CASE REPORT

Dowling-Degos Disease with Follicular Involvement Associated with Hidradenitis Suppurativa: A Manifestation of Follicular Occlusion Phenomenon?

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Abstract

A 30-year-old female patient presented with progressive reticulate pigmentation of the neck, upper chest, back, cubital fossa, and axillae since the age of 15 years. The patient also complained of recurrent multiple tender nodules and plaques associated with sinuses and pus discharge over the axillae, groins, and buttocks which healed with scarring for 4 years. There were multiple pitted scars and hyperpigmented macules over the perioral area and cheeks. Scattered comedo-like lesions were present over the upper back, chest, cubital fossae, and buttocks. Histopathology from the pigmented lesion revealed thinning of the suprapapillary epidermis, epidermal hyperplasia with finger-like elongation of the rete ridges, and increased pigmentation of their lower part, suggestive of Dowling-Degos disease (DDD). Biopsy section from comedonal lesion showed dilated infundibulum and antler-like rete ridges suggestive of follicular DDD. We report a case of DDD with follicular involvement and hidradenitis suppurativa (HS) which is a rare association and can be explained on the basis of single underlying defect in follicular epithelial proliferation. DDD-HS has been shown to result from mutations in PSENEN, encoding a critical component of the γ-secretase complex.

Key Words: Dowling–Degos disease, follicular, hidradenitis suppurativa

Introduction

Dowling-Degos disease (DDD) (Dark Dot Disease, reticulated-pigmented anomaly of the flexures) is a rare pigmentary genodermatosis characterized by symmetrical reticulate pigmentation of the flexures with prominent comedo-like lesions and pitted acneiform scars.[1-3] Hidradenitis suppurativa (HS) is a chronically relapsing inflammatory disease that is characterized by recurrent draining sinuses and abscesses occurring predominantly in the apocrine gland-bearing areas of the body, most commonly axillary, inguinal, and anogenital regions.[4] Fenske et al. speculated that a single underlying defect in follicular epithelial proliferation, characterized by variable expressivity, accounts for the coexistence of DDD, HS, and multiple keratoacanthomas.[5]

Case Report

A 30-year-old female presented with progressive pigmentation of the neck, upper chest, back, cubital fossa, and axillae since the age of 15 years. The patient also complained of recurrent multiple painful, tender nodular lesions with discharge of pus over the axillae, groins, mammary areas, and buttocks for 4 years, which healed with scarring after taking treatment. Based on the clinical presentation of nodulocystic acne, HS was considered as differential diagnosis. A history of similar complaints of reticulate pigmentation was present in her mother and younger brother. On examination, there were multiple, symmetrical, dark-brown-pigmented macules in reticular pattern and pitted scars over the axillae, groins, cubital fossae, sides of the neck, upper chest, and back [Figure 1a-d]. There were multiple pitted acneiform scars and hyperpigmented macules in the perioral area and cheeks [Figure 2a, b]. Scattered comedo-like lesions were distributed over the upper back, chest, axillae and cubital fossae, and buttocks. Multiple deep-seated nodules, cystic swellings with atrophic scarring were present over the axillae, groins, trunk, and buttocks [Figure 3a-d]. Reticulate...
pigmentation was also found over the buccal mucosa and palate [Figure 2c and d]. Other mucosae, palms, soles, hair, and nails were normal. Routine hematological investigations were normal. Histopathology from pigmented lesion over the axilla revealed long, narrow, branched rete ridges (“antler-like” appearance), dilated follicles with cysts, and increased basal melanin pigmentation which was suggestive of DDD [Figure 4].

Biopsy taken from comedonal lesion over the back revealed dilated follicular infundibulum filled with keratin and sebum debris and antler-like rete ridges and increased basal melanin pigmentation suggestive of follicular DDD [Figure 5]. The diagnosis of HS was made on the basis of the presence of recurrent nodular lesions with pus discharge, healing with scarring present over the axillae, groins, mammary areas, back, perianal areas, and buttocks, with chronic course and frequent relapses. Based on the history, clinical features, and histopathological examination, a diagnosis of follicular DDD with HS was made.
Discussion

