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An Acquired Reactive Perforating Collagenosis

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후천성 반응성 천공성 교원증 1예

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반응성 천공성 교원증은 경미한 외상에 반응하여 발생하고 재발을 잘 하는 피부 질환으로, 중심부가 함몰된 각화성 구진을 특징으로 하며 조직학적으로 변형된 교원섬유가 표피를 통해 제거되는 현상을 나타낸다. 후천적으로 당뇨병이나 신부전과 동반되어 나타나기도 한다.

환자는 48세 여자로 5개월전부터 발생된 전신의 소양감을 주소로 내원하였으며, 과거력상 10여년전부터 당뇨병과 신부전이 있었으나 특별한 치료없이 지냈다. 피부소견은 전신에 중심부가 함몰된 다수의 소양성 구진을 보였고, 조직학적으로 표피는 컵모양의 함몰과 변형된 교원섬유가 표피를 통하여 제거되는 소견을 보였다. 치료로는 국소 부신피질 호르몬제와 항히스타민제 경구복용으로 호전을 보였으나 1개월 후 재발되었고 자외선 B를 2회 투사하였다.

The term transepidermal elimination(TEE) was coined in 1968 by Mehregan[1]. TEE is the characteristic feature in four essential or primary "perforating" skin disorders : reactive perforating collagenosis, elastosis perforans serpiginosa, perforating folliculitis and Kyrle's disease. In a recent report, TEE of collagen and elastic materials was shown in skin lesions of four patients with renal insufficiency, diabetes mellitus, or both. The term acquired perforating dermatosis was proposed for this new entity[2].

Hereby, we report a case of reactive perforating collagenosis observed in a patient with diabetes mellitus and chronic renal failure characterized by the typical findings of clinical and histopathological studies.

Report of a case

A 48-year-old woman visited our department of dermatology for pruritic rash on the back and extremities for 5 months. She had long-standing diabetes mellitus and recently developed chronic renal failure that necessitated hemodialysis. Five months ago, she suffered from intense pruritus followed by skin eruptions which appeared first on the inner sides of both extremities and subsequently spread to the trunk.

On physical examination, numerous pruritic erythematous papules and nodules were distributed on the trunk and extremities(Fig. 1). Most of these nodules exhibited distinctive dark brown crusts in the umbilicated center (Fig. 2).

Laboratory studies disclosed the following values : blood urea nitrogen 42mg/dl(normal : 5~23mg/dl), creatinine 5.4mg/dl(normal 0.5~1.4mg/dl). She had renal anemia(hemoglobin 7.5g/dl, hematocrit 22.6%), glucosuria(+++) and proteinuria(+++). Chest roentgenogram showed pleural effusion in both lung

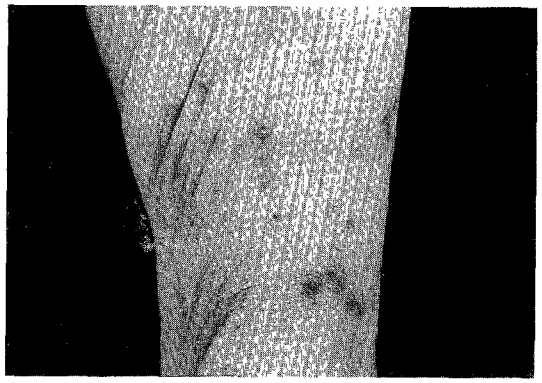

Fig. 1. The numerous pruritic erythematous papules and nodules on the extremities.

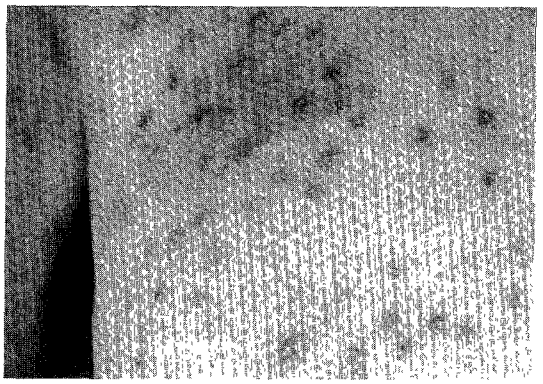

Fig. 2. Most of lesions exhibit distinctive dark brown crusts in the center.

