Single Case

Acquired Perforating Disorder: A Case with Multiple Underlying Diseases

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Keywords
Acquired perforating disorder · Diabetes mellitus · Chronic kidney disease · Hepatic insufficiency

Abstract
A 51-year-old man came to the dermatology and venereology outpatient clinic with the complaint of multiple itchy lumps on his body. The patient had a previous history of hemodialysis due to end-stage renal disease. He also had a previous history of hepatitis B, an abnormal liver function test, and high blood sugar. Histopathological examination with Masson’s trichrome revealed that the patient had extrusion collagen in the epidermis which had invagination. Acquired perforating disorder is frequently misdiagnosed as other skin diseases, thus this condition is underdiagnosed. In addition, underlying diseases frequently associated with acquired perforating collagenosis are chronic kidney disease, hepatic insufficiency, and diabetes mellitus. The patient in this case had all 3 conditions. Further investigation is needed to determine whether acquired perforating disorder with multiple underlying diseases will have similar severity with single underlying disease.

Introduction
Acquired perforating disorders (APD) consist of several conditions which have certain features of the transepidermal elimination of connective tissue components, including acquired perforating collagenosis (APC). Cutaneous manifestation of APC involves erythematous or
hyperpigmented papules with a central crust or keratotic plugs which are frequently observed in the patients with chronic kidney disease, diabetes mellitus, hepatic insufficiency, and hemodialysis [1].

APD is a rare disease. In Dr. Sardjito General Hospital, Yogyakarta, Indonesia during 2016–2020, only 14 cases of this group of diseases were reported. Here we described a case of APC with confirmation from histopathologic findings.

**Case Report/Case Presentation**

A 51-year-old online taxi driver complained of multiple itchy skin-colored papules/nodules. Six months before admission, he felt pruritus, which initially began on his arms. The pruritic symptoms worsen during the night and in warm weather. The patient came to a primary health care center and was given an oral antihistamine of 10 mg/day. Four months before admission, the patient complained that the itchy lumps had spread all over his body. The patient scratched the itchy lumps until bleeding was observed. The patient then went to a dermatology and venereology specialist in his town and was diagnosed with allergic contact dermatitis. Once again, he was given an oral antihistamine of 10 mg/day and an ointment. On the day of admission, the patient felt that his condition was not getting any better and was referred to the dermatology and venereology outpatient clinic of Dr. Sardjito General Hospital.

The patient mentioned no previous history of this pruritic symptom before. For the underlying disease of the patient, he said that he had hepatitis B since 30 years ago and never received any treatment. The patient had kidney stones in both of his kidneys; thus, the patient had to undergo hemodialysis twice per week for the last 6 months until the stones dissolved. The patient had a history of high blood glucose but never received any treatment as well. The patient also had hypertension and occasionally took amlodipine and valsartan.

Physical examination revealed multiple erythematous papules, some of which with erosion, which were observed on his face, especially the forehead, lateral side of his left and right cheeks, chest, and back. Follicular erythematous papules, some of which also with erosion, were observed on the extensor parts of both of his lower arms and lower extremities, back of his hands, and thighs (Fig. 1a, b).

Laboratory results showed that the patient had eosinophilia (14%), increased blood glucose (169 mg/dL), increased serum BUN (28 mg/dL), creatinine (1.58 mg/dL), and uric acid (9.1 mg/dL), increased aspartate transaminase (279 U/L), alanine aminotransferase (446 U/L), and reactive hepatitis B surface antigen.

Skin biopsy was taken from the lesion on his left lower arm. Histopathological results revealed basket weave and lamellar types of orthokeratosis, acanthosis, irregular elongation of the rete ridge, and invagination with keratotic plugs, collagen, neutrophils, and lymphocytes were found in the epidermis. Dilatation of blood vessels with infiltrates of eosinophils and lymphocytes, especially in the upper dermis, peri adnexa, and perivascular, were found in the dermis. Masson’s trichrome staining results showed that collagen was observed in the invagination of the epidermis (Fig. 1c, d).

**Discussion/Conclusions**

APD is a rare skin disease. Only 10% of patients with associated underlying diseases suffered from this condition [2]. Moreover, the incidence of this disease is low because APD is frequently misdiagnosed as other skin problems [3]. For this case, the differential diagnosis was
nodular prurigo, which is a skin disorder with chronic inflammation. This condition frequently occurs in patients in their 20s–60s and the predilection sites are in the extensor parts of the extremities. Multiple pruritic nodules with the size of 0.5–3 cm were observed in this disease. It was mentioned that acquired perforating dermatosis was one of the nodular prurigo types [4]. However, this differential diagnosis was excluded since collagen and keratotic plugs were not observed in the epidermis of this condition. Moreover, nodular prurigo is not associated with any underlying systemic disorder [1].

Another differential diagnosis for this case was folliculitis. Initially, this patient was treated as folliculitis since follicular erythematous papules were observed. However, during follow-up, after treatment for folliculitis was completed for 2 weeks and the patient did not feel any improvement, it was suggested that a biopsy was needed to be done for confirmation. From the biopsy, this differential diagnosis was excluded.

Histopathological findings revealed that the type of APD in this patient was APC, confirmed by the presence of collagen in the invagination of the epidermis. Typically, APC is associated with renal failure [5], hepatic insufficiency [6], hemodialysis [2], and diabetes mellitus [7]. This patient had multiple underlying diseases that are related to this type of APD. The patient had a history of regular hemodialysis for the last 6 months, an increased level of liver function test, a history of hepatitis B, and history of untreated high blood glucose. The patient had a previous history of hepatitis B for 30 years and had received intermittent hemodialysis 1.5 years before admission with uncontrolled high blood sugar. Diabetic nephropathy is the most

Fig. 1. APC of a 51-year-old man. Multiple erythematous papules with erosion was observed (a, b). Hematoxylin-eosin (c) and Masson’s trichrome staining (d) showed collagen components in the epidermal invagination.
frequent cause of chronic kidney disease in APD. The patient in this case had a history of hemodialysis due to kidney stones in both sides of the kidneys and discontinued hemodialysis after stones were removed. However, during the blood examination during the visit in our dermatology and venereology clinic, his renal function test results were still abnormal. Since the patient had a history of untreated high blood glucose, it was possible that the patient was also suffering from diabetic nephropathy. Abnormalities in his liver function test results were possibly associated with the history of untreated hepatitis B. Previous studies reported that the pathogenesis of APD is related to diabetic angiopathy/vasculopathy and deposition of silicon and salts within the dermis of dialysis patients [7–9]. Further investigation is needed to determine whether APD with multiple underlying diseases will have similar severity in patients with single underlying disease.

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**Statement of Ethics**

This retrospective review of patient data did not require ethical approval in accordance with local/national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

**Conflict of Interest Statement**

The authors have no conflicts of interest to declare.

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**Author Contributions**

Agnes Rosarina Prita Sari and Monika Puspitasari: conception and design of the study, interpretation, and writing and drafting the paper. Hardyanto Soebono and Niken Trisnowati: conception and design of the study; acquisition, analysis, and interpretation of data; and drafting the work or revising it critically for important intellectual content. All authors: final approval of version to be published and agreement to be accountable for all aspects of the work.

**Data Availability Statement**

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.
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