ORIGINAL ARTICLE

Assessing the Impact of Postoperative Radiation Therapy for Completely Resected Limited-Stage Small Cell Lung Cancer Using the National Cancer Database

Andrew T. Wong, MD,[a,b,*] Justin Rineer, MD,[c] David Schwartz, MD,[a,b] David Schreiber, MD[a,b]

[a]Department of Veterans Affairs, New York Harbor Healthcare System, Brooklyn, New York, USA
[b]State University of New York Downstate Medical Center, Brooklyn, New York, USA
[c]University of Florida Health Cancer Center-Orlando Health, Orlando, Florida, USA

Received 1 July 2015; accepted 20 October 2015

ABSTRACT

Introduction: Surgical resection is being increasingly used for early-stage small cell lung cancer (SCLC). However, there are sparse data regarding the role of adjuvant therapies, particularly postoperative radiation therapy (PORT). We investigated the impact of PORT on survival after complete surgical resection for SCLC using the National Cancer Database.

Methods: There were 3017 patients diagnosed with nonmetastatic SCLC between 1998 and 2011 who underwent R0 sublobar resection, lobectomy, or pneumonectomy. Patients were stratified by the use of PORT, and only those who received a minimum dose of 45 Gy were included. The overall survival (OS) of patients based on PORT use were analyzed by Kaplan–Meier analysis and compared using the log-rank test. Multivariate Cox regression analysis was used to identify factors associated with survival.

Results: For the entire study population, the 5-year OS was significantly poorer with the addition of PORT (33.9% versus 40.6%; $p = 0.005$). When analyzed by subgroup, patients with pN0 stage had significantly decreased OS with PORT (39.3% versus 46.3%; $p = 0.07$) and patients with pN2 stage had significantly improved OS with PORT (29.0% versus 18.6%; $p < 0.001$). No differences in OS were observed in patients with pN1 stage. On multivariate analysis, the hazard ratio for PORT in pN0 disease was 1.36 (95% confidence interval, 1.09–1.70; $p < 0.001$) and the hazard ratio for PORT in pN2 disease was 0.60 (95% confidence interval, 0.45–0.80; $p < 0.001$).

Conclusion: The use of PORT was associated with a deleterious effect on OS in patients with pN0 disease but significantly improved OS in patients with pN2 disease.

© 2015 International Association for the Study of Lung Cancer. Published by Elsevier Inc. All rights reserved.

Keywords: National Cancer Database; Postoperative radiation therapy; Small cell lung cancer

Introduction

There are an estimated 221,200 new cases of lung cancer diagnosed annually in the United States.[1] Small cell lung cancer (SCLC) represents approximately 15% of cases, of which roughly 30% are nonmetastatic.[2] Multimodality therapy is essential in the management of this disease because of its propensity for both local and distant progression. Two phase III trials have failed to show a benefit with the addition of surgery to multimodality treatment.[3,4] However, more recent studies have suggested that surgical resection may be considered in patients with early-stage disease.[5,6] Consequently, national guidelines currently support the use of surgical management for patients with clinical stage T1–2, N0 SCLC.[7]

*Corresponding author.

Disclosure: The authors declare no conflicts of interest.

Address for correspondence: Andrew T. Wong, MD, SUNY Downstate Medical Center, Department of Radiation Oncology, 450 Clarkson Ave, Box 1211, Brooklyn, NY 11203. E-mail: andrew.wong@downstate.edu

© 2015 International Association for the Study of Lung Cancer. Published by Elsevier Inc. All rights reserved.

ISSN: 1556-0864

http://dx.doi.org/10.1016/j.jtho.2015.10.011

Even in clinical stage I patients, there is substantial pathologic upstaging after surgery,[8] and locoregional failure remains high even after complete resection.[4,8] The indications for adjuvant postoperative radiation therapy (PORT) are currently not well-defined because there are few studies specifically addressing the issue. A subset analysis from a Surveillance, Epidemiology, and End Results (SEER) database study noted a survival benefit associated with PORT for pN2 disease,[5] and a small retrospective review of patients treated with complete surgical resection found that PORT significantly improved both locoregional control and overall survival for patients with pathological node-positive disease.[9] Given the paucity of data in the current literature examining the role of PORT, we analyzed the National Cancer Database (NCDB) to determine the impact of PORT on overall survival (OS) after complete resection of limited-stage SCLC (LS-SCLC) in a large cohort of patients.

