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Case Report

A Case Report on Rare Case of Pancreatic Metastasis from Primary Lung Adenocarcinoma: Treated Through a Non-surgical Approach

Syed Mohsin Raza, Adeel Riaz, Aqueel Shahid, Tabinda Sadaf

Department of Radiation Oncology, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Punjab, Pakistan

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Correspondence:
Aqueel Shahid,
7-A, Block R-3, M.A. Johar Town, Lahore 54782, Punjab, Pakistan.
Email: aqueel.shujai@gmail.com

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Abstract

Introduction: Most frequent sites of metastasis from lung cancer are the liver, brain and adrenal. Pancreas is an infrequent site of solitary metastasis from the lung primary with limited treatment options. There is insufficient data on the prognosis and optimal management of such cases. **Case Description**: We report a case of 44-year-old gentleman diagnosed with locally advanced lung adenocarcinoma Stage T4N3 who was treated radically with chemoradiation therapy, followed by a relapse of solitary pancreatic metastasis, which was treated with targeted therapy, erlotinib, due to the presence of epidermal growth factor receptor (EGFR) mutation. **Practical Implications:** This case reports an excellent radiological and symptomatic response in a patient who received erlotinib for advanced non-small-cell lung cancer (NSCLC). The use of EGFR-tyrosine kinase inhibitors has led to better prognosis and longer progression-free survival for patients with advanced NSCLC. However, the long-term survival of patients with metastatic NSCLC is limited.

Key words: Adenocarcinoma, EGFR mutation, erlotinib, exon 21, lung cancer

Introduction

Lung cancer remains the leading cause of cancer-related death. In patients with locally advanced or metastatic non-small-cell lung cancer (NSCLC), conventional platinum-based chemotherapy is the treatment of choice.[1,2] However, a significant number of patients show disease progression following conventional chemotherapy, necessitating second-line therapy to control tumour growth and progression. Although the prognosis and progression-free survival for patients with advanced NSCLC has improved with epidermal growth factor receptor (EGFR) tyrosine kinase inhibitors, long-term survival in patients with metastatic NSCLC is uncommon. Erlotinib, an EGFR inhibitor, is working miracles to prolong survival significantly, symptoms control and quality-of-life

benefits for patients who experienced disease progression after first-line chemotherapy.[3,4]

Case Description

A 44-year-old male, a non-smoker with no comorbidities, presented to us with complaints of cough for 6 months and fever for 2 months. His Eastern Cooperative Oncology Group score was 0. His computed tomography (CT) scan showed a heterogeneous left lower lobe mass 75 mm × 56 mm in size with a few adjacent nodules and a significant adjacent thickened pleura. Histopathology of the lesion was significant for adenocarcinoma grade III, thyroid transcription factor-1 positive [Figure 1].

A positron emission tomography-computed tomography (PET-CT) scan revealed a highly active mass in the lower left lobe of the lung, accompanied by lymph node enlargement in the mediastinum and left level IV cervical region [Figure 2]. Based on the AJCC 8th edition guidelines, the final diagnosis was T4N3M0 disease.[5]

Diagnosis and management

The patient was treated with two cycles of cisplatin 75 mg/m^2 and pemetrexed 500 mg/m^2. Followed by concurrent chemoradiation therapy using 55 gray units in 20 fractions [Figure 3] with cisplatin 100 mg/m^2 on Day 1 and vinorelbine 50 mg/m^2 on Day 1, 8 and 15. The patient had a near complete response to treatment and remained on follow-up, with his subsequent scan showing no recurrent disease.

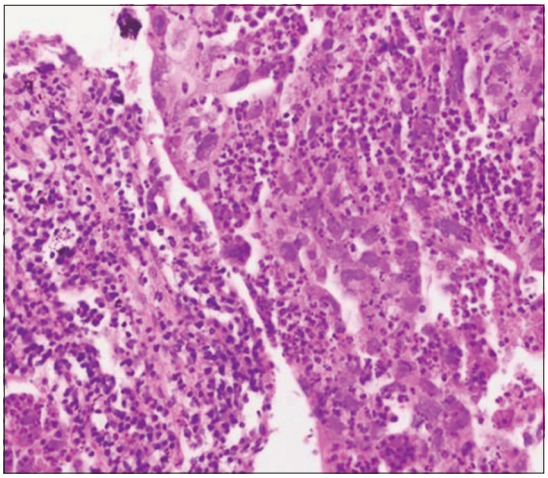

Figure 1: Histopathology slide of adenocarcinoma with thyroid transcription factor-1 positive stain

