Eruption of Multiple Linear Hyperpigmented Plaques

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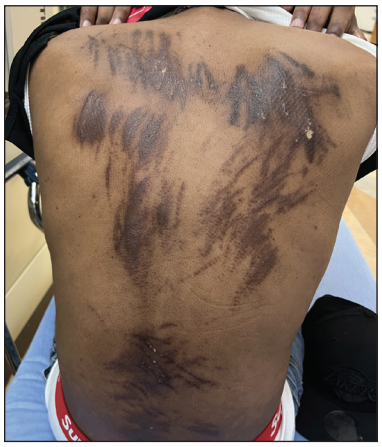

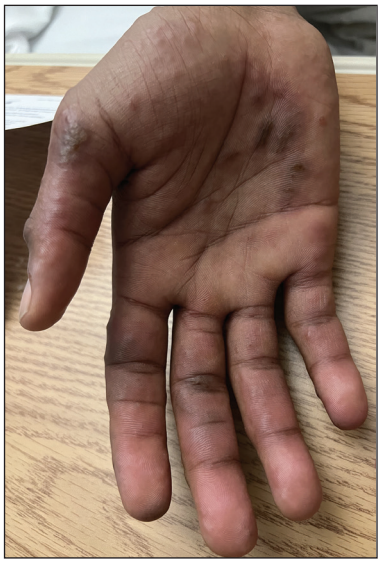

A 28-year-old man presented for evaluation of an intensely itchy rash of 5 days' duration involving the face, trunk, arms, and legs. The patient recently had been diagnosed with classical Hodgkin lymphoma and was started on a biweekly chemotherapy regimen of adriamycin, bleomycin, vinblastine, and dacarbazine 3 weeks prior. He reported that a red, itchy, papular rash had developed on the hands 1 week after starting chemotherapy and improved with antihistamines. Symptoms of the current rash included night sweats, occasional fever, substantial unintentional weight loss, and fatigue. He had no history of urticaria, angioedema, anaphylaxis, or nail changes.

Physical examination revealed widespread, itchy, linear and curvilinear hyperpigmented plaques on the upper arms, shoulders, back (top), face, and thighs, as well as erythematous grouped papules on the bilateral palms (bottom). There was no mucosal or systemic involvement.

WHAT'S YOUR **DIAGNOSIS?**

a. dermatitis artefacta
b. dermatographism
c. dermatomyositis
d. chemotherapy-induced flagellate dermatitis
e. phytophotodermatitis

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THE **DIAGNOSIS:** Chemotherapy-Induced Flagellate Dermatitis

Based on the clinical presentation and temporal relation with chemotherapy, a diagnosis of bleomycin-induced flagellate dermatitis (FD) was made, as bleomycin is the only chemotherapeutic agent from this regimen that has been linked with FD.[1,2] Laboratory findings revealed eosinophilia, further supporting a drug-induced dermatitis. The patient was treated with oral steroids and diphenhydramine to alleviate itching and discomfort. The chemotherapy was temporarily discontinued until symptomatic improvement was observed within 2 to 3 days.

Flagellate dermatitis is characterized by unique erythematous, linear, intermingled streaks of adjoining firm papules—often preceded by a prodrome of global pruritus—that eventually become hyperpigmented as the erythema subsides. The clinical manifestation of FD can be idiopathic; true/mechanical (dermatitis artefacta, abuse, sadomasochism); chemotherapy induced (peplomycin, trastuzumab, cisplatin, docetaxel, bendamustine); toxin induced (shiitake mushroom, cnidarian stings, *Paederus* insects); related to rheumatologic diseases (dermatomyositis, adult-onset Still disease), dermatographism, phytophotodermatitis, or poison ivy dermatitis; or induced by chikungunya fever.[1]

The term *flagellate* originates from the Latin word *flagellum*, which pertains to the distinctive whiplike pattern. It was first described by Moulin et al[3] in 1970 in reference to bleomycin-induced linear hyperpigmentation. Bleomycin, a glycopeptide antibiotic derived from *Streptomyces verticillus*, is used to treat Hodgkin lymphoma, squamous cell carcinoma, and germ cell tumors. The worldwide incidence of bleomycin-induced FD is 8% to 22% and commonly is associated with a cumulative dose greater than 100 U.[2] Clinical presentation is variable in terms of onset, distribution, and morphology of the eruption and could be independent of dose, route of administration, or type of malignancy being treated. The flagellate rash commonly involves the trunk, arms, and legs; can develop within hours to 6 months of starting bleomycin therapy; often is preceded by generalized itching; and eventually heals with hyperpigmentation.

Possible mechanisms of bleomycin-induced FD include localized melanogenesis, inflammatory pigmentary incontinence, alterations to normal pigmentation patterns, cytotoxic effects of the drug itself, minor trauma/scratching leading to increased blood flow and causing local accumulation of bleomycin, heat recall, and reduced epidermal turnover leading to extended interaction between keratinocytes and melanocytes.[2] Heat exposure can act as a trigger for bleomycin-induced skin rash recall even months after the treatment is stopped.

Apart from discontinuing the drug, there is no specific treatment available for bleomycin-induced FD. The primary objective of treatment is to alleviate pruritus, which often involves the use of topical or systemic corticosteroids and oral antihistamines. The duration of treatment depends on the patient's clinical response. Once treatment is discontinued, FD typically resolves within 6 to 8 months. However, there can be a permanent postinflammatory hyperpigmentation in the affected area.[4] Although there is a concern for increased mortality after postponement of chemotherapy,[5] the decision to proceed with or discontinue the chemotherapy regimen necessitates a comprehensive interdisciplinary discussion and a meticulous assessment of the risks and benefits that is customized to each individual patient. Flagellate dermatitis can reoccur with bleomycin re-exposure; a combined approach of proactive topical and systemic steroid treatment seems to diminish the likelihood of FD recurrence.[5]

Our case underscores the importance of recognizing, detecting, and managing FD promptly in individuals undergoing bleomycin-based chemotherapy. Medical professionals should familiarize themselves with this distinct adverse effect linked to bleomycin, enabling prompt discontinuation if necessary, and educate patients about the condition's typically temporary nature, thereby alleviating their concerns.

REFERENCES

1. Bhushan P, Manjul P, Baliyan V. Flagellate dermatoses. *Indian J Dermatol Venereol Leprol*. 2014;80:149-152.
2. Ziemer M, Goetze S, Juhasz K, et al. Flagellate dermatitis as a bleomycin-specific adverse effect of cytostatic therapy: a clinical-histopathologic correlation. *Am J Clin Dermatol*. 2011;12:68-76. doi:10.2165/11537080-000000000-00000
3. Moulin G, Fière B, Beyvin A. Cutaneous pigmentation caused by bleomycin. Article in French. *Bull Soc Fr Dermatol Syphiligr*. 1970;77:293-296.
4. Biswas A, Chaudhari PB, Sharma P, et al. Bleomycin induced flagellate erythema: revisiting a unique complication. *J Cancer Res Ther*. 2013;9:500-503. doi:10.4103/0973-1482.119358
5. Hanna TP, King WD, Thibodeau S, et al. Mortality due to cancer treatment delay: systematic review and meta-analysis. *BMJ*. 2020;371:m4087. doi:10.1136/bmj.m4087