduit versus IEI approach was the only revascularization-specific predictor of MACE. However, this factor may be a surrogate for overall patient well-being. We are unable to determine if optimal conduit was unavailable due to prior use of saphenous vein or inadequacy of the conduit such as for venous insufficiency or small size. However, our findings suggest patients without optimal conduit having anatomy amenable to IEI may have a small perioperative cardiac related benefit using this approach.[8, 24] This benefit should be weighed against the MALE risk of IEI noted above. Other predictors of MACE include known risk factors for MI and stroke, including age, congestive heart failure, dialysis, steroid use, totally dependent functional

status, and beta-blocker use suggesting that just as with risk factor for MALE, these patients would benefit from optimization of preoperative medications and physical status.

Using the NSQIP Vascular Targeted modules over the past four years, this analysis demonstrates improved risk-adjusted rates of 30-day MALE with LEB compared to IEI in the management of CLI. With equivalent risk for MACE, this analysis supports LEB with high quality conduit as the optimal therapy in the management of CLI. With only short-term outcomes in a propensity matched national cohort, these results demonstrate the need for further investigation into identifying patients who are most appropriate for LEB or IEI. Specifically, these results highlight the need for a prospective randomized controlled trial of LEB compared to IEI for the treatment of CLI, as is currently underway with the BEST trial.[6]

Limitations of this study include the retrospective nature of the study preventing evaluation of causality. Additionally, the NSQIP database is limited to 30-day outcomes, which prohibits comparison of long-term outcomes. This may bias results since the timeline of complications after LEB and IEI may differ. Furthermore, timing of MALE vs MACE complications are expected to differ with MACE occurring in the early perioperative period where MALE would be expected later in the course. NSQIP provides limited anatomical detail about patient pathology and there is no angiogram data or Rutherford Classifications available to compare patients. Finally, the decision of LEB or IEI is multifactorial and inherent differences exist between the populations receiving these therapies that make them difficult to compare. However, propensity matching on all available variables mitigates this bias to allow careful interpretation of these results.[17]

Conclusion

Within this large, propensity-matched, national cohort, LEB predicted lower risk-adjusted 30-day MALE compared to IEI. Additionally, LEB predicted lower major amputation in the treated limb compared to IEI. This benefit of LEB over IEI was independent of the conduit used for bypass. Importantly, there was no difference in 30-day MACE between LEB and IEI, although alternative/prosthetic conduit may independently increase the risk of MACE. These results support the effectiveness and primacy of LEB for revascularization in CLI.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table I

Endovascular vs Open Matched Preoperative Predictors. Continuous variables presented as mean and standard deviation. Categorical variables presented as n and percent.

Parameter	Endovascular	Open	p-value
Patients	1924 (50.0%)	1924 (50.0%)	
Age	69 ± 12	69 ± 12	0.42
Sex (male)	1102 (57.2%)	1123 (58.4%)	0.47
Race (white)	1497 (78.1%)	1465 (76.6%)	0.44
Transfer Status	311 (16.2%)	295 (15.3%)	0.48
Inpatient Admission	1890 (98.2%)	1890 (98.2%)	1.00
ASA 1- No Disturbance	6 (0.3%)	3 (0.2%)	0.95
ASA 2- Mild Disturbance	203 (10.6%)	42 (2.2%)	0.09
ASA 3- Severe Disturbance	1098 (57.1%)	1281 (66.6%)	0.22
ASA 4- Life Threating	423 (23.0%)	594 (30.9%)	0.34
ASA 5- Moribund	2 (0.1%)	1 (0.1%)	0.99
Preoperative Antiplatelet Therapy	1581 (82.2%)	1581 (82.2%)	1.00
Preoperative Statin Therapy	586 (69.5%)	586 (69.5%)	1.00
Steroid Use	144 (7.5%)	133 (6.9%)	0.49
Bleeding Disorder	617 (32.1%)	622 (32.3%)	0.86
Ascites	2 (0.1%)	2 (0.1%)	1.00
Congestive Heart Failure	106 (5.5%)	88 (4.6%)	0.18
Chronic Obstructive Pulmonary Disease	196 (10.2%)	194 (10.1%)	0.91
Hypertension Medication	1678 (87.2%)	1666 (86.6%)	0.57
Tobacco Use	541 (28.1%)	531 (27.6%)	0.72
Dialysis	268 (13.9%)	255 (13.3%)	0.54
Diabetes			0.70
None	722 (37.5%)	725 (37.7%)	
Non-Insulin	357 (18.6%)	375 (19.5%)	
Insulin	845 (43.9%)	824 (42.8%)	
Disseminated Cancer	14 (0.7%)	7 (0.4%)	0.13
Functional Status			0.63
Independent	1608 (83.6%)	1628 (84.6%)	
Partially Dependent	290 (15.1%)	269 (14.0%)	
Totally Dependent	26 (1.4%)	27 (1.4%)	
Preoperative Sepsis			0.31
None	1776 (92.3%)	1802 (93.7%)	
SIRS	102 (5.3%)	80 (4.2%)	
Sepsis	42 (2.2%)	40 (2.1%)	
Septic Shock	4 (0.2%)	2 (0.1%)	
Transfusion (>4 units in prior 72 hrs)	48 (2.5%)	37 (1.9%)	0.23
Weight Loss (>10% body weight in 6 months)	29 (1.5%)	24 (1.3%)	0.49
Wound Class 1- Clean	1848 (96.1%)	1783 (92.7%)	0.08