After 8 months of treatment, the patient presented with pain in the right side of the abdomen radiating to the back. CT abdomen was performed, which showed a progressive soft-tissue mass in the paraduodenal (peripancreatic area), inseparable from the uncinate part of the pancreas. Subsequently, endoscopic ultrasound and biopsy of the lesion were conducted, which showed a 46 mm × 31 mm mass involving the duodenum. Histopathology showed metastatic adenocarcinoma from the primary lesion with EGFR mutated at exon 21 and anaplastic lymphoma kinase rearrangement not detected [Figure 4]. PET-CT showed hypermetabolic activity in the mass [Figure 5].

The patient was treated with palliative radiation therapy using 20 grey units in five fractions for pain control. The pain settled a week after the completion of the radiation therapy. Based on his EGFR mutation, he was started on erlotinib 150 mg once daily (by mouth). There was a significant response to treatment clinically and radiologically. After 6 months, the CT scan revealed disease remission [Figure 6]. The patient reported no grade 2 or 3 side effects, including fatigue and diarrhoea on erlotinib. The patient remains on active follow-up and has been using the medication for the past 2 years.

Discussion

It is unusual for lung adenocarcinoma to result in pancreatic metastasis. According to Maeno *et al*., only a small percentage of autopsied lung cancer patients had pancreatic metastases. Specifically, 2.3% of patients with adenocarcinoma had pancreatic metastases, compared to 10.5% of patients with small-cell lung cancer (SCLC). This is a rare occurrence that has been documented in only a few medical cases, including our own.[6]

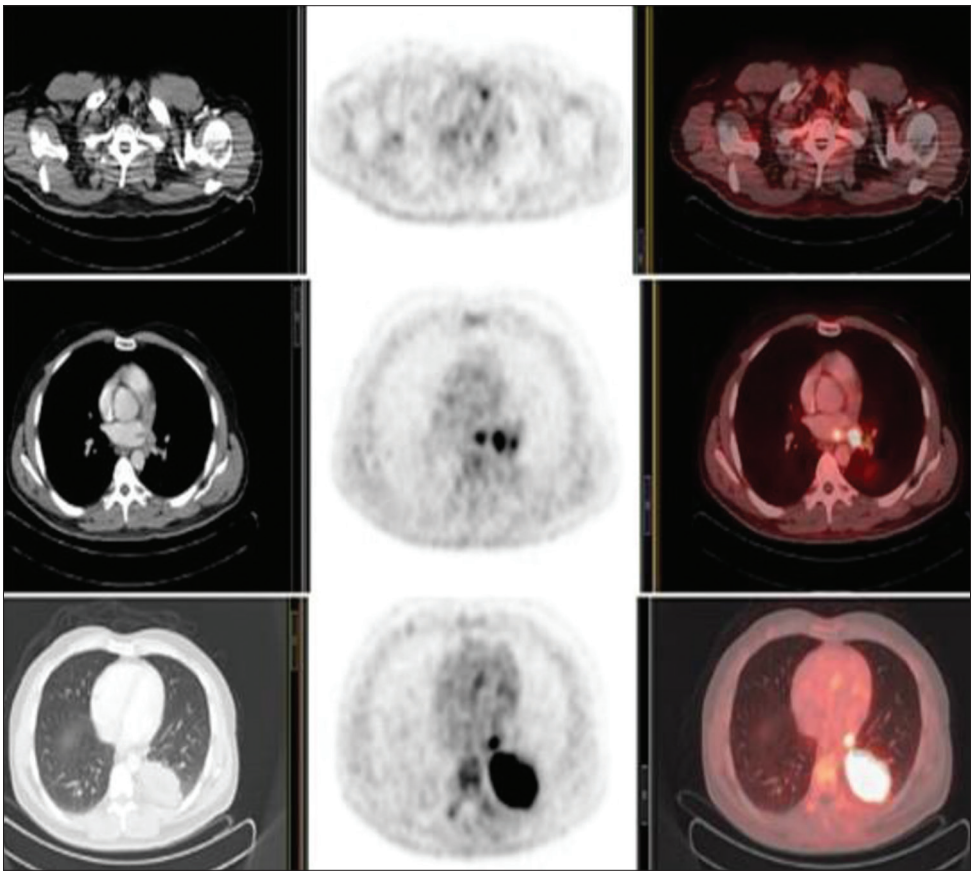

Figure 2: Staging positron emission tomography-computed tomography scan showing a hypermetabolic left lower lobe lung mass with mediastinal and left level IV cervical lymphadenopathy

