LETTER TO THE EDITOR

Pretibial myxoedema: a case report with scanning electron microscopy

Editor

Pretibial myxoedema (PTM) results from the accumulation of hyaluronic acid in the dermis and subcutis and is commonly associated with Graves' disease (GD). It occurs in up to 5% of patients with GD and in 13% of patients with GD and ophthalmopathy. PTM occasionally occurs in thyrotoxicosis but is much less frequent in patients with Hashimoto thyroiditis, primary hypothyroidism and euthyroidism. Clinically, PTM may manifest as waxy, erythematous nodules or plaques, often with evident follicular openings located on the tibial region. Diagnosis is confirmed by light microscopy.[1] We examined the dermis of a PTM case with a scanning electron microscopy (SEM), which identified unreported findings of this condition.

A 39-year-old White male patient, diagnosed with Graves' disease with thyrotoxicosis and exophthalmos, under treatment with propylthiouracil, presented with waxy, yellowish or slightly erythematous plaques, with prominent follicular openings on the anterior aspect of his legs (Fig. 1a). After 6 months, he underwent radioactive iodine therapy progressing to hypothyroidism. Histopathological samples obtained by incisional biopsy of lesions revealed accumulation of mucin in reticular dermis leading to separation of collagen bundles. Star-shaped fibroblasts were seen under haematoxylin and eosin staining (H&E) (Fig. 1b) and more evident with Alcian Blue (Fig. 1c). Intralesional infiltration with triamcinolone was used with significant improvement and subsequent partial relapse.

On examining the dermal surface of biopsy punch using SEM, three distinct areas could be visualized: areas with normal collagen bundles without deposit (×650) (Fig. 2a), a transitional area with normal and slightly distorted collagen bundles (arrow) and mucin deposition (2.200×) (Fig. 2b). In the most affected area, in the deep reticular dermis, the deposit was tightly packed, covering, separating and disrupting the bundles and the collagen fibres (850×) and (8.500×) (Figs. 2c,d).

Light microscopy can establish PTM diagnosis. The deposit can be visualized using special staining (Alcian Blue, colloidal iron or toluidine blue), which produces spaces among the collagen fibres. Normal amount of fibroblasts can be evidenced, some of them with a star-shaped outline.[2]

Even though the exact cause is still elusive, it is known that besides immunological effects, mechanical factors

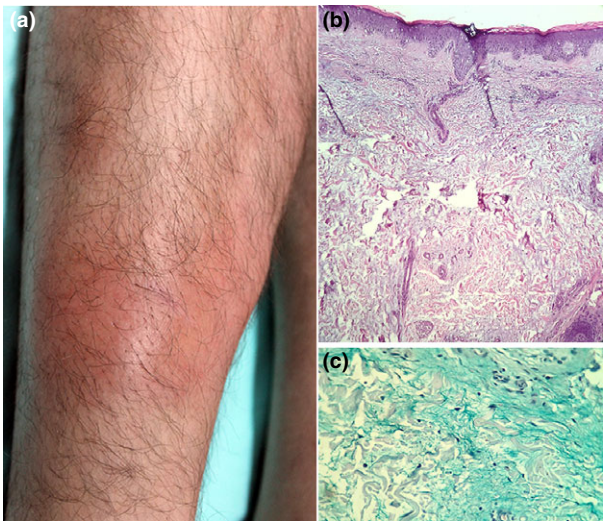

Figure 1 (a) Erythematous plaques on the anterior aspect of the legs (b) Normal epidermis; dermis with extensive interstitial deposits of mucin (amorphous, amphophilic material), permeating and pushing away the collagen fibres, more evident in the reticular dermis HE-40× (c) normal amount of star-shaped fibroblasts, Alcian Blue 400×.

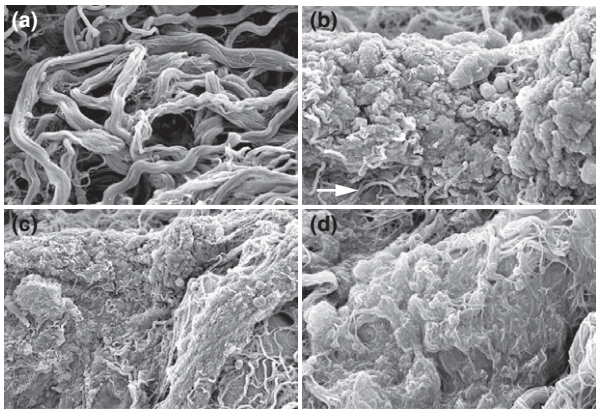

Figure 2 Scanning electron microscopy (a) normal area with collagen-forming bundles (×650), (b) transition of normal bundles (arrow) to the affected area (×2.200); (c) affected area with 'packing' of collagen with some loose bundles and fibres (×850); (d) higher magnification showing the 'packing' of collagen by deposits (×8.500).

contribute to the formation of PTM. Antibodies bind to thyroid-stimulating hormone receptor and stimulate the dermal fibroblasts, increasing the production of glycosaminoglycans. The accumulation of these polysaccharides separates the collagen fibres and obstructs the lymphatic vessels, causing oedema. The predisposition of the pretibial region could be explained by trauma.[2]

Pretibial myxoedema has been already examined by transmission electron microscopy. It was observed that the bundles and the collagen fibres were separated by wide electron-lucent gaps. Fibroblasts have a star-shaped appearance with extensive formation of cytoplasmic processes.[1]

Scanning electron microscopy has been shown to be helpful in studying the ultrastructure of dermal diseases with deposits, as previously reported in other studies. In this report, we were able to reveal the accumulation of mucin in reticular dermis. It separates, disrupts and covers most of the collagen fibres, but it does not assume a peculiar morphological appearance as it does in amyloidosis (stone-like appearance)[3] and in lichen sclerosus and atrophicus (a pearl necklace appearance).[4] SEM is not used routinely; however it can provide additional ultrastructural information of conditions with dermal involvement.

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