A Successful Institutional Strategy to Increase the Number of Therapeutic Operations Among Patients With Lung Lesions

Pulmonary resection is a diagnostic and therapeutic strategy for patients with known or suspected lung cancer. Surgeons must strike a balance between resecting early-stage cancer and improving survival, while minimizing the removal of benign lesions and the low but finite risk of resection. Overall rates of nontherapeutic resections of benign lesions (ie, benign rates) have surpassed 20% in recent large cooperative trials but may vary among institutions depending on the underlying population risk, referral patterns, and the level of aversion to risk among clinicians.1,2 Institutional strategies that include multidisciplinary conferences with participation from specialists in the fields of surgery, pulmonology, radiology, pathology, and oncology participation may minimize benign rates and increase the number of therapeutic resections.

Methods | We retrospectively examined all patients who underwent pulmonary resection for known or suspected lung cancer during the period from 2005 to 2013 from a single tertiary referral hospital with capitated institutional resources and a high acuity level among patients. Institutional review board approval was obtained prior to data collection from the Tennessee Valley Healthcare System. Informed consent was not required on the basis of deidentified data. A strategy to increase the number of therapeutic operations and reduce the number of ineffectual thoracotomies was initiated and included oral presentations at a multidisciplinary conference prior to obtaining a cancer diagnosis. Demographic and imaging data; data on diagnostic modality, pathology, and type of resection; and inclusion in the multidisciplinary conference prior to operative resection were reviewed. A benign lesion or lung cancer was the primary outcome, which was determined pathologically.

Results | There were 220 patients included in our study, and their demographic characteristics are listed in the Table. The overall benign rate was 6.8% (ie, 15 of 220 patients underwent a nontherapeutic resection of a benign lesion), and the patient information from 178 of these 220 patients (81%) were included as oral presentations at the multidisciplinary conference prior to the patients undergoing the pulmonary resection. Two-thirds of patients received a known diagnosis of cancer prior to their planned therapeutic resection. The preoperative diagnostic method was predominantly computed tomography-guided fine-needle aspiration, followed by bronchoscopy with bronchial washings or transbronchial needle aspiration (Table). One patient’s condition was diagnosed using an endobronchial ultrasonography-guided fine-needle aspiration biopsy. A surgical resection was required to obtain a diagnosis for 35% of patients with indeterminate lesions. Of the 158 patients who had fludeoxyglucose F 18–positron emission tomography scans, 149 (94%) had avid lesions. Patients who did not receive a preoperative diagnosis of lung cancer and whose patient information was presented at the multidisciplinary conference had a 20% benign rate, and those patients whose patient information was not presented at the multidisciplinary conference had a 16% benign rate. The majority of patients with cancer had pathologic stage I cancer (116 of 199 patients [58%]) or stage II cancer (57 of 199 patients [29%]).

Discussion | In this retrospective case series, 15 of 220 patients underwent a nontherapeutic resection of a benign lesion for a benign rate of 6.8%, the lowest reported in the literature.1-3 The limitations of our study include its retrospective, observational nature and our inability to prove causality between the use of a preoperative case conference and the low benign...
rate. A multidisciplinary review may lead to the comprehensive implementation of diagnostic modalities that better identify patients most likely to benefit from therapeutic resection. Recent data suggest that the engagement of surgical oncologists in tumor boards results in higher rates of curative-intent surgery for patients with early-stage non–small cell lung cancer. Owing to the limited scope of the present study, the effect of therapeutic resection on stage migration or survival was not evaluated.

In light of the National Lung Screening Trial and the 8 million individuals at risk, an estimated 3.1 million lung abnormalities will be identified in the first 3 years of a national computed tomographic screening program. Assuming a benign rate exceeding 20%, at least 24,000 operations in the first 3 years would be performed for patients with benign lesions. Reducing benign rates will ease the cost and prevent unnecessary morbidity and mortality resulting from evaluating lesions found during lung cancer screening. The benign rate has recently been proposed as a quality metric for the management of patients with indeterminate lung lesions. Implementation of a preoperative multidisciplinary review may help us to better target institutional resources while minimizing the potential harm caused by invasive diagnostic and therapeutic techniques.

Amelia W. Maiga, MD, MPH
Stephen A. Deppen, PhD
Rhonda Pinkerman, ACNP
Eric L. Grogan, MD, MPH

Author Affiliations: Tennessee Valley Healthcare System, Nashville (Maiga, Deppen, Pinkerman, Grogan); Department of Thoracic Surgery, Vanderbilt University Medical Center, Nashville, Tennessee (Maiga, Deppen, Grogan).

Corresponding Author: Eric L. Grogan, MD, MPH, Department of Thoracic Surgery, Vanderbilt University Medical Center, 1313 21st Ave S, 609 Oxford House, Nashville, TN 37232 (eric.grogan@vanderbilt.edu).


Author Contributions: Drs Maiga and Deppen had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Maiga, Deppen, Grogan.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Maiga, Deppen, Grogan.

Critical revision of the manuscript for important intellectual content: Maiga, Pinkerman, Grogan.

Statistical analysis: Maiga, Deppen.

Study supervision: Grogan.

Conflict of Interest Disclosures: None reported.

Funding/Support: Dr Maiga is supported by the Office of Academic Affiliations, Department of Veterans Affairs National Quality Scholars Program. Dr Grogan is a recipient of the Department of Veterans Affairs, Veterans Health Administration, Health Services Research and Development Service Career Development Award (10-Q24).

Role of the Funder/Sponsor: The funding agencies had no role in the design and conduct of the study; collection, management, analysis, or interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Disclaimer: The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs.

Previous Presentation: This paper was presented at the 39th Annual Meeting of the Association of VA Surgeons; May 3, 2015; Miami Beach, Florida.


Marital Status and Postoperative Functional Recovery

Chances of survival after major surgery may be better among married vs unmarried persons, but little is known regarding the association between marital status and postoperative function. Characterizing the association between marital status and postoperative function may be useful for counseling patients and identifying at-risk groups that may benefit from targeted interventions aimed at improving functional recovery.

Methods | We used data from the University of Michigan Health and Retirement Study (http://hrsonline.isr.umich.edu), a longitudinal panel survey that has enrolled 29,033 adults 50 years of age or older since 1998. The Health and Retirement Study participants undergo interviews every 2 years regarding health, functioning, medical care, and family structure. We used data from the 2004, 2006, 2008, and 2010 waves of the Health and Retirement Study; our sample included surviving participants who reported having undergone cardiac surgery in the interval since the preceding interview and deceased participants for whom proxies reported a cardiac surgery since the last interview. This study was exempted from review by the University of Pennsylvania institutional review board. Participants in the Health and Retirement Study provided written informed consent at the time of enrollment.

We collected information on marital status, age, sex, and comorbidities as recorded at enrollment and in the last interview before surgery. We also collected information on preoperative dependence in 6 activities of daily living: dressing, ambulation, bathing, eating, toileting, and getting in and out of bed. Our end point was a combined outcome of death or new dependence in 1 or more activities of daily living at the postoperative interview. We used the χ² test and the Kruskal-Wallis test to compare the distribution of patient characteristics at baseline, and we used logistic regression to test the association of marital status with postoperative death or new functional dependence after accounting for baseline characteristics. We used P < .05 to indicate statistical significance.

Results | Our study sample included 1576 participants; at the time of the baseline interview, 1026 (65.1%) were married, 184 (11.7%) were divorced or separated, 331 (21.0%) were widowed, and 35 (2.2%) were never married. Married participants were more likely to be male and to demonstrate lower