

Scattered Flesh-Colored Papules in a Linear Array in the Setting of Diffuse Skin Thickening

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A 76-year-old man presented to our clinic with diffusely thickened and tightened skin that worsened over the course of 1 year, as well as numerous scattered small, firm, flesh-colored papules arranged in a linear pattern over the face, ears, neck, chest, abdomen, arms, hands, and knees. His symptoms progressed to include substantial skin thickening initially over the thighs followed by the arms, chest, back (top), and face. He developed confluent cobblestonelike plaques over the elbows and hands (bottom) and eventually developed decreased oral aperture limiting oral intake as well as decreased range of motion in the hands. The patient had a deep furrowed appearance of the brow accompanied by discrete, scattered, flesh-colored papules on the forehead and behind the ears. Deep furrows also were present on the back. When the proximal interphalangeal joints of the hands were extended, elevated rings with central depression were seen instead of horizontal folds.



WHAT'S YOUR DIAGNOSIS?

- localized lichen myxedematosus
- reticular erythematous mucinosis
- scleredema
- scleroderma
- scleromyxedema

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The authors report no conflict of interest.

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THE DIAGNOSIS: Scleromyxedema

A punch biopsy of the upper back performed at an outside institution revealed increased histiocytes and abundant interstitial mucin confined to the papillary dermis (Figures 1 and 2), consistent with the lichen myxedematosus (LM) papules that may be seen in scleromyxedema. Serum protein electrophoresis revealed the presence of a protein of restricted mobility on the gamma region that occupied 5.3% of the total protein (0.3 g/dL). Urine protein electrophoresis showed free kappa light chain monoclonal protein in the gamma region. Immunofixation electrophoresis revealed the presence of IgG kappa monoclonal protein in the gamma region with 10% monotype kappa cells. The presence of Raynaud phenomenon and positive antinuclear antibody (1:320, speckled) was noted. Laboratory studies for thyroid-stimulating hormone, C-reactive protein, Scl-70 antibody, myositis panel, ribonucleoprotein antibody, Smith antibody, Sjögren syndrome–related antigens A and B antibodies, rheumatoid factor, and RNA polymerase III antibody all were within reference range. Our patient was treated with monthly intravenous immunoglobulin (IVIG), and he noted substantial improvement in skin findings after 3 months of IVIG.

Localized lichen myxedematosus is a rare idiopathic cutaneous disease that clinically is characterized by waxy indurated papules and histologically is characterized by diffuse mucin deposition and fibroblast proliferation in the upper dermis.¹ Scleromyxedema is a diffuse variant of LM in which the papules and plaques of LM are associated with skin thickening involving almost the entire body and associated systemic disease. The exact mechanism of this disease is unknown, but the most widely accepted hypothesis is that immunoglobulins and cytokines contribute to the synthesis of glycosaminoglycans and thereby the deposition of mucin in the dermis.² Scleromyxedema has a chronic course and generally responds poorly to existing treatments.¹ Partial improvement has been demonstrated in treatment with topical calcineurin inhibitors and topical steroids.²

The differential diagnosis in our patient included scleromyxedema, scleredema, scleroderma, LM, and reticular erythematous mucinosis. He was diagnosed with scleromyxedema with kappa monoclonal gammopathy. Scleromyxedema is a rare disorder involving the deposition of mucinous material in the papillary dermis that causes the formation of infiltrative skin lesions.³ The etiology is unknown, but the presence of a monoclonal protein is an important characteristic of this disorder. It is important to rule out thyroid disease as a possible etiology before concluding that the disease process is driven by the monoclonal gammopathy; this will help determine

