

# Erythromelalgia associated with dermatomyositis: A case series



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## INTRODUCTION

Dermatomyositis is a multisystem autoimmune connective tissue disease that can manifest with proximal muscle weakness, interstitial lung disease, and characteristic skin findings such as erythema and papules over the dorsal joints of the hand, periungual changes, heliotrope rash, and pruritic erythematous inflammation of the chest, back, arms, legs, and scalp. Erythromelalgia is a clinical diagnosis characterized by swelling, erythema, and burning pain, typically of the extremities and often triggered by heat or exertion. It can be classified as primary, due to genetic mutations, or secondary, associated with myeloproliferative, vascular, musculoskeletal, or neurologic disease.<sup>1</sup> There have been reports of biopsies of erythromelalgia having some features of connective tissue disease.<sup>2,3</sup> There are also reports of erythromelalgia associated with systemic lupus erythematosus and rheumatoid arthritis, two autoimmune connective tissue diseases.<sup>4</sup> Here, we present two cases of erythromelalgia associated with dermatomyositis, which, to our knowledge, has not been reported in the literature to date.

## Case 1

An 81-year-old woman with a history of treated breast cancer presented to the dermatology clinic for evaluation of swelling and discoloration of her bilateral hands and feet of approximately 10 years' duration associated with heat intolerance. She had been seen by numerous vascular and lymphedema specialists over the years with the ultimate

### Abbreviations used:

CT: computed tomography  
DM: dermatomyositis

conclusion that her swelling was not associated with a vascular etiology. The patient noticed improvement of her symptoms when she was exposed to air conditioning or cold water. At presentation, she also reported shortness of breath, a burning sensation on her feet and scalp, subjective proximal muscle weakness, dysphagia, and weight gain. Her physical examination was notable for periungual telangiectasias, scale, and erythema on the V of her neck area, her extensor arms, and around her eyes (Fig 1). She believed that the erythema on the V of her neck area started 30 years ago, indicating the possibility that she had had potentially undiagnosed amyopathic dermatomyositis (DM) for years before her diagnosis of erythromelalgia. The patient's basic laboratory workup and immunologic studies were unrevealing, and a myositis panel was negative. Muscle magnetic resonance imaging and electromyography were not performed because of the absence of muscle pain or objective weakness on physical examination. Two skin biopsy specimens from the upper portion of the arm and the dorsal surface of the hand showed interface dermatitis (Fig 2), consistent with a diagnosis of DM based on clinicopathologic correlation with typical features of DM (as opposed to lupus, drug reaction, viral exanthem, lichen planus, or graft

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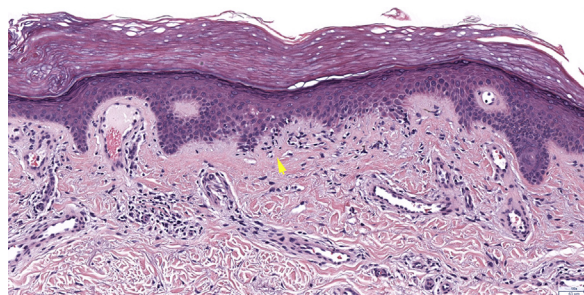


**Fig 1.** Patient 1. Swelling and erythema on bilateral hands and feet.

versus host disease). Pulmonary function testing showed an obstructive pattern with decreased carbon monoxide diffusion in the lung (62%), and chest computed tomography (CT) showed stable interstitial lung changes. The malignancy workup (including age-appropriate screening and CT of the chest, abdomen, and pelvis) was negative. The patient has had some relief from the burning sensation on her feet from topical 5% lidocaine and petroleum jelly. Because of shared decision-making and risk-benefit analysis, the patient has not started immunosuppressive therapy for her DM, but she is being followed closely.

## Case 2

A 60-year-old woman with a history of acid reflux presented to the outpatient dermatology clinic because of a rash. She had pink papules on a background of erythema on the extensor metacarpal joints, nailfold telangiectasias, erythematous patches on the lateral aspect of the thighs, the upper chest, the upper back, and the face, and scalp alopecia (Fig 3). She also had edematous, violaceous hands and feet that she reported were painful and associated with tingling. Redness and swelling of the hands and feet started 1 month after the onset of the rash and progressed over the next several months, especially during the summer. The erythema and swelling was exacerbated by heat and exertion and only minimally improved with cool water exposure. She had to increase her shoe size and could not wear her wedding rings. Additionally, she reported muscle weakness in her proximal arms and hip flexors that started 1 week before the rash; on presentation, she had objective muscle weakness to strength testing. Muscle magnetic resonance imaging and electromyography were not performed because of the Covid-19 pandemic. Laboratory testing showed creatine phosphokinase 209 U/L (upper limit of normal 182), erythrocyte sedimentation rate 44 (upper limit of normal 40), negative myositis antibodies,



