

The Treatment of Lung Cancer Between 2013-2014 at Truman Medical Center: A Retrospective Review in Fulfillment of the Requirements of Standard 4.6 (Monitoring Compliance with Evidence-Based Guidelines) for the Commission on Cancer

Lara Kujtan, MD; Abdulraheem Qasem, MD

Introduction

Lung cancer is the most common cause of cancer-related death in the United States. It is estimated that over 200 000 new cases of lung cancer will be diagnosed in 2016. Over 50% of these patients present with advanced stage disease at diagnosis. Lung cancer is divided into two major classes: small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC). Small cell lung cancer is aggressive, and responds drastically to chemotherapy. Non-small cell lung cancer is slow-growing and less sensitive to chemotherapy. Treatment and prognosis differs between these two classes, but also depend on the extent of disease, which is described by the tumor's stage. Guidelines created by the National Comprehensive Cancer Network (NCCN) describe the standard of care for patients diagnosed with lung cancer, depending on the class and stage.

Background

Several advances in technology and treatment have changed the face of lung cancer over the past decade. The identification of driver mutations, which propel the tumor to grow continuously, led to the subsequent development of targeted therapeutic agents directed at these mutations. Examples of these mutations include EGFR, ALK and ROS1, and testing for these mutations are now standard of care in patients with stage IV adenocarcinoma of the lung. Standard of care for patients also now consists of including palliative care services as part of the overall treatment strategy. This change significantly improves overall survival of patients compared to those that receive chemotherapy alone. Standards of care for treating early-stage disease have also been established through large randomized control trials, including multi-modality treatment combining chemotherapy, radiation and/or surgical resection. The purpose of this review is to monitor compliance with evidence-based guidelines put forth by the NCCN, specifically relating to these recent advances in the management of lung cancer.

Objectives

1. To determine the proportion of patients with stage IV adenocarcinoma of the lung who underwent EGFR, ALK and ROS1 testing.
2. To identify reasons why EGFR/ALK/ROS1 testing was not performed in patients diagnosed with stage IV adenocarcinoma of the lung.
3. To determine if and when patients diagnosed with stage IV adenocarcinoma of the lung were informed about palliative care or hospice services by their physicians.
4. In patients with stage IV adenocarcinoma of the lung, to determine how many physician visits occurred prior to discussion regarding palliative care or hospice services.
5. To determine if an association exists between the discussion of palliative care and/or hospice services, and the clinical setting (inpatient versus outpatient).

6. To determine the proportion of patients diagnosed with stage II or IIIA non-small cell lung cancer who underwent either resection followed by chemotherapy or definitive chemoradiation as treatment for their cancer.

7. To determine the number of patients with limited stage small cell lung cancer who underwent prophylactic cranial irradiation.

Results

In the years 2013-2014, 126 patients received a new diagnosis of lung cancer at Truman Medical Center. A random sample of sixty-eight patients was reviewed for this analysis. Non-small cell carcinoma was the diagnosis in 67% of patients, and 25% of patients were diagnosed with small cell lung cancer (Table 1).

Five patients were diagnosed with poorly differentiated carcinoma, and further classification was not achieved; one patient did not have a biopsy performed. Of patients diagnosed with non-small cell lung cancer, 59% were males, while 65% of small cell lung cancer patients were female. Of the non-small cell patients, 52% had a histologic diagnosis of adenocarcinoma, and 39% were squamous cell carcinoma. Four patients were classified only as non-small cell carcinoma.

Table 1: Patient demographics

	Non-small cell lung cancer (%)	Small cell lung cancer
Total†	46 (67%)	17 (25%)
Male	27 (59%)	6 (35%)
Squamous cell‡	18 (39%)	-
Adenocarcinoma	24 (52%)	-

