

Aesthetic Surgery in Patients with Lung Cancer: A Paradigm Shift

David A. Hidalgo, MD*
Jan Baranski, PhD†
Sammy Sinno, MD‡

Background: Lung cancer is the most common cancer worldwide and the leading cause of cancer death. With the development of targeted therapy against causative driver mutations, some patients have experienced dramatic responses that have converted their disease into a chronic, stable form. Shifting concerns away from survival and back to quality-of-life issues has led some of these patients to seek aesthetic surgery.

Methods: Three patient examples are presented to illustrate current lung cancer treatment modalities, disease responses, and subsequent experiences with aesthetic surgical procedures. Two patients presented for blepharoplasty and the third for revisional breast augmentation surgery.

Results: Two patients were treated for lung cancer with targeted therapy and a third with more traditional chemotherapy before undergoing aesthetic surgery. All 3 patients experienced a normal recovery from surgery without any untoward results. Two remain free of disease and one has chronic stable disease. All have returned to normal, active lives.

Conclusions: Recent developments in lung cancer treatment are transforming this entity into a less formidable diagnosis for some patients, much like breast cancer and prostate cancer. Plastic surgeons should be aware of this paradigm shift. Successfully treated patients should be considered as reasonable candidates for aesthetic surgery, particularly when they have the full support of their oncologist. Beyond the typical psychological benefits that plastic surgery can produce, it also provides affirmation in this patient population of a return to normalcy, thereby imparting hope and optimism for the future. (*Plast Reconstr Surg Glob Open* 2016;4:e1086; doi: 10.1097/GOX.0000000000001086; Published online 24 October 2016.)

Lung cancer is the most common cancer worldwide and the number one cause of cancer deaths in both men and women, with nearly 160,000 deaths occurring annually in the United States alone.¹⁻³ Most patients are diagnosed with advanced-stage disease that is usually highly invasive and rapidly metastasizing. Surgery, historically the most effective treatment option, has a high relapse rate even for early-stage disease. Presently the 5-year survival rate for lung cancer in the United States remains 17.4% and has been increasing at only 2% per year over the past decade.⁴

From the *Division of Plastic Surgery, Weill Cornell Medical College, New York, N.Y.; †Lung Cancer Research Foundation, New York, N.Y.; and ‡Hansjörg Wyss Department of Plastic Surgery, New York University Langone Medical Center, New York, N.Y.
Received for publication July 17, 2016; accepted August 23, 2016.

Copyright © 2016 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. All rights reserved. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially.

DOI: 10.1097/GOX.0000000000001086

The introduction of platinum-based combination chemotherapy in the 1990s achieved only slightly improved response rates and survival. Over the next decade, several novel cytotoxic drugs contributed to further outcome improvements.⁵ Today, a new class of targeted therapies has demonstrated dramatic effects in controlling disease, palliating symptoms, and prolonging life in patients with non-small cell lung cancer (NSCLC), which accounts for approximately 85% of all lung cancers.⁶

Patients with NSCLC harboring specific driver mutations such as epidermal growth factor receptor (EGFR), anaplastic lymphoma kinase (ALK), and proto-oncogene tyrosine-protein kinase ROS (ROS1) are candidates for therapies that successfully target these molecular pathways.⁷ While these mutations represent a small subset of patients with lung cancer (Fig. 1), development of targeted therapies and treatment paradigms are rapidly evolving.^{8,9} Current standard practice at the time of diagnosis now includes histologic and molecular profiling and genetic analysis to identify patients who will benefit from this promising new approach.¹⁰ Identification of additional driver mutations such as MET, RET, and BRAF,

Disclosure: The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was waived at the discretion of the Editor-in-Chief.

