



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

**Table I.** Payments for pre-operative imaging, expressed in US dollars

	Carotid Ultrasound	CT neck	MRI neck
<b>Total</b> (mean±SD)	140±40	282±94	410±146
Median (IQR)	136 (116-154)	276 (236-320)	380 (311-470)
<b>Professional Component</b> (mean±SD)	26±6	56±17	55±18
Median (IQR)	24 (23-25)	63 (46-60)	51 (46-71)
<b>Technical Component</b> (mean±SD)	114±35	213±75	353±156
Median (IQR)	117 (107-129)	234 (179-256)	348 (265-428)

**Table II.** Average pre-operative imaging studies with associated payments and inpatient reimbursements

Medicare Payments	No CSI (n=19,678)	With CSI (n=39,315)	P-value
Average number of Carotid DUS	2.4±1.9	2.5±2.1	<.001
Average number of CT neck	0	0.95±0.86	n/a
Average number of MRI neck	0	0.47±0.7	n/a
Total Pre-operative imaging payments	\$336±54	\$872±120	<.001
Average inpatient reimbursements	\$6088±4125	\$6784±3989	<.001
Pre-operative imaging + inpatient payments	\$6424±4133	\$7656±4050	<.001

the overall calculation to determine average payment per study. Inpatient reimbursements according to DRG 37-39 were calculated according to CSI use. After stratifying by CSI use we compared hospital length of stay (LOS), post-operative stroke, and carotid re-exploration rates using multivariable regression.

**Results:** A total of 58,993 CEAs were identified with pre-operative carotid imaging. The average age was 74.8±7.5 years, and 56.0% were men. Of these, 19,678 (33%) patients has ultrasound alone with an average of (2.4±1.9) exams prior to CEA. The CSI cohort had 39,315 patients with an average of 0.95±0.86 neck CTs and 0.47±0.7 MRIs in addition to 2.5±2.1 ultrasounds. The average payment for ultrasound was \$140±40, \$282±94 for CT and \$410±146 for MRI, see Table I. The average inpatient reimbursements were \$6088±4125 for patients without CSI compared with \$6784±3989 for patients with CSI, P<.001, see Table II. The average LOS during CEA admission was 2.5±3.7 days. Higher age and female gender were associated with longer LOS; however pre-operative CSI was not associated with shorter LOS. The overall post-operative stroke rate was 0.5% and carotid re-exploration rate was 0.5%; CSI was not associated with lower rates of post-operative stroke or re-exploration.

**Conclusions:** Our analysis found pre-operative imaging to include CSI in nearly two-thirds of patients prior to CEA for asymptomatic disease. CSI was not associated with improved patient outcomes regarding shorter LOS, lower post-operative stroke, and lower rates of re-operation. As imaging and inpatient payments were higher in patients with CSI, further work is needed to understand when

CSI is appropriate prior to surgical intervention to appropriately allocate healthcare resources.

<https://doi.org/10.1016/j.avsg.2021.01.034>

## ACUTE THROMBOTIC EVENT FROM COVID-19 INFECTION: SHORT-TERM FOLLOW-UP



*Christopher M. Faries Ajit Rao Nicole Ilonzo Songhron Hwang Prakash Krishnan Serdar Farhan Windsor Ting John Lantis Michael L. Marin and Peter L. Faries*

*Icahn School of Medicine at Mount Sinai, New York, NY.*

**Introduction and Objectives:** COVID-19 infection appears to result in a hypercoagulable state with subsequent thrombotic events. We describe the short-term follow-up of thirty patients with COVID-19 and a concurrent acute vascular event.

**Methods:** A retrospective review was performed on a prospectively maintained database from March to May, 2020, of patients with COVID-19 and a thrombotic event. The primary outcome was clinical patency, defined as freedom from symptoms after intervention. Secondary outcomes included mortality, length of stay (LOS), and morbidity.

**Results:** Average age was 64.8 years old. 25 (83.3%) patients experienced arterial thrombotic events and 5 (16.7%) patients experienced venous thrombotic events. Patients with arterial events were older than those with venous events (65.2 vs. 63.0 years old, p< 0.05). The

