Disorders of the skin

7

Objectives

By the end of this chapter you should be able to:

- Differentiate between vesicles, bullae and pustules
- List the five different types of psoriasis and describe the differences between them
- Describe the topical treatments for eczema
- Describe the pathways through which histamine is released in urticaria
- List the physical features of Reiter's disease
- Name some conditions aggravated by sunlight
- List the staphylococcal infections that affect the skin
- Describe the course of an infection with *Herpes simplex*
- List the factors that predispose to *Candida albicans* infection
- Describe the treatments available for scabies
- Describe the different types of naevi and their distribution
- List the risk factors for malignant melanoma
- Discuss the differences between basal cell and squamous cell carcinoma
- List the causes of hirsutism
- Explain Raynaud's phenomenon
- Describe the differing pathologies of leg ulcers
- List the cutaneous forms of malnutrition
- Name skin changes in pregnancy.

TERMINOLOGY OF SKIN DISORDERS

Dermatologists use very specific terms to describe skin disorders. They can manifest locally as lesions, or in a more widespread pattern of involvement as eruptions (rashes). These terms are split into macroscopic and microscopic.

Macroscopic appearances

Macule (Fig. 7.1A)

A flat, circumscribed lesion; an area of colour or textural change. Macules are seen in vitiligo (hypopigmentation), freckles (hyperpigmentation) and capillary haemangioma (red/purple).

Papule (Fig. 7.1B)

A solid, circumscribed, palpable elevation of skin less than 5 mm in diameter. They can appear in various forms: e.g. dome shaped (xanthomas), flat topped (lichen planus).

Nodule (Fig. 7.1C)

An elevation more than 5 mm in diameter that may be either solid or oedematous. Nodules are seen in rheumatoid arthritis, and a dermatofibroma is another example of this type of lesion.

Plaque (Fig. 7.1D)

A plaque is an extended, flat-topped lesion, a palpable elevation of skin (measuring no more than 5 mm in elevation but generally more than 2 cm in diameter). Plaques are commonly seen in psoriasis and mycosis fungoides (cutaneous T-cell lymphoma).

Blister (Fig. 7.1E)

A lesion of any size, filled with clear fluid, that forms because of cleavage of the epidermis. It may be a result of constant abrasion of the skin,

or as part of a pathological process. The cleavage may be intraepidermal or at the dermoepidermal junction.

Vesicle (Fig. 7.1 F)

Less than 5 mm in diameter, a vesicle is a skin blister filled with clear fluid. Vesicles may be subepidermal or intraepidermal, and may be single or grouped.

Pustule (Fig. 7.1G)

Similar to a vesicle, a pustule is filled with a visible collection of yellowish pus. This may indicate infection. A furuncle is an example of an infected pustule; the pustules that appear in psoriasis are sterile.

Bulla (Fig. 7.1H)

A bulla is a large, fluid-filled blister more than 5 mm in diameter. They occur typically in primary blistering disorders such as bullous pemphigoid, and sometimes in cardiac failure (oedema blisters).

Wheal (Fig. 7.1I)

Wheals are transitory, itchy, raised, discoloured papules or plaques of oedema. They are usually a sign of urticaria or angio-oedema.

Scale (Fig. 7.1J)

Scales are abnormal flat flakes on the skin surface that indicate disordered keratinocyte maturation and keratinization. They vary in appearance, from large white or brown polygonal, like fish scales in ichthyosis, to thick silvery layers in psoriasis.

Lichenification

This is chronic thickening of the epidermis with prominent skin markings, caused by continual rubbing or scratching.

Excoriation

Superficial scratch marks.

Onycholysis

Onycholysis is the separation of the nail plate from the nail bed. Subungual hyperkeratosis subsequently occurs, with the nail plate becoming thickened, crumbly and yellow. It is a feature of many disorders, including psoriasis, fungal infections and trauma.

Petechiae

Petechiae are small, round, flat red spots caused by haemorrhage into the skin or the mucous membranes. They can coalesce to form a purpuric rash.

Purpura

This is a skin rash caused by haemorrhage into the skin from capillaries. It can develop as a result of fragility or damage of the capillaries or an abnormally low blood platelet count.

Microscopic appearances

Hyperkeratosis

This is thickening (hypertrophy) of the surface layer of the epidermis (stratum corneum).

Parakeratosis

Parakeratosis is a pathological process where the nuclei of the cells in the stratum corneum persist. It is seen in disease states such as psoriasis.

Acanthosis

This is thickening (hypertrophy) of the stratum spinosum of the epidermis. It can be regular or irregular.

Dyskeratosis

This term describes a process in which keratinocytes mature early, becoming keratinized before they reach the surface of the skin.

Acantholysis

This is a pathological process where the prickle cells of the stratum spinosum separate, leading to atrophy of the epidermis. Acantholysis is seen in diseases such as pemphigus vulgaris and keratosis follicularis.

Papillomatosis

Accentuated undulating configuration of the demo-epidermal junction often seen in psoriasis.

Spongiosis

This is an inflammatory intercellular oedema of the epidermis.

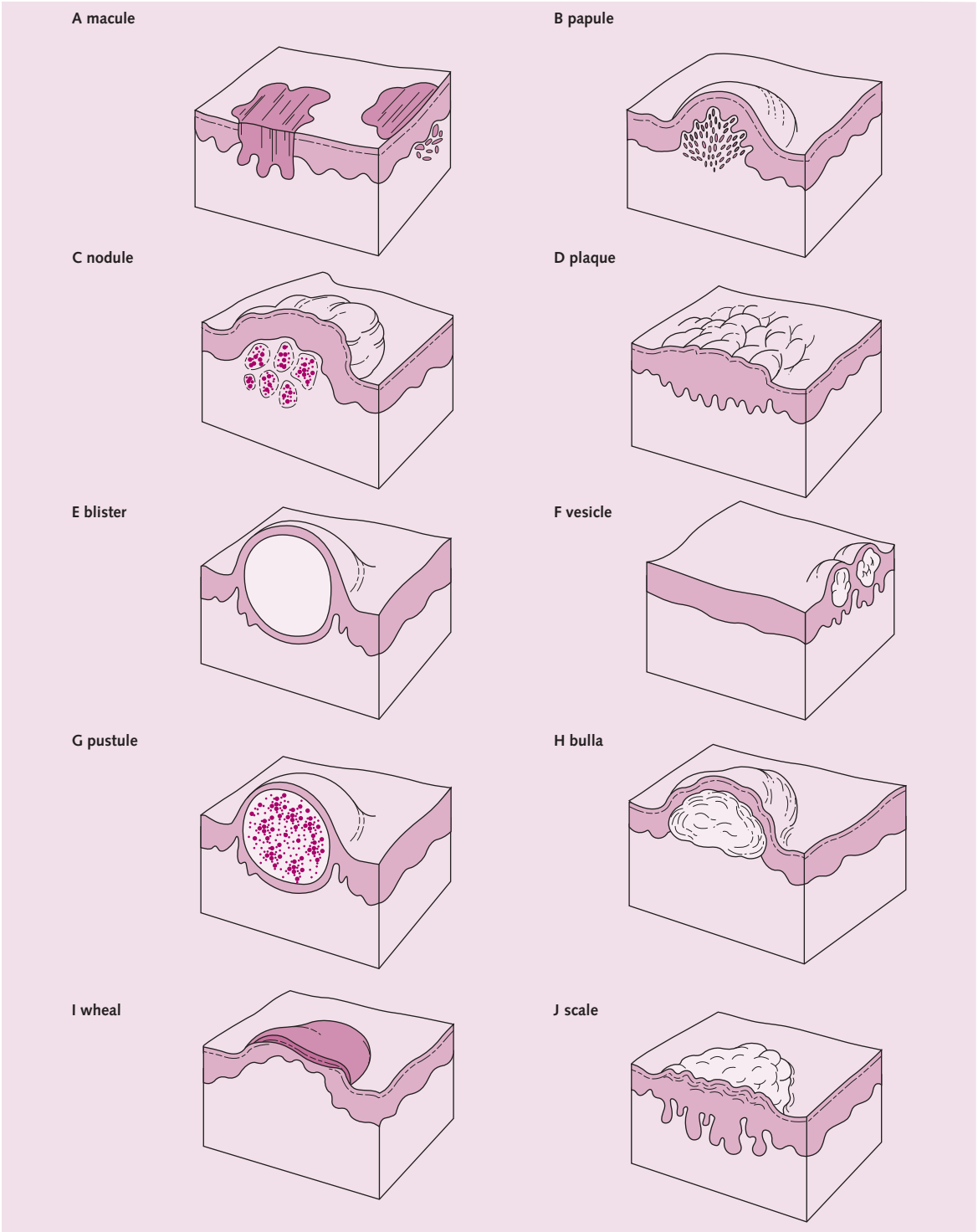


Fig. 7.1 (**A**) Macule; (**B**) papule; (**C**) nodule; (**D**) plaque; (**E**) blister; (**F**) vesicle; (**G**) pustule; (**H**) bulla; (**I**) wheal; (**J**) scale. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

Exocytosis

This term is used in pathology to describe the migration of inflammatory cells into the epidermis.

Erosion

A destructive lesion of the skin that causes a superficial discontinuity confined to the epidermis, and that heals without scarring.

Ulceration

The formation of a surface defect of the skin (by sloughing of inflammatory, necrotic tissue or trauma).

A Mongolian (blue) spot is a dark brown to blue pigmentation of the sacral area that is present at birth in most babies of east Asian and African descent, as well as some Caucasians. They can also be present in infants of mixed race. It is of no clinical significance and usually fades by 6 years of age.

INFLAMMATION AND SKIN ERUPTIONS

Psoriasis

Psoriasis is an immune-mediated hyperproliferative disorder that involves the skin. It is a chronic inflammatory dermatosis that presents with well-demarcated, silvery-scaled erythematous plaques.

Classification of types

There are six different clinical variants of psoriasis: plaque, flexural, palmoplantar pustulosis, guttate, scalp and acrodermatitis of Hallopeau, the last being extremely rare and therefore not covered in this text (Fig. 7.2).

