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Carotid Endarterectomy During Index Hospital Admission for Patients With Acute Mild to Moderate Stroke

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Table II. Outcomes in propensity-matched cohort: VSs vs NSs

Outcome	VS (n = 5115)	NS (n = 1027)	aOR for outcomes (95% CI)	*P* value
Mortality	40 (0.8)	9 (0.9)	0.89 (0.43-1.86)	.76
Cardiac	48 (0.9)	19 (1.9)	0.50 (0.30-0.85)	**.01**
MI/arrhythmia	56 (1.1)	17 (1.7)	0.66 (0.39-1.12)	.11
Cardiac arrest	15 (0.3)	4 (0.4)	0.75 (0.25-2.28)	.61
Pulmonary	88 (1.7)	35 (3.4)	0.50 (0.34-0.73)	**.0005**
Renal	12 (0.2)	3 (0.3)	0.80 (0.23-2.85)	.73
Sepsis	18 (0.4)	12 (1.2)	0.30 (0.14-0.62)	**.0013**
Wound	29 (0.6)	2 (0.2)	2.92 (0.69-12.32)	.14
Return to OR	157 (3.1)	32 (3.1)	0.98 (0.67-1.45)	.94
Bleeding	67 (1.3)	23 (2.2)	0.58 (0.36-0.94)	**.03**
Stroke	107 (2.1)	39 (3.8)	0.54 (0.37-0.78)	**.0012**
TIA	47 (0.9)	12 (1.2)	0.78 (0.41-1.49)	.46
Restenosis	19 (0.4)	7 (0.7)	0.54 (0.23-1.27)	.16
Distal embolization	15 (0.3)	6 (0.6)	0.50 (0.19-1.30)	.15
Operative time, minutes	123 ± 48	145 ± 53	NA	**<.0001**[a]
Hospital LOS, days	3.2 ± 4.2	4.8 ± 5.7	NA	**<.0001**[a]

aOR, Adjusted odds ratio; *CI*, confidence interval; *CS*, cardiac surgeon; *LOS*, length of stay; *MI*, myocardial infarction; *NA*, not applicable; *OR*, operating room; *TIA*, transient ischemic attack; *VS*, vascular surgeon.
Data presented as number (%) or mean ± standard deviation.
Boldface *P* values represent statistical significance.
[a]Using the nonparametric Kruskal-Wallis test.

compared between all specialties using χ^2 analysis. We then compared the following groups after propensity matching (5 VSs to 1 NS/CS) for all preoperative variables: VSs vs CSs and VSs vs NSs. The 30-day outcomes, including mortality, major morbidity, stroke, reoperation, operative time, and hospital stay, were evaluated between the matched groups.

Results: A total of 30,336 patients had been treated by VSs, 1052 by NSs, and 353 by CSs. After 5:1 matching, the analysis consisted of 1707 VSs vs 345 CSs and 5115 VSs vs 1027 NSs. CSs had treated the greatest proportion of asymptomatic patients, and NSs had treated the greatest proportion of symptomatic patients (72.8%, 56.6%, and 24.4% for CSs, VSs, and NSs, respectively; $P < .0001$). CSs had the highest proportion of patients with American Society Anesthesiologists class >III (39.9%, 22%, and 21.2% for CSs, NSs, and VSs, respectively; $P < .0001$). VSs had used general anesthesia the least often (84.8%, 99.6%, and 100% for VSs, NSs, and CSs, respectively; $P < .0001$) and intraoperative shunting the most frequently (33.2%, 9.2%, and 11.6% for VSs, NSs, and CSs, respectively; $P < .0001$). After matching, no significant preoperative differences were found within the groups. No significant differences were found between the VSs and CSs in mortality or stroke. However, compared with the CSs, the VSs reported fewer pulmonary complications (adjusted odds ratio [aOR], 0.36; $P = .0005$) and unplanned reoperations (aOR, 0.45; $P = .005$), with longer operative times (122 minutes vs 76 minutes; $P < .0001$; Tables I and II). Compared with NSs, VSs had significantly reduced rates of stroke (aOR, 0.54; $P = .0012$), pulmonary complications (aOR, 0.50; $P = .0005$), and cardiac complications (aOR, 0.50; $P = .01$), with shorter operative times (123 minutes vs 145 minutes; $P < .0001$; Tables I and II).

Conclusions: Differences in patient selection, anesthesia techniques, and operative times were found between VSs, CSs, and NSs. In our propensity-matched analysis, VSs had fewer postoperative complications than either NSs or CSs.

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IP123.

Analysis of Length of Stay and Readmission Quality Indications After Asymptomatic Carotid Endarterectomy

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Objective: Next-day discharge and 90-day readmission after asymptomatic carotid endarterectomy (CEA) have been used as quality measures. Our goal was to analyze the reasons for a prolonged (>1 day) length of stay (LOS) and 90-day readmission after CEA.