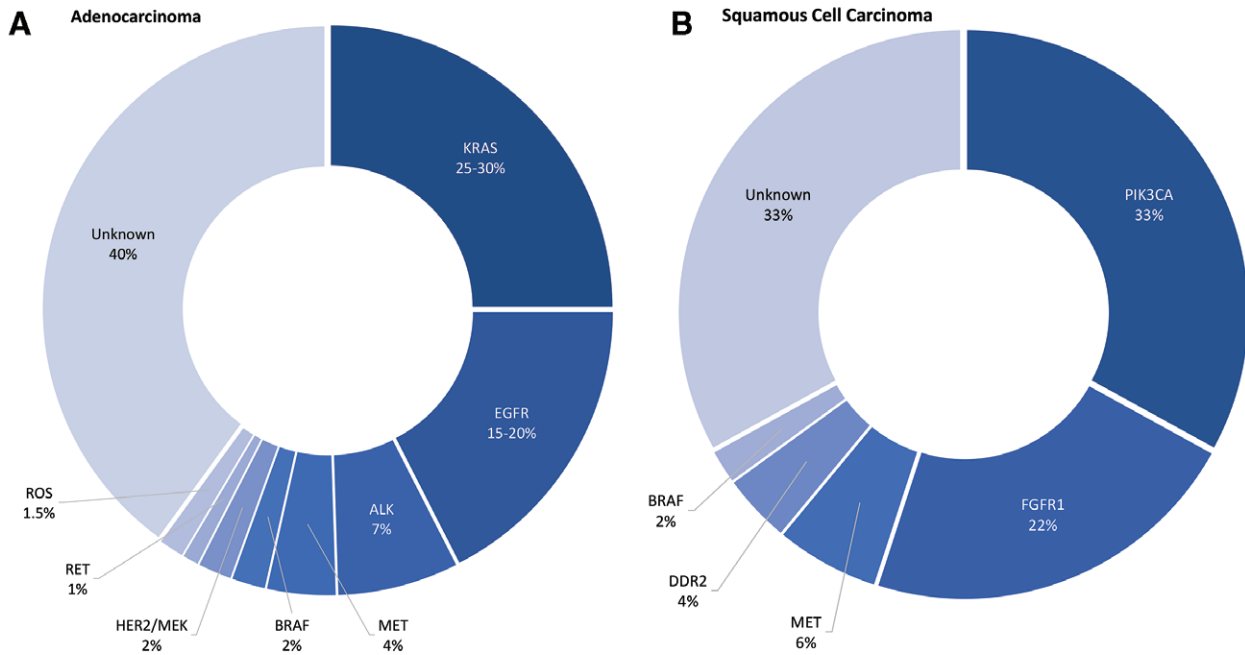


Fig. 1. Mutated driver genes responsible for the development of adenocarcinoma and squamous cell lung cancer are shown.

the development of new active and passive immunotherapies, and the expansion of existing therapies into other histologies such as small cell lung cancer aim to convert lung cancer as a whole into an increasingly chronic and stable disease. The specificity of targeted therapy also means less systemic impact and side effects compared to conventional chemotherapy.

Patients already experiencing prolonged survival after successful treatment are shifting their focus away from survival back to quality-of-life concerns. Some are now engaging in the pursuit of aesthetic surgery, which heretofore has not been a realistic option in this patient population. This report describes several lung cancer survivors that have undergone aesthetic surgery procedures after successful treatment for lung cancer.

PATIENT EXAMPLES

Conventional Chemotherapy

A nonsmoking patient was diagnosed with stage IV NSCLC at age 54 in 2006. There were no specific gene mutations associated. He underwent treatment with erlotinib, an EGFR inhibitor, cisplatin, and radiation of the spine for a single metastasis. He was subsequently treated with pemetrexed, another chemotherapy agent. He inquired about aesthetic eyelid surgery and was turned down as a candidate by the practice anesthesiologist despite having normal pulmonary function studies. He continued to do well and had an upper and lower blepharoplasty elsewhere in 2014. He remains free of disease and leads a rugged outdoor life today.

Targeted Therapy

A nonsmoking patient was diagnosed with NSCLC with an EGFR mutation at the age of 66 in 2013. Since diagnosis, she has been treated with the targeted therapy using

afatinib. She received radiation for a brain metastasis in 2014 and subsequently had that lesion resected. She inquired about aesthetic eyelid surgery in 2015 with the full support of her oncologist. An upper and lower blepharoplasty was performed and subsequent chest and brain scans were normal. She remains active and fully engaged as a university professor.

This nonsmoking patient was diagnosed with NSCLC with an ALK mutation at the age of 43 in 2010. She was initially treated with targeted therapy using crizotinib for 1.5 years, then switched to brigatinib for 1.5 years due to mutation resistance development, and is now on lorlatinib therapy for mutation resistance reemergence. She had brain metastases treated with radiation therapy and currently has stable brain and lung metastases. She had subpectoral silicone breast implants placed years before her lung cancer diagnosis with recurrent episodes of bilateral capsular contracture. She presented for treatment of severe bilateral capsular contracture in 2015. She had the full support of both her oncologist (and a close neurosurgeon acquaintance) for treatment. She underwent a 5-hour procedure for removal and replacement of her breast implants including placement of acellular dermal matrix to line the lower subpectoral implant pocket. She is 1 year postoperatively with Baker I-II breast consistency and stable disease. She remains actively employed in the private sector and fully engaged as a lung cancer survivor advocate.

DISCUSSION

Aesthetic surgery in cancer survivors is not new. Breast and prostate cancer patients commonly present for aesthetic surgery after successful treatment. However, both of these diseases have a high survival rate following decades

of progress in the development of new treatments, with patient survival in the range of 72–100% for non-stage IV breast cancer and 95–100% for prostate cancer.^{11,12} In fact, these patients are often considered better surgical risks for aesthetic surgery compared with patients with benign chronic diseases such as insulin-dependent diabetes and coronary artery disease.

The stigma of smoking as an etiologic factor in the development of lung cancer is a contributory factor in a negative perception of the patient with lung cancer.^{13,14} However, the incidence of nonsmoking-related lung cancer is significant, particularly in women, and is on the rise.¹⁵ This report is limited to the latter subgroup where targeted therapy with or without conventional chemotherapy is the primary treatment modality instead of surgery. Smokers treated by surgery for lung cancer may also be aesthetic surgery candidates however. They require thorough preoperative evaluation to measure the impact of previous resection and any coexisting chronic obstructive pulmonary disease on pulmonary function.