Plaque psoriasis

This is the most common type, affecting 80–90% of those with psoriasis. Plaques are well-defined, red, raised lesions topped with silvery-white scales and are usually seen over the extensor surfaces of the limbs, especially the elbows (Fig. 7.3) and knees, over the scalp and at the hairline. Plaques can be large or small and may itch, although itching is not a cardinal

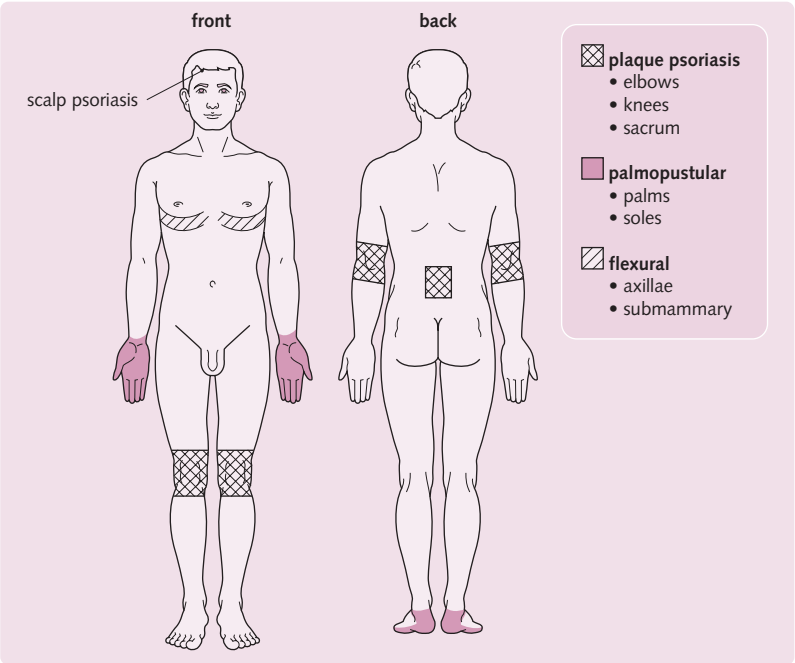


Fig. 7.2 Distribution of the different types of psoriasis.

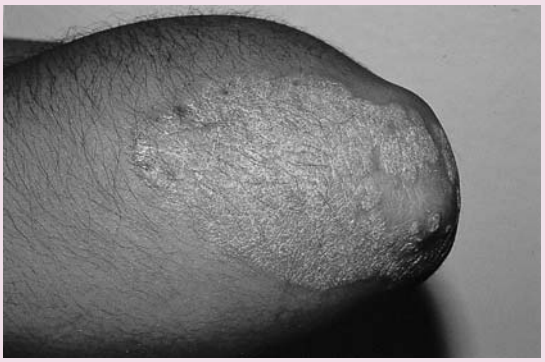


Fig. 7.3 Plaque psoriasis.

feature of plaque psoriasis. Nail involvement can occur, manifesting as pitting and separation from the nail bed (onycholysis). Psoriatic arthropathy can also develop.

Flexural psoriasis

The lesions in flexural psoriasis are clearly demarcated, pink lesions that lack scales. The sites normally affected are the skin folds, especially the groin, perianal regions and genital skin. Less commonly the inframammary skin folds and the umbilicus may be affected. Flexural psoriasis is aggravated by sweat and friction, and there is a risk of secondary infection.

Pustular psoriasis

This can occur in localized (palmoplantar) or generalized forms.

Generalized pustular psoriasis, the most severe form of erythrodermic psoriasis, is a severe systemic variant in which sterile pustules and scaling develop over the trunk and limbs. It causes widespread inflammation with malaise, pyrexia and circulatory disturbance. It can be lethal, as the skin loses its ability to maintain efficient thermoregulation and fluid balance. It can develop spontaneously, or occasionally as a complication of potent corticosteroid therapy (especially when high-dose systemic steroids are rapidly withdrawn). Management is similar to that for burn patients, as the disruption to the skin's functions must be minimized and controlled.

Palmoplantar psoriasis is limited to sterile pustule formation on the palms and soles without systemic symptoms. It is more common in cigarette smokers, typically middle-aged women, some of whom also have classic plaque psoriasis elsewhere.

Guttate psoriasis

Guttate psoriasis is characterized by multiple small, oval, 'raindrop-like' lesions that appear on large body areas such as the trunk, scalp and limbs. It frequently develops after a streptococcal throat infection, and is more common in children and young adults.

Scalp

Scalp lesions can be the only clinical manifestation of psoriasis. Hyperkeratotic plaques can be seen at the hair margin; the scales appear thicker and are better demarcated than in simple dandruff.

Epidemiology

Two per cent of people living in temperate climates are affected by psoriasis. The male:female ratio is 1:1. The disease commonly presents in the second and third decades where there is a positive family history, though onset may occur at any age, with a late-onset peak between 50 and 60 years of age. It is rare in children.

Aetiology

The cause is unknown, although it is believed to have a strong genetic link, with identical twin studies showing high concordance, and a third of patients showing a family history. It is associated with several HLA-specific antigens, particularly HLA-Cw6. Trigger factors include drugs such as β-blockers, lithium and antimalarials, as well as streptococcal infection, local trauma and stress. It is not contagious.

Pathology

Pathological features of psoriasis to note are:

- Accentuated, deepened rete ridges
- Incomplete maturation of keratinocytes through the epidermal layers, resulting in abnormal keratin production (parakeratosis), creating silvery scales on the skin surface
- Active, psoriatic skin has a cell turnover rate 20–30 times faster than that of normal skin, and this results in an abnormally thin epidermis only 2–3 cells thick. Where this is associated with dilated blood vessels in the upper dermis it can result in erythema, or bleeding spots (Auspitz sign), caused when scales become cut or are dislodged
- Polymorphs migrating through the dilated vessels can aggregate to form sterile pustules (Fig. 7.4)

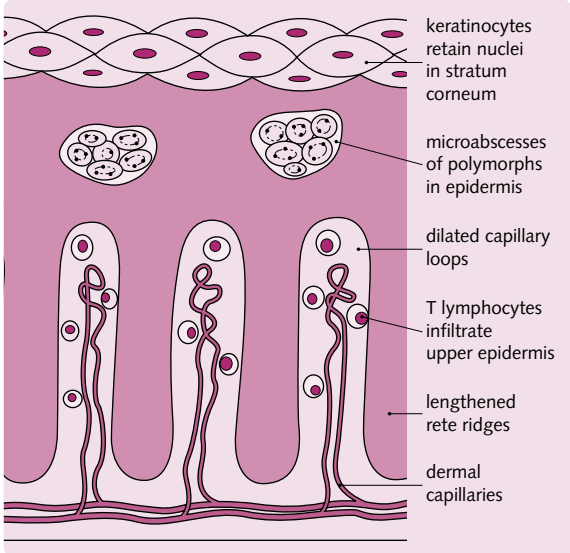


Fig. 7.4 Histological changes in psoriasis.

- Trauma to the upper layers of the skin, such as a scratch or a surgical incision, may lead to the formation of psoriatic skin at the site of damage: this is known as the Koebner phenomenon.
- Sunlight aggravates psoriasis in a minority of individuals, although for most it is beneficial.

Complications

Erythroderma

Erythroderma is a term used to describe any inflammatory dermatosis that involves more than 90% of the skin surface. It requires prompt intensive hospital management, as its systemic complications can be fatal. Erythrodermic psoriasis can be precipitated by the withdrawal of systemic steroid treatment or an intercurrent drug eruption.

Psoriatic arthritis

Around 5% of patients with psoriasis develop joint disease. This most commonly manifests as a distal arthritis that causes swelling of toes and digits (called dactylitis), but a rheumatoid-like arthritis may also develop, with a similar polyarthritic pattern.

Severe psoriasis may cause arthritis mutilans, a destructive arthritis that erodes the small bones, especially of the hands and feet, leading to progressive deformity. In addition, patients with psoriasis who are HLA B27 positive may develop spondylosis or sacroiliitis.

Nail involvement

The nails become involved in up to half of patients with psoriasis. Nail changes in psoriasis include:

- Nail plate pitting
- Separation of the nail plate from the underlying nail bed (onychloysis)
- Discoloration of the nail
- Subungal hyperkeratosis.

Sometimes nail changes can precede cutaneous disease.

Bacterial infection

Psoriatic plaques can occasionally become infected, although this is uncommon.

Management

The treatment objective is to control the progression of the disease and control its symptoms.

Localised, topical therapy is usually the first line of treatment, with systemic therapy used for psoriasis that is not responsive to topical treatment, is life-threatening in severity, or which significantly reduces the patient's quality of life.

Topical

Emollients are often prescribed, as they hydrate the dry scaly skin.

First-line therapy involves:

- Vitamin D analogues
- Topical steroids
- Coal-tar-based products
- Dithranol.

Vitamin D analogues These act by inhibiting cell proliferation and promoting keratinocyte differentiation, thereby reversing some of the structural abnormalities of the skin present in psoriasis.

Topical corticosteroids Topical steroids should only be used for stubborn plaques, symptomatic disease, or for treating plaques on the face, genitalia or flexures, as the steroids are non-irritant compared to other agents. Their use must be carefully monitored, as the side effects of steroid usage include:

- Atrophy (thinning) of the skin
- Induction of acne or perioral dermatitis
- Precipitation of unstable psoriasis upon treatment withdrawal
- Allergic contact dermatitis
- Infection (fungal, bacterial or viral) precipitated by steroid treatment

- Reduced efficacy after prolonged use (tachyphylaxis)
- Systemic effects of steroidal treatment—growth retardation, a cushingoid appearance, and endocrine effects caused by systemic absorption of steroid.

Topical steroids are available as creams, ointment, lotion and gels (for the scalp).

Tar-based preparations These are distilled from coal tar. Often used in combination with ultraviolet (UV) B (UVB) exposure or dithranol (see below), the tar preparations appear to work by altering the DNA synthesis of the skin.

Dithranol is applied as a paste and retards skin mitosis. However, despite being effective, it is problematic as dithranol is messy and smelly. It can also irritate normal skin adjacent to the treatment area, so protective measures are required.

Salicylic acid ointment can be used as an adjunct to other therapies, especially for psoriatic lesions associated with thick layers of scale.

Systemic therapy

Methotrexate This drug acts by inhibiting cell mitosis. It is usually administered orally, although it can be given intramuscularly or intravenously. Normal liver, kidney and marrow function must be established before the treatment begins, and monitored carefully throughout the course. The most serious side effects of methotrexate include hepatic fibrosis and cirrhosis. A therapeutic response is usually observed within 2–4 weeks.

Retinoids Oral retinoids such as acitretin, a vitamin A analogue, can be used to treat both plaque and pustular psoriasis. It can be used alone or combined with UVB or PUVA therapy. Acitretin is teratogenic, so premenopausal women must use contraception from 1 month before beginning treatment and for 3 years after stopping the course, because of the long half-life of the drug.

Immunosuppressants such as ciclosporin clear psoriasis when taken in high doses. Ciclosporin is nephrotoxic, however, and renal function should be carefully monitored throughout the course. The long-term side effects of ciclosporin are not yet fully clear, but there may be a small increase in the occurrence of certain malignancies, particularly lymphoma.

Eczema and dermatitis

The terms eczema and dermatitis are used interchangeably to describe the same non-infective inflammatory condition. There are several different forms of eczema.

