Title

Medicare Patients with Symptomatic Carotid Disease Requiring Carotid Revascularization Are Likely to Have Delayed Access: An Analysis of a Multi-Center Surgical Data

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direct correlation with cardiac function reduction as well. Further studies are required to evaluate long term significance of initial EF reduction and potential effect on mortality.

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PC064

Increasing Occlusive Disease in the Circle of Willis Correlates with Worse Cognitive Function in Patients with High-grade Asymptomatic Carotid Stenosis

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Objectives: Our group has previously demonstrated that some patients with asymptomatic carotid artery stenosis (ACAS) demonstrate cognitive impairment, and that some patients with ACAS demonstrate cerebral hypoperfusion. Cerebral hypoperfusion from flow-limiting carotid stenosis in conjunction with inadequate cross-collateralization via the circle of Willis (CoW) may be the mechanism underlying these cognitive impairments. This study evaluates the relationship between abnormal (hypoplastic or absent) segments in the CoW and cognitive function in patients with high-grade (≥70%) ACAS.

Methods: Twenty-three patients with high-grade ACAS were recruited and underwent carotid duplex ultrasound, cognitive function assessment, and magnetic resonance imaging, including three-dimensional time-of-flight magnetic resonance angiography of the intracranial circulation. The cognitive battery comprised nine neuropsychological tests assessing four cognitive domains: learning and memory, motor and processing speed, executive function, and attention and memory. Raw cognitive scores were converted into standardized t scores. The magnetic resonance angiography images were interpreted by a board-certified neuroradiologist. Imaging assessment included the vertebral and carotid circulation and each segment of the CoW, which was classified as normal, hypoplastic (stenosed), or absent (occluded). Linear regression was used to assess the association between abnormal (hypoplastic or absent) segments in the CoW and cognitive domain scores. Significance was set to a P value of $<.05$.

Results: The mean age of study patients was 66.4 ± 9.75 years and 78% were male. All 23 patients were found to have at least one CoW segment classified as abnormal. ACAS patients demonstrated a significant negative correlation between the number of abnormal segments in the CoW and cognitive performance in the domains of attention and memory ($t = -2.4$; $P = .02$), and learning and memory ($t = -2.5$; $P = .02$) (Figure). The cognitive scores for executive function and motor and processing speed also demonstrated a negative correlation but did not reach statistical significance ($t = -1.9$ [$P = .07$]; $t = -0.9$ [$P = .36$], respectively).

Conclusions: Our data demonstrate that the presence of increasing occlusive disease in the COW correlates with worse cognitive function in patients with high-grade ACAS. This correlation was significant in the domains of attention/memory and learning/memory. These findings lend support to the hypothesis that cerebral hypoperfusion resulting from ACAS in the presence of a diseased CoW may underly cognitive impairments in patients with high-grade ACAS.

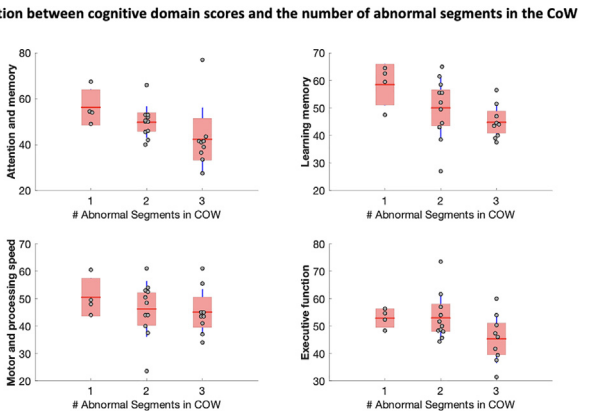

Fig. Boxplots of performance in each cognitive domain for patients with high-grade asymptomatic carotid artery stenosis (ACAS) in relation to the number of abnormal (hypoplastic or absent) segments in the circle of Willis (CoW). Red horizontal line indicates the mean domain score; the box represent the 95% confidence interval for the mean; each dot indicates individual subject cognitive domain scores.

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PC066

Medicare Patients with Symptomatic Carotid Disease Requiring Carotid Revascularization Are Likely to Have Delayed Access: An Analysis of a Multicenter Surgical Data

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Objectives: The Society for Vascular Surgery clinical practice guidelines for management of extracranial cerebrovascular disease recommends carotid revascularization as soon as the patient is neurologically stable after 48 hours and before 14 days of symptom onset in patients with recent stroke. In the United States, insurance status has been demonstrated to play a role in wait times for surgical care. There are no large-scale studies that assess the effect of patient primary insurance status on time to surgery in patients with symptomatic carotid disease. We utilized the Vascular Quality Initiative (VQI) database to evaluate our hypothesis that insurance status is associated with waiting times before surgery in patients with symptomatic carotid disease.