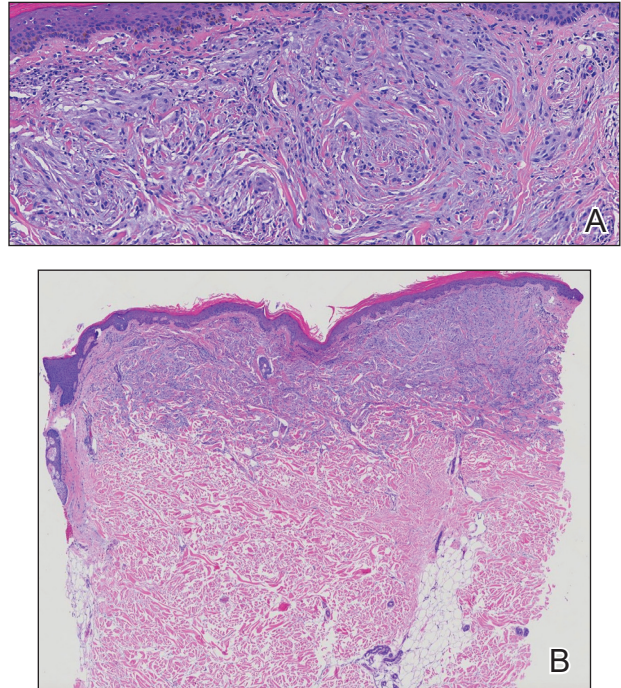


FIGURE 1. A and B, Histopathology showed increased histiocytes and abundant interstitial mucin confined to the papillary dermis (H&E, original magnifications $\times 100$ and $\times 10$).

appropriate therapies.^{4,5} Usually the monoclonal protein is associated with the IgG lambda subtype. Intravenous immunoglobulin often is considered as a first-line treatment of scleromyxedema and usually is administered at a dosage of 2 g/kg divided over 2 to 5 consecutive days per month.³ Previously, our patient had been treated with IVIG for 3 years for chronic inflammatory demyelinating polyneuropathy and had stopped 1 to 2 years before his cutaneous symptoms started. Generally, scleromyxedema patients must stay on IVIG long-term to prevent relapse, typically every 6 to 8 weeks. Second-line treatments for scleromyxedema include systemic corticosteroids and thalidomide.⁶ Scleromyxedema and LM have several clinical and histopathologic features in common. Our patient's biopsy revealed increased mucin deposition associated with fibroblast proliferation confined to the superficial dermis. These histologic changes can be seen in the setting of either LM or scleromyxedema. Our patient's diffuse skin thickening and monoclonal gammopathy were more characteristic of scleromyxedema. In contrast, LM is a localized eruption with no internal organ manifestations and no associated systemic disease, such as monoclonal gammopathy and thyroid disease.

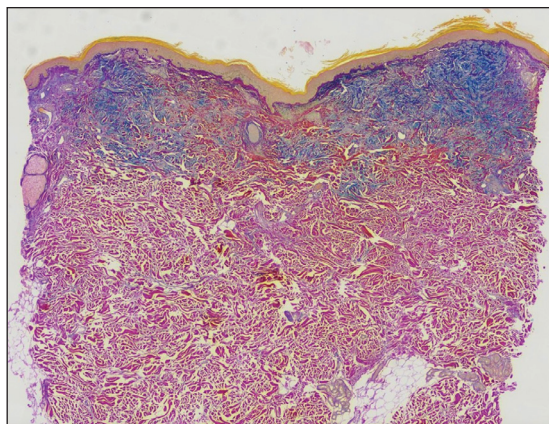


FIGURE 2. Colloidal iron staining showed increased mucopolysaccharides in the papillary dermis (original magnification $\times 10$).

Scleredema adultorum of Buschke (also referred to as scleredema) is a rare idiopathic dermatologic condition characterized by thickening and tightening of the skin that leads to firm, nonpitting, woody edema that initially involves the upper back and neck but can spread to the face, scalp, and shoulders; importantly, scleredema spares the hands and feet.⁷ Scleredema has been associated with type 2 diabetes mellitus, streptococcal upper respiratory tract infections, and monoclonal gammopathy.⁸ Although our patient did have a monoclonal gammopathy, he also experienced prominent hand involvement with diffuse skin thickening, which is not typical of scleredema. Additionally, biopsy of scleredema would show increased mucin but would not show the proliferation of fibroblasts that was seen in our patient's biopsy. Furthermore, scleredema has more profound diffuse superficial and deep mucin deposition compared to scleromyxedema.