Atopic eczema

Aetiology

Atopic eczema commonly occurs in patients with a past medical or family history of atopic disease such as asthma and hay fever, and affects 10–15% of children in Europe; 65% of patients have an atopic family history, and the majority of those likely to present with atopy will do so in the first year of life. In half of patients, the disorder will remit by the age of 15 years.

Pathogenesis

The pathophysiology of atopic eczema is not fully understood. Underlying genetic factors such as variants in the filaggrin gene contribute to a state in which inflammation is caused by high levels of circulating IgE antibodies, coupled with abnormal T-cell activation in reaction to commonly encountered allergens, such as house-dust mites, and exacerbating factors such as chemicals and stress. The resulting inflammation is pruritic, and affects both the dermis and the epidermis (Fig. 7.5).

Clinical features

Atopic eczema can present in a variety of different ways, but most commonly with general skin dryness or itching (pruritus) with itchy, red, scaly patches on the flexor creases of the body. In the first 6 months of life it can present as a symmetrical erythematous eruption affecting the face, trunk and limbs (Fig. 7.6). As the child reaches 2 years, the eruption increasingly affects the flexures (Fig. 7.7). Acute eczematous lesions are vesicular and can weep. Dry skin, excoriations and lichenification (thickening of the skin, with accentuated crease marks) all occur, and these are aggravated by the child scratching or rubbing the affected skin (the itch–scratch cycle). The pruritus often causes difficulty with sleep. The skin often feels rough to the touch owing to the dryness of eczema, and in eczema patients fish-like scaling of the skin can sometimes occur without inflammation (ichthyosis vulgaris). Atopic eczema can also involve the nail beds, causing ridging or pitting.

Diagnosis is usually clinical, although allergen sensitivity tests, such as skin prick testing or RAST (radioallergosorbent assay) tests, can sometimes be helpful. Blood eosinophilia is often seen.

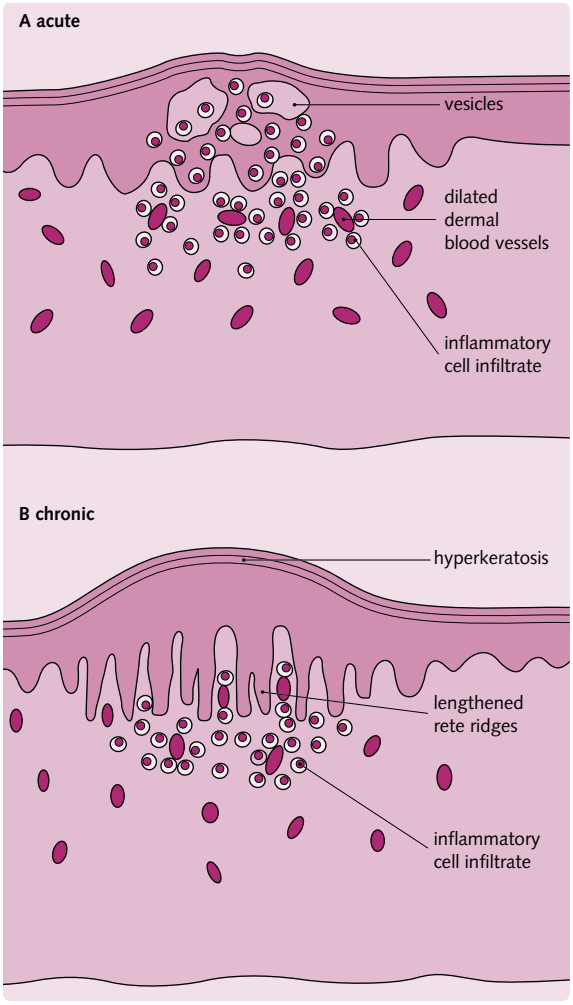


Fig. 7.5 Histological changes in eczema. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

Complications

Eczematous areas are prone to secondary infection. Bacterial colonization is common with *Staphylococcus aureus* and occasionally streptococci. Viral infections can occur, e.g. *Herpes simplex*, which in atopic patients can develop into the severe condition eczema herpeticum.

Management

Conservative management Educating the patients and their family is very important in the management of atopic eczema. Various lifestyle changes can lessen skin irritation: loose-fitting cotton clothing, avoiding heat and known irritants (e.g. wool, and occupational irritants or allergens), filing the nails to limit scratching. If pet hair is thought to aggravate the disease care should be taken to minimize contact. Efforts to reduce the presence of house-dust mites can sometimes be helpful. Dietary changes are rarely helpful unless there is a history of reaction to specific foods.

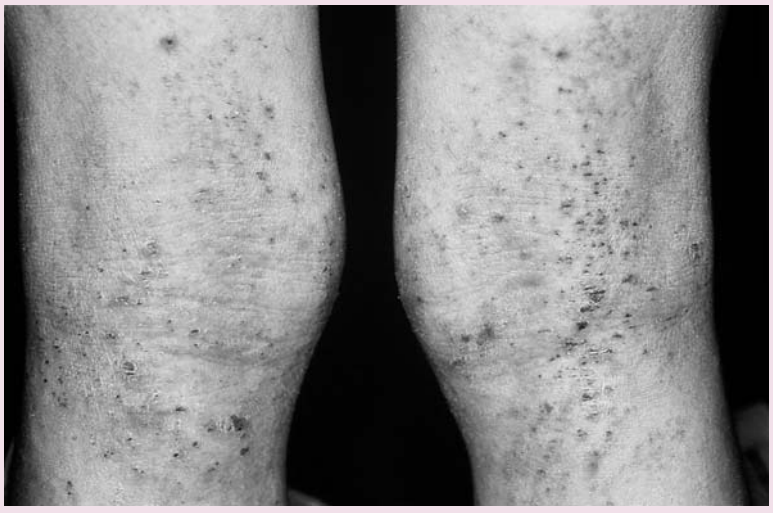
Both local and national support groups exist for patients with atopic eczema; details of both should be made available to the patient.

In children, it should be made clear to the patient that the condition improves in the majority of cases and often remits by the teenage years.

Topical therapy Topical therapy controls atopic eczema in most patients, usually with a combination of emollients (moisturizers), alternatives to soap (e.g. aqueous cream) and topical steroids.

Emollients Aqueous cream, emulsifying ointment and bath-oil emollients moisturize the skin, hydrating the surface layers and reducing pruritus.

Fig. 7.6 Atopic eczema.



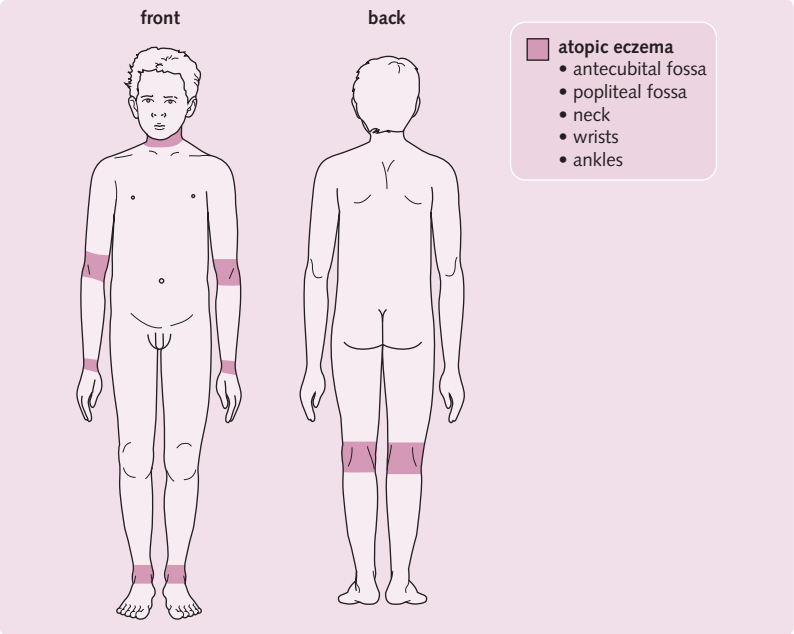


Fig. 7.7 Distribution of eczema.

Topical steroids Topical steroids of different potencies are used, depending on the body site being treated. The mildest is 1% hydrocortisone, which is usually sufficient for the face and flexures, where the skin can easily become atrophic with the use of stronger steroids. For other body sites, potent steroids such as betamethasone (Betnovate) preparations are often needed.

Medicated bandages Bandages may be useful in excoriated or lichenified eczema, improving the absorption of topical medication and providing a barrier against scratching. With exudative eczema, non-medicated wet wraps may help.

Antibiotics and antiseptics These are used to treat the infective complications of eczema (usually bacterial, with *Staphylococcus aureus*).

Systemic therapy *Antihistamines* Sedative antihistamines, e.g. hydroxyzine, given at night may help reduce scratching in severe cases.

Oral antibiotics and antiviral agents Flucloxacillin given four times daily (qds) is used to treat secondary staphylococcal infection, and penicillin V qds for streptococcal infections. Aciclovir is used to manage eczema herpeticum and in severe cases may need to be given intravenously as inpatient therapy.

Second-line treatments Severe eczema unresponsive to treatment can be treated by a course of PUVA or a 12-week course of ciclosporin or azathioprine. However, these are associated with significant side effects and require careful monitoring.

Contact dermatitis

Eczema precipitated by an environmental agent is termed contact dermatitis. Clinically similar to atopic eczema, it is caused by repeated exposure to a chemical irritant or an allergen. Irritant dermatitis is a major cause of morbidity in industry (Fig. 7.8). It is caused by wet work, detergents, and a wide range of other products. Atopic patients are more prone to the development of contact dermatitis.

An unusual or localized site of presentation may raise suspicion of contact dermatitis and of possible causative factors (Fig. 7.9).

Whereas irritant dermatitis is more likely with intensive or repeated exposure to the causative factors, allergic dermatitis can result from brief exposure even to very small traces of the allergen concerned. The commonest causes of allergic contact dermatitis include nickel, latex, perfume and plants. The most common of these is nickel, which affects one in 10 women and one in 100 men. Patch testing is useful if a suspected allergen is involved, and management is based largely on avoiding it once identified. Topical steroids are the second line of treatment.

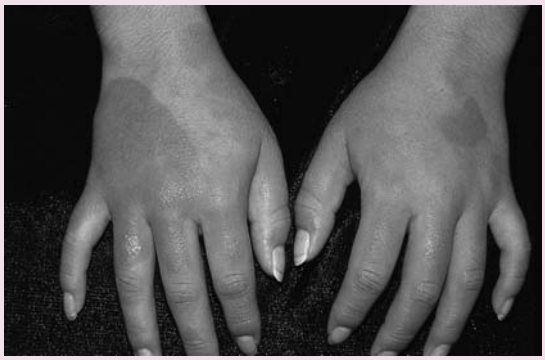


Fig. 7.8 Contact dermatitis.

