Chapter 19

Disorders of the Skin Appendages

This chapter discusses disorders of the skin appendages: sweat glands, sebaceous glands, hair follicles and nails. When these are affected by intrinsic or extrinsic factors, cosmetic appearance and the ability to regulate the body temperature are affected. The diseases whose main lesions occur in the skin appendages are introduced in this chapter (see Chapter 1 for the functions of skin appendages).

A. Disorders of the sweat glands

1. Miliaria

Synonym: Sweat retention syndrome

Outline

- Commonly called heat rash, it is caused by obstruction to the eccrine sweat ducts.
- Skin care is the main treatment.

Clinical features, Classification

Miliaria is classified by the location of the obstructed sweat ducts into miliaria crystallina, miliaria rubra and miliaria profunda (Fig. 19.1).

1. Miliaria crystallina

The sweat ducts are obstructed in or directly under the horny cell layer, producing superficial transparent vesicles. Flushing is
not present. The vesicles soon dry and become thin, white scales. They heal in one to several days without itching or inflammation. They commonly occur on the face of infants; however, they may appear accompanying fever in adults.

2. Miliaria rubra

It frequently occurs in an environment with high temperature and humidity, or in infants, the obese and persons with hidrosis (Fig. 19.2). Inflammation occurs from obstruction of the sweat ducts in the granular cell layer region, and rose pink papules of 1 mm to 2 mm in diameter are produced. It is accompanied by flushing and itching. The trunk, extensor surfaces of the extremities, neck region and axillary fossae are most commonly affected. It often becomes eczematous (miliaria eczematosa) or pustular (miliaria pustulosa).

3. Miliaria profunda

The sweat ducts are destroyed at the dermo-epidermal junction. Flat-surfaced, white papules without itching occur secondarily after miliaria rubra.

**Pathogenesis**

The pathogenesis of miliaria is poorly understood. It is thought that the sweat ducts are obstructed by eccrine perspiration, affecting the sweat flow. Retained sweat leaks into the peripheral tissue of the sweat ducts, causing eruptions. Miliaria is easily caused when hyperhidrosis is present from physical exercise in a hot, humid environment. It tends to occur in those who have a febrile disease or who wear dressings, casts, medical tape, or clothing that does not breathe.

**Treatment**

High temperature and humidity should be avoided. Careful washing of the body is necessary. When the eruptions are eczematous, the treatments are the same as those for eczema. Secondary infections should be carefully avoided.

2. Pompholyx

**Synonym:** Dyshidrosis

Pompholyx is a form of eczema of the palms and soles in which edema fluid accumulates to form visible vesicles or bullae. Small blisters 1 mm to 5 mm in diameter occur multiply on the palms and soles. The contents of the blister disappear in a few days, resulting in scaling (Fig. 19.3). The blisters may become eczematous and itchy in some cases; the condition is called dyshidrotic eczema (Fig. 19.4).

Previously, pompholyx was thought to be a phenomenon caused by sweat retention, because it most frequently occurs during the summer, and hidrosis accompanies many cases. Nevertheless, the pathology is subcutaneous blistering accompanied by epidermal spongiosis, which is not always associated with sweat
ducts or sweat glands. Further, the blister contents differ from those of sweat.

Any exacerbating factors such as allergenic drugs should be removed. Antiperspirant and keratolytic agents are used. Steroids are applied topically on eczematous lesions.

### 3. Bromhidrosis

**Synonym:** Osmidrosis

**Definition, Classification, Clinical features**

Bromhidrosis (osmidrosis) is a general term for abnormal body odor arising from sweat glands. Eccrine bromhidrosis and apocrine bromhidrosis are the main types.

1. **Eccrine bromhidrosis**

   Eccrine sweat may have a distinct odor, from intake of drugs and foods such as garlic and spices. Bromhidrosis in feet is caused by the bacterial action on keratin softened by sweat.

2. **Apocrine bromhidrosis**

   Osmidrosis axillae, commonly called body odor, is the well-known type. Bromhidrosis of the genitalia is also caused by apocrine sweat. The sweat itself is odorless; however, fatty acids are decomposed by superficial bacteria, resulting in the odor. The apocrine glands begin to develop at puberty. Perspiration increases with mental excitement and physical exercise.

