

Scleroderma-like Skin Changes as a Diagnostic Challenge: A Case Report

Amphay Khounthep¹, Siraphop Suwannaroj¹, Chingching Foocharoen¹, Patnarin Pongkulkiat¹, Tippawan Onchan¹, Ajanee Mahakkanukrauh¹, Piti Ungarreevittaya²

¹Division of Rheumatology, Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, 40002, Thailand.

²Division of Pathology, Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, 40002, Thailand.

Background: Scleroderma-like skin changes are rare paraneoplastic manifestations of plasma cell dyscrasias. Case Presentation: A 62-year-old woman presented with progressive skin thickening and Raynaud-like symptoms, initially diagnosed as systemic sclerosis (SSc). However, rapid disease progression, atypical high-resolution computed tomography (HRCT) findings, and seronegativity for SSc-specific autoantibodies prompted further investigation. Laboratory studies revealed IgG-kappa monoclonal gammopathy, and bone marrow biopsy confirmed multiple myeloma. Associated sensorimotor polyneuropathy also suggested a possible POEMS syndrome overlap.

Conclusion: Myeloma-directed therapy led to significant improvement in skin manifestations. This case emphasizes the need to consider paraneoplastic syndromes in atypical, seronegative SSc presentations.

Keywords: Scleroderma-like syndrome, systemic sclerosis mimic, multiple myeloma, POEMS syndrome, plasma cell dyscrasia

Corresponding Author:

Associate Professor Ajanee Mahakkanukrauh, M.D.
Division of Rheumatology, Department of Medicine
Faculty of Medicine, Khon Kaen University
Khon Kaen 40002, Thailand
Email: majanee@yahoo.com

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Introduction

Systemic sclerosis (SSc) is an autoimmune disorder characterized by vasculopathy and progressive fibrosis. However, several "scleroderma-like syndromes" can mimic its presentation, posing a diagnostic challenge. These mimics often stem from environmental exposures, metabolic disorders, or paraneoplastic phenomena, particularly hematological malignancies like plasma cell dyscrasias. Conditions such as multiple myeloma or POEMS syndrome (Polyneuropathy, Organomegaly, Endocrinopathy, M-protein, Skin changes) can induce skin induration through pro-fibrotic cytokines like TGF- β and VEGF. Early differentiation is crucial, as management strategies differ significantly from primary SSc.

Case Presentation

A 62-year-old Thai woman presented with a one-year history of progressive swelling, stiffness, and bluish discoloration of both hands, accompanied by digital numbness. The symptoms advanced to include diffuse skin thickening and puffy fingers.

Physical examination revealed bilateral periorbital edema, diffuse induration of the skin on all four limbs, puffy fingers, and multiple telangiectasias on the face and chest (Figure 1). Hyperpigmented areas were noted on the extremities, but no digital pitting scars or "salt-and-pepper" depigmentation was observed.

Initial laboratory studies showed mild anemia (hemoglobin 9.2 g/dL, hematocrit 29%) and thrombocytopenia (platelets 149,000/ μ L). Autoimmune serologies, including antinuclear antibody (ANA), anti-centromere antibody, and anti-topoisomerase I (Scl-70), were negative. High-resolution computed tomography (HRCT) of the chest showed bilateral ground-glass opacities with mosaic attenuation. Echocardiography ruled out significant pulmonary hypertension. An initial impression of early systemic sclerosis was made, and treatment was started with prednisolone 5 mg daily, hydroxychloroquine, omeprazole, folic acid, and calcium.