Other forms of dermatitis

The other forms of dermatitis are listed in Fig. 7.10.

Urticaria and angioedema

These two conditions are associated with acute oedema. Urticaria, often known as nettle rash or hives, is a common condition characterized by the development of transient, itchy swellings (or wheals) that are caused by extravascular plasma leakage. Angio-oedema is a more widespread collection of extravascular fluid that involves the dermis and subcutis.

Aetiology

In most cases the condition is idiopathic. It is believed to have an autoimmune component and is commoner in atopic individuals. It can also occur as a reaction to bacterial or viral infections, drug or food allergies, and sometimes in response to cold, stress or heat.

Pathology

The lesions arise from the release of inflammatory mediators such as histamine from mast cell degranulation, causing dermal capillaries to become leaky. This release can be mediated through autoantibodies against IgE receptors of mast cells in those with a genetic susceptibility (a form of type 1 hypersensitivity reaction). It can also occur in response to some drugs, or through blockage of the prostaglandin pathway (caused by drugs such as aspirin and NSAIDs).

Clinical features

Urticaria is classified as acute if it lasts less than 6 weeks, and chronic if it lasts longer than this. Itchy, red wheals rapidly appear and disappear on the skin, usually within 24 hours, leaving no residual mark. The lesions vary in size, shape and number. Severe urticaria may be accompanied by soft tissue swelling (angio-oedema), especially of the tongue and lips. Dermographism (wheals induced by firm stroking of

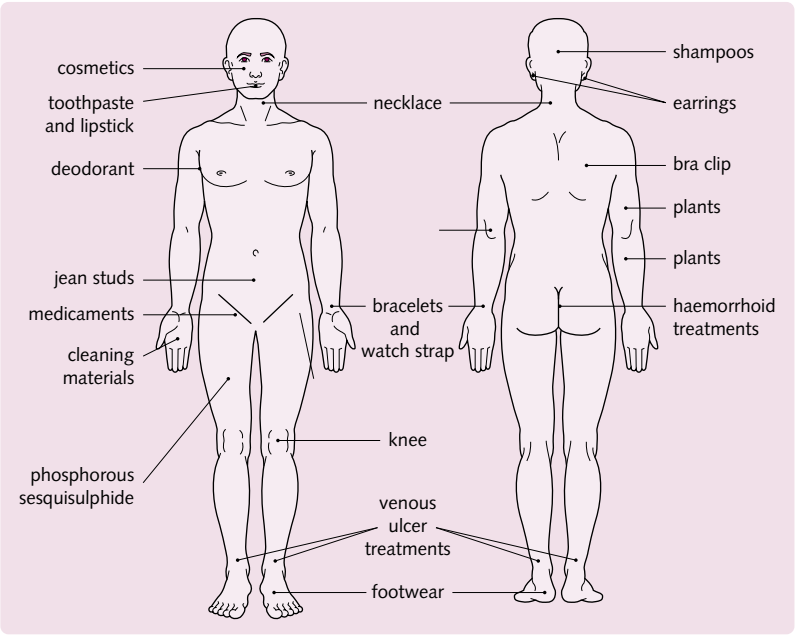


Fig. 7.9 Distribution of contact dermatitis. (Note that medical ointments and creams may cause rashes wherever applied.) (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

Fig. 7.10 Endogenous forms of dermatitis

Type of dermatitis	Comments
seborrhoeic dermatitis	disease of adults; *Pityrosporum ovale* plays an important role; dry, persistent redness and scaling seen on face; pruritus ani and chronic otitis externa are common symptoms
venous dermatitis of legs	feature of chronic venous insufficiency in legs; caused by venous hypertension in deep veins owing to valve incompetence
hand dermatitis	includes pompholyx, a vesicular pattern of dermatitis; may also be caused by discoid dermatitis, primary irritant hand dermatitis, allergic contact dermatitis and hyperkeratotic eczema
asteatotic dermatitis	seen mainly in the elderly, particularly in the winter, and usually on the legs; consists of fine scaling, minor erythema and superficial fissuring
neurodermatitis	localized lichenification seen in adult women on occipital scalp, nape, neck and arms; lesions are well-defined ovoid or elongated plaques; hyperpigmentation is common; itching intermittent and intense
discoid dermatitis	multiple, well-defined discoid lesions with prominent oedema; may be atopic, or may be precipitated by emotional stress
generalized exfoliative dermatitis	also known as erythroderma; skin is erythematous, oedematous and scaly; may be complicated by reversible loss of body hair

the skin) can be demonstrated, and cold urticaria can be induced by applying ice to the skin for 1 minute. Often no underlying cause is found, and the disorder usually resolves spontaneously within a few months. A careful and thorough history can sometimes suggest the causative factor.

Management

A thorough history is necessary, but investigations are rarely required. Hereditary angio-oedema can be detected by a low serum level of C_1 esterase inhibitor. The mainstay of treatment is oral antihistamines (H_1 blockers such as cetirizine) and avoidance of provoking factors. Severe acute angio-oedema causing acute anaphylactic shock or airways obstruction requires immediate treatment with a subcutaneous injection of adrenaline and systemic steroids—this is life saving.

Patients should be advised to not take aspirin or opiate-containing agents as they can stimulate mast cell degranulation.

Lichenoid eruptions

Lichen planus

This is a fairly common, itchy inflammatory dermatosis. It can occur anywhere, but is most common on the flexor surfaces of the wrists and lower legs. It presents as pruritic, papular, flat polygonal lesions, which may coalesce to form small plaques (Fig. 7.11). A white lace-like pattern may form on the top of plaques (Wickham's striae). Lichen planus may also present as annular, atrophic or hypertrophic lesions. Mucosal involvement is common, particularly around the mouth, but also around the genitalia, causing white plaques or ulcers, which may be painful. Severe forms of the disease can affect the nails, causing dystrophy. Most patients recover spontaneously within 18 months. Hypertrophic and atrophic disease are generally more persistent, and ulcerative mucosal disease is premalignant. Although the disease is self-limiting, symptomatic treatment involves the use of potent

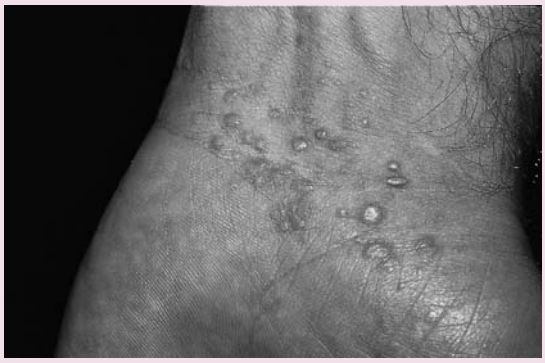


Fig. 7.11 Lichen planus.

topical steroids, or, in resistant cases, systemic steroids and immunosuppressive agents.

Lichen sclerosus et atrophicus

This uncommon disorder is characterized by well-defined white, macular, atrophic lesions that particularly affect the genital region. Lichen sclerosus is an autoimmune-associated disorder that more commonly affects females than males. Individuals can be affected at any age. Where there is clinical doubt, a biopsy of the lesion may be taken to confirm the diagnosis. Management of genital lichen sclerosus is symptomatic, involving potent topical steroids, with an antiseptic or antibiotic if necessary. Extragenital lichen sclerosus does not always require treatment. The condition can disappear of its own accord some years after presentation. Long-term disease can result in scarring and deformity of the genital area, causing complications such as phimosis, anal fissuring, and fusion of the labia minora.

Papulosquamous eruptions

Pityriasis rosea

Pityriasis rosea is typically preceded by a single erythematous oval macule (herald patch) which appears 4–14 days before a generalized eruption of multiple, smaller plaques over the trunk, upper arms and thighs. The rash is symmetrical and may follow the distribution of the dermatomes, forming a 'Christmas tree' pattern.

Individual lesions can appear as oval, pink patches which are slightly raised around the edges (medallion plaques) and may have a fine collar of scales, or as maculopapules (Fig. 7.12). It commonly affects young adults and adolescents. Clearance usually takes 1–2 months and recurrence is very uncommon. The aetiology of the disease is unclear, but the eruption is thought to be a response to a viral infection. It is a self-limiting condition. Lesions may be pruritic; the itch can be relieved by a mildly or moderately potent topical steroid.

Pityriasis versicolor

Previously known as tinea versicolor, this disorder is caused by *Pityrosporum* yeasts. It presents as brown or pinkish macules that coalesce to form larger, superficially scaly lesions. Eruption sites include the neck, shoulders, upper arms and upper trunk.

Pityriasis versicolor mostly affects young adults and is more common in tropical climates. On microscopy, skin scrapings demonstrate the spores and short, rod-like hyphae—the so-called 'grapes and bananas' appearance. Treatment involves applying 2.5% selenium sulphide shampoo, or a topical imidazole cream. Oral itraconazole can be used for resistant cases. When proliferative yeasts are cleared, persistent hypopigmented areas may remain at the site of previous inflammatory lesions. Hypopigmentation usually clears, but this may take several months.

Reiter's disease

This term is used to describe a collection, or triad, of physical signs, which include a seronegative arthritis, urethritis and iritis/conjunctivitis. It affects HLA B27-positive men, and usually follows a non-gonococcal urethritis or enteritis. Skin lesions that may occur in Reiter's disease include brown aseptic abscesses

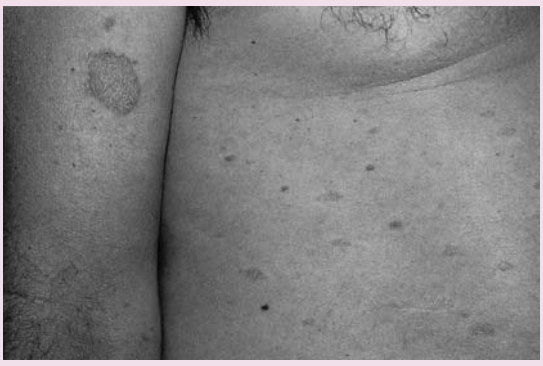


Fig. 7.12 Pityriasis rosea.

(keratoderma blennorrhagicum) forming on the palms and soles and a painless penile rash (circinate balanitis). Arthropathy and nail involvement may be severe. Management includes treating the initial infection, anti-inflammatory analgesia for the arthropathy, and topical steroids for skin lesions.

Parapsoriasis

Known also as chronic superficial dermatitis, this is an eruption of pink, oval or round plaques that are topped by scales. The lesions may be premalignant. They appear in mid to late adulthood and are usually sited on the abdomen, buttocks or thighs. Some lesions progress to malignant cutaneous T-cell lymphoma (mycosis fungoides), although the majority remain benign. Biopsy is necessary to detect premalignant plaques; treatment is with topical steroids for benign parapsoriasis, and ultraviolet phototherapy (PUVA or UVB) for premalignant plaques.

