Dermatology Practical & Conceptual

Folliculitis Decalvans Due to Epidermal Growth Factor Inhibitor

Aurora Maria Alessandrini[2], Alice Nadia Rossi[2], Emi Dika[1,2]

1 IRCCS Azienda Ospedaliero-Universitaria di Bologna, Bologna, Italy

2 Dermatology, Department of Medical and Surgical Sciences (DIMEC), Alma Mater Studiorum, University of Bologna, Bologna, Italy

Key words: folliculitis decalvans, dermatologic drug adverse effects, EGFR inhibitors, trichology

Citation: Alessandrini AM, Rossi AN, Dika E. Folliculitis Decalvans Due to Epidermal Growth Factor Inhibitor. *Dermatol Pract Concept*. 2024;14(3):e2024161. DOI: https://doi.org/10.5826/dpc.1403a161

Accepted: February 27, 2024; **Published:** July 2024

Funding: None.

Competing Interests: None.

Authorship: All authors have contributed significantly to this publication.

Corresponding Author: Alice Nadia Rossi MD, Dermatology, Department of Medical and Surgical Sciences (DIMEC), Alma Mater Studiorum, University of Bologna, via Massarenti 9, 40138 Bologna, Italy. telephone/fax: 051 214 4844. Email: alicenadia.rossi@studio.unibo.it

Ethics Statement: The patients in this manuscript have given written informed consent for the publication of their case details.

Introduction

Folliculitis decalvans is a form of recurrent painful scalp folliculitis causing scarring alopecia. The etiology is unclear, although Staphylococcus aureus appears to play a role in its pathogenesis. It predominantly affects the vertex and occipital areas, starting as erythematous follicular papules and progressing to pustules and scarring. Symptoms include pain, pruritus and burning. Diagnosis includes clinical examination and trichoscopy showing tufted hairs, perifollicular erythema, scaling, pustules and hemorrhagic crusts. In long-standing lesions, white and milky red areas without follicular openings predominate [1]. Skin biopsy is required to confirm the diagnosis. Treatment involves a combination of oral and topical antibiotics and corticosteroids. Isotretinoin and dapsone have also been reported as therapeutic options [2].

Folliculitis decalvans could be a rare adverse effect of epidermal growth factor receptor (EGFR) inhibitors that is responsible for cutaneous adverse events in 75% to 90% of patients [3]. The most common include papulopustular and acneiform eruptions, xerosis, seborrhoeic dermatitis, chronic paronychia and changes in hair texture. Only a few cases of EGFR inhibitor-associated folliculitis decalvans have been described in the literature, mainly related to erlotinib [4], while knowledge about osimertinib is limited. Osimertinib is a third-generation EGFR inhibitor approved for the first-line treatment of patients with metastatic non-small cell lung cancer (NSCLC) with EGFR mutations [5].

The mechanisms behind EGFR inhibitors-induced scalp toxicity are still unclear. EGFR is involved in keratinisation and regulation of the hair growth cycle. It is highly expressed in basal keratinocytes, sebaceous and eccrine glands, and in the outer root sheath of hair follicles. EGFR inhibition causes defects in the anagen-catagen transition along with a significant inflammatory response, resulting in hair follicle necrosis and destruction [6]. Our case shows that osimertinib, along with other EGFR inhibitors, may cause treatment-induced folliculitis decalvans.

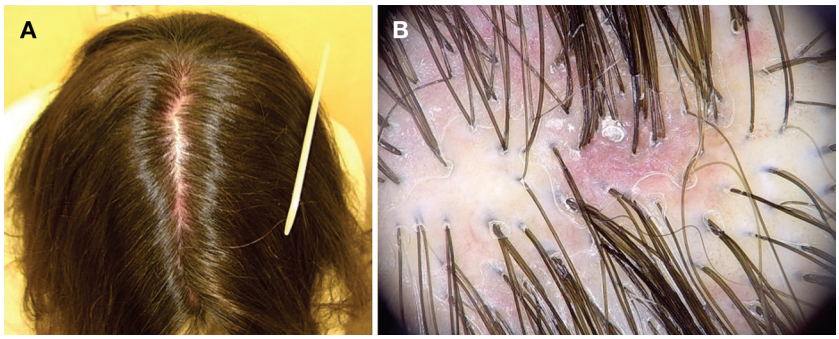

Figure 1. (A) Clinical picture of our patient, showing erythema and scaling. (B) Trichoscopy of our patient: tufted hairs, perifollicular erythema and scaling.