Scleroderma is an autoimmune cutaneous condition that is divided into 2 categories: localized scleroderma and systemic sclerosis (SSc).⁹ Localized scleroderma (also called morphea) often is characterized by indurated hyperpigmented or hypopigmented lesions. There is an absence of Raynaud phenomenon, telangiectasia, and systemic disease.⁹ Systemic sclerosis is further divided into 2 categories—limited cutaneous and diffuse cutaneous—which are differentiated by the extent of organ system involvement. Limited cutaneous SSc involves calcinosis, Raynaud phenomenon, esophageal dysmotility, skin sclerosis distal to the elbows and knees, and telangiectasia.⁹ Diffuse cutaneous SSc is characterized by Raynaud phenomenon; cutaneous sclerosis proximal to the elbows and knees; and fibrosis of the gastrointestinal, pulmonary, renal, and cardiac systems.⁹

Scl-70 antibodies are specific for diffuse cutaneous SSc, and centromere antibodies are specific for limited cutaneous SSc. Scleromyxedema shares many of the same clinical symptoms as scleroderma; therefore, histopathologic examination is important for differentiating these disorders. Histologically, scleroderma is characterized by thickened collagen bundles associated with a variable degree of perivascular and interstitial lymphoplasmacytic inflammation. No increased dermal mucin is present.⁹ Our patient did not have the clinical cutaneous features of localized scleroderma and lacked the signs of internal organ involvement that typically are found in SSc. He did have Raynaud phenomenon but did not have matlike telangiectases or Scl-70 or centromere antibodies.

Reticular erythematous mucinosis (REM) is a rare inflammatory cutaneous disease that is characterized by diffuse reticular erythematous macules or papules that may be asymptomatic or associated with pruritus.¹⁰ Reticular erythematous mucinosis most frequently affects middle-aged women and appears on the trunk.⁹ Our patient was not part of the demographic group most frequently affected by REM. More importantly, our patient's lesions were not erythematous or reticular in appearance, making the diagnosis of REM unlikely. Furthermore, REM has no associated cutaneous sclerosis or induration.

REFERENCES

1. Nofal A, Amer H, Alakad R, et al. Lichen myxedematosus: diagnostic criteria, classification, and severity grading. *Int J Dermatol.* 2017;56:284-290.
2. Christman MP, Sukhdeo K, Kim RH, et al. Papular mucinosis, or localized lichen myxedematosus (LM)(discrete papular type). *Dermatol Online J.* 2017;23:8.
3. Haber R, Bachour J, El Gemayel M. Scleromyxedema treatment: a systematic review and update. *Int J Dermatol.* 2020;59:1191-1201.
4. Hazan E, Griffin TD Jr, Jabbour SA, et al. Scleromyxedema in a patient with thyroid disease: an atypical case or a case for revised criteria? *Cutis.* 2020;105:E6-E10.
5. Shenoy A, Steixner J, Beltrani V, et al. Discrete papular lichen myxedematosus and scleromyxedema with hypothyroidism: a report of two cases. *Case Rep Dermatol.* 2019;11:64-70.
6. Hoffman JHO, Enk AH. Scleromyxedema. *J Dtsch Dermatol Ges.* 2020;18:1449-1467.
7. Beers WH, Ince AI, Moore TL. Scleredema adultorum of Buschke: a case report and review of the literature. *Semin Arthritis Rheum.* 2006;35:355-359.
8. Miguel D, Schliemann S, Elsner P. Treatment of scleroderma adultorum Buschke: a systematic review. *Acta Derm Venereol.* 2018;98:305-309.
9. Rongioletti F, Ferrelli C, Atzori L, et al. Scleroderma with an update about clinicopathological correlation. *G Ital Dermatol Venereol.* 2018;153:208-215.
10. Ocanha-Xavier JP, Cola-Senra CO, Xavier-Junior JCC. Reticular erythematous mucinosis: literature review and case report of a 24-year-old patient with systemic erythematous lupus. *Lupus.* 2021;30:325-335.