

From the Society for Clinical Vascular Surgery

Readmissions after thoracic endovascular aortic repair

Bindu Kalesan, PhD, MPH,^a Thomas W. Cheng, MS,^b Alik Farber, MD,^b Yi Zuo, MPH,^a Jeffrey A. Kalish, MD,^b Douglas W. Jones, MD, MPH,^b and Jeffrey J. Siracuse, MD,^b Boston, Mass

ABSTRACT

Objective: The care of patients undergoing thoracic endovascular aortic repair (TEVAR) can be resource intensive, which can be driven by readmissions. Our objective was to characterize index readmissions at 30, 90, and 180 days after TEVAR.

Methods: A retrospective analysis of the Nationwide Readmissions Database was performed for patients who underwent TEVAR in 2013. Multivariable analysis identified independent predictors for index readmission at 30, 90, and 180 days.

Results: There were 4045 TEVARs performed for descending thoracic aortic dissection (37.7%), nonruptured aneurysm (56%), and ruptured aneurysm (6.3%). There were 419 (11.1%) index readmissions at 30 days, 895 (23.6%) at 90 days, and 1131 (29.8%) at 180 days. The most frequent reason for index readmission was heart related at 30 days (15.5%) and aorta related at 90 days (18%) and 180 days (19.6%). Reinterventions were performed at 6.4%, 9.5%, and 9.7% of 30-, 90-, and 180-day readmissions, respectively. The majority of these included additional endovascular stent graft placement (51.9% of reinterventions at 30 days, 67.7% at 90 days, and 65.9% at 180 days). In multivariable analysis, 30-day index readmission was associated with initial ruptured presentation (odds ratio [OR], 1.48; 95% confidence interval [CI], 1.1-3.5; $P = .023$) and diagnosis-related group (DRG) severity grades of moderate (OR, 1.42; 95% CI, 0.74-2.73), major (OR, 2.47; 95% CI, 1.28-4.74), and extreme (OR, 1.60; 95% CI, 0.76-3.36; $P = .009$). Index readmission at 90 days was independently associated with initial ruptured presentation (OR, 1.88; 95% CI, 1.18-3.01; $P = .008$), urgent/emergent TEVAR (OR, 1.41; 95% CI, 1.08-1.85; $P = .014$), and DRG severity grades of moderate (OR, 1.53; 95% CI, 0.95-2.47), major (OR, 2.27; 95% CI, 1.39-3.7), and extreme (OR, 2.45; 95% CI, 1.43-4.18; $P = .002$). Finally, at 180 days, initial ruptured presentation (OR, 1.66; 95% CI, 1.05-2.62; $P = .029$), urgent/emergent TEVAR (OR, 1.37; 95% CI, 1.08-1.79; $P = .013$), and DRG severity grades of moderate (OR, 1.55; 95% CI, 1.01-2.38), major (OR, 2.15; 95% CI, 1.38-3.33), and extreme (OR, 2.39; 95% CI, 1.47-3.89; $P = .002$) were, again, independently associated with index readmission.

Conclusions: A large portion of patients treated with TEVAR were readmitted most commonly for heart-related reasons at 30 days and aorta-related reasons at 90 and 180 days. TEVAR performed to treat initial aortic rupture and greater DRG severity grade were independently associated with an index readmission at 30, 90, and 180 days. Urgent/emergent TEVAR was independently associated with an index readmission at 90 and 180 days. These factors are important to consider in using readmissions as a quality measure. (J Vasc Surg 2018;■:1-11.)

As our health care delivery system transitions from fee-for-service to value-based care, hospital readmission, a surrogate for both quality of care and resource utilization, has become an ever important metric.^{1,2} A number of studies have demonstrated that patients undergoing

vascular surgery procedures have 30-day readmission rates as high as 28.5%.²⁻⁶ In particular, patients with Medicare undergoing vascular surgery have a 30-day readmission rate of 23.9%, which is highest among other surgical specialties.²

The Centers for Medicare & Medicaid Services introduced the Hospital Readmissions Reduction Program in 2012 to reduce readmissions by penalizing centers with higher than expected readmission rates by withholding up to 1% of Medicare reimbursement. Multiple independent predictors of readmission have been identified across common vascular surgery procedures, including lower extremity bypass, carotid endarterectomy, open abdominal aortic aneurysm repair, and endovascular abdominal aortic aneurysm repair.⁷⁻¹⁰

However, there are limited data on readmissions for patients undergoing thoracic endovascular aortic repair (TEVAR). As TEVAR becomes a standard in treating patients with descending thoracic aortic disease, it is paramount to characterize predictors for readmissions after TEVAR in this cohort of high-risk patients.¹¹⁻¹⁶ Therefore, our objectives were to describe readmission and reintervention rates after TEVAR both to evaluate reasons

From the Center for Clinical Translational Epidemiology and Comparative Effectiveness Research, Preventive Medicine and Epidemiology, Department of Medicine, Boston University School of Medicine^a; and the Division of Vascular and Endovascular Surgery, Boston University, Boston Medical Center.^b

Author conflict of interest: B.K. and Y.Z. are funded by the Evans Research Foundation.

Presented as a plenary oral presentation at the Forty-fifth Annual Symposium of the Society for Clinical Vascular Surgery, Lake Buena Vista, Fla, March 18-22, 2017.

Additional material for this article may be found online at www.jvascsurg.org.

