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Successful Treatment of Morphea with Topical Ruxolitinib

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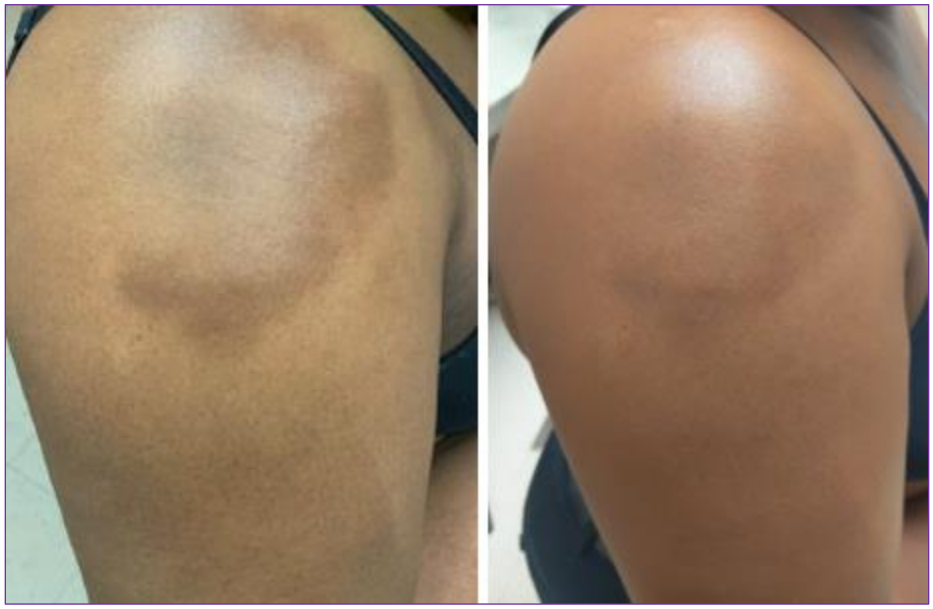

Figure 1. Right shoulder hyperpigmentation before (left) and after (right) 3 months of topical ruxolitinib 1.5% cream.

INTRODUCTION

A 50-year-old female, Fitzpatrick skin type V, presented to the dermatology clinic with several areas of hyperpigmentation and skin thickening. While asymptomatic, the lesions were of concern to the patient and a workup was initiated. Physical exam revealed several indurated, ill-defined hyperpigmented plaques on the right upper shoulder, left upper back, and right chest (Figure 1). Laboratory workup was negative for autoimmune antibodies, including anti-nuclear antibodies, SCL 70 anti-centromere antibodies, and anti-RNA polymerase I/III antibodies. A biopsy of the lesions showed thickened, homogenized dermis replaced by an acellular fibrosis with diminution of adnexae. Given the clinicopathologic correlation, the patient was diagnosed with morphea and was counseled on the risks and benefits of available treatments. She ultimately decided against systemic therapy due to her un-vaccinated status against COVID-19. Topical clobetasol was initiated but discontinued due to localized cutaneous atrophy. Further conventional treatment

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options were trialed with unsatisfactory response, including topical and intralesional triamcinolone and topical tacrolimus. Due to the lack of improvement, the patient was initiated on topical ruxolitinib 1.5% BID, and at her 3-month follow up visit, physical exam revealed lightened hyperpigmentation in affected areas with improvements in texture (Figure 2). The patient was pleased with the response, and she was counseled to continue to use topical ruxolitinib.

Morphea, also known as localized scleroderma, is thought to arise due to activation of the immune system.[1,2] The autoimmune nature of the disease causes inflammation and subsequent hyperactivation of fibroblasts with resultant collagen deposition and fibrosis.[1,2] Elevated inflammatory cytokines, including IL-2 and IL-6, could play a role disease pathogenesis.[3] Morphea typically presents with sclerotic, firm and fibrotic plaques or patches of cutaneous hyperpigmentation.[1] Lesions can be active, presenting as erythematous lesions with central dyspigmentation surrounded by a violaceous border, or inactive, presenting as hyperpigmented lesions with sclerosis in the central lesion. [1] There are many variants of morphea, most commonly presenting as circumscribed or, more rarely, generalized.[1]

While there is no gold-standard therapy, first-line treatment for circumscribed or generalized morphea typically consists of a topical corticosteroid, tacrolimus, or phototherapy.[1,2] Our case highlights an interesting response to topical ruxolitinib, which is not historically used for morphea treatment. Ruxolitinib is a Janus-Kinase (JAK) 1 and 2 inhibitor with anti-inflammatory properties.[4,5] Ruxolitinib works by blocking the receptor-associated protein kinases JAK1 and JAK2, inhibiting the JAK-STAT pathway.[4,5] When JAK1 and JAK2 are active, this pathway produces inflammatory cytokines and hematopoiesis.[4,5] Ruxolitinib blocks this mechanism, downregulating the production of pro-inflammatory cytokines, such as IL-2 and IL-6, and thus decreasing the damaging effects of inflammation.[4,5] Interestingly, ruxolitinib has been found to be efficacious in other inflammatory processes, including atopic dermatitis and psoriasis.[4] We suspect the positive response seen in our patient may be due to the anti-inflammatory effects of ruxolitinib, which may have blocked the immune activation, cytokine release, and residual fibrosis seen in morphea.[1] Our case highlights a potential safe and effective therapeutic alternative for the treatment of morphea, which may inform future clinical considerations for patients unable to tolerate or respond to traditional therapies.

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