Photodermatoses

Idiopathic causes

Polymorphic light eruption

This is the most common of the photodermatoses in temperate climates and occurs most commonly in young women. A pruritic rash develops hours after the skin has been exposed to the sun. Lesions can be urticarial papules, plaques or vesicles that can persist for hours to days. The condition begins to manifest in spring, but improves during the summer as prolonged exposure to the sun hardens the skin, desensitizing it. Sunscreen is an effective protective measure in mild cases. In more severe cases a course of ultraviolet phototherapy in the spring can often desensitize or harden the skin, so that a patient will not suffer light-induced problems during the summer months.

Chronic actinic dermatitis

Known also as photosensitive eczema, this is a rare disorder that typically affects men in mid to late adulthood. It is characterized by the development of thickened, lichenified plaques on sun-exposed skin, and there may be a previous history of eczema. Diagnosis is made by specialist monochromator light testing. It is managed by avoiding sunlight, and by the use of emollients and protective sunscreen. Treatment with topical steroids can be effective in mild cases. If the dermatitis is resistant to these measures, oral steroids or azathioprine may be necessary. A combination of PUVA and steroids can help to desensitize the skin.

Solar urticaria and actinic prurigo

In solar urticaria, skin wheals appear within minutes of exposure to sunlight and clear within 1–2 hours. With actinic prurigo, sun-induced papules and lichenified nodules first appear in childhood and may resolve by adolescence. Both conditions are rare.

Other non-idiopathic causes

Other photodermatoses include:

- Porphyria—a metabolite accumulation due to enzyme insufficiency
- Pellagra—nicotinic acid deficiency
- Genetic—e.g. xeroderma pigmentosum
- Drug-induced photosensitivity—e.g. nifedipine, thiazides, angiotensin-converting enzyme inhibitors and NSAIDs
- Systemic lupus erythematosus (SLE).

Effects of sunlight on other dermatological conditions

Sunlight aggravates the following conditions:

- SLE
- Herpes simplex, especially cold sores
- Rosacea
- Psoriasis (a minority)
- Vitiligo.

It benefits the following conditions:

- Acne
- Psoriasis
- Parapsoriasis
- Pityriasis rosea
- Atopic eczema.

Sunlight consists of the ultraviolet (UV) rays A and B (UVA, UVB). Both can damage DNA and cause skin cancer, but UVA has the greatest ageing effects on the skin; UVB stimulates vitamin D production. Sunblock products have a numerical sun protection factor (SPF) rating for protection against UVB and a star rating for UVA protection. Products with only UBV protection should be avoided.

INFECTIONS AND INFESTATIONS

The normal skin microflora

Normal bacterial flora resident on the skin include staphylococci, micrococci, corynebacteria and

propionibacteria, and these prevent pathogenic organisms from residing on the skin. In addition to bacteria, other microorganisms present in healthy skin include yeasts and mites. The numbers of microorganisms vary depending on the site (e.g. forearm versus moist environs of axillae) and the individual.

Bacterial infections

Diseases caused by overgrowth of normal flora

Erythrasma

Colonization with *Corynebacterium minutissimum* can lead to this dry, orange–brown rash that usually affects the flexural creases such as the toe webs or axillae. The affected skin will fluoresce coral pink under Wood's light. Erythrasma clears when treated with topical or oral antibiotics, including erythromycin or tetracyclines.

Pitted keratolysis

This is a proliferation of corynebacteria that frequently involves the soles of the feet, exacerbated by tight-fitting footwear and excessive sweating. It may lead to small, punched-out lesions, a foul-smelling odour, and discoloured and pitted nails. Improved hygiene will limit the problem. Topical antimicrobials, e.g. clindamycin, 1:10 000 aqueous potassium permanganate foot soaks, and antiperspirants, such as aluminium chloride, may help.

Staphylococcal infections

Impetigo

Impetigo is a highly contagious skin disease that most commonly affects schoolchildren. It is usually caused by staphylococci, but group A streptococci can also cause this clinical picture, so skin swabs should be taken to determine the cause and guide treatment. It presents as superficial exudative lesions that develop a characteristic yellow crust (Fig. 7.13). The lesions spread rapidly. Occasionally the bacteria produce toxins that cause the lesions to blister (bullous impetigo). The lesions may complicate other skin disorders such as atopic eczema and herpes simplex. Management involves topical fusidic acid and antiseptics applied to localized disease. Children should be kept off school for 1 week after the lesions first crust, and picking of the lesions should be discouraged. If the infection becomes widespread, systemic antibiotics are necessary. With the most serious form of impetigo, that caused by *Streptococcus pyogenes*, oral penicillin is given to prevent glomerulonephritic complications.

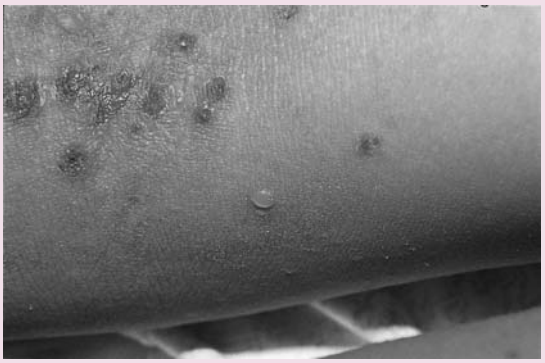


Fig. 7.13 Impetigo.

Ecthyma

Ecthyma is an uncommon disease resulting from cutaneous infection with *Staph. aureus* or streptococci. It presents as round, well-demarcated ulcerative lesions, usually on the legs. After treatment with systemic antibiotics the ulcers crust over and scar upon healing. The disease is associated with poor hygiene and states of malnutrition, and is more commonly seen in developing countries, and in the Western world among IV drug users and immunosuppressed patients.

Folliculitis

Folliculitis is an inflammation of the hair follicle that presents with itchy or tender papules or pustules. It is often caused by infection with *Staph. aureus*. The pustules have erythematous edges and often contain an emerging hair shaft. Management is with topical antiseptics and antibiotics, or systemic antibiotics; to prevent recurrence the patient should be educated about improved hygiene.

Streptococcal infections

Erysipelas

Presenting with localized erythema, swelling and tenderness, erysipelas is an acute infection of the dermis and the upper subcutaneous layer, usually caused by streptococci. The inflammation is well defined and may have palpable borders. It occurs with general malaise and flu-like symptoms. The clinical picture in erysipelas overlaps with that of cellulitis. The eruptions usually clear within

2–3 weeks of treatment with oral or intravenous penicillin to prevent haematogenous systemic spread and streptococcal septicaemia. Penicillin can also be used prophylactically in recurrent cases; these lead to lymphatic damage and irreversible oedema.

Cellulitis

This is an infection of the deep subcutaneous layer of the skin, usually by streptococci. The area becomes erythematous, hot and tender to the touch, and the infection can spread rapidly (Fig. 7.14). Patients are systemically unwell and pyrexial. Infection can arise from breaks in the skin barrier, such as IV catheters, wounds, surgical incisions or leg ulcers, and injection sites in IV drug users. Broad-spectrum antibiotic cover should be initiated as soon as possible until the results of blood cultures yield the organism and its antibiotic sensitivities. Any identified underlying cause should be treated. It is common practice to draw around the site of erythema on the skin, as this allows monitoring of any spread and response to treatment.

Necrotizing fasciitis

This serious infection may occur after minor trauma; it must be treated immediately to prevent serious skin necrosis in the affected area and death. The infection is characterized by a high fever and an ill-defined erythema that usually occurs on the leg. High-dose IV antibiotics and surgical debridement of the necrotic tissue are required.

Mycobacterial infections

Lupus vulgaris

This condition, which is now very rare in the Western world, is the most common type of cutaneous TB. It arises as a postprimary infection and usually begins in childhood. Painless, red–brown nodules form, which scar and heal slowly. They can coalesce to form larger, erythematous plaques, which are most commonly seen on the head and neck. Complications include the destruction of deeper skin tissues and the increased risk of developing squamous cell carcinoma in chronic lesions. A biopsy will aid the diagnosis and the Mantoux test is positive. Treatment is that for the eradication of TB.

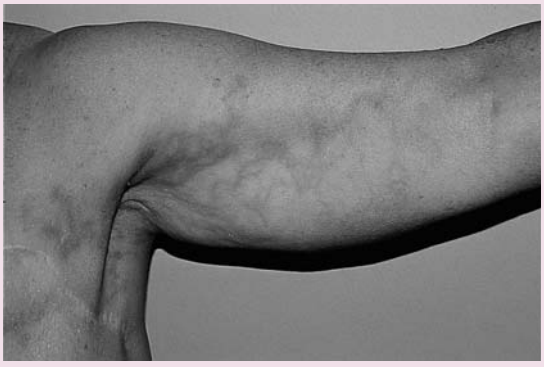


Fig. 7.14 Cellulitis.

Scrofuloderma

This is an infection that occurs on the skin overlying a lymph node infected with TB, or an affected bone or joint. A dull red nodule develops, which ulcerates and can lead to fistulae, granulation, scarring and discharge.

Warty tuberculosis

This results from the inoculation of TB into the skin of previously infected patients. It forms warty plaques on cold erythematous areas, commonly of the hands, knees and buttocks. The condition is now extremely rare in the Western world, but is still common in developing countries.

Spirochaetal infections

Secondary syphilis

The secondary stage of syphilis begins 1–3 months after the primary chancre, and is characterized by pink or copper-coloured papules that appear on the trunk, palms, limbs and soles. The papules resolve spontaneously in 1–3 months without treatment.

Yaws/bejel/pinta

These non-venereal treponemal infections are endemic in tropical developing countries. In all three serology is positive for syphilis, and the infection may be treated with penicillin.

Lyme disease

This condition is caused by *Borrelia burgdorferi* and is spread by tick bites. Lyme disease is characterized by a slowly expanding erythematous ring at the site of the initial bite. Complications include arthritis, neurological pathology and cardiac sequelae. Treatment is with penicillin or tetracycline.

Other bacterial infections

Anthrax

Primarily a disease of animals, anthrax causes haemorrhagic bullae at the site of inoculation. The lesions are accompanied by oedema and fever. The diagnosis is made by culture of blister fluid and

the disease is treated by intramuscular injections of penicillin or intravenous tetracycline (followed by an oral course).

Gram-negative infections

Gram-negative bacilli, such as *Pseudomonas aeruginosa*, may secondarily infect skin wounds such as leg ulcers. They may also cause nail discoloration, folliculitis and, occasionally, cellulitis (see Fig. 7.14).

Viral infections

Viral warts

Viral warts are benign overgrowths (tumours) of cutaneous squamous epithelium caused by infection with human papillomavirus (HPV). The virus spreads through direct or indirect contact (e.g. feet in swimming baths) and through sexual contact. There are over 70 HPV subtypes, responsible for lesions including warts of the hands, the plantar surfaces of the feet and the anogenital region. Certain HPV types have a much increased risk of associated malignancy (e.g. carcinoma of the cervix).