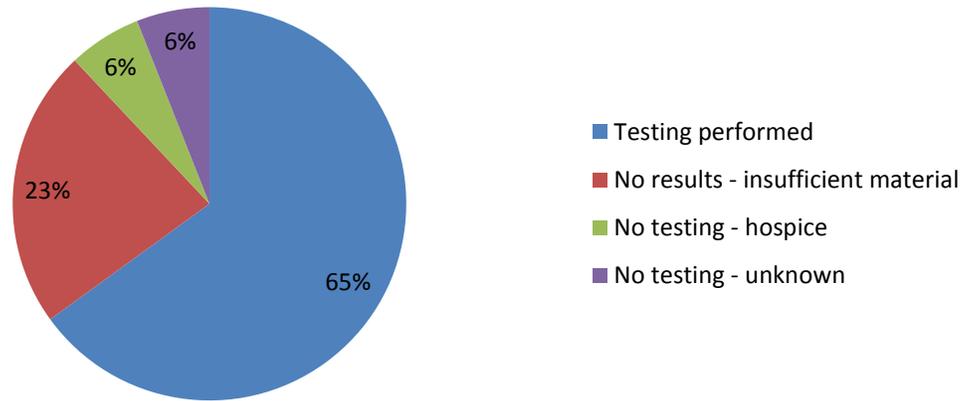
† 6 patients had poorly differentiated carcinoma -not otherwise specified, or were never biopsied.

‡ 4 patients were classified only as “non-small cell carcinoma”

Seventeen patients were diagnosed with biopsy-proven stage IV non-small cell lung cancer. Eleven of these patients (65%) underwent molecular testing for EGFR, ROS and ALK1 mutations (Figure 1). Of the six patients who did not receive mutation testing, four (67%) had insufficient material available from the biopsy to perform the required testing; one patient was placed on hospice and further testing was not pursued; one patient had no documentation as to why testing was not performed.

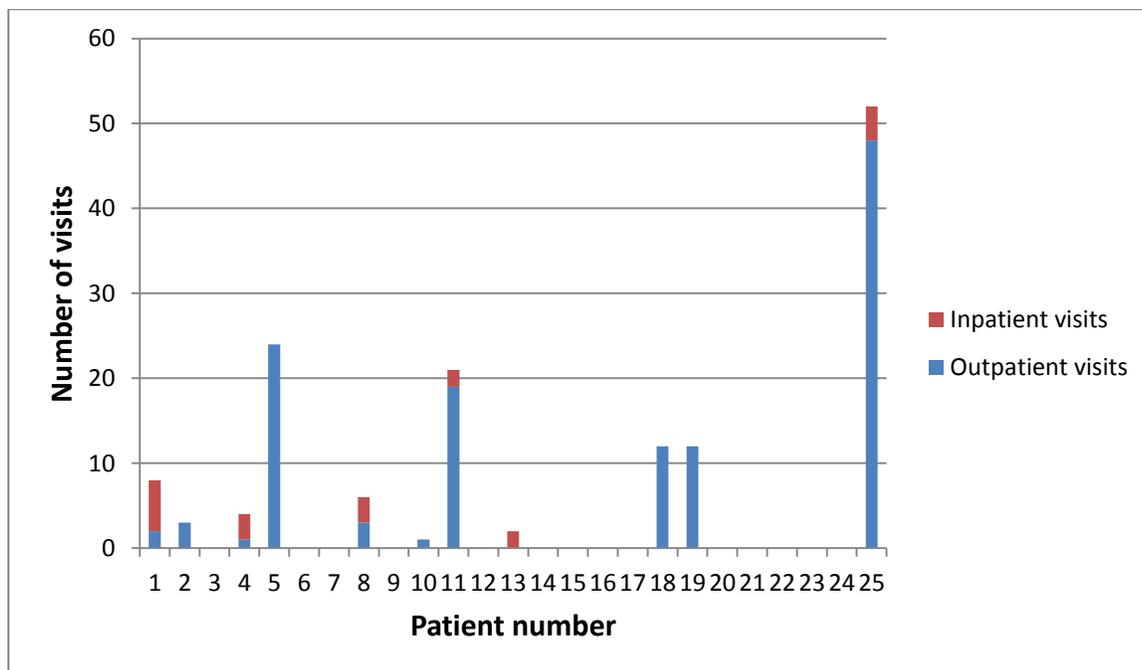
Four patients underwent resection with negative margins for stage II or IIIA non-small cell lung carcinoma; three patients (75%) received adjuvant chemotherapy; the fourth patient declined chemotherapy. Five patients were diagnosed with stage IIIA unresectable non-small cell lung cancer, and all five patients underwent definitive chemoradiation.