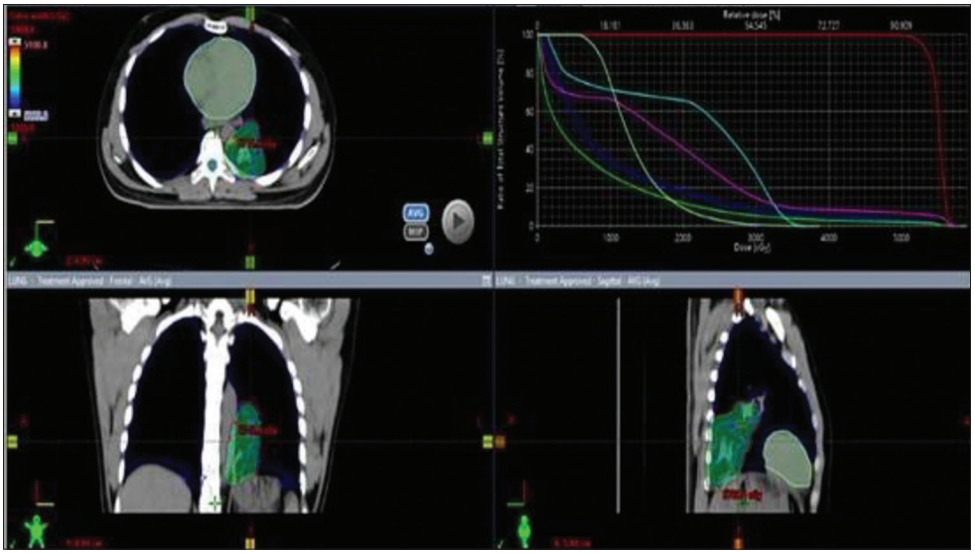

Figure 3: Radiotherapy plan for primary lung mass showing target volume coverage and dose volume histogram demonstrating planning volume radiation coverage doses to organs at risk

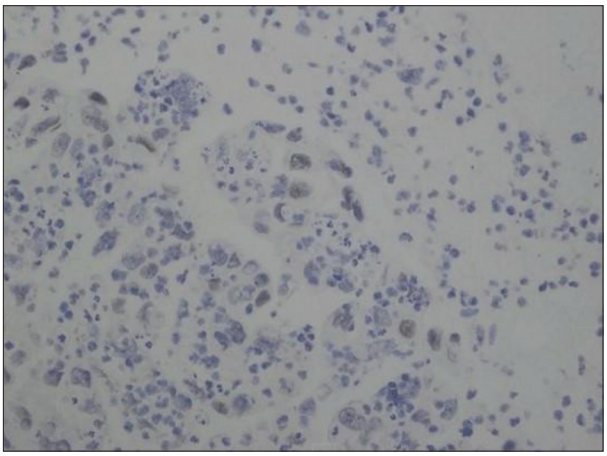

Figure 4: Histopathology slide of metastatic lesion showing adenocarcinoma from primary lung cancer showing epithelial growth factor receptor mutation and anaplastic lymphoma kinase rearrangement not detected

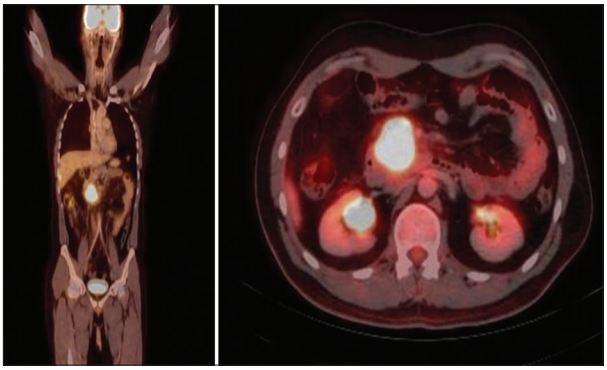

Figure 5: Positron emission tomography-computed tomography scan showing hypermetabolic soft tissue mass in paraduodenal/peripancreatic area inseparable from uncinated process of pancreas

