

A unique case of concurrent cutaneous lichen amyloidosis and myxedema

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Abstract

Lichen amyloidosis is believed to be caused by damage to keratinocytes, often by chronic scratching. It has also been associated with autoimmune conditions, including thyroid disease. Dermatologic manifestations of poorly controlled thyroid disease are well described within the medical literature, within both hypothyroid and hyperthyroid states. Myxedema is a rare complication of Graves disease. We report a unique case of concurrent myxedema and lichen amyloidosis in a 63-year-old patient with uncontrolled hypothyroidism in the setting of post-ablative Graves disease.

Keywords: amyloid, autoimmune, Graves disease, lichen amyloidosis, myxedema, mucinosis, mucinous myxedema, pretibial myxedema, thyroid dermopathy

Introduction

Myxedema can develop as a rare complication of Graves disease, affecting only 2% of patients. Patients present with nonpitting lower extremity edema and waxy, “woody” nodules and plaques on the shins, upper extremities, and trunk. Histopathology reveals mucin deposition throughout the dermis with collagen bundles reduced in size. Myxedema is caused by deposition of glycosaminoglycans (GAGs) by fibroblasts. Similar to the mechanism in Graves orbitopathy, this activity is likely propagated through autoantibody production rather than the effect of elevated thyroid hormone. Consistent with this theory, restoration of

a euthyroid state has not been associated with improvement of myxedema [1].

Lichen amyloidosis (LA) is a rare, predominantly sporadic condition caused by deposition of keratin intermediate filament proteins in the dermal papillae. Patients often present with hyperkeratotic plaques distributed over extensor surfaces. Lichen amyloidosis is associated with pruritic conditions and may arise as a result of repetitive local trauma to the affected areas. Additionally, LA appears as a cutaneous finding of multiple endocrine neoplasia 2A (MEN 2A), an autosomal dominant syndrome [2]. Although LA has repeatedly shown a strong association with certain autoimmune and endocrine abnormalities, only a few reports suggest a particular connection between thyroid disease and LA [3-5]. Effective treatments for LA are limited and are typically aimed at breaking the itch-scratch cycle to prevent further trauma and irritation to the sites involved. To date, a “gold standard” treatment has yet to be identified. A systematic review performed in 2016 found that data on the efficacy of a variety of treatments for lichen amyloidosis are lacking and relegated to small case series or isolated case reports [6].

Herein, we report a case of 63-year-old man with Graves disease and post-ablative hypothyroidism who presented with chronic pruritic papules with histologic features of both lichen amyloidosis and myxedema.

Case Synopsis

A 63-year-old man with a history of coronary artery disease and Graves disease with post-ablative

hypothyroidism presented to the dermatology clinic with a 20-year history of chronic pruritic plaques primarily distributed on his bilateral shins and dorsal forearms. Ten years prior, a biopsy of his plaques revealed lichenoid dermatitis with eosinophils; a diagnosis of drug eruption was suspected in the context of angiotensin-converting enzyme inhibitor use. Despite discontinuation of the ACE inhibitor and further trials of topical fluocinonide, his pruritic plaques persisted and enlarged. Current medications included levothyroxine, aspirin, atorvastatin, lisinopril, and metoprolol. His personal history and family history were negative for endocrinopathies and other manifestations of MEN syndromes.

On examination, the patient was found to have large lichenified, scaly, cerebriform hyperpigmented plaques on his bilateral shins, as well as lichenified plaques and papules along the dorsal forearms (**Figure 1**). Close examination of these areas revealed thick underlying induration with non-pitting edema. Clubbing of his fingers was also noted, suggesting thyroid acropachy.

Laboratory evaluation revealed a thyroid stimulating hormone of 65.64 μ U/mL with a fT4 of <0.10ng/dL. Complete blood count and complete metabolic panel drawn four months prior had both been within normal ranges. Serum protein electrophoresis showed mild elevation of total protein (8.6g/dL). Human immunodeficiency virus and hepatitis panels drawn years prior were negative.

A punch biopsy was performed on his left arm. The hematoxylin and eosin sections of a biopsy from the lower leg show mild epidermal hyperplasia with hyperkeratosis and pallor in the dermis (**Figure 2A**). There were microscopic foci where colloid bodies were collected along the dermal epidermal junction along with lymphocytes and melanophages (**Figure 2B**). The Congo red stain confirmed the presence of amyloid in the papillary dermis (**Figure 2C**) in the pattern of lichen amyloidosis. The congophilic material in the tissue sections showed apple green birefringence under polarized light microscopy. The pallor in the reticular dermis related to increased acid mucopolysaccharides between collagen fibers visualized in an Alcian blue/periodic acid-Schiff stain (**Figure 2D**) in a pattern typical of myxedema.



Figure 1. Clinical findings. Hyperkeratotic plaques over extensor surfaces of bilateral shins **A**) and forearms **B**) with underlying thick induration and non-pitting edema.