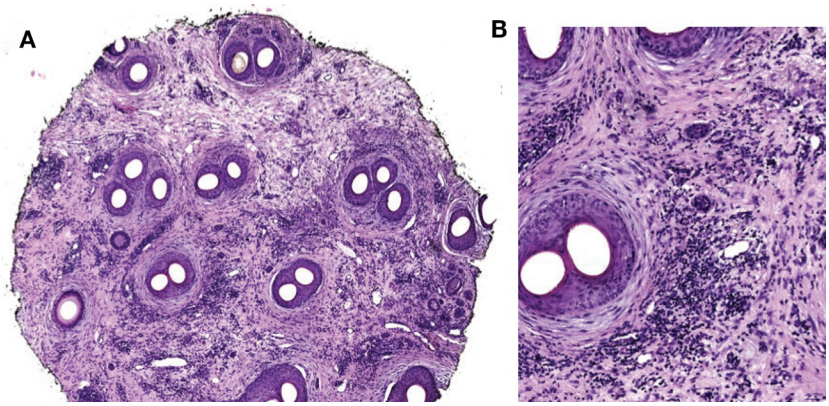

Figure 2. Transverse section of one biopsy from scalp showing overall reduction in hair follicle number (A) with perifollicular and perivascular predominantly neutrophilic inflammatory infiltrate and fibrosis (B). (H&E original magnifications: A, x50; B, x120.).

Case Presentation

We report a case of osimertinib-induced folliculitis decalvans in a middle-aged woman. Cutaneous adverse effects have been frequently described in association with EGFR tyrosine kinase inhibitors (TKIs), particularly erlotinib, but little is known about osimertinib.

A 55-year-old female patient was referred to our department for the onset of scalp symptoms. She had been diagnosed with stage IIIC EGFR-mutant lung adenocarcinoma and was started on osimertinib. During treatment, the patient developed an itchy and crusty scalp eruption. Physical examination and trichoscopy showed erythematous and scaly lesions with pustules, crusting and scarring along with the characteristic tufted hairs (Figure 1). A punch biopsy was obtained: histopathological examination revealed reduced follicular density, loss of sebaceous glands, oedema, dilated vessels, a dense follicular and perivascular predominantly neutrophilic infiltrate and severe and extensive fibrosis (Figure 2). These findings were consistent with a diagnosis of folliculitis decalvans. The condition was improved by a systemic antibiotic treatment with doxycycline 100 mg twice daily for one month, followed by once daily for three months and topical steroids. Osimertinib dosage remained unchanged.

Conclusions

As the use of osimertinib and other EGFR inhibitors increases, it is important for dermatologists to be aware of their potential cutaneous side effects, including rare ones such as folliculitis decalvans, to enable early diagnosis and treatment and thus prevent adverse aesthetic and functional outcomes.

References

1. Fernández-Domper L, Ballesteros-Redondo M, Vañó-Galván S. Trichoscopy: An Update. *Actas Dermosifiliogr.* 2023;114(4):327-333. DOI: 10.1016/j.ad.2022.12.003. PMID: 36574917.
2. Bardazzi F, Savoia F, Parente G, et al. Azithromycin: a new therapeutical strategy for acne in adolescents. *Dermatol Online J.* 2007;13(4):4. PMID: 18319001.
3. Lacouture ME, Wainberg ZA, Patel AB, et al. Reducing skin toxicities from egfr inhibitors with topical braf inhibitor therapy. *Cancer Discov.* 2021;11(9):2158-2167. DOI: 10.1158/2159-8290.CD-20-1847. PMID: 33910927. PMCID: PMC8418997.

4. Dervout C, Chiappa A-M, Fleuret C, Plantin P, Acquitter M. Alopécie cicatricielle à type de folliculite décalvante induite par l'erlotinib. *Ann Dermatol Venereol*. 2020;147(12):848-852. DOI: 10.1016/j.annder.2020.08.043. PMID: 33097309.
5. Osimertinib tablets. United States Prescribing Information. US National Library of Medicine. Available at: http://www.accessdata.fda.gov/drugsatfda_docs/label/2018/208065s008lbl.pdf (Accessed on August 26, 2019).
6. Philpott MP, Kealey T. Effects of EGF on the morphology and patterns of DNA synthesis in isolated human hair follicles. *J Invest Dermatol*. 1994 Feb;102(2):186-91. DOI: 10.1111/1523-1747.ep12371760. PMID: 8106747.