The Cockayne-Touraine Type of Dominant Dystrophic Epidermolysis bullosa—Ultrastructural Similarities to the Pasini Variant

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Biopsies from the uninvolved skin of 5 patients with the Cockayne-Touraine (CT) type of dystrophic epidermolysis bullosa (DEB) were studied with the electron microscope. Dermal fibrillar bodies were noted in 2 patients and 3 showed basal lamina (BL) duplication or splitting. Discontinuity of the BL with herniation of keratinocyte cytoplasm was present in one patient. These changes, thought previously to be characteristic of the Pasini variant, indicate that abnormalities of the BL may be involved in blister formation in both disease subgroups. *Key words: Dystrophic epidermolysis bullosa; Electron microscopy; Fibrillar bodies.* (Received November 3, 1983.)

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The dominant dermolytic variants of DEB are clinically distinct entities; the Pasini form shows albopapuloid papules (1), whilst the CT type has less severe and more localised blistering. Until now the recognised ultrastructural differences have been that the CT type shows regional variations in anchoring fibril (AF) development (2), whereas in Pasini DEB, AF abnormalities are generalised and BL duplication with hernia-like basal cell protrusions are found (3).

We present evidence that some of the latter features can also occur in patients with the CT variant of DEB.

PATIENTS AND METHODS

Punch biopsy specimens were obtained under local anaesthesia from five patients, all of whom had mild dominant DEB, lacked albopapuloid lesions and were diagnosed on clinical and genetic grounds as having the CT variant (Table 1). The specimens were all taken from non-predilected sites and in each case the skin remained intact during the procedure. The tissue was immediately fixed in 3% glutaraldehyde in 0.1 M sodium cacodylate buffer (pH 7.4). Following post fixation in 2% osmium and dehydration, the specimens were embedded in Spurr resin. The sections were stained with uranyl acetate and lead citrate before examination in a Philips 301 electron microscope.

RESULTS

Electron microscopy demonstrated normal AF in all five patients, with the fibrils normally distributed along the BL. Patients 1, 3 and 4 showed duplication or splitting of the BL (Fig. 1), which was of variable thickness, being diffuse at the site of attachment and lacelike where lateral separation occurred. At these points, thin strands of BL projected into the dermis.

Large dermal fibrillar bodies (Fig. 2) were seen in specimens from patients 1 and 3. The fibrillar bodies measured up to 5.3 μm in diameter, were similar to the BL in electron opacity and were composed of filaments 10 nm in diameter. The surrounding collagen fibres were normal.

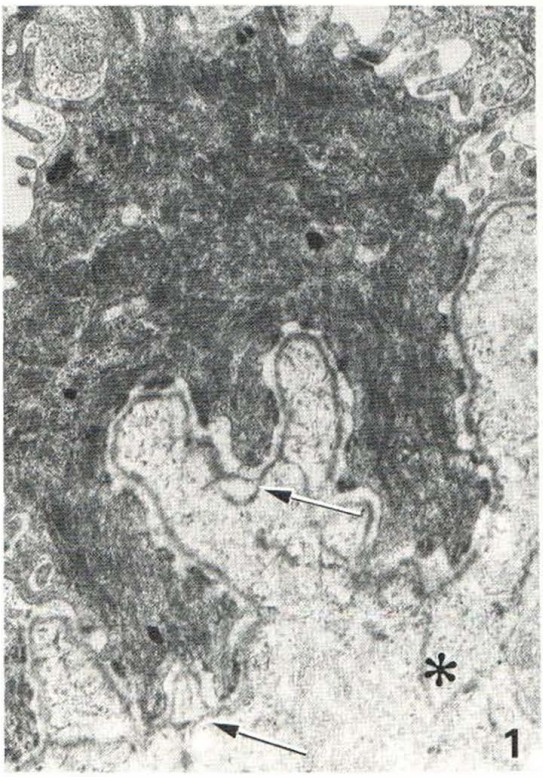
Patient 5 differed from the others in that the lamina densa was discontinuous in places, allowing micro-protrusions of the overlying basal keratinocytes to project into the dermis (Fig. 3). There were no associated fibrillar bodies and no other abnormality was present.

