Atlas of Dermatology

Inflammatory, Infectious and Tumoral Skin Diseases

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Inflammatory Skin Diseases

Chapter 1
Papulosquamous and Eczematous Dermatoses: Dermatitis

In this group of dermatological diseases are all the entities that present clinically as papules or plaques in association with erythema, desquamation, and lichenification. Among the most frequently cited diseases are dermatitis or eczema, psoriasis, lichen planus, and lichenoid reactions. The most common dermatitis- or eczema-related conditions are documented in this chapter:

A. Contact dermatitis.
   (i) Allergic contact dermatitis.
   (ii) Irritant contact dermatitis.
B. Atopic dermatitis.
C. Asteatotic dermatitis.
D. Nummular dermatitis.
E. Gravitational dermatitis.
F. Seborrheic dermatitis.
G. Vesicular palmoplantar dermatitis.
   (i) Pompholyx.
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H. Disseminated eczema (autosensitization dermatitis).
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J. Infective dermatitis.
K. Lichen simplex chronicus.
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M. Juvenile plantar dermatosis.

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Contact Dermatitis

- *Definition*: Contact dermatitis (also known as contact eczema) represents the most frequent occupational dermatosis in industrialized countries. It is characterized as a disease of chronic fluctuating course with relapses and remissions [1].
- *Pathogenesis*: There are two presentations of contact dermatitis depending on the pathophysiological mechanism involved. Reactions can be immunologically mediated (allergic contact dermatitis) or mediated via direct damage via the exposed substance to the skin (irritant contact dermatitis) [1]. *Allergic contact dermatitis* occurs in response to a delayed type IV hypersensitivity reaction to external chemicals (allergens) (Figs. 1.1, 1.2, and 1.3). The inflammatory process occurs secondary to a previous sensitization phase that can take 10 to 14 days. Subsequent re-exposure to the allergen after this phase results in more rapid and severe disease activity [2]. *Irritant contact dermatitis* is a nonspecific and immunologically mediated localized reaction secondary to external physical, mechanical, or chemical agents that cause direct damage to the keratinocyte and its components [2] (Fig. 1.4).
- *Clinical presentation*: In acute injuries, it is common to find papules, vesicles, blisters, edema, and erythema (Figs. 1.5, 1.6, and 1.7). In subacute lesions, papules that converge forming plaques can be observed, accompanied by scales as well as eroded areas secondary to the rupture of vesicles and blisters, serous crusts, and exudation (Figs. 1.8 and 1.9). Lichenification and hyperkeratosis are typical of chronic eczemas whereby the inflammatory process leads to epidermal hyperplasia in response to local damage (Figs. 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, and 1.16).
- *Diagnosis*: The diagnosis of contact dermatitis is based on patient history, physical examination, and response to corticosteroids and, in some cases, is supported

Fig. 1.1 Allergic contact dermatitis: Desquamative erythematous plaque with well-defined regular edges in contact with a metal handle (allergen) on the back of the right wrist

Fig. 1.2 Allergic contact dermatitis: Erythematous plaque with fine superficial scaling on the left wrist and in contact with a metal handle (allergen)