Common warts appear as dome-shaped papules with a rough surface (Fig. 7.15). They spread by direct contact and commonly develop in children and young adults. At least 50% of common warts resolve spontaneously without scarring. Treatment includes paring, and topical keratolytic agents such as salicylic acid; cryotherapy and cautery can also be considered. Genital warts are treated by cryotherapy, topical podophyllin or curettage and cautery. A more recent topical therapy is the immune response modifier imiquimod. It is important to screen patients presenting with genital warts for other STDs, along with their partners.

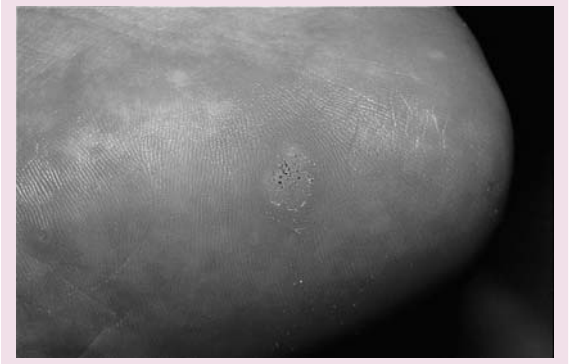


Fig. 7.15 Simple viral wart.

Scalded skin syndrome

This is a serious condition, usually caused by toxins released from specific strains of staphylococci. It usually affects infants, and causes severe erythema and the shedding of large sheets of epidermis from the body. The disorder responds well to prompt treatment with flucloxacillin or erythromycin, although a drug-induced adult variant of the condition (toxic epidermal necrolysis) is often fatal.

Molluscum contagiosum

Caused by a poxvirus, molluscum contagiosum mainly affects children. The lesions appear as multiple pearly-pink papules a few millimetres in diameter, with a central punctum. They commonly occur on the face, neck and trunk but can occur on any site of the body, including the genitalia. They tend to occur in crops over a 6–12-month period. They resolve spontaneously, although trauma such as squeezing or scratching the lesions can help stimulate a host response and speed up recovery. Cryotherapy can be considered in older children but may cause significant scarring.

Herpes simplex

The *Herpes simplex* virus has two genomic subtypes that cause different types of (primary) infection. Type 1 primary infection is spread by direct contact, commonly causing a subclinical infection but occasionally causing painful blisters of the face and gums (gingivostomatitis).

Type 2 primary infection occurs after sexual contact in young adults, with lesions in the genital region. If the primary infection occurs in women more than 36 weeks pregnant, caesarian section is required to minimize the risk of vertical transmission to the baby during labour, as neonatal infection is associated with severe neurological sequelae.

After the primary infection has subsided the virus can become latent, residing in dorsal root ganglia. Recurrent attacks lead to lesions at a similar site each time, and are commoner in immunosuppressed patients. The vesicular eruption may be preceded by a tingling or burning sensation, crusts form within 1–2 days, and the lesions clear after about a week.

Primary herpes simplex virus manifestations and painful genital lesions can be treated with oral aciclovir. Treatment of recurrent cold sores is with

antiviral drugs such as aciclovir or famciclovir. Those suffering from genital herpes can also use famciclovir. Barrier contraception should be used by those infected, and sexual intercourse should be avoided altogether during symptomatic episodes.

Herpes zoster

Otherwise known as shingles, this infection occurs as a result of reactivation of the varicella zoster virus (VZV) following a previous infection, commonly 'chickenpox' in childhood. Following prodromal paraesthesia and tingling, painful vesicular eruptions occur in crops following a dermatomal distribution, accompanied by local lymphadenopathy. The thoracic dermatomes are most often involved (Fig. 7.16).

Complications include persistent pain (postherpetic neuralgia). Involvement of the ophthalmic division of the trigeminal nerve results in ocular disease and corneal ulcers. The disease is most severe in older patients.

Treatment is with analgesia, and if secondary bacterial infection occurs topical antiseptic or antibiotic is necessary. Oral aciclovir can be given in severe cases and in the immunosuppressed.

Fungal infections

Fungal skin infections are called mycoses. Fungi are saprophytic organisms present throughout the environment. Three groups of pathogenic fungi are:

- Dermatophytes
- Candida albicans
- Pityrosporum.

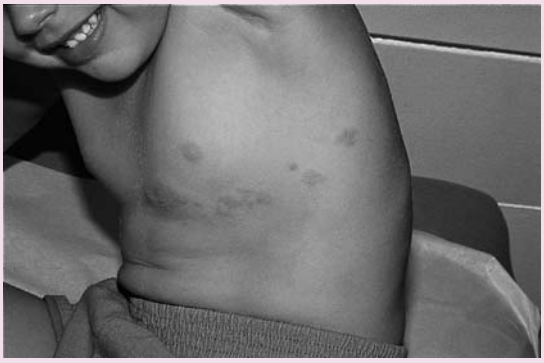


Fig. 7.16 Herpes zoster.

Dermatophyte infections

These fungi reproduce by producing spores, causing a 'ringworm'-type (tinea) rash. The usual sites of dermatophyte infection are the nails, hair and stratum corneum. Three different types of dermatophyte cause tinea in humans: *Microsporum*, *Trichophyton* and *Epidermophyton*. All are spread by direct contact from infected humans or animals.

Microsporum

Infecting skin and hair, *Microsporum* organisms fluoresce under Wood's light. They usually cause infection during childhood. Along with *Trichophyton* they cause tinea capitis (ringworm of the scalp). Two *Microsporum* organisms are responsible: *M. audouinii*, which spreads from child to child, creating epidemics in schools, and *M. canis*, which is passed on from family pets, mainly kittens and puppies.

Trichotophyton

Trichophyton organisms cause many types of tinea; this type of dermatophyte cannot be detected by Wood's light and diagnosis requires examination of skin scrapings under microscopy. The commonest example is *T. rubrum*, which causes tinea cruris (ringworm of the groin), tinea pedis (ringworm of the foot), tinea barbae (beard), and tinea facei (glabrous skin of the face) as well as infection of the hands (tinea manuum), feet (tinea pedis) and nails (tinea unguium).

Epidermophyton

Epidermophyton causes tinea cruris (ringworm of the groin) and tinea pedis (ringworm of the foot).

Treatment

Localized or flexural ringworm is effectively treated with a 2-week course of topical antifungal cream.

Widespread ringworm, such as tinea pedis and capitis, requires a 2-month course of oral antifungal therapy in adults.

Tinea unguium is more resistant to treatment and often requires: oral antifungal treatment given for 3 months or more.

Candida albicans infections

Candida albicans is a yeast organism normally resident in the mouth and gastrointestinal tract. It is an opportunistic pathogen, colonizing and causing infection where the possibility arises. Risk factors that predispose to an increased risk of *Candida albicans* infection include:

- Pregnancy
- Oral contraceptive pill
- Wide spectrum antibiotics
- Corticosteroid treatment
- Immunosuppressive drugs
- Diabetes mellitus
- HIV infection
- Poor hygiene
- Humid environment.

Flexural areas provide a warm, moist environment ideal for candidal growth. Infection creates red, ragged edges with small pustules or papules (satellite lesions) (Fig. 7.17). It can affect the genital, oral mucocutaneous tissue and nails, either alone or as part of a systemic infection.

Candida can colonize the mucosa of the mouth, oesophagus and genital tract, producing superficial, white pseudomembranous lesions, commonly in those taking broad-spectrum antibiotics or those who are immunosuppressed.

Management involves improved hygiene, and removing any predisposing factors, such as stopping systemic antibiotics, if appropriate.

Topical therapy includes nystatin and imidazoles. Amphotericin, nystatin and miconazole lozenges are used for oral candida. Systemic therapy includes oral itraconazole and fluconazole, and can be also be used in candida nail infection. Vaginal candida can be treated by a single dose of clotrimazole or econazole given intravaginally as a pessary.

Pityrosporum

Pityrosporum yeast forms part of the skin's normal flora. It can colonize the scalp, flexural creases and the upper trunk in an opportunistic manner. It is responsible for the conditions pityriasis versicolor and pityrosporum folliculitis. Pityrosporum proliferates exuberantly in seborrhoeic dermatitis.

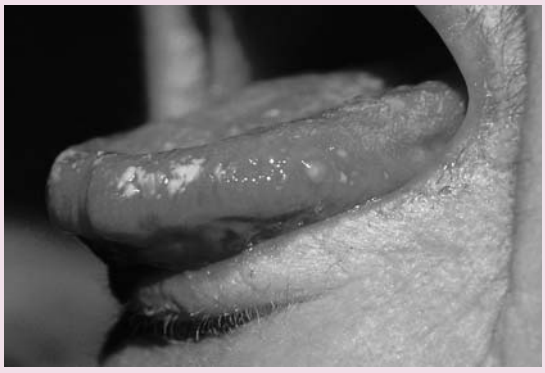


Fig. 7.17 *Candida albicans*.

Infestations

Insect bites

Insect bites can cause a chemical, irritant or immune-mediated response in the skin, caused by the introduction of foreign material. Depending on the type of bite, the lesion can present as anything from itchy wheals to a large bulla. Lesions are identified as insect bites by their pattern—often grouped into clusters (papular urticaria) and may be tracking up a limb. Secondary infection of the lesions may occur, requiring antibiotic treatment.

Management involves elimination of the source of the insects (bedbugs, cat fleas, etc.). Symptoms may be alleviated with antipruritic agents.

Insect bites can cause an allergic or irritant reaction to foreign material introduced by the insect. They commonly become pruritic, and scratching can cause secondary bacterial infection. Hydrocortisone cream or calamine lotion can help relieve the itching.

Pediculosis (lice)

Lice infestations are of three types: from the pubic louse (phthiriasis pubis), the body louse (pediculosis corporis) and the head louse (pediculosis capitis) (Fig. 7.18). Head lice often cause epidemics in schoolchildren: they are spread by direct contact, encouraged by overcrowding. The lice lay their eggs (nits) on hair. Lice cause itching and excoriation of the scalp.

Body lice are found in conditions of poverty and poor hygiene. They are commonly found on clothing, rather than being visible on the skin. They are spread on infested clothing or bedding.

Pubic lice are generally found in young adults and are spread through sexual contact. Infestation causes nocturnal itching, the resulting excoriation leading to an increased risk of secondary infection.

Management involves treatment with malathion, permethrin or phenothrin lotions, depending on the type of infestation. A nit comb can to help to remove head lice and their eggs.