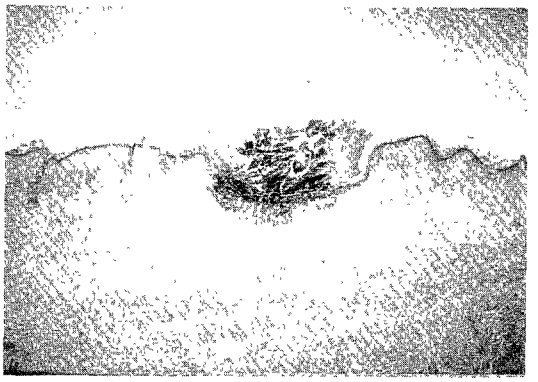

Fig. 3. The epidermis formed a cup-shaped depression filled with a plug composed of parakeratotic keratinocytes, basophilic debris and degenerated vertical collagen fibers(H&E, ×40).

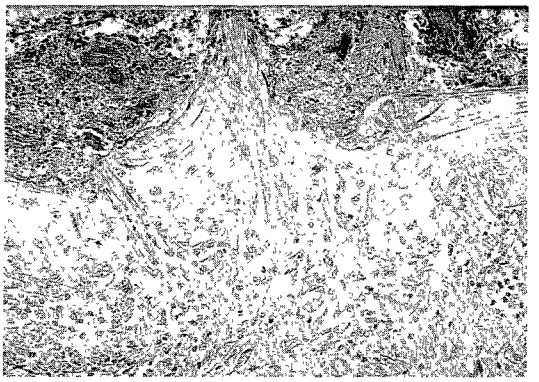

Fig. 4. Perpendicular collagen bundles perforating through the epidermis(H&E, ×200).

fields. An ultrasound study showed bilateral chronic renal parenchymal disease and ascites. And electromyography showed demyelination and axonal degeneration in a nerve conduction study.

A skin biopsy was taken from a crusted papule on her back. The epidermis formed a cup-shaped depression filled with a plug composed of parakeratotic keratinocytes, basophilic debris and degenerated vertical collgen fibers. In the underlying dermis, there was a mild perivascular mononuclear infiltrate(Fig. 3). The perpendicular collagen bundles perforating through the epidermis were seen(Fig. 4). Masson's trichrome stain showed perforation of the epidermis by degenerated collagen. There was no elastic fibers of perforated bundles and parakeratotic plug.

The clinical feature and histologic findings confirmed a diagnosis of acquired reactive perforating collagenosis.

The patient improved with the use of topical steroid and oral administration of antihistamines as diabetic renal insufficiency improved by hemodialysis. But 1 month later, the lesions recurred and were treated with ultraviolet B irradiation twice. It was equipped with ultraviolet B lamps with a maximum at 310 to 315nm. Ultraviolet B dose was 300 and 500mJ/cm2. After the UVB irradiation, itching sensation was slightly relieved. Unfortunately the patient lost to follow up.

Discussion

The perforating diseases constitute a group of disorders characterized by the transepidermal elimination

of some component of the dermis. Transepidermal elimination(TEE) is the characteristic feature in four essential or primary perforating skin disorders : (1) reactive perforating collagenosis(RPC) ; (2) elastosis perforans serpiginosa, characterized by TEE of collagen and of elastic fibers, respectively ; (3) perforating folliculitis ; (4) Kyrle's disease[3], characterized by TEE of keratotic material[4].