Methods

The NCDB is a joint project of the American Cancer Society and the Commission on Cancer of the American College of Surgeons. It is estimated that 70% of all diagnosed malignancies in the United States are captured by facilities participating in this registry and are reported to the NCDB. The Commission on Cancer's NCDB and the hospitals participating in the NCDB are the source of the deidentified data used in this study. However, they have not verified and are not responsible for the statistical validity or conclusions reached by the authors of this study. Exemption was obtained from the New York Harbor Veterans Affairs Committee for Research and Development before this study began.

Adult patients with nonmetastatic SCLC who were treated with surgery consisting of sublobar resection, lobectomy, or pneumonectomy from between 1998 and 2011 were included. All included patients had negative margins and a pathological nodal stage of N0 to N2. For patients who received PORT, they had to be treated with external beam radiation to the lung and received a minimum dose of $\geq$4500 cGy. We also excluded those for whom laterality and chemotherapy use were not identified. We identified 3581 patients who met the study criteria. In order to account for immortal time bias,[10] we also excluded 564 patients who survived $<$4 months, resulting in a cohort of 3017 patients.

Clinical, pathological, and demographic details were compared between patients who received PORT and those who did not using the chi square, Fisher's exact, and Mann–Whitney tests where appropriate. The primary objective of this study was to determine whether the delivery of PORT impacts OS. Kaplan–Meier analyses of OS were performed comparing patients who received PORT with those who did not. Because immortal time bias has been proposed to potentially impact survival outcomes, we also repeated the analyses for patients who survived $<$7 months to confirm that there were not significant differences in our findings. Separate Kaplan–Meier analyses were performed, stratifying patients by pathologic N stage. This was performed because nodal stage was noted to be a significant metric in identifying appropriate candidates for postoperative radiation in the non-SCLC (NSCLC) setting.[11–13] Multivariate Cox regression was also stratified by N group in order to determine the effect of covariates on survival. The variables measured included the selection of PORT, age group, race, sex, receipt of chemotherapy, year of diagnosis, T grouping, and surgery type. The year of diagnosis was included to account for the potential benefit of improved conformal radiation techniques. Because the encoding of intensity-modulated radiation (IMRT) was first initiated in 2005 in the NCDB, we used 1998–2004 and 2005–2011 as the year of diagnosis cutoff points. Data regarding local control and cause of death are not available in the NCDB. Significant values were defined as $p < 0.05$. Statistical analysis was performed using SPSS software (version 21; IBM Inc, Armonk, NY).

Results

Patient Characteristics

There were 3017 patients who met the inclusion criteria. The most common surgical procedure was lobectomy (70%) followed by sublobar resection (25%). The median number of days from diagnosis to definitive surgery was 20 days. Chemotherapy was delivered to 61.2% of patients at a median of 57 days from diagnosis. With regard to PORT, 448 patients (14.8%) received PORT to a median dose of 54 Gy. The median number of days from diagnosis until receipt of radiation was 91 days. The median age was 68 years and the median follow-up was 28.6 months. At last contact, 63.4% of patients were dead. Additional details regarding patient characteristics and comparisons between those who did or did not receive PORT are available in Table 1.

Survival

Analyzing the entire cohort, OS was poorer in patients who received PORT (5-year OS 33.9% versus 40.6%; $p = 0.005$). However, when analyzed by N stage subgroup, differences emerged. The 5-year OS for pathologic N0 was 39.3% versus 46.3% ($p = 0.07$; Fig. 1). For pathologic N1 disease, the 5-year OS was 33.3% for PORT versus 27.7% for no PORT ($p = 0.22$; Fig. 2). However, for pathologic N2 disease, the 5-year OS was improved with the use of PORT (29.0% versus 18.6%; $p < 0.001$; Fig. 3).

Download English Version:

https://daneshyari.com/en/article/3989412

Download Persian Version:

https://daneshyari.com/article/3989412

Daneshyari.com