Methods: Using a single-institution database, we retrospectively identified patients who had undergone CEA between 2014 and 2019. We defined asymptomatic as no stroke within the previous 6 months. The demographic and perioperative factors were prospectively collected. The factors associated with a LOS >1 day and 90-day readmission were analyzed in a univariable logistic regression model.

Results: A total of 125 patients had undergone 133 CEAs; 49 (36.8%) were asymptomatic. The average age was 68.1 ± 8.1 years, and 36 (73.5%) were men. More than one half of these patients (55.1%) had had a postoperative LOS >1 day. Patients with a postoperative LOS >1 day were more likely to be men (58.3% vs 41.7%), white (53.3% vs 46.7%), Medicare recipients (64.3% vs 35.7%), smokers (52.8% vs 47.2%) and to have hypertension (60% vs 40%), chronic kidney disease (66.7% vs 33.3%), a history of a remote transient ischemic attack (75% vs 25%), and independent ambulation before surgery (58.8% vs 41.2%; $P < .05$). The in-hospital factors seen more often with LOS >1 day included preoperative anticoagulation (100% vs 0%), afternoon operations (63.6% vs 36.4%), operation durations of ≥3 hours (57.1% vs 42.9%), Friday procedures (75% vs 25%), postoperative intravenous antihypertension medications (66.7% vs 33.3%), minor complications (nerve palsy, urinary tract infection, headache; 71.4% vs 28.6%), and major complications (hemorrhage, stroke, dysphagia; 100% vs 0%). The most common reasons for prolonged LOS were blood pressure control (n = 12), stroke or transient ischemic attack (n = 5), and headache (n = 3). Ninety-day readmission was seen more often with minor complications (neck hematoma, headache, urinary retention; 28.6% vs 71.4%), congestive heart failure (25% vs 75%), and coronary artery disease (19.2% vs 80.8%). The common reasons for 90-day readmission were acute cholecystitis, anemia, and altered mental status.

Conclusions: More than one half of asymptomatic CEA patients were discharged after postoperative day 1. Interventions on modifiable clinical risk factors, such as hypertension management for asymptomatic patients, might decrease the LOS. Management of minor complications and cardiac comorbidities might decrease the 90-day readmission rates. CEA is a common procedure; thus, the LOS and 90-day readmission rates and associations are important for quality evaluation and cost containment initiatives.

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IP125.

Carotid Endarterectomy During Index Hospital Admission for Patients With Acute Mild to Moderate Stroke

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Objective: The timing of carotid endarterectomy (CEA) after acute stroke due to an infarct in the middle cerebral artery territory with ipsilateral internal carotid artery stenosis remains controversial. We evaluated the results of CEA in this group of patients during the index hospital admission.

Methods: We performed a retrospective review of all patients admitted with acute, mild (National Institutes of Health [NIH] stroke scale score, 1-5) and moderate stroke (NIH stroke scale score, 6-14) in the distribution of the middle cerebral artery with ≥70% ipsilateral internal carotid artery

stenosis admitted to two midsize teaching hospitals with stroke certification from 2005 to 2020. Patients with focal transient ischemic attacks were excluded. An indwelling shunt was placed if the patient developed a new neurologic deficit with carotid cross-clamping or ischemic electroencephalographic changes under general anesthesia.

Results: A total of 74 patients (45 men) aged 35 to 87 years (mean age, 70.1 ± 10.8 years). Of the 74 patients, 61 had a NIH stroke scale score of 1 to 5) and 13 an NIH stroke scale score of 6 to 14. Twelve patients were given intravenous tissue plasminogen activator. Of the 74 patients, 21 had undergone CEA 3 to 5 days after stroke and 53 had done so 6 to 8 days after stroke. Cervical block anesthesia was used for 54 patients (20 with general anesthesia), and a shunt was required for 15 patients (20%). Four patients (5.4%) had experienced severe postoperative stroke (three new ischemic infarcts and one intracerebral hemorrhage), resulting in death in all four. Two patients (2.7%) had developed postoperative seizures. Two patients (2.7%) had experienced temporary cranial nerve palsy (hypoglossal in one, ramus mandibularis in one).

Conclusions: CEA for acute mild to moderate stroke can be performed with satisfactory results during the index admission. This strategy is useful to prevent recurrent stroke.

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IP127.

Transcarotid Artery Revascularization Might Offer a Lower Early Stroke Rate in Asymptomatic Female Patients: A Retrospective Study Using the Vascular Quality Initiative

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Objective: Increasing evidence has shown that transcarotid artery revascularization (TCAR) offers lower stroke rates compared with transfemoral carotid artery stenting (TFCAS). However, the gender differences between the two modalities are poorly understood. We investigated the postoperative complication rates in TCAR and TFCAS stratified by gender.