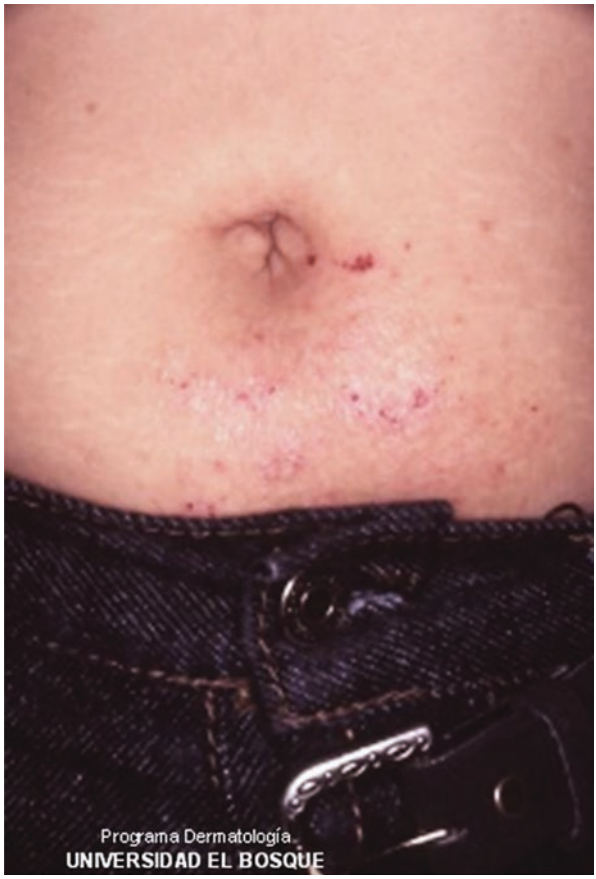

Fig. 1.3 Allergic contact dermatitis: In the suprapubic region, a scaly erythematous plaque is observed with some excoriated areas, secondary to contact with a metal belt (allergen)

Fig. 1.4 Erythematous irritative dermatitis Sevestre-Jacquet's posterosive syphilitic dermatitis: In the perianal region of an older infant with a history of anal sphincter failure (with chronic exposure to irritants from fecal matter), erythematous plaques and nodules with well-defined regular edges are observed

Fig. 1.5 Acute contact dermatitis: Multiple vesicles and blisters with irregular borders are observed in the distal third of the forearm

by patch tests to confirm and identify the specific allergenic agent. Skin biopsy in eczema is indicated to rule out diseases such as psoriasis, lichen planus, or chronic eczema which can often present similarly to the initial stages of cutaneous T-cell lymphoma (mycosis fungoides). The histopathology findings of allergic contact dermatitis compared to irritant contact dermatitis reveal increased spongiosis in the allergic variant, while in the contact variant, the histopathological findings will depend on the chemical composition and concentration of the irritant, the type and time of exposure, and the severity of the response at the time the sample is taken [3].

- The histopathological and clinical characteristics of contact dermatitis vary depending on whether the disease is acute or chronic. In the *acute state*, spongiosis (intercellular edema that generates rupture of the cell-to-cell junction bridges) is observed along with the consequent formation of epidermal vesicles. There is

Fig. 1.6 Acute contact dermatitis: Tense blisters on an erythematous macular base are observed on the dorsums of the hands in a patient with a history of exposure to a chemical

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Fig. 1.9 Allergic contact dermatitis in the subacute phase: On the forehead and extending to the eyelids, multiple erythematous papules are observed that coalesce, forming a large plaque with serous crusting on its surface

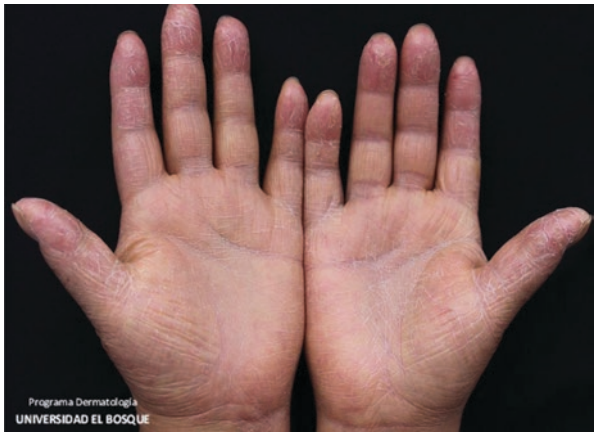

Fig. 1.10 Chronic contact dermatitis: Patient with erythematosus and lichenified plaques that compromise the entire surface of the palms. Note the presence of fissures in the fingertips

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Fig. 1.16 Chronic allergic contact dermatitis: A large, erythematous, scaly, and lichenified plaque with well-defined irregular edges is observed on the dorsum of the left foot

variable infiltration of the epidermis by lymphocytes with an increase in epidermal mitotic activity leading to acanthosis. In the *subacute phase* of the disease, a decrease in spongiosis and vesiculation is observed with an increase in acanthosis and the formation of a parakeratotic corneal layer that contains coagulated plasma and pyknotic nuclei of inflammatory cells. In *chronic eczema*, hyperkeratosis is gradually replaced by parakeratosis with a predominance of acanthosis and little or no spongiosis. The epidermal infiltrate is less evident, and the dermal changes are more prominent with an elongation of the dermal papilla that, added to the epidermal changes, are findings typical of lichenification [4].

