Squamous cell carcinomas of the skin responsive to erlotinib: 5 cases

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Key words: epidermal growth factor receptor; epidermal growth factor receptor inhibitor; erlotinib; squamous cell carcinoma of the skin.

INTRODUCTION

Epidermal growth factor receptor inhibitors (EGFRi) are a class of targeted antineoplastics used for the palliative treatment of aggressive squamous cell cancers of skin (SCCS). Most reports describe the monoclonal antibody, cetuximab, or the small molecule, gefitinib.[1-6] Response rates of SCCS to EGFRi are high, with complete response (CR) not uncommon. The molecular basis for susceptibility of SCCS to EGFRi remains unknown. A report found no EGFR mutations in SCCS of patients treated with gefitinib.[1]

Erlotinib is an orally available EGFRi approved for the treatment of lung and pancreatic cancer. Here we describe the courses of 5 patients with recurrent/unresectable or metastatic SCCS who had palliative benefit from erlotinib. We also report the results of EGFR mutational analysis of their archived tumors. One of these patients was reported on previously in an abstract.[2]

Abbreviations used:

CR:	complete response
EGFR:	epidermal growth factor receptor
EGFRi:	epidermal growth factor receptor inhibitors
mTOR:	mechanistic target of rapamycin
SCCS:	squamous cell cancers of skin

METHODS

Institutional Review Board approval was obtained for chart review and archival tumor analysis. Specimens were analyzed using the ResponseDX test (Response Genetics Inc, Los Angeles, CA).

CASE SERIES

Case 1

A 60-year-old man with a history of remote Hodgkin's disease and multiple SCCS had metastases to parotid and neck lymph nodes. Intravenous cisplatin and 5-fluorouracil produced no response. He began gefitinib in May 2004 with resolution of 1 disease site and stability of others, which were later resected. In March 2006 he discontinued using gefitinib after local progression. Resection was attempted followed by various ineffective medical treatments. In August 2007 he began erlotinib, 150 mg daily, with docetaxel, 75 mg/m^2 every 3 weeks, receiving 8 cycles through February 2008 with response and clinical benefit. He continued with erlotinib monotherapy until progression in May 2008. Erlotinib and taxanes were ineffective, and he died in January 2009.

Case 2

A 54-year-old nonimmunosuppressed man with SCCS of the face received radiation followed by orbital exenteration and right side of the neck dissection. He developed a submental mass and posterior cervical adenopathy within 6 months and was treated with cisplatin and radiation. Two months after radiation, his submental mass recurred, and he began erlotinib at 150 mg daily with CR (Fig 1). There was skepticism that this mass had actually been

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Funding sources: This project was paid for by departmental discretionary funds given to Dr Read. There was no other support to Dr Read or any of the coauthors relevant to this project.

Conflicts of interest: None declared.

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JAAD Case Reports 2015;1:153-6.
2352-5126

http://dx.doi.org/10.1016/j.jdcr.2015.02.014

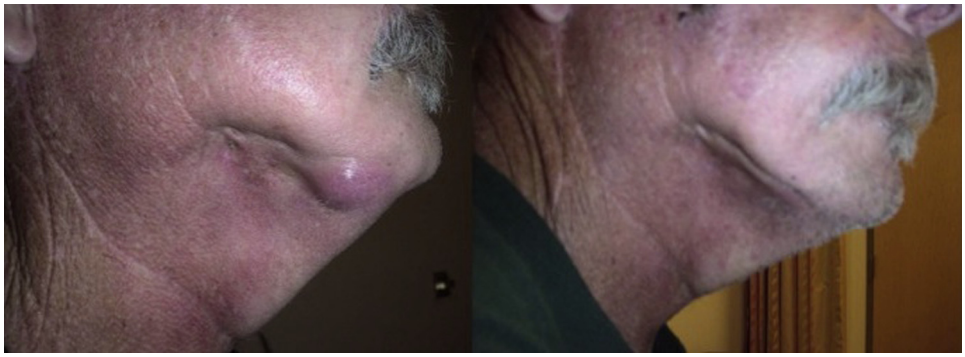

Fig 1. Case 2. Submental recurrence of SCCS before (5/30/2006) and after (6/22/2006) erlotinib.