Parameter	Endovascular	Open	p-value
Wound Class 2- Clean/Contaminated	23 (1.2%)	58 (3.0%)	0.12
Wound Class 3- Contaminated	17 (0.9%)	43 (2.2%)	0.18
Wound Class 4- Dirty/Infected	36 (1.9%)	40 (2.1%)	0.76
Tissue Loss	1274 (66.2%)	1268 (65.9%)	0.84
Infrageniculate Revascularization	572 (29.7%)	540 (28.1%)	0.26
Prior Bypass of Current Segment	331 (17.2%)	376 (19.5%)	0.22
Prior Percutaneous Intervention of Current Segment	440 (22.9%)	346 (18.0%)	0.08

Table II

Revascularizations performed for Critical Limb Ischemia in Matched Cohort. Presented as n and percent of all revascularizations.

Procedure	Incidence
Supragenicular Revascularization	
IEI	
Femoropopliteal angioplasty/stenting/atherectomy	1352 (35.1%)
LEB	
Femoropopliteal bypass w/ single segment saphenous vein	730 (19.0%)
Femoropopliteal bypass w/prosthetic/spliced vein/composite	654 (17.0%)
Infrageniculate Revascularization	
IEI	
Tibial angioplasty/stenting	572 (14.9%)
LEB	
Femoral distal bypass w/ single segment saphenous vein	244 (6.3%)
Femoral distal bypass w/ prosthetic/spliced vein/composite	147 (3.8%)
Popliteal distal w/ single segment saphenous vein	116 (3.0%)
Popliteal distal bypass w/ prosthetic/spliced vein/composite	33 (0.9%)

Table III

30 Day MALE and MACE Outcomes with components. Presented as n and percent.

Parameter	Endovascular Intervention (n=1,924)	Lower Extremity Bypass (n=1,924)	p-value
MALE	235 (12.2%)	177 (9.2%)	0.003
Untreated Loss of Patency	32 (1.7%%)	52 (2.7%)	0.03
Re-intervention	105 (5.5%)	93 (4.8%)	0.38
Amputation	131 (6.8%)	80 (4.2%)	0.0003
MACE	72 (3.7%)	95 (4.9%)	0.07
CVA or MI	40 (2.1%)	54 (2.8%)	0.14
Mortality	41 (2.1%)	55 (2.9%)	0.15

Table IV

MALE Logistic Regression. Presented as Odds Ratio and 95% confidence intervals.