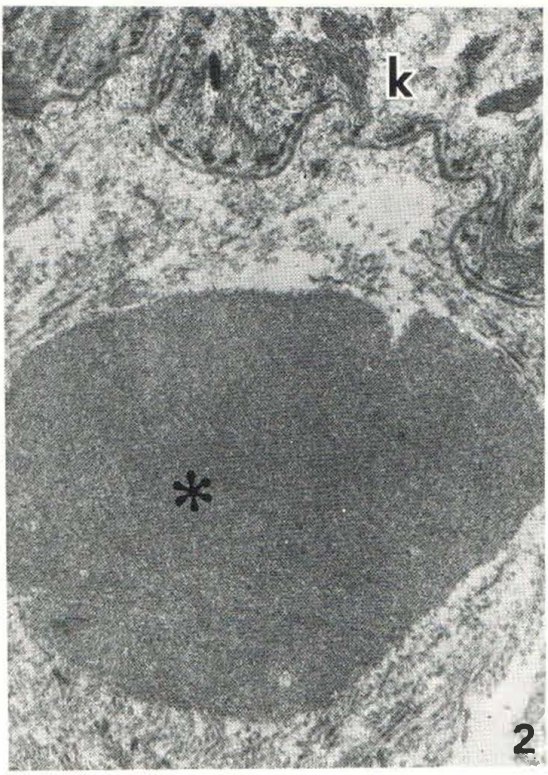
DISCUSSION

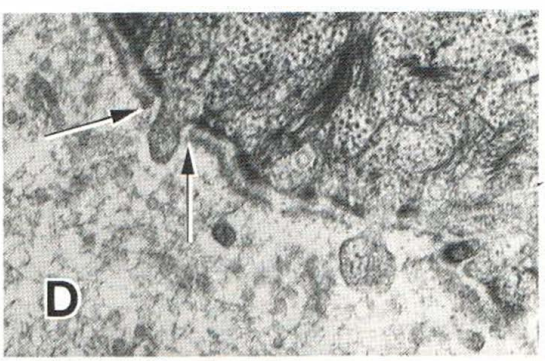
The ultrastructural distinction between the dermolytic variants of dominant DEB has hitherto been based on reduced numbers of rudimentary AF being limited to predilected

Table I. *Five patients with Cockayne-Touraine DEB*

Patient	Sex	Age (y.)	Site of biopsy	Clinical details
1	Female	38	Forearm	Involvement of flexures, hands, feet and buccal mucosa with scarring and milia formation. Dystrophic nails
2	Male	15	Forearm	Similar case 1. Son of case 1
3	Female	40	Forearm	Involvement of flexures, hands and feet with scarring and milia but no oral involvement. Dystrophic nails
4	Male	18	Forearm	Similar to case 3. Son of case 3
5	Male	16	Inner aspect of knee	Involvement of hands, feet, arms and legs with scarring and milia formation







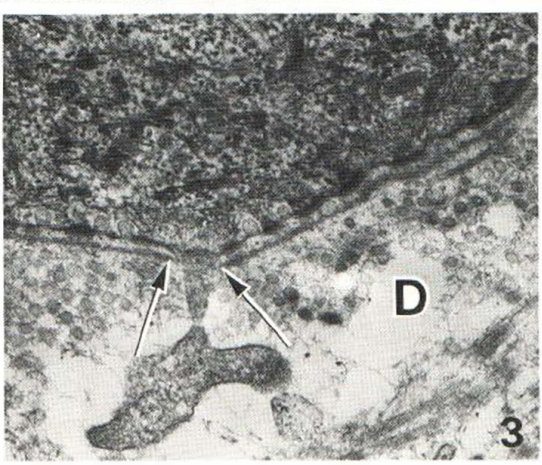


Fig. 1. The BL is of variable thickness and shows duplication (arrows) in places. Thin tails of BL (*) project into the dermis at sites where lateral separation has occurred. ×17 640.

Fig. 2. A dermal fibrillar body (*) composed of microfilaments, lies close to the BL of an overlying keratinocyte (K). The surrounding collagen fibres appear normal. ×14 040.

Fig. 3. Discontinuities in the BL (arrows) allow microprotrusions of basal keratinocyte to project into the dermis (D). ×32 400.

sites in the CT type, but involving both predilected and non-affected areas in the Pasini variant (2, 3). However, the validity of a subdivision based on the AF density is questionable following the recent observation that AF counts vary between normal individuals and also between different sites on the same body (4). The ultrastructural changes found in our CT variant patients resemble those described in patients with Pasini DEB and suggest that aetiological similarities exist.

The fibrillar bodies observed by ourselves and others (3) in DEB have ultrastructural similarities to the colloid bodies found in lichen planus and other conditions (5). These bodies may be derived from degeneration of epidermal cells (5) and their presence in the dermis of our patients could be the result of the passage of keratinocyte material through a BL split, although no BL changes were detected in the vicinity of the fibrillar bodies. The BL may duplicate under dividing basal cells and can be discontinuous in a repairing epithelium. However, the ultrastructural appearance in our patients suggests that lateral splitting of the BL has occurred and in one patient, dermal herniation of basal cell pseudopodia through the resulting spaces was found.

These abnormalities of the BL may play a part in blister formation and could account for the anomalies of AF frequency and the appearances observed in both variants of DEB.

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