There are two types of RPC ; inherited(or primary) and acquired forms. In inherited type of RPC, the first lesions appear early in life on exposed surface after a minor trauma or arthropod bite. Lesions are asymptomatic and less prominent in pruritus. Primary form shows autosomal recessive inheritance. In contrast, the acquired form manifested in adult life usually is accompanied by general and prominent pruritus. And it has been associated with[2] diabetes mellitus[5], chronic renal failure, hemodialysis and lymphoma. Other diseases associated with RPC such as hypothyroidism, posterior subcapsular cataract, congestive heart failure, hepatic disese, juvenile melanoma and AIDS[6] are reported. In 1994, Inacio et al[7] propose the diagnostic criteria for the acquired RPC : (1) histopathologic findings of elimination of necrotic basophilic collagen tissue into a cup-shaped epidermal depression, (2) clinical presentation of umbilicated papules or nodules with a central adherent keratotic plug and (3) onset of skin lesions after the age of 18 years.

The cause and pathogenesis of RPC is unknown. Some authors[8] speculate on a primary(inherited) biochemical defect of collagen, which may lead to TEE in conjunction with additional factors like scratching, UV exposure, toxic metabolites, or altered acid-base equilibrium in renal insufficiency, diabetes mellitus, or both. Others regard TEE of connective tissue components as a secondary event due to inflammatory reactions caused by epidermal trauma(eg, scratching[8][9], insect bite, abrasions, and acne lesions). A genetic predisposition including autosomal recessive mode of inheritance is suggested by familial occurrence. Some families may have an autosomal dominant form. Sporadic cases have been reported usually in children[10]. Incidence of the disease increased during cold weather and diminished during summer. In our case, chronic renal failure and hemodialysis rather than pruritus may lead to RPC because the course is related with those of renal failure by hemodialysis. As many as 10 percents of patients on dialysis[11] develop various perforating disorders. Though often associated with hemodialysis, some cases occurred even before dialysis had been started[2].

Histologically[8] in early lesions, the epidermis appears hyperplastic and markedly spongiotic in the region directly overlying the plug and forms a cup-shaped depression. Underneaths of the epidermis appeared to encircle the plug with a narrow epidermal band. The dermoepidermal junction appeared intact throughout the lesion but was transversed by several vertically oriented collagen bundles. An area of necrobiosis, deeply basophilic collagen are showed in the papillary dermis. The older lesions in which the basophilic collagen has already been largely eliminated through perforations in the epidermis show within the cup-shaped central area of depression on accumulation of parakeratotic keratin, basophilic collagen, and numerous pyknotic nuclei of inflammatory cells. Collagen is present but no elastic fibers are present in the plug. The epidermis at the base of the plug appears atrophic. The number of polymorphonuclear leukocyte in serum is decreased. In 1991, Bernhard et al[8] speculated that accumulation, disintegration, and enzyme release from polymorphonuclear leukocytes may represent important. Lysosomal enzymes may be responsible for opening up the transepidermal route by impaired intercellular keratinocyte cohesion. The basophilic bundles of collagen are stained red with the van Gieson method, green with the Masson-Trichrome method. Elastic tissue stain shows no increase in number of elastic fibers in the dermis and no elastic fibers in the keratotic plug or in the areas of perforation in the epidermis. Our case does not have histopathologically elastic fibers. As seen by electron microscopy, the collagen fibrils appear intact with regular periodicity. Electron microscopy shows a loss of basement membrane adjacent to perforation, although desmosomes are still intact, collagen bundles appear interspersed within

widened intercellular space.

A number of therapeutic approaches have been tried with little success. Avoidance of trauma is essential. The most widely recommended therapies include topical keratolytics such as salicylic acid, topical tretinoin[12) 13)], phototherapy(UVB[13)] or PUVA) or liquid nitrogen cryotherapy. Other treatments which may help include oral isotretinoin, methotrexate[14)], emollient creams, topical steroid under occlusion or intralesional injection and topical 5-fluorouracil, oral erythromycin and tetracycline. Control of the serum phosphorous level is also beneficial[15)]. The lesions may be involuted spontaneously.

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