Correspondence: Jeffrey J. Siracuse, MD, Department of Surgery, Boston University School of Medicine, 88 E Newton St, Ste C520, Boston, MA 02118 (e-mail: jeffrey.siracuse@bmc.org).

The editors and reviewers of this article have no relevant financial relationships to disclose per the JVS policy that requires reviewers to decline review of any manuscript for which they may have a conflict of interest.

0741-5214

Copyright © 2018 by the Society for Vascular Surgery. Published by Elsevier Inc. <https://doi.org/10.1016/j.jvs.2017.12.035>

for index readmissions and to identify factors that are independently associated with index readmission at 30, 90, and 180 days.

METHODS

Database. The Nationwide Readmissions Database (NRD) is an inpatient database designed by the Agency for Healthcare Research and Quality (AHRQ) as part of the Healthcare Cost and Utilization Project to identify areas for improving patient care, specifically hospital readmissions.¹⁷ The NRD includes all hospitalizations including readmissions within a state except for those at rehabilitation and long-term acute care hospitals.¹⁷ This study used the 2013 NRD, which consists of 21 states and captures 49.3% of the U.S. resident population and 49.1% of all hospitalizations within the United States in 2013.¹⁷

Selection of patients. Patients were first identified if they were older than 18 years and if they had a primary or secondary diagnosis for dissection of the thoracic aorta, dissection of the thoracoabdominal aorta, ruptured thoracic aneurysm, thoracic aneurysm without rupture, and any aortic aneurysm without rupture using the respective *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) diagnosis codes: 441.01, 441.03, 441.1, 441.2, and 441.9. Patients with a primary or secondary procedure code for TEVAR (ICD-9: 39.73) were then included. All available diagnosis and procedure codes in the NRD database were evaluated. Patients who underwent open surgical repair were excluded with the following primary or secondary ICD-9 procedure code: resection of aorta or thoracic vessel with anastomosis (38.34, 38.35) or with replacement (38.44, 38.45) and repair of a vessel with a patch (39.57, 39.58). Patients who underwent proximal debranching or iliac access were identified using the respective primary or secondary ICD-9 procedure codes: 39.22 and 39.29. Patients were then classified into three indications at initial presentation: dissection, nonruptured aneurysm, and ruptured aneurysm. The indication was determined by the primary diagnosis code or by the secondary diagnosis code that was closest to the primary diagnosis code by numerical order.

Sample groups and data collection. The resulting cohort of patients was categorized into two groups: those with an index readmission and those not readmitted after the TEVAR procedure at 30, 90, and 180 days. Demographics, comorbidities, indication at initial presentation, Elixhauser score, and hospital characteristics were collected at each time point. The Elixhauser score is a single numeric comorbidity score used in primarily administrative databases to assess the patient's disease burden.^{18,19} The Elixhauser score consists of 30 comorbidity measures, such as hypertension, congestive heart failure, chronic pulmonary disease, obesity, and renal

ARTICLE HIGHLIGHTS

- **Type of Research:** Retrospective analysis of prospectively collected data of the Nationwide Readmissions Database
- **Take Home Message:** In this study of 4045 thoracic endovascular aortic repair (TEVAR) patients enrolled in the Nationwide Readmissions Database, patients were most frequently readmitted for cardiac reasons at 30 days and aorta-related reasons at 90 and 180 days. TEVAR for aneurysm rupture predicted readmission at 30, 90, and 180 days.
- **Recommendation:** The authors suggest considering readmissions for ruptured aneurysms and for cardiac and aorta-related reasons as quality measures of TEVAR.

failure, that may have an impact on outcomes, such as length of stay, hospital charges, and in-hospital mortality.^{18,19} The Elixhauser score can also be implemented to evaluate risk of readmission.²⁰ Hospital characteristics collected included hospital bed size (large, medium, and small). A hospital bed size defined by the AHRQ depends on the region (Northeast, Midwest, Southern, and Western) and location and teaching status of the hospital (rural, urban, and nonteaching, and urban and teaching).¹⁷ An urban teaching hospital with >425 beds in the Northeast region, 375 beds in the Midwest region, 450 beds in the Southern region, and 325 beds in the Western region was considered a large bed size.¹⁷ Patients who were readmitted at 30 days were included in the later readmission time points. Also, patients who died during follow-up were not included in the analysis as demonstrated in previous studies that analyzed readmission for resource utilization.^{5,21}

Outcome variables collected at 30, 90, and 180 days were survival, readmission reasons, and reinterventions. Readmission reasons after the index TEVAR were identified by the primary ICD-9-CM diagnosis code and categorized by similarity. These categories included cardiac, aortic, infectious, gastrointestinal, other, renal failure, pulmonary, wound complication, peripheral ischemia, altered mental status, hypertension, musculoskeletal, trauma, bleeding, venous thromboembolism, and stroke. The aortic category was subcategorized to those with a reintervention. Reinterventions for TEVAR and open repair were identified using the previously described primary or secondary ICD-9 procedure codes.

The Boston University School of Medicine Institutional Review Board approved this study, and informed consent was waived.

Statistical analysis. Weighted numbers and percentages were used for all statistical analysis as recommended by the AHRQ.¹⁷ As the 2013 NRD does not include

Download English Version:

<https://daneshyari.com/en/article/8671403>

Download Persian Version:

<https://daneshyari.com/article/8671403>

[Daneshyari.com](https://daneshyari.com)