Parameter	Odds Ratio	p-value
Age	0.99 [0.99, 1.01	0.53
Female vs male	0.86 [0.69, 1.07]	0.17
Asian vs White	0.96 [0.37, 2.49]	0.93
Black vs White	1.21 [0.94, 1.56]	0.14
Outpatient vs Inpatient	0.59 [0.21, 1.65]	0.31
ASA Class 1 vs 3	3.17 [0.75, 13.38]	0.12
ASA Class 2 vs 3	0.53 [0.32, 0.90]	0.02
ASA Class 4 vs 3	1.04 [0.81, 1.34]	0.75
ASA Class 5 vs 3	<0.001[<0.001, >999.999]	0.99
ASA Class Not Assigned vs 3	1.13 [0.72, 1.78]	0.60
Steroid Use	1.19 [0.80, 1.77]	0.39
Ascites	<0.001[<0.001, >999.999]	0.98
Bleeding Disorder	1.09 [0.87, 1.37]	0.46
Congestive Heart Failure	1.20 [0.76, 1.89]	0.43
Chronic Obstructive Pulmonary Disease	0.78 [0.53, 1.14]	0.20
Hypertension Medication	0.93 [0.67, 1.28]	0.64
Tobacco Use	1.20 [0.92, 1.55]	0.18
Dialysis	1.35 [0.99, 1.82]	0.05
Insulin Controlled Diabetes	0.90 [0.69, 1.17]	0.44
Medication Controlled Diabetes	1.07 [0.79, 1.45]	0.65
Disseminated Cancer	0.815 [0.19, 3.57]	0.79
Partially Dependent vs Independent	1.13 [0.83, 1.54]	0.44
Totally Dependent vs Independent	1.36 [0.60, 3.12]	0.46
SIRS vs None	2.48 [1.70, 3.62]	<.0001
Sepsis vs None	2.13 [1.19, 3.79]	0.01
Septic Shock vs None	<0.001[<0.001, >999.999]	0.98
>4u Blood Transfusion 48hrs Preoperatively	1.45 [0.80, 2.63]	0.22
Weight Loss (>10% in 6 months)	2.05 [1.03, 4.09]	0.04
Tissue Loss	1.13 [0.88, 1.44]	0.33
Infrageniculate Target	1.37 [1.09, 1.72]	0.01
Prior ipsilateral bypass of current segment	1.84 [1.41, 2.41]	<.0001
Prior ipsilateral percutaneous intervention of current segment	1.19 [0.90, 1.57]	0.21
Antiplatelet	0.76 [0.58, 1.00]	0.049
Statin	0.78 [0.62, 0.99]	0.04
BetaBlocker	1.11 [0.87, 1.42]	0.41
Open Optimal Conduit vs Endovascular	0.70 [0.54, 0.92]	0.01
Open Suboptimal Conduit vs Endovascular	0.74 [0.56, 0.98]	0.04
Preoperative Hospital Days	1.01 [0.99, 1.03]	0.38

Table V

Amputation Logistic Regression. Presented as Odds Ratio and 95% confidence intervals.

Parameter	Odds Ratio	p-value
BMI	0.99 [0.96, 1.10]	0.27
Female vs male	0.74 [0.55, 1.00]	0.05
Asian vs White	0.82 [0.19, 3.47]	0.78
Black vs White	1.63 [1.18, 2.25]	0.003
Outpatient vs Inpatient	0.32 [0.04, 2.31]	0.26
Steroid Use	1.36 [0.82, 2.25]	0.24
Dialysis	1.78 [1.25, 2.54]	0.001
Partially Dependent vs Independent	1.25 [0.85, 1.83]	0.26
Totally Dependent vs Independent	1.90 [0.72, 5.04]	0.20
SIRS vs None	3.16 [2.03, 4.93]	<.0001
Sepsis vs None	3.27 [1.71, 6.25]	0.0003
Septic Shock vs None	<0.001[<0.001, >999.999]	0.98
Weight Loss (>10% in 6 months)	2.61 [1.16, 5.87]	0.02
Tissue Loss	1.34 [0.99, 1.81]	0.06
Infrageniculate Target	1.34 [0.99, 1.81]	0.06
Prior ipsilateral bypass of current segment	1.92 [1.33, 2.79]	0.001
Prior ipsilateral percutaneous intervention of current segment	1.22 [0.83, 1.79]	0.30
Antiplatelet	0.70 [0.49, 0.99]	0.049
Statin	0.81 [0.59, 1.11]	0.19
Open Optimal Conduit vs Endovascular	0.51 [0.35, 0.75]	0.001
Open Suboptimal Conduit vs Endovascular	0.72 [0.50, 1.05]	0.09

Table VI

MACE Logistic Regression. Presented as Odds Ratio and 95% confidence intervals.

Parameter	Odds Ratio	p-value
Age	1.02 [1.01, 1.04]	0.01
Asian vs White	0.31 [0.04, 2.31]	0.23
Black vs White	0.52 [0.33, 0.81]	0.01
Steroids	1.80 [1.08, 2.99]	0.03
Ascites	5.72 [0.50, 64.83]	0.13
Congestive Heart Failure	1.72 [1.00, 2.96]	0.02
Tobacco Use	0.66 [0.41, 1.06]	0.07
Dialysis	2.31 [1.55, 3.45]	<.0001
Partially Dependent vs Independent	1.307 [0.87, 1.95]	0.14
Totally Dependent vs Independent	3.08 [1.25, 7.58]	0.01
SIRS vs None	2.08 [1.17, 3.71]	0.01
Sepsis vs None	1.33 [0.51, 3.44]	0.50
Septic Shock vs None	15.60 [2.98, 81.80]	0.001
Antiplatelet	1.41 [0.88, 2.29]	0.19
Beta-Blocker	1.63 [1.09, 2.43]	0.01
Open Good Conduit vs Endovascular	1.36 [0.93, 1.99]	0.11
Open Poor Conduit vs Endovascular	1.60 [1.08, 2.36]	0.02