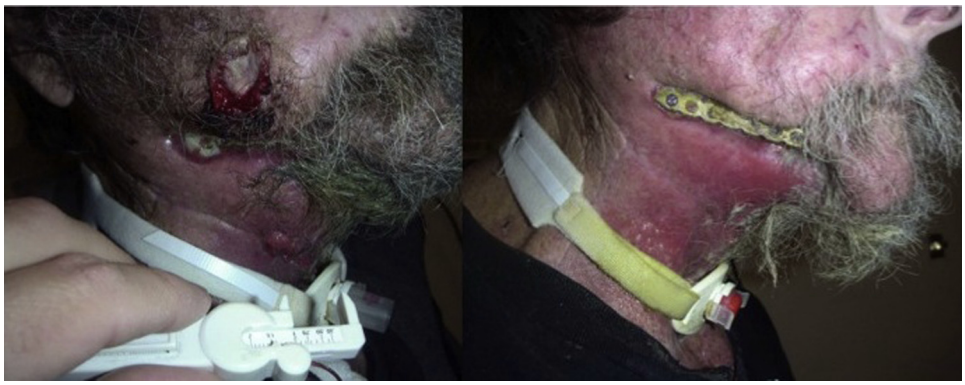

Fig 2. Case 2. Diffuse postoperative recurrence of SCCS before (1/30/207) and after (3/27/2007) erlotinib.

cancer, and erlotinib was stopped. After the mass recurred and biopsy confirmed SCCS, erlotinib again produced CR. In an attempt to clear his disease, he underwent a resection of the mandible and submental mass. By 6 weeks after surgery, there was tumor growing from his wounds together with new sites on the cheek. He restarted erlotinib, and within 2 months again achieved CR of all evident tumor sites (Fig 2). He did well on erlotinib for 8 months, with weight gain and improved quality of life. On diffuse relapse in the skin and neck, he opted to discontinue further treatment and died.

Case 3

A 91-year-old nonimmunosuppressed man with multiple prior SCCS had multiple nodular metastases in the parotid and adjacent skin and neck. He began treatment with erlotinib at 150 mg daily in June 2010 achieving a near CR (Fig 3). Six months later (December 2010) the remaining nodule began to grow, and he underwent reirradiation with ongoing erlotinib. His disease remained stable through June 2011 when he died from heart failure.

Case 4

A 38-year-old man with history of lung transplant suffered multiple SCCS in the face. He underwent neck dissections in June 2005 followed by radiation and carboplatin but suffered clinical progression in the skin. Imaging showed multiple new lung nodules, which proved to be SCCS on biopsy. Immunosuppression was switched from tacrolimus to sirolimus, and he began erlotinib at 150 mg daily. Follow-up computed tomography showed a marked reduction in the size and number of lung metastases. Unfortunately, his extrapulmonary cancers responded only transiently, and he died from their continued progression. Computed tomography performed shortly before his death 7 months later showed no evidence of progressive cancer or pneumonitis in his lungs.

Case 5

A 60-year-old nonimmunosuppressed man with a history of a remote prior oral cancer had a rapidly growing SCCS of the lip. Erlotinib was started at 150 mg daily while surgery was arranged. His tumor regressed completely by day 14 (Fig 4). On resection, only a 2-mm focus of tumor remained. Five months later he had recurrence lateral to his previous site. He began erlotinib at 75 mg daily (prior treatment caused a rash) and had CR, leaving defects in the skin where the tumor had been. He then received

