

Erlotinib as a Successful Treatment of Vision-Threatening Ocular Metastases from Non-Small-Cell Lung Cancer

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Abstract

A 54 year old healthy man presented with a two-month history of decreased vision of the right eye (OD). His past medical history was unremarkable, with no history of smoking. Vision was 1/60 for OD and 1.0 for the left eye (OS). The right eye showed a large, solid choroidal mass with exudative retinal detachment and was clinically suspected for a choroidal metastasis. CT imaging revealed pulmonary and osseous lesions. Biopsies showed TTF1-positive adenocarcinoma with an EGFR mutation. Treatment with erlotinib was started. After one month visual acuity increased to 0.32, with further improvement to 0.9 after three months. Five months after erlotinib was started, bone metastases progressed without deterioration of vision and our patient died ten months after onset of treatment. Choroidal metastases can be a presenting manifestation of lung carcinoma and erlotinib can cause rapid and lasting recovery of vision in the palliative phase.

Keywords: Erlotinib; Adenocarcinoma; EGFR Mutation; Choroidal Metastases

Introduction

Lung cancer is the leading cause of cancer-related deaths in the United States with 86.380 cases for men and 71.660 for women in 2015, accounting for 28% and 26% of all deaths respectively [1]. The two most common choroidal metastasis originate from lung cancer (21 - 29%) and breast cancer (40 - 47%). The choroid has a rich vascular supply and is a common site for metastatic disease. Bilateral, multifocal metastases are often found with breast cancer, whereas lung cancer metastases are mostly seen as unilateral, unifocal lesions [2]. Visual symptoms caused by choroidal metastases can be a presenting manifestation of an unknown primary tumor but can also be an additional, invalidating, expression of known disseminated disease [3].

The median survival of patients with stage IV non-small lung carcinoma is six months and the five year survival rate is only two per cent. Treatment is palliative. In non-small cell carcinoma with non-squamous cell histology, molecular analysis of the tumor yields a mutation in the EGFR gene in 15 per cent of patients of Caucasian descent. In patients of Asian descent, EGFR gene mutations are present in 22 to 62 percent [4]. While treatment with EGFR tyrosine kinase inhibitors prolongs progression-free survival (HR 0.43), improvement of overall survival is not seen [5].

Case Report

A 54 year old male patient was referred to our ocular oncology clinic because of progressive deterioration of vision of the right eye (OD) since two months. His past medical history was unremarkable, he was a lifelong nonsmoker. He was born in Suriname, his ancestors were from India. At presentation his vision for OD was 1/60 (counting fingers at one meter) and 1.0 for the left eye (OS). Fundus

examination revealed a large choroidal mass with exudative retinal detachment in OD, and no abnormalities in OS. Differential diagnosis included a choroidal melanoma, haemangioma, posterior scleritis or metastasis from an unknown primary tumor. Ultrasound examination showed a mid-reflective tumor with a maximum diameter of 19 x 17.3 millimeters and a maximal prominence of 5.22 millimeters with extensive sub retinal fluid (Figure 1). An indocyanine green angiography showed no ‘wash-in wash-out’ effect, which made a haemangioma less likely. CT of thorax and abdomen was performed which showed multiple osteolytic lesions, pulmonary nodules and lymphadenopathy suspect for metastases (Figure 2). Bone biopsy showed adenocarcinoma, possibly from a primary pulmonary process. He was referred to a pulmonologist. Endobronchial ultrasound (EBUS) yielded adenocarcinoma. Molecular characterization showed an Epidermal Growth Factor Receptor (EGFR) mutation.

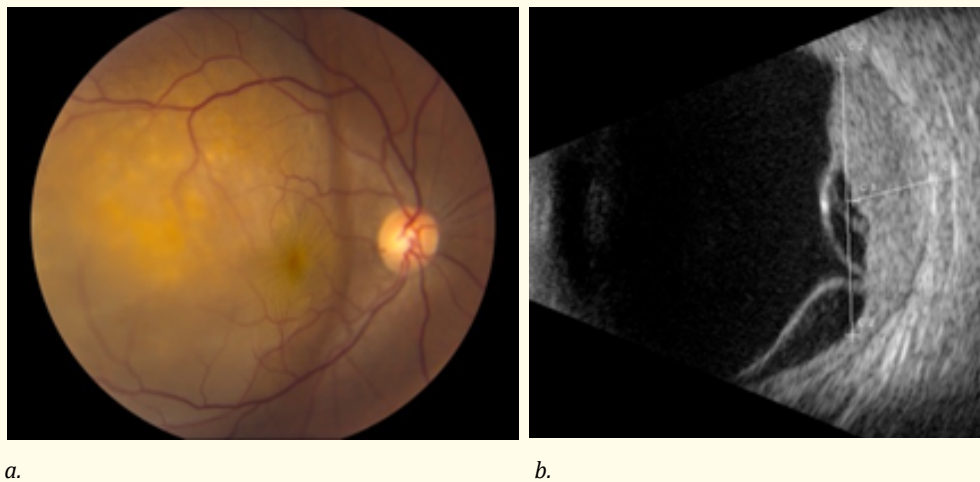


Figure 1: a. funduscopy view of a large choroidal mass with extensive sub-retinal fluid b. ultrasound examination revealing a mid-reflective lesion with sub-retinal fluid.