**Treatment**

The skin should be kept clean to reduce bacterial flora and apocrine sweat of the axilla. Application of antiperspirants, deodorants or antibiotics, and shaving are effective. Systemic antibiotics are most helpful. Laser, surgical or electrolysis depilation may be performed as permanent cure. Reduction of eccrine sweating using aluminum chloride may help decreases the local bacterial flora, but will not reduce apocrine sweat production. However, many patients who complain of offensive odor do not actually have the odor; the complaints may represent paranoia and phobia (osmidrophobia).

### 4. Fox-Fordyce disease

**Synonym:** Apocrine miliaria

**Definition**

Chronic, itchy papules occur, mainly on areas distributed with apocrine sweat glands, such as the axillae and the pubic area.

**Clinical features**

The disease is uncommon and most of the reported cases have occurred in young or middle-aged women. Follicular, solid, normal skin color or rose pink papules 2 mm to 3 mm in diameter aggregate on the axillary fossae, areola of nipples, and genitalia.
They are accompanied by intense itching.

**Pathogenesis**

When the sweat ducts of apocrine sweat glands are obstructed, apocrine sweat exudes into the epidermis. The pathogenesis of sweat gland obstruction is unknown; however, there is possible involvement of hormones.

**Treatment**

The treatment of Fox-Fordyce disease is difficult. Laser therapy and topical application or local injection of steroids are the first-line treatments. Clindamycin solution and tretinoin cream are occasionally effective.

**Prognosis**

It is chronic and intractable.

### 5. Hyperhidrosis

**Synonym:** Hyperidrosis

Hyperhidrosis, caused by enhanced perspiration from the eccrine glands, is classified into the subtypes described below.

1. **Generalized hyperhidrosis**
   - This occurs physiologically in hot, humid environments, during exercise, or from sympathetic hypertonia. It also occurs in patients with hyperthyroidism, diabetes, hypoglycemia, dumping syndrome, gout, neurologic disease, spinal cord injury, malignancies (especially, in Hodgkin’s disease), or other primary disease, or it may be induced by drugs (e.g., antipyretics, anti-cholinesterase agents), pregnancy or obesity.

2. **Localized hyperhidrosis**
   - This occurs in the palms, soles, axillary fossae, face and elsewhere. Most cases are from emotional perspiration. The condition is associated with constitutional factors and mental stress. Iontophoresis using tap water is effective as a treatment in some cases.

**Hyperhidrosis palmaris et plantaris** may accompany atopic condition or palmoplantar keratosis.

**Hemihyperhidrosis** is seen in patients with partial paralysis or Parkinson’s disease. The hyperhidrosis occurs on one side of the body from impairment of the peripheral nerves on that side.

### 6. Anhidrosis

**Synonym:** Hypohidrosis

This is a condition with scant or absent perspiration. The skin is dry and coarse. Scaling and mild itching occur, and fever may be produced by exercise because of lack of perspiration. Diseases suspected of causing anhidrosis are shown in **Table 19.1**.

<table>
<thead>
<tr>
<th>Cause of anhidrosis</th>
<th>Disease producing that cause</th>
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</thead>
<tbody>
<tr>
<td>Congenital absence of sweat gland function</td>
<td>Hypohidrotic ectodermal dysplasia</td>
</tr>
<tr>
<td>Metabolic disorder</td>
<td>Hypothyroidism, dehydration, thermic fever, Fabry’s disease</td>
</tr>
<tr>
<td>Neurological disorder</td>
<td>Disorder of the hypothalamus and spinal cord, alcoholic neuritis, leprosy, diabetic neuropathy</td>
</tr>
<tr>
<td>Obstruction of sweat pores and ducts</td>
<td>Ichthyosis, seborrheic dermatitis, atopic dermatitis, erythroderma, psoriasis</td>
</tr>
<tr>
<td>Atrophy or damage of sweat glands</td>
<td>Scleroderma, systemic sclerosis, Sjögren syndrome, systemic lupus erythematosus, solar elastosis, and the like</td>
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