

Acquired Perforating Dermatoses Associated With End-stage Diabetic Kidney Failure in a Hemodialysis Patient

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Acquired perforating dermatosis (APD) is an uncommon skin disorder seen in majority among patients with chronic kidney disease and also in those with diabetes mellitus. We present the clinicopathological features of APD in a 65-year-old patient with diabetes mellitus and end-stage kidney disease on hemodialysis and review the recent advances in the management of APD, as well as the mechanisms of transepidermal elimination of perforating dermatoses.

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INTRODUCTION

Acquired perforating dermatosis (APD) is an uncommon cutaneous disorder. It is characterized clinically by hyperkeratotic papules and nodules, and histopathologically by transepidermal elimination of various substances such as keratin, collagen, and elastic fibers. The disease arises mainly in adulthood, usually in association with diabetes mellitus or chronic kidney failure. In recent years, however, it has also been reported in patients with various other disorders.¹⁻³ The

literature data on APD are still limited. We present the clinicopathological features of APD in a 65-year-old patient with diabetes mellitus and end-stage kidney disease on hemodialysis.

CASE REPORT

A 65-year-old man of Roma origin presented with severely pruritic (visual analog scale, 7) multiple hyperpigmented light-grey keratotic papules and nodules localized mainly on the extremities, lower back, and shoulders (Figure 1). His body mass



Figure 1. Left, Disseminated dark-reddish papules and nodules with central horny material, localized on the lower trunk and buttock. Right, The concentration of cornified white keratin plugs, dark discoloration, and scratches on the lumbosacral part of the trunk (skin xerosis).

index was 28.26 kg/m². The lesions underwent periods of exacerbations and remissions and had persisted for 8 months prior to presentation. The mucous membranes, scalp, palms, soles and nail plates remained unchanged. Since admission, the patient had not been dermatologically treated. He denied history of any skin diseases and possible injuries. Dermatological family history was negative. Medical history included insulin-independent diabetes mellitus type 2, arterial hypertension, circulatory insufficiency, the New York Heart Association Functional Classification IV, 3 myocardial infarctions (treated with bypass graft), tricuspid valve incompetence, mitral valve repair, cardiac resynchronization therapy-defibrillator implantation, staphylococemia, and cholecystectomy. Due to end-stage renal disease category G5, which was a consequence of diabetes mellitus, the patient was being treated with hemodialysis for 1 year (Kt/V of 1.2). His medications encompassed omeprazole, calcium carbonate carvedilol, salicylic acid, and INN-insulin human.

The laboratory blood tests values (including blood count and serum levels of calcium, chloride, potassium, sodium, aminotransferases, cholesterol, and triglycerides) were within the normal range, with the exception of creatinine (2.24 mg/dL), urea (167.1 mg/dL), fasting glucose (17 mmol/L), phosphate (6.8 mg/dL), and d-dimers (1094.6 ng/mL), which were elevated.

For the confirmation of suspected APD diagnosis, 3 skin biopsies were taken for histological examination (Figure 2). The observed histological alterations resembled Kyrle disease-like lesions. The patient died before any dermatologic treatment was administered.

DISCUSSION

Acquired perforating dermatosis is an uncommon pruritic skin disease; however, its frequency significantly increases among patients with end-stage kidney failure. It occurs in up to 10% of patients undergoing hemodialysis. The huge majority of them are also diabetic.² Saray and colleagues¹ found that approximately 70% of APD cases were associated with chronic kidney failure and half of them also with diabetes mellitus. The association with chronic kidney failure is more common when the patients undergo hemodialysis,