DDD was first described by Dowling and Freudenthal in 1938,[5] then by Degos and Ossipowski in 1954.[6] DDD runs in families and has an autosomal-dominant mode of transmission with female preponderance. The etiopathogenesis of DDD involves mutations that have been shown to produce haploinsufficiency of the keratin 5 gene (KRT5) on chromosome 12q.[7] Keratin 5 is an essential element of the basal keratinocyte cytoskeleton, together with keratin 14. KRT 5 dysfunction leads to alterations in organelle transport and in epidermal differentiation. From a study in 2013, Li et al. identified a mutation in chromosome 20 in a family with generalized DDD. The heterozygous deletion of gene POFUT1 leads to the decreased expression of keratin 5 and other proteins (Notch1-2, Hes1) in keratinocytes.[8] It is characterized clinically by brownish, hyperpigmented macules in reticular pattern over the skin of flexures (submammary, axillae, and groins), cervical region, trunk, and anterior surface of the thighs and upper arms. The presence of pinpoint papules with keratin plugs simulating comedones is also common in the palmar, axillary, cervical, perioral, and gluteal regions. HS is a chronically relapsing inflammatory disease which is characterized by recurrent draining sinuses and abscesses occurring predominantly in the skin folds considered to occur more frequently in females than in males. HS occurs in the age range of 11–50 years, with an average age of 23 years. Clinically, it is characterized by painful, tender erythematous papules and nodules, abscesses that burst open leading to sinus formation. A deep-seated lesion heals with scarring. HS has been described to coexist with pigmentary disorders such as DDD and reticulate acropigmentation of Kitamura; other cutaneous conditions such as squamous cell carcinoma, epidermal cysts, and keratoacanthoma; and neutrophilic disorders and rheumatological diseases such as Crohn’s disease, arthritis.[1,3-9,11] Etiopathogenic factor that has been observed is a defect of epithelial proliferation in the external sheath, leading to follicular occlusion, described as a possible common origin for all these disorders.[1] Fenske et al. speculated that a single underlying defect in follicular epithelial proliferation, characterized by variable expressivity, accounts for the coexistence of these clinically distinct disorders of follicular derivation.[2] Recently, it has been found that PSENEN mutations are associated with HS with DDD and suggesting a role for Notch signaling in the pathogenesis of this disorder as decreased Notch activity is associated with mutations in POFUT1.[9,10,11] Pigmentary disorders such as DDD and Kitamura disease have been reported with HS. There is a paucity of literature describing the association of HS and DDD [Table 1]. DDD and HS share important clinical features including onset during puberty, flexural location, and hair follicle involvement.

Table 1: Literature describing the association of hidradenitis suppurativa and Dowling-Degos disease

| Case report | Age/sex | Associations |
|-------------|---------|--------------|
| Weber et al., 1990[12] | - | Dowling-Degos disease, hidradenitis suppurativa, squamous cell carcinoma |
| Fenske et al., 1991[2] | 38/female | Dowling-Degos disease, hidradenitis suppurativa, and multiple keratoacanthomas |
| Balus et al., 1993[13] | - | Dowling-Degos disease, hidradenitis suppurativa |
| Bedlow and Mortimer, 1996[14] | 39/female | Dowling-Degos disease, hidradenitis suppurativa |
| Li et al., 1997[1] | 68/male | Hidradenitis suppurativa, Dowling-Degos disease and perianal squamous cell carcinoma |
| Loo et al., 2004[1] | 49/female | Hidradenitis suppurativa, Dowling-Degos and multiple epidermal cysts |
| Dixit et al., 2006[15] | 48/female | Dowling-Degos disease, hidradenitis suppurativa and arthritis |
| Choudhary et al., 2013[16] | 44/female | Dowling-Degos disease, hidradenitis suppurativa |
| Arjona-Aguilera et al., 2015[17] | 43/female | Dowling-Degos disease, hidradenitis suppurativa |
| Pavlovsky et al., 2018[9] | 3F in second-third decades | Dowling-Degos disease, hidradenitis suppurativa |
| Gonzalez villanueva et al., 2018[18] | 33/female | Dowling-Degos disease, hidradenitis suppurativa |
| Our case report | 30/female | Follicular type Dowling-Degos disease, hidradenitis suppurativa |
We report a case of association of follicular type of DDD with HS because of its rarity.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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