- The diagnosis of allergic contact dermatitis is confirmed by the patch test in which the individual is exposed to specific concentrations of particular antigens in order to induce inflammation at the site of application in susceptible individuals. These tests are indicated in patients with allergic contact dermatitis, especially with therapeutic failure; chronic hand or foot eczema; persistent or

intermittent eczema of the face, eyelids, and perineum; and in some cases gravitational eczema [5].

- *Differential diagnosis*: The most important differential diagnosis of irritant contact dermatitis is allergic contact dermatitis. Similarly, the differential diagnosis also depends on the location of the lesions. On hands and plantar surfaces of the feet, plantar psoriasis should be ruled out, while in photo-exposed sites, a photocontact dermatitis should be ruled out. In some cases, it is important to exclude atopic dermatitis or seborrheic dermatitis on the face. Dermatophytosis, fixed drug eruption, and phytophotodermatitis are also relevant differential diagnoses [6].

Atopic Dermatitis

- *Definition*: Atopic dermatitis is a chronic and inflammatory skin disease caused by an alteration in the barrier function of the epidermis that generates dry skin and IgE-mediated sensitization to different allergens [7].
- *Pathogenesis*: Atopic dermatitis is an inflammatory condition of the skin secondary to the defect of essential proteins involved in the structural and functional integrity of the stratum corneum [8]. The genetically derived epidermal barrier dysfunction combined with other environmental factors (e.g., *Staphylococcus aureu*s enterotoxin and topical allergens) can trigger an immune response in susceptible infants and adults [7, 8].
- *Clinical presentation*: Atopic dermatitis affects all population groups with a predominance in children. The clinical presentation of the disease varies according to the age of the patient as determined by its distribution and morphology of lesions in infants, children, adolescents, and adults [8, 9]. *Infant atopic dermatitis* presents as exudative and erythematous plaques that can be accompanied by meliceric crusts secondary to serous secretion or in some cases bacterial superinfection [6]. Lesions are mainly located on the face and cheeks (respecting the nasolabial folds), the extensor areas of the extremities, and, to a lesser extent, the trunk (Figs. 1.17 and 1.18). In this age group, the diaper area is usually preserved [9]. From 2 years of age or *childhood atopic dermatitis*, atopic dermatitis presents with polymorphic lesions with involvement mainly on the flexor areas and folds that can extend to further include the trunk and extremities (Figs. 1.19 and 1.20). *Atopic dermatitis* in adolescents and adults presents as lichenified and excoriated plaques in flexor areas, wrists, ankles, and eyelids [9] (Fig. 1.21). Some adults with atopic dermatitis may develop allergic contact dermatitis on the hands or additional sites including the retroauricular region, the neck, and the chest. Any presentation of atopic dermatitis can manifest as erythema associated with desquamation of more than 90% of the body surface (erythroderma), where a thorough differential diagnosis must be made to rule out other causes of erythroderma and establish immediate treatment [8] (Figs. 1.22, 1.23, and 1.24).

Fig. 1.17 Atopic dermatitis of the infant: Erythematous plaques covered with serous crusts in the malar region and forehead without compromise of the nasogenian sulcus

  - *Besnier prurigo*: Chronic lesions due to atopic dermatitis occur with lichenification, in some cases producing infiltrated plaques and nodules that resemble nodular prurigo. The association of prurigo with atopic dermatitis is called Besnier prurigo or atopic prurigo [10] (Fig. 1.25).

- *Diagnosis*: There are no specific laboratory or histopathology findings for the diagnosis of atopic dermatitis. Different diagnostic criteria have been proposed, such as those of Hanifin and Rajka in 1980, with difficulty for clinical validity due to the low specificity of some criteria. Until 2003, the American Academy of Dermatology proposed different essential characteristics to make the diagnosis such as the presence of itching associated with chronic and recurrent eczema that affects typical areas according to the affected age group. The above added to important characteristics at the time of diagnosis such as early age of onset of disease, personal or family history of atopy, IgE hyperreactivity, and associated xerosis are all important features aiding the diagnosis of atopic dermatitis [11].
- *Differential diagnosis*: The main entities to rule out are scabies, seborrheic dermatitis (especially in infants), contact dermatitis (allergic or irritative), ichthyosis, psoriasis, cutaneous T-cell lymphoma, photosensitivity dermatitis, and immunodeficiency diseases, among others [10].