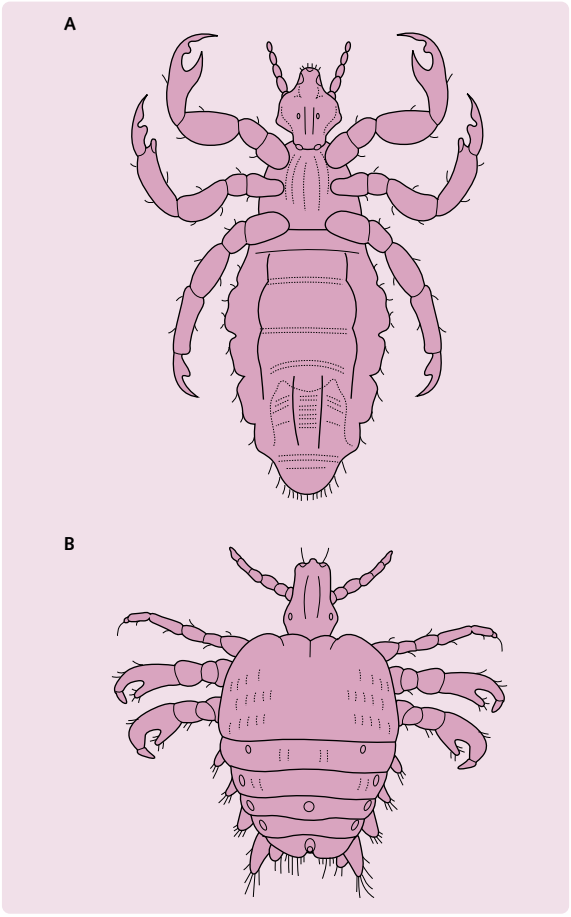


Fig. 7.18 (**A**) Body louse (*Pediculus humanus*). (**B**) Female pubic louse. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

Scabies

Scabies is caused by *Sarcoptes scabiei*, a mite (Fig. 7.19) that can only survive on human skin. There are 300 million cases worldwide each year, more commonly in poorer countries with social overcrowding. Scabies infestation develops as a chronic, pruritic and highly contagious disease. The female mite burrows into the skin at a rate of 2 mm a day, laying eggs as she goes. After 3 days the eggs hatch, maturing after 2 weeks. The mites mate; the males die and the females continue the cycle.

The skin takes 4–6 weeks to react to the infestation, so the infection may be spread by direct contact before the problem is recognized. Once the hypersensitivity reaction occurs, scratching reduces the mite population down to 12 or fewer.

Clinical symptoms include itchy, red papules occurring anywhere except on the face. There may be excoriations caused by itching, and scaly burrows, measuring up to 1 cm in length (Fig. 7.20). Burrows can be found on the wrists and ankles, around the nipples and the umbilicus, in the webs of the fingers and toes, and on the genitalia. Itching is usually most intense at night. Excoriations can predispose to secondary bacterial infection. The diagnosis can be confirmed by taking skin scrapings of a lesion to look for mites or their eggs.

In immunosuppressed patients, proliferation of the scabies mite leads to the formation of large, hyperkeratotic, encrusted eruptions that carry large numbers of mites. This is known as 'Norwegian scabies' and is an extremely contagious form of infestation that requires vigorous treatment and strict barrier nursing procedures. Management includes contact tracing and the use of a topical scabicide, e.g. malathion or 5% permethrin lotion, to treat infected patients and contacts.

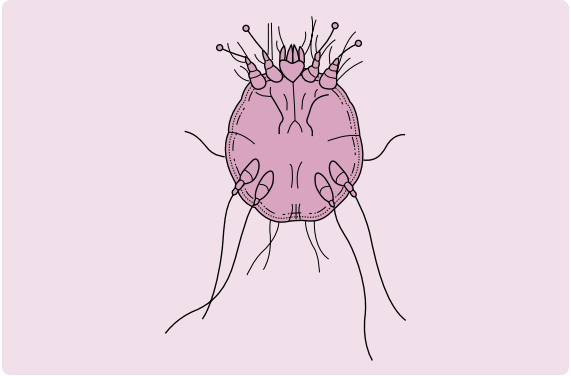


Fig. 7.19 Female scabies mite. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

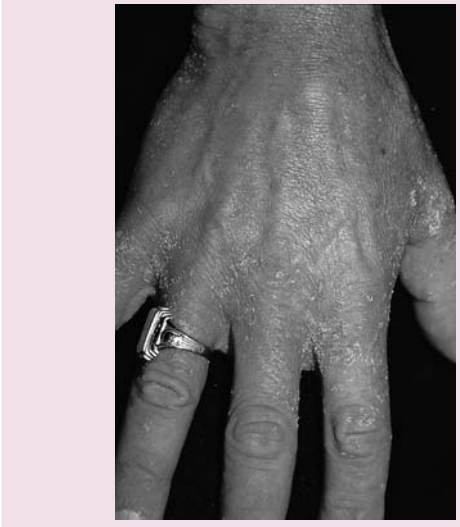


Fig. 7.20 Scabies infestation.

Children diagnosed with scabies should be excluded from school until 24 hours after treatment.

Tropical skin infections and infestations

Although not endemic in the West, tropical skin diseases can be seen in visitors and immigrants, and an awareness of the diseases listed below is useful in western medicine.

Leprosy

Caused by the acid-fast bacillus *Mycobacterium leprae*, leprosy is spread via nasal droplets and incubates for several years. Depending on the response of the host's cell-mediated immune system to the bacillus, the patient will develop either localized tuberculoid leprosy, where there is a strong cell-mediated immune response, or lepromatous leprosy, a serious systemic disease associated with a weak cell-mediated immune response. Tuberculoid leprosy affects the nerves, causing anaesthesia and muscle atrophy, as well as the skin, causing a hypopigmented, well-demarcated, single plaque, commonly on the face. Lepromatous leprosy affects all organs but affects the skin first, causing multiple symmetrical macules, papules, nodules and plaques on the face (leonine facies), arms, legs and buttocks.

Treatment lasts between 6 months and 2 years, and involves multidrug regimens because of increased resistance of the bacillus.

Leishmaniasis

This disease is caused by a protozoon transmitted to humans through the bite of sandflies. There are three types of leishmaniasis: cutaneous (endemic to the dry deserts around the Mediterranean), American (endemic to South and Central American tropics) and visceral (endemic to India).

Filariasis

Caused by the nematode worm *Wuchereria bancrofti*, filariasis is characterized by gross oedema of the legs and scrotum, termed 'elephantiasis'. It is treated with diethylcarbamazine.

Larva migrans

This is seen in holidaymakers returning from tropical beaches, where they may have been infested with a hookworm larva. These larvae emerge from eggs present in the faeces of infested cats and dogs; they penetrate the skin and migrate in a serpentiginous fashion, causing intensely itchy red burrows. The disease is self-limiting as the larvae die within a few weeks, but may be successfully treated with topical 10% thiabendazole cream, or oral albendazole, when symptomatic.

Onchocerciasis

Caused by *Onchocerca volvulus*, this filarial infestation is common in Africa and South America where the organisms are transmitted through gnat bites. The adult worm may grow up to 7 cm long, with microfilariae found in the dermis and, more seriously, in the eye, causing blindness.

Granulomatous nodules are present on the skin, following an itchy, papular eruption. Onchocerciasis can be treated with a single dose of ivermectin, followed by repeated doses at 6-month intervals until the worm has been eradicated.

Tumours of the skin

Benign tumours

Epidermal tumours

Seborrhoeic wart Otherwise known as a basal cell papilloma, seborrhoeic warts are benign overgrowths of the basal cell layer of the epidermis of unknown aetiology. They are common in the elderly or the middle-aged (Fig. 7.21).

The lesions appear to be stuck onto the skin, with an irregular, greasy-looking surface, and well-defined margins. They can be flesh-coloured, brown or black in colour and vary in size and number. They are found on the trunk and face. They can be treated by liquid nitrogen cryotherapy, curettage or shave biopsy.

Skin tags Skin tags are benign, pedunculated fibroepithelial polyps, commonly found on the neck, axillae, groin and eyelids of middle-aged to elderly patients. They are usually only removed for cosmetic reasons. The stalk of the polyp is cut or cauterized and the lesion removed. Skin tags can also be removed by cryotherapy.

Epidermoid cysts These cystic swellings are filled with keratin and form a central punctum. They arise from the epidermis. They can occur at any site, and are firm lesions, up to about 3 cm in diameter. They can occasionally rupture, causing inflammation of

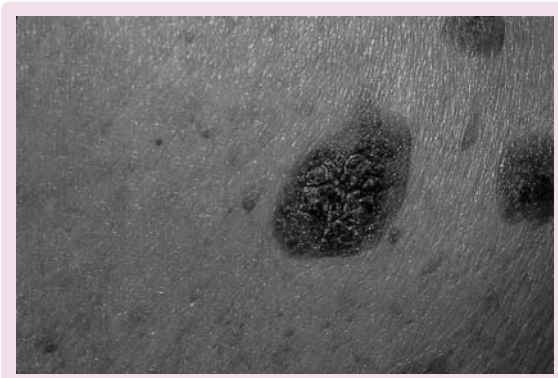


Fig. 7.21 Seborrhoeic warts.

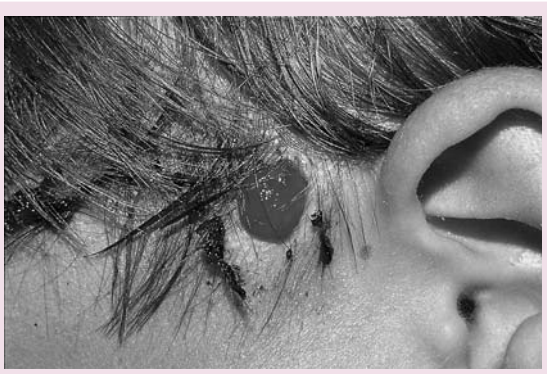


Fig. 7.22 Pyogenic granuloma.

the site. Excision will clear the lesion. They were previously known as sebaceous cysts. Pilar cysts are similar, arising on the scalp, although they lack a central punctum. They can have a familial tendency.

Milia These are small (1–2 mm), keratin-filled white cysts usually found around the eyelids or on the cheeks. They can appear at any age, and may follow the healing of subepidermal blisters. They can be successfully excised using a sterile needle.

Dermal tumours

Dermatofibroma Typically asymptomatic, dermatofibromas present as firm, purplish nodules that may or may not be pigmented. They usually occur on the legs, and are more common in women than men. If the diagnosis is in doubt, an excisional biopsy should be performed.

Pyogenic granuloma This is a benign overgrowth of blood vessels, actually neither pyogenic nor granulomatous, which presents as a rapidly growing, bright-red papule or nodule, often on the fingers or lips (Fig. 7.22). The lesion, which develops rapidly over a few weeks, is pedunculated, friable and bleeds easily. Pyogenic granuloma is treated by curettage or excision. The excised material is examined histologically to exclude an amelanotic malignant melanoma.

