

# Akatsuki disease in a patient using an epidermal growth factor receptor-tyrosine kinase inhibitor

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## DESCRIPTION

A 74-year-old man with epidermal growth factor receptor (EGFR)-mutated non-small cell lung cancer (NSCLC) who had been receiving erlotinib and ramucirumab for 3 weeks presented to the dermatology outpatient department with crusting in the jaw and the scalp (figure 1A). He had developed an acne-like skin rash (grade 2 evaluated by common terminology criteria for adverse events version 5.0) 1 week after the administration of erlotinib and ramucirumab and had used medium strength topical corticosteroids (hydrocortisone butyrate), heparinoids and white petrolatum. However, the skin rash became worse and he had not washed his face for more than 10 days because of the pain from the skin rash.

The crusts were macerated with olive oil and completely removed. Erythema and pustules were observed on the jaw after removal of the crusts, and bacterial culture of the pus showed *Staphylococcus aureus*, but fungal culture of the pus failed to isolate *Malassezia* species such as *M. furfur*. The patient was diagnosed with Akatsuki disease. Daily cleansing with soap and application of topical gentamicin and hydrocortisone butyrate cured the skin rash after 2 weeks (figure 1B). Presently, he has been receiving erlotinib and ramucirumab for 5 months and his skin problems are well controlled.

Akatsuki disease is a condition in which substances that should be shed and cleaned by normal daily activities accumulate as scaly crusts because local cleansing is prevented primarily by psychological mechanisms.<sup>1</sup> The name 'Akatsuki disease' is derived from the Japanese words 'aka' meaning exfoliation and 'tsuki' meaning to accumulate. Pomade crust is considered to be a similar disease.<sup>1,2</sup> Akatsuki disease is not responsive to topical corticosteroids, but the scaly crusts can easily be removed by brushing, and that is the diagnostic treatment. In this case, fear of the pain of the skin rash caused the patient to avoid washing his face. It is important to



**Figure 1** Photograph of the patient's face shows crusting in the jaw (A). Skin rash was cured after 2 weeks of treatment (B).

## Learning points

- ▶ Akatsuki disease is a condition in which substances that should be shed and cleaned by normal daily activities accumulate as scaly crusts because local cleansing is prevented primarily by psychological mechanisms.
- ▶ In lung cancer patients receiving epidermal growth factor receptor-tyrosine kinase inhibitors (EGFR-TKIs), Akatsuki disease can be caused by inappropriate skin care.
- ▶ Early intervention for skin problems during EGFR-TKI treatment by a multidisciplinary team comprising an oncologist, a dermatologist, a nurse and a pharmacist is necessary.

consider this differential diagnosis, especially when a patient complains of poor hygiene and prolonged use of viscous topical ointments.

EGFR-tyrosine kinase inhibitors (TKIs), including erlotinib, commonly induce skin problems such as acne-like skin rash, pruritus, dry skin, skin fissure/cracks and nail changes. Generally, acne-like skin rash presents 1–2 weeks after EGFR-TKI treatment initiation.<sup>3</sup> Ramucirumab is a human immunoglobulin G1 monoclonal antibody against vascular endothelial growth factor receptor 2. Ramucirumab plus erlotinib demonstrated superior progression-free survival compared with placebo plus erlotinib in patients with untreated EGFR-mutated metastatic NSCLC.<sup>4</sup> Although no new adverse effects were identified, ramucirumab increased the severity of erlotinib-induced acne-like skin rash (increased grade 3 incidence; 15% in the ramucirumab plus erlotinib group vs 9% in the placebo plus erlotinib group).<sup>4</sup> Exacerbation of skin problems may be accompanied by sociopsychological effects and limitations in activities of daily living. Unhygienic conditions can cause EGFR-TKI-induced acne-like skin rash to progress to Akatsuki disease, as in our patient. Therefore, early intervention for skin problems by a multidisciplinary team comprising an oncologist, a dermatologist, a nurse and a pharmacist is necessary.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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