Methods: The Vascular Quality Initiative (VQI) database was filtered for TFCAS and TCAR procedures involving treatment of one atherosclerotic lesion in the internal carotid artery (ICA) in asymptomatic patients. The patients were selected from 2005 to 2020 and divided into TCAR and TFCAS groups using the defined variables. Statistical analysis was conducted using SPSS, version 20 (IBM Corp, Armonk, NY). A statistically significant difference in numerical variables between the male and female patients was assessed using the Mann-Whitney *U* test. Postoperative complications included any complications from procedure to discharge.

Table I. Asymptomatic female patients: TCAR vs TFCAS

Variable	Procedure			*P* value
	TFCAS (n = 584)	TCAR (n = 1506)	Total (n = 2090)	
Age, years	70 ± 8.6	73.7 ± 9.1	72.7 ± 9.1	**.000**
Hypertension	89.3 (520)	91.4 (1376)	90.8 (1896)	.152
CAD	45.3 (263)	47.4 (714)	46.8 (977)	.379
COPD	30.9 (180)	29.7 (447)	30 (627)	.600
Preoperative statin	83.6 (488)	86.9 (1308)	85.9 (1796)	.052
Prior TIA or stroke	22.8 (133)	21.7 (327)	22 (460)	.596
Postprocedural complications	6.4 (37)	6.6 (99)	6.5 (136)	.855
Postoperative LOS, days	2.3 ± 11.9	2 ± 9.8	2.1 ± 10.5	**.002**
Postoperative TIA	0.9 (5)	0.7 (10)	0.7 (15)	.638[a]
Postoperative stroke	2.6 (15)	1.2 (18)	1.6 (33)	**.024**
Access site complications	3.1 (18)	3.7 (56)	3.5 (74)	.480
Pseudoaneurysm	1.2 (7)	0 (0)	0.3 (7)	**.000**[a]
Mortality	0.2 (1)	0.4 (6)	0.3 (7)	.420[a]
Mortality related to disease/treatment	0.2 (1)	0.3 (4)	0.2 (5)	.692[b]

CAD, Coronary artery disease; *COPD,* chronic obstructive pulmonary disease; *LOS,* length of stay; *TCAR,* transcarotid artery revascularization; *TFCAS,* transfemoral carotid artery stenting; *TIA,* transient ischemic attack.
Data presented as average ± standard deviation or % (number).
Boldface *P* values represent statistical significance.
[a]More than 20% of cells had expected cell counts <5; χ^2 results could be invalid.
[b]Minimum expected cell count <1; χ^2 results could be invalid.

Table II. Asymptomatic male patients: TCAR vs TFCAS

Variable	Procedure			*P* value
	TFCAS (n = 1348)	TCAR (n = 2753)	Total (n = 4101)	
Age, years	70.1 ± 9.1	73.3 ± 8.5	72.3 ± 8.8	**<.01**
Hypertension	90.3 (1215)	91 (2503)	90.7 (3718)	.478
CAD	55.4 (747)	59.3 (1632)	58 (2379)	**.018**
COPD	23.3 (314)	24.7 (681)	24.3 (995)	.308
Preoperative statin	85.8 (1157)	90.5 (2491)	89 (3648)	**.000**
Prior TIA or stroke	26.8 (361)	22.9 (631)	24.2 (992)	**.007**
Postprocedural complications	4.7 (63)	5.6 (154)	5.3 (217)	.214
Postoperative LOS, days	2.3 ± 14.8	2.2 ± 14.7	2.2 ± 14.7	**<.01**
Postoperative TIA	0.7 (10)	0.3 (9)	0.5 (19)	.066055
Postoperative stroke	1 (13)	0.8 (23)	0.9 (36)	.678286
Access site complications	1.9 (26)	2.8 (76)	2.5 (102)	.108
Pseudoaneurysm	0.1 (2)	0 (1)	0.1 (3)	.213[a,b]
Mortality	0.1 (1)	0.3 (7)	0.2 (8)	.220[a]
Mortality related to disease/ treatment	0 (0)	0 (0)	0 (0)	NA

CAD, Coronary artery disease; *COPD,* chronic obstructive pulmonary disease; *LOS,* length of stay; *TCAR,* transcarotid artery revascularization; *TFCAS,* transfemoral carotid artery stenting; *TIA,* transient ischemic attack.
Data presented as average ± standard deviation or % (number).
Boldface *P* values represent statistical significance.
[a]More than 20% of cells had expected cell counts <5; χ^2 results could be invalid.
[b]Minimum expected cell count <1; χ^2 results could be invalid.

Results: When stratifying the data by gender (women: Table I; men: Table II) and procedure, the patients were slightly older in the TCAR group than in the TFCAS group (women: age, 73.7 years vs 70 years; $P < .01$; men: age 73.3 years vs 70.1 years; $P < .01$). TFCAS procedures involving asymptomatic women had a higher rate of postoperative stroke compared with TCAR (2.6% vs 1.2%; $P = .026$). Among asymptomatic male patients, no significant differences were found in postprocedural stroke between TFCAS and TCAR. Similar results were seen in symptomatic patients,