Methods: All patients who underwent carotid revascularization in the VQI dataset from 2010 to 2022 were included. Patients with

incomplete or missing outcomes data, Modified Rankin score of >2 and asymptomatic were excluded. Primary outcome was time between onset of symptomatic carotid disease and intervention. Categorical variables were compared using χ^2 test and one-way analysis of variance for continuous variables. Multivariable logistic regression was used to assess the association between insurance status and waiting time to surgery while adjusting for potential confounders.

Results: The study consisted of 11,973 patients who had carotid revascularization within 14 days of symptoms (early cohort) and 21,253 patients in the late cohort (after 14 days). Patients in the late cohort were older (70.1 ± 9.8 vs 69.8 ± 10.5; $P = .02$), less likely to undergo carotid endarterectomy (85.9% vs 88.4%; $P < .01$), and more likely to have an elective procedure (90.3% vs 44.3%; $P < .01$). Fig 1 shows the distribution of insurance coverage among the study cohort. After adjusting for potential confounders, compared to Medicare, recipients of other insurer types had lower odds of experiencing delayed surgery: Medicare Advantage (adjusted odds ratio [aOR], 0.89; 95% confidence interval [CI], 0.80-0.99; $P = .03$), commercial (aOR, 0.84; 95% CI, 0.78-0.90; $P < .001$), military/Department of Veterans Affairs (aOR, 0.67; 95% CI, 0.54-0.84; $P < .001$), and self-pay (aOR, 0.54; 95% CI, 0.45-0.65; $P < .001$). Medicaid patients had similar delay (aOR, 0.90; 95% CI, 0.78-1.03; $P = .14$) and non-US insurance had longer delay to surgery (aOR, 1.48; 95% CI, 1.13-1.95; $P = .005$), in comparison to Medicare patients (Fig 2).

Conclusions: Symptomatic carotid patients on Medicare and Medicaid are more likely to receive delayed revascularization procedures compared to patient with commercial insurance. Future studies are needed to investigate and potentially mitigate the underlying causes for the delay and the overall health implications of such a delay on the long-term outcomes of these patients.

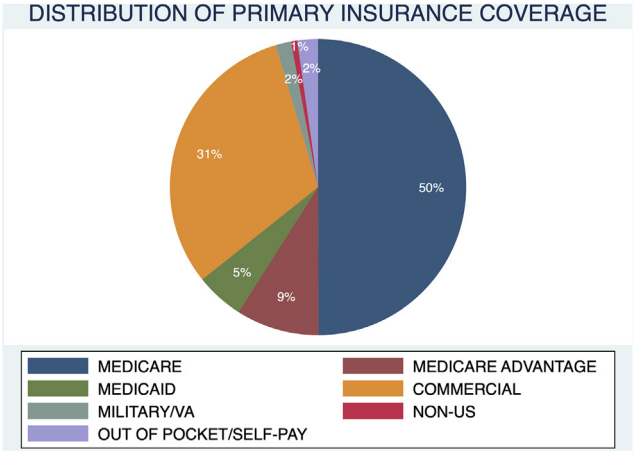

Fig 1. Distribution of patients according to primary insurance coverage.

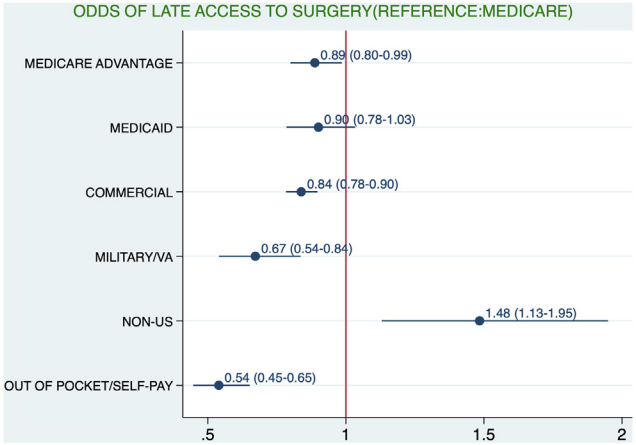

Fig 2. Adjusted odds of receiving late carotid revascularization in symptomatic patients requiring surgery: comparing other major insurance providers with Medicare. *Model adjusted for urgency of procedure, prior coronary artery disease, prior carotid endarterectomy/coronary artery stenting, preoperative beta-blocker use, prior congestive heart failure, type of procedure (carotid endarterectomy, transcarotid artery revascularization, transfemoral carotid artery stenting), age, race, body mass index, preoperative creatinine levels, preoperative hemoglobin concentration, preoperative dysrhythmia, previous major amputation, preoperative functional status, American Society of Anesthesiologists class, chronic obstructive pulmonary disease, and degree of stenosis.

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PC068

Risk Stratified Outcomes of Carotid Endarterectomy vs Transcarotid Artery Revascularization

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Objectives: Transcarotid artery revascularization (TCAR) offers a minimally invasive alternative to carotid endarterectomy (CEA) in patients at