The document is a case report titled "Extraordinary and prolonged erlotinib-induced clinical response in a patient with EGFR wild-type squamous lung cancer in third-line therapy: a case report." The authors are Elisabetta Gambale, Consiglia Carella, Paolo Amerio, Fiamma Buttitta, Rosa Lucia Patea, Clara Natoli, and Michele De Tursi. The report discusses the use of erlotinib in a patient with wild-type EGFR squamous-cell cancer and provides a detailed account of the clinical response. The introduction outlines the role of epidermal growth factor receptor (EGFR)-tyrosine kinase inhibitors (TKIs) in the treatment of NSCLC, emphasizing the activity of erlotinib in wild-type EGFR squamous carcinoma. The case report details a 65-year-old Caucasian man with a history of smoking, hypertension, and COPD, who showed a prolonged and unexpected clinical response to erlotinib. The abstract, introduction, and case report sections are included in the document.
and infiltration of the pulmonary vein. In October 2009, the patient underwent surgical right pneumonectomy and ipsilateral hilar-mediastinal lymphadenectomy. Histopathology and mutation testing (PCR in real time) showed an EGFR wild-type squamous non-small cell lung cancer (sqNSCLC) involving the cava vein and the mediastinum with no metastasis in 13 lymph nodes removed; whole-body CT scan did not show evidence of metastasis (TNM 2009: pT4 pN0). Post-operative course was complicated by stroke and transient hemiparesis. The first post-surgery CT scan evaluation performed in January 2010 revealed a solid nodule of 2.6 cm in diameter in the mediastinum, a paraesophageal lesion and spleen metastases. The patient received a first-line chemotherapy regimen, four cycles of carboplatin and gemcitabine, but subsequent CT scan evidenced disease progression. The patient was started on a second-line weekly docetaxel chemotherapy; this treatment was interrupted after the first cycle for grade 4 neutropenia and atrial fibrillation. The clinical history of this patient (short disease progression-free interval and limiting bone marrow toxicity) ruled out the use of a new chemotherapy regimen. Therefore, erlotinib, 150 mg/day, was started in March 2011. The patient presented a grade 3 skin rash within 1 month from the beginning of erlotinib treatment. Skin toxicity was treated with topical and systemic therapies, and an erlotinib dose reduction was needed (100 mg/die). The first posttreatment evaluation CT scan showed a stable disease according to RECIST criteria (reduction of paraesophageal lesion from 50 mm to 40 mm). The patient continued erlotinib 100 mg once daily with a persistent grades 2–3 skin toxicity. No other adverse events were reported. Four months later, a new CT scan highlighted a persistent stable disease with continuing reduction of the paraesophageal lesion (35 mm vs 40 mm). CT scans were performed every 4 months with confirmed stable disease. The paraesophageal lesion continued to decrease: a CT scan performed on May 2, 2013, showed a reduction of paraesophageal lesion (18 mm [Figure 1B] vs 35 mm [Figure 1A]). Several CT scans performed every 4 months confirmed stable disease, but due to G4 skin toxicity, erlotinib treatment was stopped in March 2016, 5 years after the beginning of the therapy. However, 2 months later, in May 2016, the first posttreatment CT scan documented lung disease progression. Written informed consent has been provided by the patient to publish the case and the image.

**Discussion**

Approximately 10% of Caucasian and up to 50% of Asian patients with NSCLC are positive for EGFR mutations, and this is predictive for response to the EGFR-TKIs. Several randomized trials showed that TKIs provide an improved RR and PFS, with a good tolerability of treatment and a better quality of life (QoL), when compared with cytotoxic treatment as a first-line chemotherapy in EGFR-mutated advanced NSCLC patients. Conversely, for the first-line treatment of locally advanced or metastatic NSCLC with wild-type or unknown EGFR status, platinum-based doublet chemotherapy (with agents such as taxanes, gemcitabine, vinorelbine and etoposide) remains the standard of care.

Regarding the second- or third-line therapies, the BR.21 trial demonstrated that erlotinib is superior to the best supportive care for the treatment of patients with EGFR wild-type NSCLC, including squamous-cell cancer. These results were confirmed by a Phase IV study (Tarceva Lung Cancer Survival Treatment [TRUST]). However, a randomized trial comparing erlotinib and docetaxel as a second-line treatment for EGFR wild-type NSCLC (TArceva Italian Lung Optimization tRial [TAILOR]) demonstrated the superiority of using docetaxel in a second-line therapy. Similarly, a Japanese randomized Phase III trial of erlotinib versus docetaxel as a second- or third-line therapy (Docetaxel and Erlotinib Lung Cancer Trial [DELTA]) indicated the superiority of using chemotherapy in an EGFR wild-type subpopulation. However, despite the evidence of the TAILOR and DELTA trials, for patients in whom no alternative is recommended, erlotinib might be considered. Furthermore, in the BR.21 trial, the survival benefit with erlotinib was maintained in male smokers with squamous histology and in the TAILOR trial, there was similar OS in the sqNSCLC patients treated with erlotinib or docetaxel.

**Conclusion**

Although activating mutations in the EGFR gene are the most important predictive biomarkers for EGFR-TKI treatment, the clinical benefits cannot only be explained by these mutations.
In patients with progressive EGFR wild-type sqNSCLC after failure of standard chemotherapy, comorbidities and a low probability of a response to a chemotherapy, EGFR-TKIs are a valid treatment option over placebo or best supportive care. In fact, although in the second-line setting, survival outcomes are comparable between cytotoxic treatment and EGFR-TKI treatment in a meta-analysis, the latter is more tolerable as a second-line therapy.\(^\text{15}\) In the present case report, the choice of erlotinib exhibited an unexpected prolonged response, unexpected because the clinical characteristics of our patient did not correlate with those predictive of response. In fact, despite the absence of EGFR mutation, squamous histology, male sex and heavy smoking history, the clinical efficacy of TKI continued for 5 years. Our patient has already reached a PFS of 62 months and OS not yet reached, with a global objective response of 64%. Moreover, our case report shows how important it is to maintain EGFR inhibition overtime. In fact, when skin toxicity forced to stop therapy, the disease has quickly progressed.

In conclusion, this case report confirms that EGFR-TKI therapy may confer benefit in terms of PFS and OS, regardless of the mutation status, histological subgroup and other clinical characteristics.

**Disclosure**

The authors report no conflicts of interest in this work.

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