

Resolution of Radiation-Induced Acneform Eruption Following Treatment With Tretinoin and Minocycline: A Case Report

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Practice Points

- It is important for dermatologists to be familiar with cutaneous side effects of radiation therapy.
- Radiation-induced acneform eruptions are rare, and treatments are based mostly on case reports.
- Combination treatment with a topical retinoid and oral minocycline can rapidly resolve radiation-induced acne.

Postradiation comedogenesis is an uncommon side effect of radiation therapy, with few cases reported in the medical literature. The proposed etiology of this reaction is alteration of pilosebaceous unit secretions and retention of proliferating ductal keratinocytes due to stricture and scarring. We report a case of a 48-year-old woman who had been treated for infiltrating ductal carcinoma of the right breast with lumpectomy and radiation therapy. She subsequently developed open and closed comedones as well as tender inflammatory papules and papulopustules in the irradiated area. Our patient was treated with tretinoin cream and oral minocycline, with rapid improvement in symptoms and complete resolution of lesions after 2 months of therapy. We review the literature on the pathogenesis, clinical features, and treatment of postradiation acne, and discuss rapid resolution of a radiation-induced acneform eruption after combination treatment with tretinoin and minocycline.

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Postradiation comedogenesis is a rare and poorly understood side effect of radiation therapy. Patient responses to different therapies have been inconsistent given that the etiology is still not completely clear. We propose a therapy aimed at targeting both comedogenesis and inflammation that has proven to be

successful in a clinical setting. In our patient, treatment with a topical retinoid and oral minocycline rapidly resolved all radiation-induced acneform lesions in a painless manner.

Case Report

A 48-year-old woman with a T1N0M0 infiltrating ductal carcinoma of the right breast was treated via lumpectomy and megavoltage radiation therapy (50 Gy with a 10 Gy boost). Three months following completion of radiation therapy, the patient presented to our clinic with open and closed comedones along with tender inflammatory papules and papulopustules in the irradiated area (Figure 1). The patient had a history of acne as a teenager. Prior to presentation, she had used several over-the-counter topical agents with no relief. We prescribed tretinoin cream 0.05% for daily application to the affected area along with oral minocycline (100 mg twice daily). The patient showed rapid improvement in lesion pain within weeks of starting this regimen and complete resolution of the lesions after 2 months of therapy (Figure 2).

Comment

The first known case of a postradiation acneform eruption was reported by Swift¹ in 1956. Over time, several other cases emerged in the literature, and it was determined that comedogenesis is a rare late sequela of radiation therapy.² In a review of 27 cases reported in the literature, Martin and Bardsley³ found that this type of acneform eruption occurred more commonly in the head and neck areas, presented between 2 weeks and 6 months following radiation therapy, and was more prevalent in patients treated with acneogenic drugs in the same time frame. Song et al⁴ considered radiation

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Figure 1. Radiation-induced acneform eruption in the inframammary area with multiple open and closed comedones (A) as well as inflammatory papules and papulopustules (B).



Figure 2. Resolution of radiation-induced acneform lesions following treatment with topical tretinoin and oral minocycline.

therapy to be a direct causative agent, as acne eruptions in their patient developed in a confined portal area for radiation therapy.

Different models for the pathogenesis of radiation-induced acne have been proposed, including alteration of sebum composition, an increase in proinflammatory cytokines secondary to cell injury, retention of proliferating ductal keratinocytes due to stricture and scarring as the sebaceous glands begin to recover 3 to 4 weeks after

completion of therapy, and an inflammatory reaction to pilosebaceous remnants that act as foreign bodies after radiation therapy.^{3,5-7}

Reported treatments include combinations of topical antibiotics, mild topical steroids, manual comedone extraction, dermabrasion, keratolytics, and topical retinoids.^{2-4,6,8,9} Manual extraction may not always be an optimal choice, especially in the presence of inflammatory lesions. Stein et al⁶ reported the case of a 45-year-old woman with a postradiation acneform eruption in the mediastinal area who could not tolerate extraction of comedones and cysts due to severe pain, even after intravenous sedation. Although topical retinoids have been effective in clearing radiation-induced comedones within months, the resolution of inflammatory lesions and the associated pain may be prolonged.^{6,7} The addition of an oral antibiotic such as minocycline can expedite symptomatic relief due to its anti-inflammatory properties. As a result, we treated our patient with both a topical retinoid and oral minocycline. Subsequently, our patient experienced rapid improvement in lesion pain within weeks of initiating topical tretinoin and oral minocycline, followed by complete resolution of all lesions after 2 months of therapy.

Conclusion

Our case suggests that addition of an oral antibiotic to the topical retinoid treatment regimen should be considered in patients with radiation-induced acneform eruptions and inflammatory lesions. Our case supports both a comedogenic and inflammatory pathogenesis, but further studies should be conducted for better understanding of the etiology of this condition.

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