Figure 2: CT-scan with extensive osteolytic lesions.

The tyrosine kinase inhibitor erlotinib 150mg once a day was started. The side effect experienced by our patient was a Common Toxicity Criteria (CTC) grade 3 skin eruption. Three weeks later shortness of breath and thoracic pain subsided. One month after the onset of treatment, vision of the right eye improved from 1/60 to 0.3 and ultrasound showed dramatic tumor regression and resorption of sub retinal fluid (Figure 3). Chest X-ray showed regression of the multiple pulmonary nodules (Figure 4). After three months visual acuity further improved to 0.9 with total regression of the lesion and only a small amount of sub retinal fluid remained (Figure 5).



Figure 3: One month after onset of treatment with erlotinib a. funduscopy view with evident regression of choroidal mass and sub-retinal fluid b. ultrasound examination showing regression of the tumor but extensive residual sub-retinal fluid.

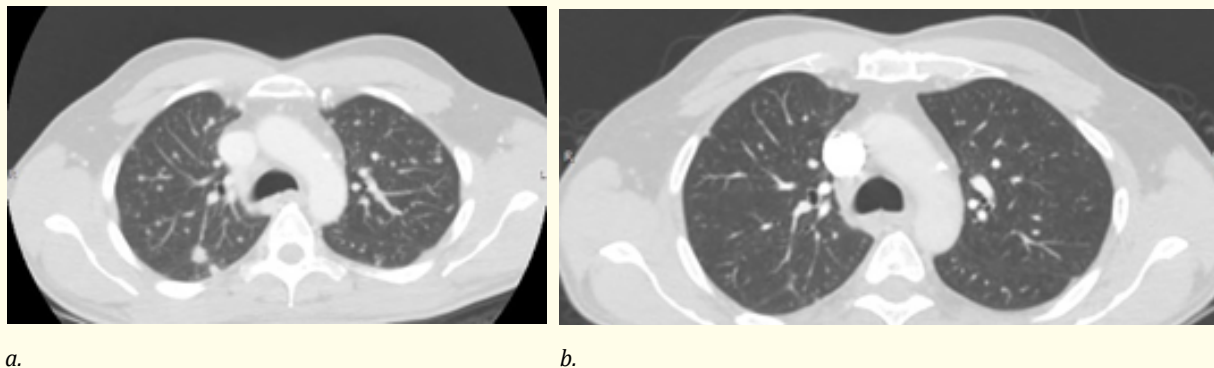


Figure 4: Computed Tomography of the chest a. before treatment and b. after five months of treatment with erlotinib showing resolution of multiple pulmonary nodules.

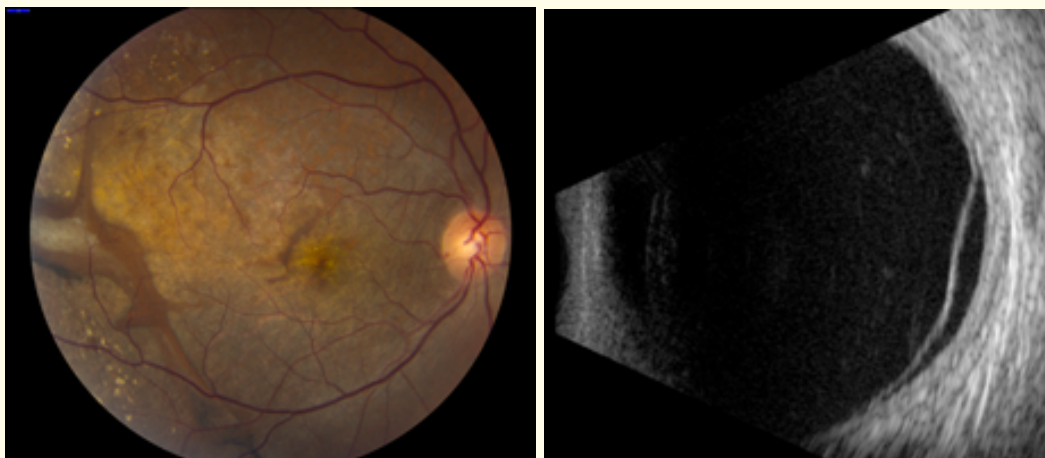


Figure 5: Three months after onset of treatment with erlotinib a. fundoscopic view with further regression of sub-retinal fluid b. ultrasound examination showing only minimal residual sub-retinal fluid.

Five months after erlotinib was started, bone metastases progressed without deterioration of vision. He died ten months after onset of treatment.

Discussion

Treatment with tyrosine kinase inhibitors like erlotinib can prolong the palliative phase for patients with stage IV NSCLC with EGFR mutation. Because of the effect of this therapy on choroidal metastases, quality of life in this phase can improve dramatically. Other treatment options for choroidal metastases like orbital radiotherapy can cause side effects and require more hospital visits. Choroidal metastases can be a presenting manifestation of pulmonary cancer and erlotinib can cause rapid and lasting recovery of vision with improved quality of life in the palliative phase.

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