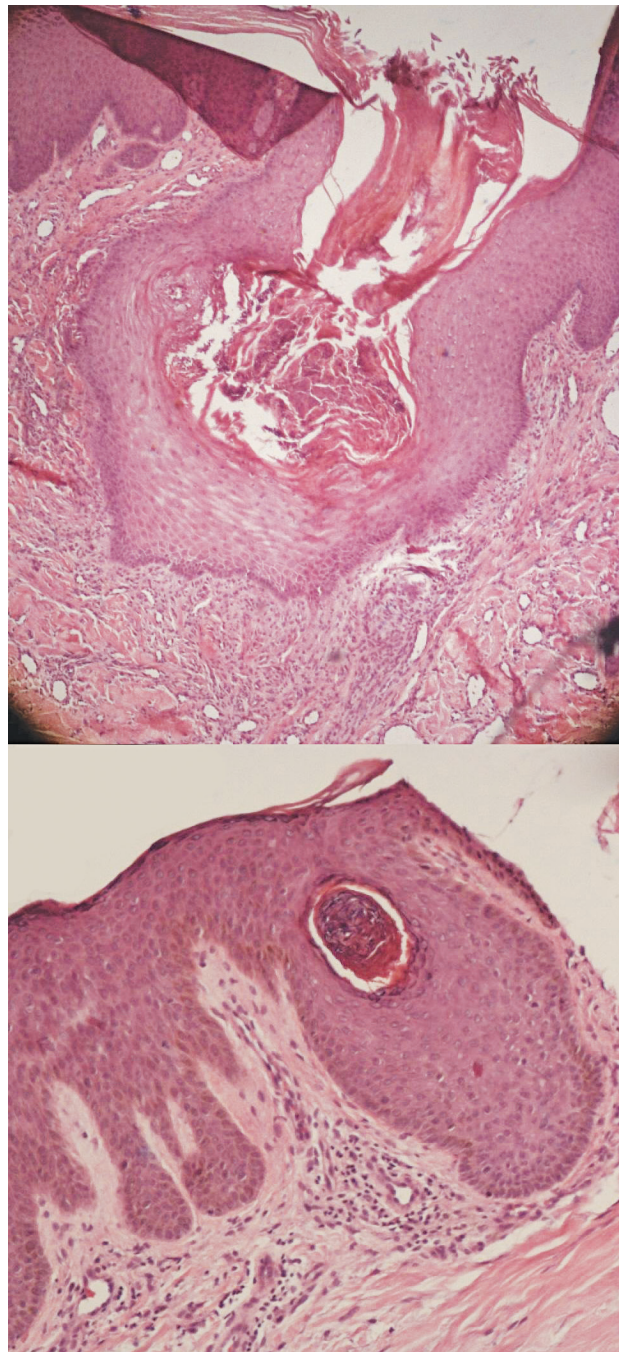


Figure 2. Top, Pathologic examination shows central cup-shaped invagination of the epidermis consisting of keratin plug admixed with parakeratotic basophilic cellular debris. The inflammatory infiltration of granulocytes is observed in the dermis. Orcein staining for elastic fibers was negative. Bottom, Acanthosis and formation of keratin plug which has pushed down the lower layer of hyperplastic epidermis (hematoxylin-eosin, × 40).

but there is no relationship with the underlying kidney problem.⁴

To date, APD is a disease of unknown etiology. It is suggested that the disease may be precipitated

Histopathological Features of Acquired Perforating Dermatoses

- Cornified keratin plugs in the recesses of the hair follicle or skin
- Horny plugs presented as parakeratosis and deposits basophils whose area may be accompanied by thinning of the epidermis
- Local dyskeratosis, reactive hyperplasia of the epidermis
- Chronic purulent inflammation in the dermis
- Infiltrates of lymphocytes of moderate intensity in the upper layers of the dermis
- Negative staining for elastic fibers

by dermal microdeposits of substances such as calcium salts, which are possibly a byproduct of the chronic kidney failure. However, it has also been reported in patients with various other disorders, and no link with diabetes mellitus or chronic kidney failure was revealed.¹ Noteworthy, it is known that kidney transplantation clears APD. Interestingly, APD may also develop after kidney transplantation; there are 3 cases described in medical literature up to date.

Some kind of skin injury may also be of relevance.¹ Microangiopathy has also been considered to be an additional and important predisposing factor for APD in diabetic patients who scratch their pruritic skin. It was proposed that trauma from scratching may cause dermal necrosis due to poor blood supply that results from vasculopathy, with necrotic dermal material then being extruded through the epidermis.^{1,2}

An infectious background of the disease, including hepatitis C as a trigger factor,¹ has been also reported. Furthermore, positive response for antibiotics suggests a possible bacterial background.⁵ Theory of isotopic response could confirm cases of APD at the places where herpes zoster was present.⁶ Interestingly, APD were also detected in eight individuals in whom neither a systemic disease nor any other dermatological problem was observed.¹

The mainstay of APD diagnosis is clinical and histological manifestation. Dispersed widespread pruritic papules and nodules filled with central horny plugs are usually located on trunk and outer parts of extremities, less often on head.^{1,7}

As the lesions within the same patient may differ by the dermal component that is being transepidermally extruded, and the clinical and histological presentation of APD may vary vastly from patient to patient, it has been suggested to conduct multiple biopsies to confirm the diagnosis (Table).³ The differential diagnosis of APD must take into account, inter alia Flegel disease, nodular prurigo, viral warts, multiple keratoacanthoma or

even verrucous manifestations of lichen planus, or psoriasis.^{7,8}

The most common APD treatment seems to be potent topical steroids applied concomitantly with retinoids.² The APD management involves also itch-reducing drugs, like sedative antihistamins.³ Systemic therapy includes retinoids, glucocorticoids, and phototherapy.⁹ Narrow-band ultraviolet B phototherapy could be especially recommended because of its effectiveness in the relief of concomitant uremic pruritus intensity.³ Anecdotal reports concern the effectiveness of treatment with allopurinol and antibiotics.^{5,10} No definite preventive measures have been described up to date.

CONFLICT OF INTEREST

None declared.

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