

Generalized Morphea with Blisters

A Case Report

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A patient suffering from generalized morphea developed blisters in the morpheic plaques on her buttocks. The plaques had an increased concentration of serum aminoterminal propertice of type III procollagen, an echo response and thickened skin on ultrasound scanning, and compact bundles of collagen fibrils with bimodal distribution of the diameters. The blisters appeared as an echo-free band in the subepidermal zone by ultrasound scanning. Electron

microscopy revealed blisters in the upper papillary dermis, surrounded by degraded collagen fibrils. Key word: Collagen fibril degradation.

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Blister formation in morpheic plaques is rare. Garb & Sims (1) reviewed 25 cases of this complication between 1869 and 1959, since when similar cases have been reported sporadically (2-5). Lichen sclerosus et atrophicus, the clinical features being confused with morphea, also forms blisters in the patches. D-penicillamine, used to treat scleroderma, can also cause blisters (6-8). This paper deals with new diagnostic trials, and with blister formation in a patient with generalized morphea.

CASE REPORT

The patient was a 70-year-old female. Since 1984, she has suffered from Reynaud's phenomenon upon exposure to cold, and felt her skin to be rigid when she exercised. When the patient was first seen in 1987, the skin on her legs, thighs and forearms was whitened, edematous and tense, with an itchy sensation. These areas had a violaceous border. Her fingers, toes, face and trunk were not involved. Movement of her large joints was limited.

Histological examination of sclerotic areas showed thick fibrotic dermis with sparse perivascular infiltrate of lymphocytes and thin epidermis without hyperkeratosis or liquefaction degeneration of basal cells. Clinical examinations of liver, kidney and lung function were normal. Peripheral blood was normal. Borrelia antibody test was negative. Antinuclear antibodies, tested by indirect immunofluorescence using human *in vitro* fibroblasts, were negative. The patient started medication of D-penicillamine in increasing doses up to 750 mg a day.

Since then, the lilac-coloured borders extended. Buttocks, feet, upper arms and hands were involved. Her fingers became lilac-coloured, swollen, and claw-shaped. Subsequently, ivory-white hard patches developed in the lilac-coloured areas. Repeated clinical and histological examinations gave similar results, as before. Scintigraphs of bone and thyroid were normal. Ultrasound scanning of the abdomen showed no pathology.

In 1989, blisters, 3-4 cm across, developed in the sclerotic areas on her buttocks around the gluteal cleft and in

the sciatic region (Fig. 1). The blister content was yellowish, gelatinous and sterile. Some blisters healed without scarring after resorbing the content, while others burst and discharged the fluid, leaving painful ulcers. The morpheic plaques of the blistered areas remained unchanged.

To reconfirm a differential diagnosis between morphea and lichen sclerosus et atrophicus, further examinations were carried out using the following three methods. High-frequency ultrasound scanning and electron microscopy were used to compare blistered plaque, non-blistered plaque, and uninvolved skin. The serum level of the amino-terminal of type III procollagen (P-III-NP) was also determined. For high-frequency ultrasound scanning, a Dermascan C 20 MHz ultrascanner (Cortex Technology, Hadsund, Denmark) was used (9). Sclerotic dermis appeared in a thick echo band, and blisters in a thin echo-free band (Fig. 2). The skin thickness was 1.8 mm in the uninvolved area, while that in the blistered area was 3.9 mm including a 0.9 mm thick echo-free zone. The non-blistered area was 3.2 mm thick with a 0.4 mm thick echo-free band (Fig. 2). Ultrastructural examination was carried out by routine preparation. Blisters were located in the upper part of the papillary dermis, surrounded by degraded collagen fibrils (Fig. 4). The dermo-epidermal junction was normal. The papillary dermis contained thin collagen fibrils, 20-30 nm across, and granular material (Fig. 3). The reticular dermis showed compact bundles of collagen fibrils, 30-40 nm and 100-120 nm thick. The elastic fibres were unchanged.