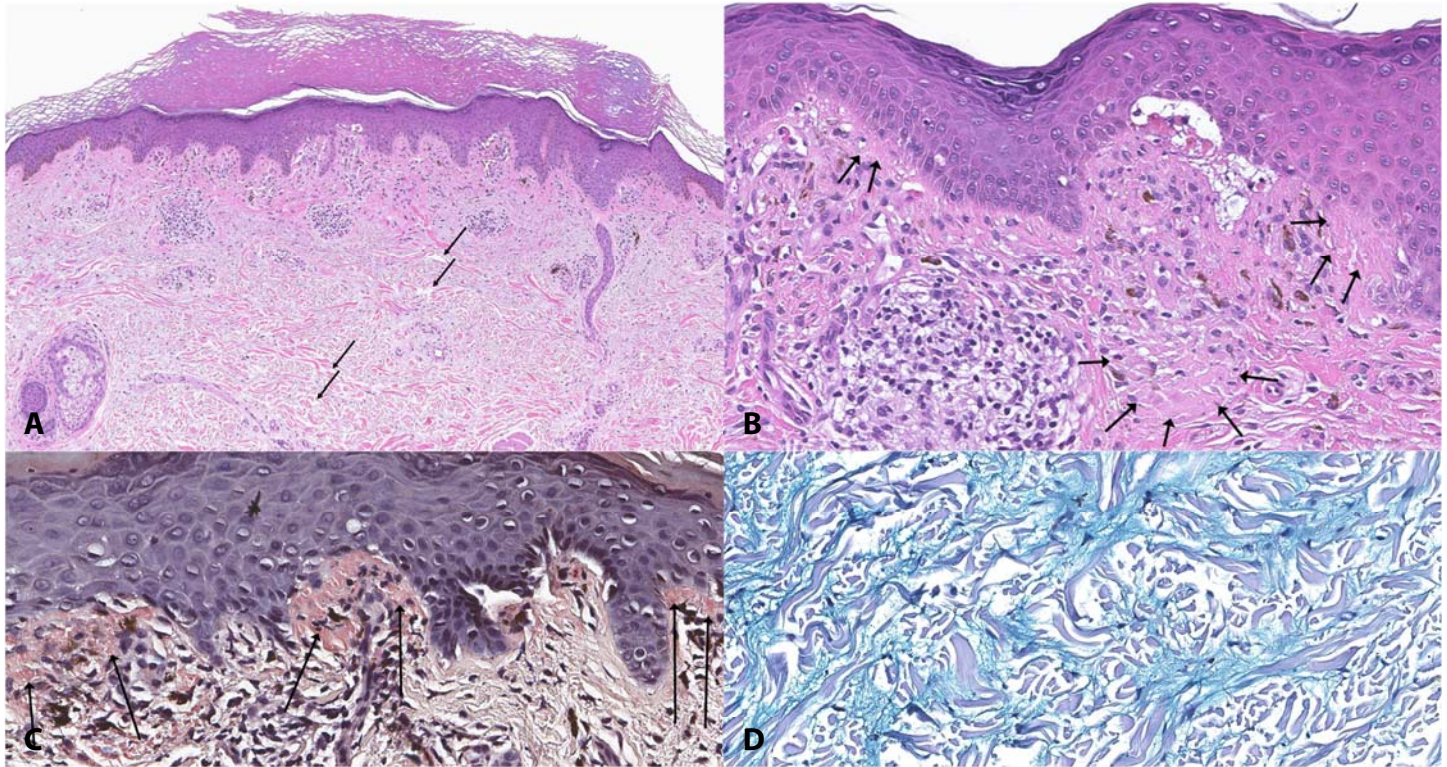


Figure 2. Histopathological findings. **A)** H&E section shows mild epidermal hyperplasia with hyperkeratosis, pallor in the dermis with increased spacing between collagen bundles (arrows), 7 \times . **B)** Colloid bodies are present at the dermal epidermal junction along with lymphocytes and melanophages and eosinophilic material suggestive of amyloid (arrows), 40 \times . **C)** Congo Red staining demonstrates reactivity in the papillary dermis (arrows), 40 \times . **D)** Prominent mucin is present in the reticular dermis on Alcian Blue staining, 40 \times .

Per records, the patient was noted have had difficulty maintaining a euthyroid state post-ablation for years and was encouraged to seek changes in his current thyroid replacement treatment with his primary care provider. In our clinic, his left lower leg was wrapped with an Unna boot with triamcinolone 0.1% ointment and he was prescribed clobetasol 0.05% ointment to apply twice daily to other extremities under occlusion. He returned one week later with noted improvement of pruritus of his left lower leg. The patient has since continued topical corticosteroid treatment under occlusion to his extremities.

Case Discussion

In this patient with a history of post-ablative hypothyroidism because of Graves disease treatment, the etiologies of myxedema and lichen amyloidosis are likely rooted in both sequelae of a high autoantibody titer as well as chronic, uncontrolled hypothyroidism. The former has been associated with myxedema as well as acropachy, as

seen in this patient [7]. Lichen amyloidosis and its association with chronic pruritus has been widely recognized, which is believed to relate to keratinocyte damage resulting from chronic scratching and localized trauma [8]. Our patient's longstanding, poorly managed hypothyroidism likely contributed to his significant chronic pruritus, allowing amyloid build up over time from this process. We propose that a direct physiological link between his myxedema and lichen amyloidosis is unlikely and the two are likely related through their contribution to, and exacerbation of this patient's chronic pruritus and subsequent repetitive localized trauma.

Conclusion

To our knowledge, this is the first case reporting the concurrence of both myxedema and lichen amyloidosis. Although this case is unique, it contributes to a growing body of evidence suggesting a link between lichen amyloidosis and autoimmune thyroid disease and provides an

example of a successful conservative approach to management.

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Potential conflicts of interest

The authors declare no conflicts of interest.