Demographics	All patients	Arterial Cases	Venous Cases	p-value
Number of patients	30 (100%)	25 (83.3%)	5 (16.67%)	--
Age	64.8	65.2	63	<0.05
Female	10 (33.33%)	9 (36.0%)	1 (20.0%)	0.49
<b>Ethnicity</b>				
Caucasian	9 (30.0%)	9 (36.0%)	0 (0%)	0.11
Hispanic	6 (20.0%)	5 (20.0%)	1 (20.0%)	1.00
African American	7 (23.33%)	5 (20.0%)	2 (40.0%)	0.33
Asian	3 (10.0%)	2 (8.00%)	1 (20.0%)	0.41
Unknown/other	5 (16.67%)	4 (16.0%)	1 (20.0%)	0.83
<b>Medical Comorbidities</b>	<b>All Patients (n=30)</b>	<b>Arterial (n=25)</b>	<b>Venous (n=5)</b>	<b>p-value</b>
Hypertension	21 (70.0%)	18 (72.0%)	3 (60.0%)	0.59
Hyperlipidemia	12 (40.0%)	11 (44.0%)	1 (20.0%)	0.32
Peripheral Vascular Disease	10 (33.33%)	10 (40.0%)	0 (0%)	0.08
Diabetes Mellitus	13 (43.33%)	11 (44.0%)	2 (40.0%)	0.87
Chronic Kidney Injury	2 (6.67%)	2 (8.0%)	0 (0%)	0.51
ESRD on HD	1 (3.33%)	1 (4.0%)	0 (0%)	0.65
Coronary Artery Disease (CAD)	7 (23.33%)	6 (24.0%)	1 (20.0%)	0.85
Stroke	5 (16.67%)	4 (16.0%)	1 (20.0%)	0.83
Obesity	8 (26.67%)	7 (28.0%)	1 (20.0%)	0.71
Former Smoker	8 (26.67%)	8 (32.0%)	0 (0%)	0.14
Current Smoker	5 (16.67%)	3 (12.0%)	2 (40.0%)	0.13
<b>Covid Severity</b>				
Mild	14 (46.67%)	11 (44.0%)	3 (60.0%)	0.51
Moderate	12 (40.0%)	12 (48.0%)	0 (0%)	0.03
Severe	4 (13.33%)	2 (8.0%)	2 (40.0%)	0.05

Table 1: Demographics and Comorbidities.

admitting diagnosis was an acute thrombotic event in 22 (73.3%) patients, COVID-19 infection in 7 (23.3%) patients, and hypertension for 1 patient (3.3%). Average LOS was 9.9 days. Procedures performed included 11 (36.7%) surgical embolectomies or bypasses, 7 (23.3%) percutaneous angiograms or venograms, 6 (20.0%) major amputations, and 2 (6.7%) minor amputations. 10 (33.3%) patients were treated conservatively. At one-month follow-up, 8 patients (26.7%) expired. 100% of patients who expired did so during the initial hospital stay. One-month clinical patency was 70.0%, (62.5% in arterial cases and 100% in venous cases). There were 6 readmissions (20.0%). Complications included wound infections (20.0%), acute kidney injuries (13.3%), hemorrhage (13.3%), and major amputations (10.0%).

**Conclusions:** Patients with COVID-19 infections who experienced thrombotic events saw high mortality

Mortality	All Patients (n=30)	Arterial (n=25)	Venous (n=5)	p-value
Total Mortality	8 (26.67%)	8 (32.0%)	0 (0%)	0.14
Cardiac Arrest	3 (10.0%)	4 (8.0%)	0 (0%)	0.40
Pneumonia	4 (13.33%)	4 (16.0%)	0 (0%)	0.40
Multisystem Organ Failure	1 (3.33%)	1 (4.0%)	0 (0%)	0.34
<b>1 Month Clinical Patency</b>	14 (70.0%)	10 (62.5%)	4 (100%)	0.23
<b>Postoperative Complications</b>				
Total Readmissions	6 (20.0%)	4 (16.0%)	2 (40.0%)	0.42
Unplanned Readmissions	5 (16.67%)	3 (12.0%)	2 (40.0%)	0.26
Deep Vein Thrombosis	2 (6.67%)	2 (8.0%)	0 (0%)	0.50
Hemorrhage	4 (13.33%)	3 (12.0%)	1 (20.0%)	0.66
Wound Infection	6 (20.0%)	6 (24.0%)	0 (0%)	0.21
Myocardial Infarction	2 (6.67%)	1 (4.0%)	1 (20.0%)	0.20
Major Amputation	3 (10.0%)	3 (12.0%)	0 (0%)	0.40
Acute Kidney Injury	4 (13.33%)	4 (16.0%)	0 (0%)	0.40
Stroke	2 (6.67%)	2 (8.0%)	0 (0%)	0.50
Pneumonia	1 (3.33%)	1 (4.0%)	0 (0%)	0.65
Reintubation	1 (3.3%)	1 (4%)	0	0.65

Table 2: Outcomes of Covid-19 infection and an acute thrombotic event upon one-month follow-up

and complication rates, and low patency rates.

<https://doi.org/10.1016/j.avsg.2021.01.035>

## LONG-TERM DURABILITY OF SUPERFICIAL FEMORAL VEIN AV FISTULA FOR DIALYSIS ACCESS



Kristine C. Orion,<sup>1</sup> Tanner Kim,<sup>2</sup> Anthony Rizzo,<sup>1</sup> Jonathan Cardella,<sup>2</sup> Anthony Rizzo,<sup>3</sup> and Timur Sarac,<sup>1</sup>

<sup>1</sup>Ohio State University Wexner Medical Center, Columbus, OH.

<sup>2</sup>Yale University School of Medicine, New Haven, CT.

<sup>3</sup>Cleveland Clinic, Columbus, OH.

**Objective:** Over the last half century, the numbers of patients on dialysis continue to increase. Central venous stenosis or occlusion, inadequate arm veins, and ultimate failure of repeated interventions are not uncommon. Many patients, especially the young, face exhaustion of traditional dialysis access options and abandonment of the upper extremities. Superficial femoral vein (SFV) arterial venous fistula of the