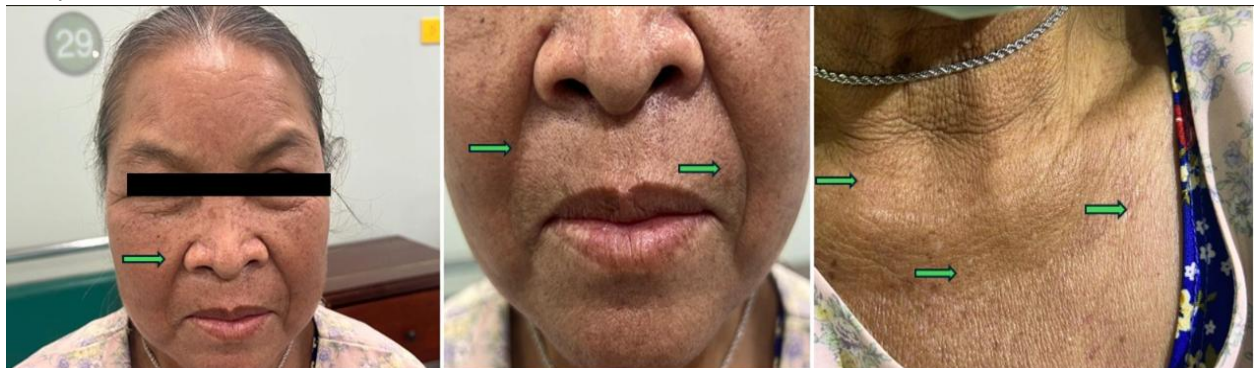


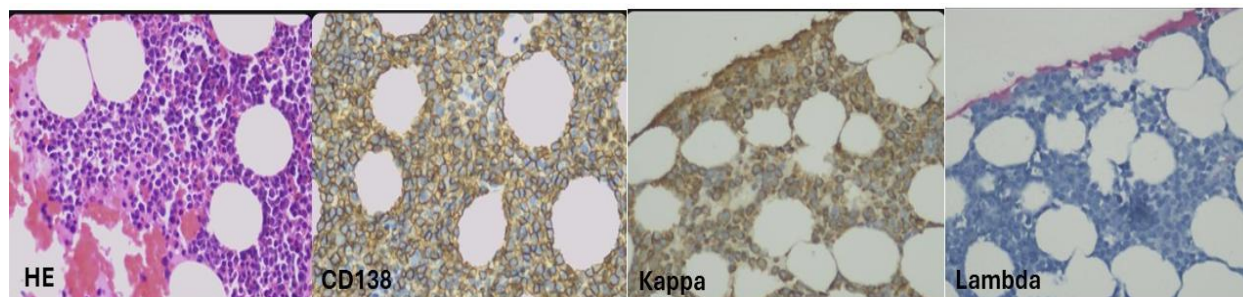
Figure 1 The patient exhibited bilateral periorbital edema. Scattered telangiectasias were observed over the cheeks, perioral area, nose, and chest (as visually marked).

Despite treatment, the patient's skin thickening progressed rapidly over the following week, accompanied by persistent fine basal lung crepitations. Hydroxychloroquine was discontinued, and mycophenolate mofetil (MMF) was initiated for suspected early diffuse cutaneous systemic sclerosis (Figure 2). However, skin induration and hyperpigmentation continued to worsen.



Figure 2 The patient presents with Raynaud phenomenon (RP) and scleroderma-related cutaneous findings, specifically sclerodactyly and proximal skin induration extending to the bilateral elbows and knees.

A broadening diagnostic workup was pursued. Repeat HRCT confirmed diffuse bilateral ground-glass opacities. Laboratory evaluation revealed subclinical hypothyroidism (TSH 11.1 μ IU/mL, FT4 1.32 ng/dL) and a profoundly elevated serum kappa free light chain (671.36 mg/L) with an abnormal kappa/lambda ratio of 43.57. Serum protein electrophoresis and immunofixation confirmed a dominant IgG kappa monoclonal gammopathy, with a markedly elevated serum IgG level of 7256 mg/dL (Figure 3). Further hematological evaluation confirmed multiple myeloma: a bone marrow aspirate demonstrated a clonal plasma cell population comprising 80% of cellularity, and a skeletal survey identified lytic lesions in the skull. Additional findings included an elevated serum beta-2 microglobulin of 2.54 mg/L and a preserved albumin level of 3.4 g/dL, classifying the myeloma as International Staging System (ISS) Stage II. Electromyography revealed a sensorimotor polyneuropathy.



The bone marrow aspirate showed hypercellularity (2+) with markedly suppressed normal hematopoietic lineages (M:E ratio uninterpretable; decreased of myeloid, erythroid and megakaryocytic lineages). The section of marrow clot aspiration demonstrated diffusely infiltrated by an overwhelming burden of young and bizarre CD138+ plasma cells with Kappa light chain restriction, comprising 80% of cellularity compatible with plasma cell neoplasm

Given the confluence of a plasma cell dyscrasia, polyneuropathy, sclerotic skin changes, and endocrinopathy, the differential diagnosis narrowed to multiple myeloma versus POEMS syndrome. The bone survey revealed no evidence of lesions involving the long bones or the skull. Then MMF was discontinued, and the patient was referred to hematology.

She received pulse dexamethasone followed by initiation of a VCD (bortezomib, cyclophosphamide, dexamethasone) chemotherapy regimen, along with zoledronic acid, acyclovir, and trimethoprim-sulfamethoxazole prophylaxis. Following the commencement of myeloma-directed therapy,

the patient's skin thickening and hyperpigmentation showed noticeable improvement, though some residual induration persisted. A skin biopsy performed earlier in the course was consistent with scleroderma-like changes. The final diagnosis was symptomatic IgG kappa multiple myeloma (ISS Stage II) presenting with paraneoplastic systemic sclerosis-like skin changes, polyneuropathy, and subclinical hypothyroidism.

Discussion

This case highlights the "red flags" that should trigger suspicion of a paraneoplastic mimic: rapid progression, seronegativity, and severe polyneuropathy. While the pathogenesis in multiple myeloma involves pro-fibrotic cytokine secretion, the overlap with POEMS features suggests a complex pro-fibrotic microenvironment likely driven by VEGF.

The clinical improvement following chemotherapy confirms the paraneoplastic nature of the skin changes. Our findings align with recent literature advocating for monoclonal gammopathy screening in older, seronegative patients with atypical sclerodermoid presentations.

Conclusion

This case illustrates that a scleroderma-like phenotype can be a prominent and misleading initial manifestation of an underlying plasma cell dyscrasia, such as multiple myeloma. Key clinical clues that should raise suspicion for a paraneoplastic syndrome include rapid progression, seronegativity for SSc-specific antibodies, the presence of a monoclonal gammopathy, and associated features like polyneuropathy or unexplained endocrinopathy. A comprehensive diagnostic workup including serum protein electrophoresis, immunofixation, serum free light chain assay, and bone marrow examination is crucial in such atypical presentations. Early recognition and directed treatment of the underlying hematological malignancy can lead to significant improvement in systemic manifestations, fundamentally altering patient management and prognosis. Clinicians must maintain a high index of suspicion to navigate this diagnostic pitfall successfully.

Statements

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