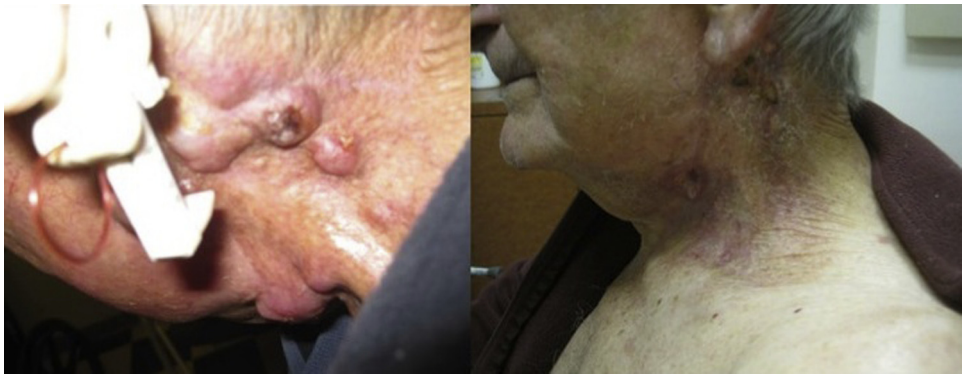

Fig 3. Case 3. Diffuse regional recurrence of SCCS before (6/15/2010) and after (10/12/10) erlotinib.

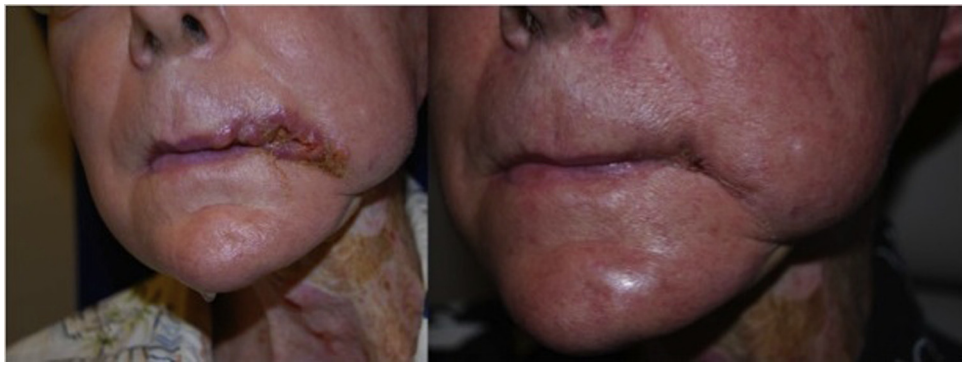

Fig 4. Case 5. New primary SCCS of skin of lip before (5/20/2007) and after (6/1/2007) erlotinib.

radiation with concurrent erlotinib, discontinuing the erlotinib February 2009. Ten months later he had a recurrence in the contralateral neck and restarted erlotinib, 75 mg daily, with CR. On progression 5 months later, his dose was increased to 150 mg with CR producing an extensive cavity in the tissues of his neck. Because of declining performance status, he discontinued his cancer treatment in September 2010 and died 1 month later.

RESULTS—MUTATIONAL ANALYSIS

All 5 tumor specimens were found to contain wild-type EGFR.

DISCUSSION

In these patients with incurable SCCS, erlotinib produced responses lasting months with palliative benefit and low toxicity. It is not known why EGFRi is active against SCCS. These EGFRi-responsive tumors did not contain mutant EGFR. Perhaps the normal EGFR pathway is important to SCCS because of nonmutational amplification. Overexpression of EGFR could explain the patient in case 5, whose tumors progressed during erlotinib treatment but again responded completely to a double dose. Increased EGFR gene copy number has been reported in SCCS.[7,8]

The mechanistic target of rapamycin (mTOR) pathway is downstream from EGFR, and treatment with the mTOR inhibitor, sirolimus, has been associated with a reduced rate of new SCCS in transplant patients as well as regression of some established cancers.[9] The mechanism by which sirolimus accomplishes this is not known. One explanation is that sirolimus accomplishes this by attenuating the EGFR pathway. Other treatments operating along the mTOR/EGFR axis might be beneficial for persons suffering advanced or metastatic SCCS.

Even though erlotinib is less expensive and does not require an infusion center, cetuximab is often cheaper for the patient because of differences in insurance coverage. Nevertheless, erlotinib should be considered for off-label use in palliating advanced SCCS.

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