

## Botulinum Toxin A for Focal Hyperhidrosis in Leg Amputees: A Case Report

Sir,

Among the side-effects arising with a prosthesis, fitting problems and dermatological complaints are the most frequent. The importance of prevention or early recognition of skin problems cannot be overemphasized to avoid bed rest and other handicaps (1).

One major problem in leg amputees is stump hyperhidrosis. The use of silicone pads and other rather occlusive materials in prostheses aggravates hyperhidrosis, leading to lubrication. Whereas occlusion alone can cause hydration of the stratum corneum, the combination of lubrication with occlusion initiates prolonged disturbance of the skin's barrier function (2).

Hyperhidrosis is linked to discomfort and a number of skin complaints including malodour, folliculitis and other bacterial and mycological skin disease, and the development of irritant and allergic contact dermatitis (1). Several attempts have been made to treat hyperhidrosis including topical astringent agents and tap water iontophoresis (3). Recently, botulinum toxin A (BTXA) has been used to treat focal hyperhidrosis (4, 5). BTXA is a zinc endopeptidase. The toxin is internalized by endocytosis at the axon terminal and becomes fully activated by disulphide reduction once inside the cell. BTXA targets SNAP-25 involved in acetylcholine release (6). We report a patient with leg amputation and hyperhidrosis of the stump treated successfully with BTXA for stump hyperhidrosis.

A 58-year-old man, with a lower leg amputation due to osteomyelitis in 1962, was referred to the Department of Dermatology because of suspected contact dermatitis. He suffered from diabetes mellitus, stump hyperhidrosis, and nummular microbial eczema. On examination we found a lower leg amputation stump with a suction stocking prosthesis. The itching, malodorous, exudating, hyperhidrotic skin showed erythematous scaling lesions and mild distal verrucous hyperplasia.

Laboratory investigations, including differential blood count, creatinine, urea, bilirubin, serum enzymes, urine analysis, total IgE, and protein electrophoresis, were normal. Several swabs were taken from the exudating skin lesions. A mixed bacterial culture was found including aerobic (*Acinetobacter iwoffii*, *Corynebacterium spp.*, *Sphingomonas paucimobilis* and *saprophytic staphylococci*) and anaerobic species (*Camphylobacter rectus*, *Propionibacteria*, *Peptostreptococci* and *Bacteroides spp.*). Patch testing was performed according to the German Contact Dermatitis Research Group (7). No type-IV sensitization was found against the most common allergens of the standard test, textile colours, rubbers, topical ointments and conservatives, and materials of his own prosthesis.

We performed topical treatment of the microbial eczema including a povidone-iod based disinfectant and topical corticosteroid creme (initially amcinonide; later on prednicarbat). Eczema and pruritus disappeared. After informed consent we treated his stump hyperhidrosis with BTXA. Hyperhidrotic areas were identified by Minor's iodine—starch test (8). As shown in Fig. 1, they were found on both the distal and the lateral part of the stump. For treatment, 100 U of BTXA (Botox; Allergan, Irvine, CA, USA; distributed by Merz Pharma Germany) were diluted with 4.0 ml 0.9%



Fig. 1. Identification of hyperhidrotic areas after Minor's sweat test.

sterile physiological saline without preservative. The toxin was injected in amounts of 0.05–0.1 ml (5–10 U) strictly intracutaneous using a 30 gauge needle. Analgesic therapy was not necessary. The effect was evaluated by Minor's iodine—starch test 3 days later (Fig. 2). The patient had a consultation 3 months later. He was still satisfied with the anhidrotic effect. There was no relapse of the microbial eczema.

The development of functional and aesthetic leg prostheses is a great advantage for amputees. The ongoing use of the prosthesis, however, may account for some discomfort and skin problems. Sweating inside the socket is annoying and



Fig. 2. Hyperhidrotic areas 3 days after botulinum toxin A.

may irritate skin, facilitate the development of contact dermatitis or bacterial and mycological infections (1).

BTXA has been used recently to treat focal hyperhidrosis (gustatory sweating, palmo-plantar and axillary hyperhidrosis) (4, 5). There are no data available for the treatment of stump hyperhidrosis. We used BTXA for stump hyperhidrosis in a dosage comparable to that used in palmar hyperhidrosis, i.e. 100 U of Botox<sup>®</sup>. The treatment was very effective not only for focal hyperhidrosis of the stump but it also showed a preventive effect on the associated eczema. In another study with tap water iontophoresis for hyperhidrotic hand eczema, it could be demonstrated that effective treatment of hyperhidrosis is an important factor for prolongation of disease-free interval in atopic eczema and contact dermatitis (9). Further studies should be performed to investigate this positive side-effect of hyperhidrosis treatment.

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## Basal Cell Carcinoma Arising in a Localized Linear Verrucous Epidermal Naevus

Sir,

A 40-year-old female had had multiple, firm, brown verrucous papules arranged in a linear plaque over her left cheek since birth. The lesion had been static until 2 months before presentation, when she noticed an asymptomatic, erythematous papule that appeared spontaneously in the centre of the lesion. She had not received any treatment previously for the condition. Her general physical and systemic examination were within normal limits. Local examination revealed a 5 × 1 cm linear band-shaped plaque composed of multiple, 1–3 mm, brown verrucous papules over her left cheek. There was a single, firm, erythematous, dome-shaped, smooth-surfaced, 1.0 cm papule in the centre of the lesion (Fig. 1). A clinical diagnosis of localized linear verrucous epidermal naevus was made.

Biopsy from the centre of the lesion showed hyperkeratosis, parakeratosis, irregular acanthosis and papillomatosis. Budding of basaloid cells from the basal layer into the dermis was seen (Fig. 2). A histopathological diagnosis of verrucous epidermal naevus with basal cell carcinoma (BCC) change was considered. Excision biopsy of the remaining portion of the dome-shaped papule with an adequate margin revealed features of BCC. The section showed islands of basaloid cells with dense chronic inflammatory cell infiltrate in the dermal stroma (Fig. 3). The peripheral cells of the tumour had a palisading arrangement of nuclei, confirming the diagnosis of solid type of BCC change occurring in the verrucous

epidermal naevus lesion. The patient has been on follow-up for the last 18 months with uneventful course.

## DISCUSSION

Verrucous epidermal naevus are circumscribed developmental (hamartomatous) lesions comprised of keratinocytes (1). BCC is a known complication of epidermal naevi. It occurs more



Fig. 1. Plaque of localized linear verrucous epidermal naevus with a recently visible dome-shaped papule of basal cell carcinoma (arrow).