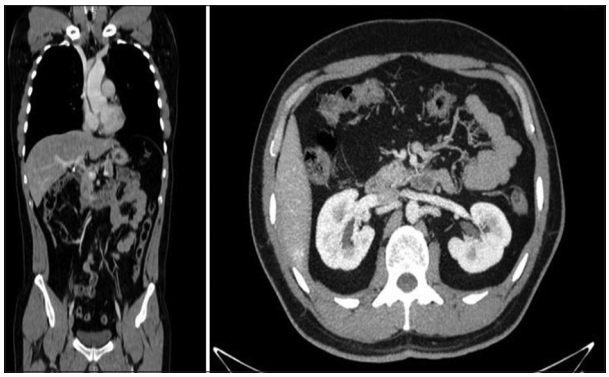

Figure 6: Coronal and axial sections of computed tomography scan post 6 months of erlotinib treatment showing complete resolution of pancreatic mass

Chemotherapy options for advanced NSCLC are frequently associated with toxicities that may adversely affect a patient's quality of life, and many of them require frequent hospitalisation.[7] The treatment of NSCLC patients with advanced disease has been revolutionised by newer targeted therapies, particularly those that target specific molecular alterations. Certain genes have been highlighted due to the molecular characteristics of NSCLC. The EGFR is a cell membrane receptor in the ERB family that plays a specific role in cell proliferation, differentiation and survival.[8] The EGFR mutations affecting exon 19 deletion or exon 21 substitution, as in our case, predict response to the EGFR-tyrosine kinase inhibitors like erlotinib. Erlotinib, a potent inhibitor of EGFR tyrosine-kinase activity, has similar efficacy to chemotherapy and a favourable tolerance.[9]

In a phase III trial, erlotinib provided a significant progression-free survival benefit over placebo in patients with advanced NSCLC who had previously received chemotherapy (hazard ratio 0.70, 95% confidence intervals 0.58–0.85, $P < 0.001$).[3] This has led to its approval in the metastatic setting. This study revealed that adenocarcinoma histology, no smoking history, female gender and Asian ethnicity were associated with a significantly greater likelihood of response to erlotinib. Our patient possessed the majority of these characteristics and showed a prolonged radiographic and symptomatic response to erlotinib. The study also showed survival benefits in almost all patient subgroups studied, including male sex, former/current smokers, squamous-cell carcinoma histology, a group that would be expected to have a low tumour response rate.[3,10,11]

Erlotinib is currently under investigation as a front-line treatment for advanced NSCLC, and several phase II studies of first-line erlotinib monotherapy have reported promising results.[9-12]

Another phase IV study (TRUST) proved the efficacy profile of erlotinib in a diverse population comprising more than 6000 patients. The trial included patients with Stage IIIB/IV NSCLC who

had previously failed to respond to the standard chemoradiotherapy or were considered unsuitable. In patients with locally advanced NSCLC, the PFS and OS in this study were 3.25 months and 7.9 months, respectively, whereas the disease control rate was 69%. TRUST study proved that erlotinib could benefit many patients, including those previously thought unlikely to respond to this treatment.[13] Ongoing trials have demonstrated that erlotinib is equivalent to pemetrexed or docetaxel in refractory patients whose disease progressed on standard platinum-based chemotherapy.[14]

Erlotinib may cause dermatological rash and diarrhoea, the most common toxicities associated with its use. However, symptomatic medications can easily manage these side effects and do not require a dose modification.[15,16] Patients who develop a rash are more likely to respond better to the treatment, which provides significant symptom control and improves their quality of life.[3,4,16] Our patient is 15 months out of cancer-related issues including cough after erlotinib therapy while maintaining activities of daily life.

Erlotinib has been shown to be effective in treating metastatic NSCLC by improving survival rates and symptom control with minimal (and manageable) side effects. This targeted therapy has transformed how advanced and metastatic lung cancers are treated. Our patient with metastatic NSCLC received erlotinib and had an exceptional radiological and symptomatic response, as reported in this case.

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Authors' Contributions

Conceived and designed the analysis: SMR; Collected the data: SMR and AS; Contributed data or analysis tools: SMR, AR and AS; Performed the analysis: SMR and TS; Wrote the paper: SMR, AR and TS.