**Fig 2.** Patient 1. A specimen from the dorsal surface of the left hand shows small foci of vacuolar interface dermatitis with lymphocytes present at the dermal-epidermal junction (arrow). Many telangiectatic vessels in the dermal papillae and a sparse perivascular lymphocytic infiltrate are present. (Hematoxylin-eosin stain; original magnification:  $\times 160$ .)

and negative antinuclear, anti-Sjögren's syndrome-related antigen A/Sjögren's syndrome-related antigen B, anti-Smith, and anti-ribonucleoprotein antibodies. Skin biopsy of the thigh showed vacuolar interface dermatitis, perivascular lymphocytic infiltrate, and mucin deposition, consistent with dermatomyositis (Fig 4). The malignancy workup was negative. She was initially treated with hydroxychloroquine 200 mg/day and intermittent prednisone. Her rash persisted, and she was started on methotrexate titrated to 20 mg/week, with some overall improvement in rash, muscle symptoms, and hand and foot erythema and swelling.

## DISCUSSION

Because erythromelalgia is a clinical diagnosis, the diagnosis cannot be made with complete certainty; however, the clinical history, age of onset, and appearance of the hands and feet in these cases support a diagnosis of secondary erythromelalgia. The temporal association with the underlying disease may vary, as has been seen in erythromelalgia secondary to systemic lupus erythematosus as well<sup>5</sup> (in case 1, the onset of the erythromelalgia preceded the dermatomyositis rash by approximately 20 years;



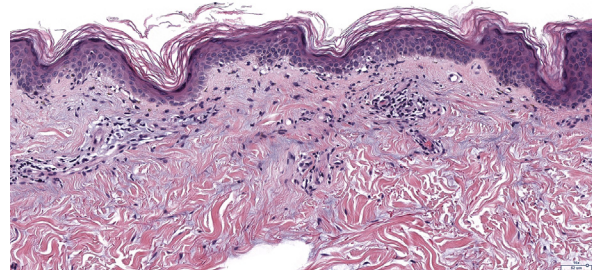
**Fig 3.** Patient 2. Erythema overlying joints of the hand and swelling and livedo pattern on the foot.

in case 2, the dermatomyositis rash preceded the erythromelalgia by 1 week).

#### ADDITIONAL EVALUATION

At a diagnosis of either dermatomyositis or erythromelalgia, regular routine age-appropriate screening, including colonoscopy, Papanicolaou smears, and mammograms, should be encouraged, and a malignancy workup should be considered, including a CT scan of the chest, abdomen, and pelvis and a pelvic ultrasound for women. Both dermatomyositis and erythromelalgia are associated with an increased risk of occult malignancy,<sup>6</sup> although the association is less well characterized for patients with erythromelalgia. Given an association with myeloproliferative disorders, a complete blood count with differential should be obtained as part of the patient's initial evaluation. Alternative diagnoses, such as peripheral artery disease, lipodermatosclerosis, cellulitis, and other conditions, should be considered. Raynaud's phenomenon can occur in patients with erythromelalgia, especially in cases with comorbid connective tissue disease. This is important to recognize, as it may preclude treatment with beta-blockers, which are sometimes used to treat erythromelalgia symptoms.

The primary treatment for secondary erythromelalgia is treatment of the underlying disease.<sup>1</sup> Thus, recognizing that erythromelalgia can be due to underlying dermatomyositis is important in developing a treatment approach. Physicians should be



**Fig 4.** Patient 2. A specimen from the right thigh shows interface dermatitis with lymphocytes at the dermal-epidermal junction with vacuolar change with focal pigment incontinence in the papillary dermis. Increased dermal mucin and a perivascular lymphocytic infiltrate are also present. (Hematoxylin-eosin stain; original magnification:  $\times 160$ .)

aware of this association and develop a treatment plan addressing the underlying dermatomyositis.

In addition to treatment of the underlying condition, there are other therapies recommended for symptomatic treatment of erythromelalgia. Patients should start with nonpharmacologic management, including limb elevation and the use of a fan or exposure of the affected area to cool water for short periods of time. Additionally, avoidance of triggers such as heat should be encouraged when possible.<sup>1</sup> Case series have recommended the use of topical lidocaine patches as well as topical compounded 2% amitriptyline combined with ketamine 0.5% in a lipoderm base, as well as



capsaicin.<sup>7</sup> For systemic therapy, the initial treatment is generally aspirin 325 mg daily.<sup>7</sup> Other common treatments with varying degrees of success include gabapentin, pregabalin, venlafaxine, and oral misoprostol.<sup>7</sup> Pain management programs may also be helpful. Additionally, oral corticosteroid use has been thought to benefit some patients with erythromelalgia.<sup>8</sup>

Although there is unfortunately no cure for erythromelalgia, a disease that can have a significant impact on quality of life, treatment of underlying conditions in the case of secondary erythromelalgia and symptomatic treatment of the erythromelalgia may help. More research is needed to determine whether erythromelalgia associated with connective tissue disease improves with immunosuppressive treatment.

**Conflicts of interest**

None disclosed.

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