Figure 1: EGFR/ROS/ALK1 testing in stage IV lung adenocarcinoma patients



Twenty-five patients were diagnosed with metastatic non-small cell lung cancer (Figure 2). The mean number of visits with a medical oncologist prior to discussing palliative care or hospice services was 5.8. Four patients never had a discussion with their medical oncologist regarding palliative care or hospice services. Twelve discussions (57%) took place as an outpatient; nine discussions (43%) took place in the inpatient setting.

Figure 2: Number of visits with medical oncology before palliative care services were discussed



One patient was diagnosed with limited stage small cell lung cancer with good response to initial treatment, and underwent subsequent prophylactic cranial irradiation.

Discussion

Approximately two-thirds (65%) of patients diagnosed with stage IV adenocarcinoma of the lung underwent testing for EGFR/ALK/ROS1.

Of the patients who did not undergo molecular testing, two-thirds did not have sufficient material available to perform further testing. Core biopsies are the preferred method to obtain an adequate sample of tissue, however are not always feasible due to the location of the tumor. Even with core biopsies, samples can still be inadequate, necessitating repeat tissue biopsy, which requires patient consent for repeat biopsy. Of the remaining two patients, one was not a candidate for systemic chemotherapy, and therefore no further testing was performed; the other patient had no clear documentation as to why testing was not performed. Oncology-specific add-ons to electronic medical records are often utilized to keep track of the molecular status of tumors.

Palliative care services were rarely documented as being discussed with patients by their medical oncologist. Any patients admitted to the hospital and visited by the palliative care team were counted as documentation of palliative care services discussion. Many physicians documented only discussing hospice services with their patients, or that the patient would be receiving chemotherapy that was palliative in nature. Palliative care or hospice discussions took place slightly more frequently on an outpatient basis; the division between inpatient and outpatient discussions was close to 50%.

The mean number of visits with a medical oncologist prior to the discussion of palliative or hospice services was 5.8.

Almost all patients diagnosed with stage II or IIIA non-small cell lung cancer who underwent surgical resection with negative margins received adjuvant chemotherapy (75% compliance). Only one patient did not receive adjuvant chemotherapy, and in that case, chemotherapy was offered, but the patient declined. All patients who were diagnosed with unresectable stage IIIA non-small cell lung carcinoma received definitive chemoradiation.

One patient was diagnosed with limited stage small cell lung cancer with good response to initial treatment, and underwent prophylactic cranial irradiation; therefore compliance with this guideline was 100%.

Recommendations

1. Adequate tissue biopsies must be performed if at all possible, preferably core biopsies over fine-needle aspiration and cytology. The availability of pathologists while the biopsy is taking place can help to ensure that an adequate amount of tissue is obtained.
Plan: Discuss and re-inforce these ideas at Thoracic Multidisciplinary Tumor Board with proceduralists and pathology. Also ensure that pathologists are kept up-to-date with required tests by prompt discussion when new guidelines are published.
2. The use of reliable alternative methods to tissue biopsy to obtain molecular testing should be

encouraged.

Plan: A prospective trial will start to enroll patients by the end of this year, examining the feasibility of liquid biopsies in our patients.

3. Implementation of an oncology-specific add-on to the current electronic medical record can help physicians track the molecular status of their patients, and serve as a reminder regarding missing data.

Plan: The medical oncology clinic is attempting to enroll in a trial of the oncology add-on prototype for the electronic medical record currently in use by Truman Medical Center.

4. Physicians need to clearly document why molecular testing is not performed in eligible patients, in order to better identify obstacles to compliance with guidelines.

Plan: Discuss and re-inforce with medical oncology physicians.

5. Palliative care services in conjunction with palliative chemotherapy must be discussed with all patients diagnosed with stage IV lung adenocarcinoma, and preferably within the first 1-3 visits with a medical oncologist.

Plan: An initiative to increase the frequency of palliative care discussions was introduced into the medical oncology clinic.