DISCUSSION

When blisters are found in morphea-like patches, it should be determined whether the patch is morpheic or lichen sclerosus et atrophicus. Clinical features of both diseases are often confused, and lichen sclerosus et atrophicus produces blisters in the plaques more frequently than morphea (5, 10, 11). Previous papers have used epidermal changes and dermal perivascular cell infiltrate seen histologically for differentiation (1, 5, 10, 11). The location, construction



Fig. 1. Morpheic patches with blisters.

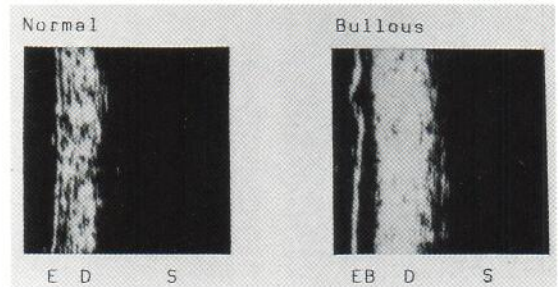


Fig. 2. Ultrasound C-scan cross-sectional pictures in normal skin (left) and morpheic plaque (right) on the buttocks. The morpheic plaque showed an echo-free dark band representing a bullous surface relief and subclinical blisters. Echo band of epidermis (E) and dermis (D). Subepidermal echo-free band (B). Subcutaneous space (S).

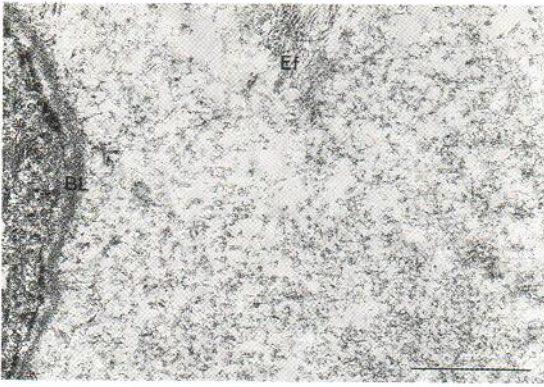


Fig. 3. Upper part of papillary dermis shows dense granular material and fine collagen fibrils. Epidermal basal lamina (BL) is normal. EF: Bundles of elastic fibrils. $\times 30,000$.

and content of the blisters and the course of the present case were identical with those described previously (1). This paper introduced three further methods for differentiation, viz. ultrasound scanning (9), electron microscopy (12) and serum P-III-NP (13). Though the present patient was clinically and histologically typical for generalized morphea according to classical criteria, the authors have reconfirmed the diagnosis when blisters formed in the plaques.

Blisters in the morpheic plaque is provoked by mechanical injury (1). Collagen fibril degradation in the present findings probably predisposes to blister formation. "Filamentous aggregates of collagen" (14) is an ultrastructural sign of collagen

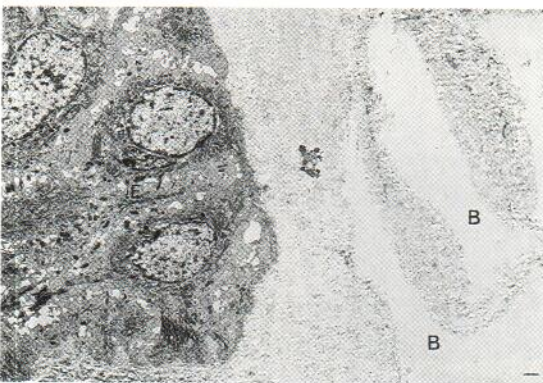


Fig. 4. A large blister (B) is seen as a cleft in the papillary dermis. E: Epidermis. $\times 3,200$.

(The scales in the electron micrograms indicate 1 μ .)

fibril degradation by cellular collagenase. Scleroderma (12) and lichen sclerosus et atrophicus (15) showed this sign in the dermis. Blistering is also caused by D-penicillamine. The blisters produced are acantholytic (6), spongiotic (7) or take the form of epidermolysis bullosa aquisita (8). Blisters caused by D-penicillamine did not correspond to the blisters of the present patient.

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