Until now a lung cancer diagnosis has been considered a contraindication to aesthetic surgery unless the patient presents with a history of early-stage disease successfully resected years previously. However, the emergence of targeted therapy for specific driver mutations has radically transformed the treatment of this disease in recent times. Most recently, immunotherapies such as programmed death-1/programmed death-ligand 1 function-blocking antibodies have ushered in another new class of treatment options.¹⁶ First showing promise in melanoma, these immune checkpoint inhibitors have recently been approved for use as second-line therapies in some forms of NSCLC and work by overcoming the immunosuppressive activity of tumor cells.

Taken together, these new advances in treatments are transforming lung cancer for certain patients into chronic and stable disease. These patients are able to return to a relatively normal existence and look forward with a focus on quality of life instead of survival concerns.

In light of this context, plastic surgeons should view lung cancer survivors with a new perspective and remain sensitive to the fact that many of these patients do not have a history of smoking. Given the rise of nonsmoking-related lung cancer in women, it is likely that the number of survivors requesting plastic surgery will increase. Patients with lung cancer should be considered reasonable candidates for surgery if they pass normal preoperative scrutiny and have the full support of their oncologists. Beyond the typical psychological benefits that plastic surgery produces, it also provides affirmation in this patient population of a return to normalcy, thereby imparting hope and optimism for the future.

David A. Hidalgo, MD

Division of Plastic Surgery
Weill Cornell Medical College
655 Park Avenue
New York, NY 10065
E-mail: dh@drdavidhidalgo.com

REFERENCES

1. Bray F, Ren JS, Masuyer E, et al. Global estimates of cancer prevalence for 27 sites in the adult population in 2008. *Int J Cancer* 2013;132:1133–1145.
2. Ferlay J, Soerjomataram I, Ervik M, et al. *Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11* [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available at: <http://globocan.iarc.fr>. Accessed December 15, 2015.
3. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2015. *CA Cancer J Clin*. 2015;65:5–29.
4. Howlader N, Noone AM, Krapcho M, et al. *SEER Cancer Statistics Review, 1975–2012* [Internet]. Bethesda, MD: National Cancer Institute; 2015. Available at: http://seer.cancer.gov/csr/1975_2012/. Accessed April 2015.
5. Schiller JH, Harrington D, Belani CP, et al; Eastern Cooperative Oncology Group. Comparison of four chemotherapy regimens for advanced non-small-cell lung cancer. *N Engl J Med*. 2002;346:92–98.
6. Gosney J, Travis WD. *Pathology and Genetics: Tumors of the Lung, Pleura, Thymus and Heart*. Lyon, France: International Agency for Research on Cancer; 2004.
7. Minguet J, Smith KH, Bramlage P. Targeted therapies for treatment of non-small cell lung cancer—recent advances and future perspectives. *Int J Cancer* 2016;138:2549–2561.
8. Booleel V, Alameer M, Watkins DN, et al. The evolution of therapies in non-small cell lung cancer. *Cancers (Basel)* 2015;7:1815–1846.
9. Rothschild SI. Targeted therapies in non-small cell lung cancer—beyond EGFR and ALK. *Cancers (Basel)* 2015;7:930–949.
10. National Comprehensive Cancer Network. *NCCN Clinical Practice Guidelines in Oncology Non-Small Cell Lung Cancer*. January 2016. Available at: http://www.nccn.org/professionals/physician_gls/pdf/nscl.pdf. Accessed January 11, 2016.
11. American Cancer Society. *Breast Cancer Survival Rates, by Stage*. July 2016. Available at: <http://www.cancer.org/cancer/breastcancer/detailedguide/breast-cancer-survival-by-stage>. Accessed July 5, 2016.
12. American Cancer Society. *Survival Rates for Prostate Cancer*. March 2016. Available at: <http://www.cancer.org/cancer/prostatecancer/detailedguide/prostate-cancer-survival-rates>. Accessed July 5, 2016.
13. Criswell KR, Owen JE, Thornton AA, et al. Personal responsibility, regret, and medical stigma among individuals living with lung cancer. *J Behav Med*. 2016;39:241–253.
14. Weiss T, Weinberger M, Schwerd AM, et al. A 30-year perspective on psychosocial issues in lung cancer: how lung cancer “Came out of the Closet”. *Thorac Surg Clin*. 2012;22:449–456.
15. Pelosof L, Ahn C, Horn L, et al. Increasing incidence of never smokers in non small cell lung cancer patients. Abstract presented at: 16th World Conference on Lung Cancer; September 6–9, 2015; Denver, CO. Abstract ORAL22.01.
16. Bustamante Alvarez JG, González-Cao M, Karachaliou N, et al. Advances in immunotherapy for treatment of lung cancer. *Cancer Biol Med*. 2015;12:209–222.