Fig. 1.18 Atopic dermatitis: A 2-year-old patient with erythematous exudative plaques and serous crusts in the bilateral malar region. Note the presence of the Dennie-Morgan infraorbital double eyelid fold, a clinical sign frequently associated with atopic dermatitis

Fig. 1.19 Childhood atopic dermatitis: A 5-year-old patient with lichenified excoriated erythematous plaques in bilateral popliteal fossae

Fig. 1.20 Childhood atopic dermatitis: Multiple erythematous papules that coalesce to form a large excoriated plaque in the cubital fossa

Asteatotic Dermatitis

- *Definition*: Asteatotic dermatitis or eczema craquelé is a special variant of irritant dermatitis present in older adult patients or in patients using oral retinoids [12].
- *Pathogenesis*: Although the pathogenesis is not entirely elucidated, it is suggested that the alteration of skin lipids and a decrease in the quantity of the natural moisturizing factor from the keratohyalin granules are triggers of the disease. In the case of the elderly, this dermatitis is triggered by very frequent baths associated with the use of detergent soaps or passing prolonged periods in rooms with high temperatures and low humidity [12, 13]. In young adults, it can be related to oral retinoid intake and rarely associated with endocrinopathies such as hypothyroidism or Sjögren's syndrome [11, 12].

Fig. 1.21 Adult atopic dermatitis: Erythematous plaques with fine flaking that involve the eyelids, perioral region, and neck

- *Clinical presentation*: Xeroderma and ichthyosiform plaques present on the skin that are prone to exacerbation by repetitive and frequent baths at low temperatures with detergent [14] (Figs. 1.26 and 1.27). The plaques are pruritic in nature and typically involve the legs, arms, and hands, often with relapses in cold climates [11].
- *Diagnosis*: The diagnosis is clinical, and in relatively few cases, a skin biopsy is necessary. The classically observed histopathological characteristics are those of subacute eczema with a variable dermal infiltrate [11].
- *Differential diagnosis*: Irritant or allergic contact dermatitis, nummular dermatitis, gravitational dermatitis, or ichthyosis may have similar characteristics with eczema craquelé [12].

Fig. 1.22 Erythroderma due to atopic dermatitis: Adolescent patient with a history of difficult-to-manage atopic dermatitis with the presence of erythema and scaling of more than 90% of the total body surface

Fig. 1.23 Erythroderma due to atopic dermatitis: Adult patient with erythema and scaling of more than 90% of the total body surface. The patient has a history of atopy and asthma since childhood

Fig. 1.24 Erythroderma due to atopic dermatitis: On the back of a young adult, erythema and scaling are observed with few areas of healthy skin

Fig. 1.25 Besnier prurigo: A 10-year-old chronic atopic dermatitis patient with multiple lichenified and excoriated erythematous-violaceous papules and plaques on the trunk and extremities

Nummular Dermatitis

- *Definition*: Nummular dermatitis, also called discoid eczema or microbial eczema, is characterized by its presentation of oval or circular eczematous plaques with a well-defined and regular border, unlike other types of eczema [15].
- *Pathogenesis*: Its etiology is unknown, and for some authors, it is a form of endogenous primary eczema with particular characteristics [11]. It has been

Fig. 1.26 Asteatotic dermatitis: Older adult with erythematous and cracked plaques that involve the anterior aspect of the legs

Fig. 1.27 Eczema craquelé: Ichthyosiform plaques with irregular edges in the middle third of the right leg

related in some cases to bacterial superinfection or contact sensitization. Similarly, it can be associated with xerosis and venous hypertension [15].

- *Clinical presentation*: Dermatologic examination reveals oval or coin-sized plaques (hence the nummular name) covered by serous or meliceric crusts (Fig. 1.28). The most frequently affected sites are the legs in men and the forearms and back of hands in women [16] (Fig. 1.29).
- *Diagnosis*: Based on clinical findings. Histopathology shows subacute dermatitis indistinguishable from other forms of eczema, accompanied by spongiotic vesicles and a lymphohistiocytic infiltrate in the superficial dermis [14] (Figs. 1.30, 1.31, 1.32, 1.33, and 1.34).
- *Differential diagnosis*: Nummular eczema can be difficult to distinguish from other entities that present with scaly plaques that are sometimes oval, such as superficial dermatophytosis, contact dermatitis, psoriasis, the initial presentation of a mycosis fungoides, impetigo, and benign familial pemphigus [17].