Keloid A keloid is a smooth, hard lesion caused by excessive collagen production, commonly after an injurious assault to the skin such as surgery or trauma. Unlike normal skin scarring, a keloid persists, often progressing beyond the limit of the original injury. They most commonly develop on the upper back, chest, ear lobes and chin.

Keloids are more common in the Afro-Caribbean population. Management involves steroid injections into the lesion.

Campbell-de-Morgan spot Also known as cherry angiomas, these are benign angiomas which present as bright-red/purple pinpoint papules, becoming increasingly prevalent with age. They are found mostly on the trunk. No treatment is required.

Lipoma Lipomas present as soft subcutaneous masses on the trunk, neck and upper extremities. The fatty nodules may be multiple and are sometimes painful, in which case they can be removed by excision.

Naevi

Melanocytic naevi

Aetiology Commonly known as 'moles', melanocytic naevi are benign overgrowths of melanocytes and are present in most white-skinned people. The number of naevi appears to be influenced by a genetic component. Most melanocytic naevi develop during childhood and adolescence. Pregnancy or excessive sun exposure may cause the development of further naevi in later life.

Skin changes that commonly occur during pregnancy are increased pigmentation, greater prominence of existing melanocytic naevi and the development of abdominal striae and spider naevi.

Pathology Naevus cells are thought to derive from melanocytes (Fig. 7.23) Naevi start with a proliferation of naevus cells at the dermoepidermal junction, forming brown macules (junctional naevi). Continued proliferation of naevus cells deeper into the dermis causes the mole to rise above the skin's surface, forming a compound naevus, with even pigmentation and a well-demarcated border. Eventually they may lose their pigmentation and develop into intradermal (cellular) naevi.

Complications Dysplastic naevi, which change size, shape or colour, and those that itch, become inflamed or encrusted must be examined and biopsied, as such alterations may be a sign of malignant melanoma.

Management Naevi displaying suspicious features should be biopsied and/or excised and sent for histology. Otherwise excision is rarely required, unless for cosmetic reasons. However, in this instance the patient should be counselled that excision could leave a scar and create cosmetic issues of its own.

Vascular naevi

These naevi are often present at birth. Most are derived from superficial capillary networks; larger angiomas are caused by deeper, multivascular plexuses.

Port-wine stain Also known as capillary haemangioma, this is a large, irregular, flat, red–purple macule arising as a result of abnormal dilatation of dermal capillaries. This lesion commonly affects the face asymmetrically. It does not resolve or improve, but in later life may become darker, thicker and nodular. If it occurs near the orbital region, ophthalmic function should be examined as there is an increased risk of glaucoma. Laser therapy can be very effective.

Salmon patch The most common vascular naevus, this lesion presents in half of all newborns. Pink patches on the upper eyelid often clear rapidly, but those at the back of the neck—'stork-marks'—may persist.

Strawberry naevus Also known as a capillary cavernous haemangioma, strawberry naevi affect about 1% of infants. They usually develop soon after birth as a red, lumpy nodule, growing to a maximum size at 1 year. The naevus begins to involute at about 2 years, and usually resolves by the age of 7 years. Strawberry naevi can occur anywhere on the skin. Management is usually simple reassurance to the parents.

Epidermal naevi These linear lesions are warty and pigmented, presenting at birth or in early childhood.

Fig.7.23 Clinical features of pigmented naevi

Type of naevus	Clinical features
congenital	present at birth; usually greater than 1 cm in diameter; can become prominent and hairy; vary from light brown to black; 5% carry risk of malignancy
junctional	flat macules up to 1 cm in size; round or oval; light to dark brown in colour; usually found on palms, soles and genitalia
intradermal	dome-shaped papule or nodule; seen on face and neck; may or may not be pigmented
compound	macules usually smaller than 1 cm; vary in pigmentation; occur anywhere; larger lesions may develop warty surface
Spitz	firm, red–brown nodule; usually occur in children on face; growth initially rapid; dermal vessels are dilated
blue	usually solitary; blue in colour; common on hands and feet
halo (Sutton's)	seen on trunk of adolescents and children; indicative of destruction of naevi cells by body's defence system; white halo of pigmentation surrounds existing naevus; there is an association with vitiligo
Becker's	rare; unilateral lesion in adolescent males; hyperpigmented, becoming hairy; found on back and chest; non-melanocytic

They can range from a few centimetres long to involving the whole of a limb, and may recur after excision. A scalp variant, naevus sebaceous, should be removed as it may become neoplastic.

Malignant epidermal tumours

Malignant melanoma

Epidemiology

Melanoma is a malignant tumour of melanocytes (Fig. 7.24). It is the most lethal of the skin tumours as it metastasizes early. Childhood exposure to excessive amounts of sun, as well as intermittent sun exposure and sunburn, is thought to be associated with the development of melanomas. The incidence is 10–20 cases per 100 000 population per year in the UK, and is increasing. The male:female ratio is 1:1.5. Melanoma is commoner in older people, but also affects the young. Melanomas tend to develop on areas exposed to the sun. The back is the most common site in men and the leg in women.

Clinical features

Many melanomas develop at the site of a pre-existing melanocytic naevus. Individuals with multiple melanocytic naevi, a previous history of malignant melanoma, a family history of melanoma and those with a fair complexion (especially people with red hair and blue eyes) who burn easily in the sun are also at increased risk. The criteria used for diagnosis can be easily remembered as ABCDE:

- **A**symmetry of a mole
- **B**order irregularity
- **C**olour variegation
- **D**iameter > 6 mm
- **E**levation.

The patient may also report the lesion itching and bleeding.

Pathology

There are four main variants of malignant melanoma (Fig. 7.25).

The excised lesion is analysed and scored according to its:

- Thickness (Breslow)
- Depth (Clark's level)
- Mitotic rate.

The results from these can used to predict the prognosis. The prognosis relates to the depth of tumour (Fig. 7.26).

Management

Malignant melanomas are treated by wide surgical excision with a margin of healthy skin excised alongside the tumour, the extent of which is determined from the Breslow thickness. Patients are closely followed to detect recurrence, which may occur locally or through metastases. Public heath education about the disease and its association with sun exposure can help to reduce excessive sun exposure in the future and the incidence of disease.

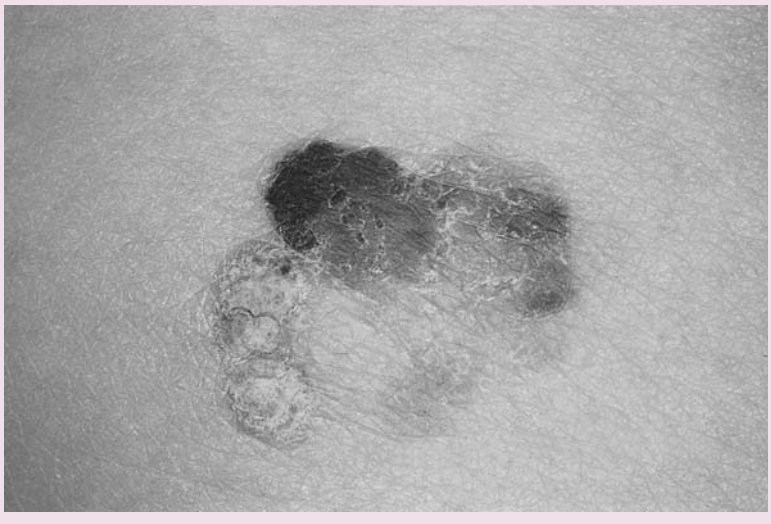


Fig. 7.24 Malignant melanoma.

Fig. 7.25 Main variants of malignant melanoma

Variant	Percentage of new UK cases	Clinical features
superficial spreading melanoma	50	occurs commonly in women; mainly on lower leg; macular; variable pigmentation; can regress; large, flat; grows laterally before it invades vertically
lentigo maligna melanoma	15	develops in pre-existing lentigo maligna (macular lesion arising in elderly or on sun-damaged skin); most common on face
acral lentiginous melanoma	10	affects palms, soles and nail beds; often diagnosed late so has poor survival rates; most common melanoma in Asian populations
nodular melanoma	25	commonly occurs in men; usually arises on trunk; non-pigmented nodule that grows rapidly, bleeds and ulcerates; most aggressive type; can mimic pyogenic granuloma

Basal cell carcinoma

Otherwise known as rodent ulcer, basal cell carcinoma is the most common type of skin malignancy. It arises from basal keratinocytes in the epidermis, and is most common in middle to late life.

Aetiology

Basal cell carcinoma is most commonly caused by excessive sun exposure, but can also result from chronic scarring. There is also some evidence of genetic predisposition. Fair-skinned individuals are most at risk, and the incidence is greater in men than in women.

Fig.7.26 Melanoma prognosis and tumour depth

Depth of tumour (mm)	5-year survival rate (%)
<1.49	93
1.5–3.49	67
>3.5	38

Pathology

The tumour is composed of basophilic cells, which bud down from the epidermis to invade the dermis. They often invade in a lobular fashion (Fig. 7.27).

Clinical features

The lesions tend to arise on sun-exposed areas of the face, such as the nose, eyelids and temple. They present as telangiectatic papules or nodules that can ulcerate. They usually grow slowly and are locally invasive. Owing to their slow growth, lesions may have been present for 2 or more years before the patient presents (Fig. 7.28). They almost never metastasize.

Management

If possible, complete excision is the best treatment. This can be difficult if lesions are around the eye or nasolabial folds. Radiotherapy can also be used. Cryosurgery may also be used on superficial trunk lesions.

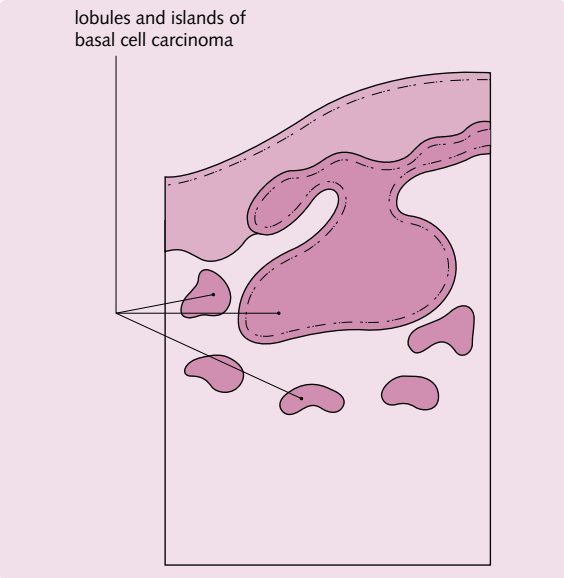


Fig. 7.27 Histopathology of basal cell carcinoma. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

Squamous cell carcinoma

Aetiology

These arise from epidermal keratinocytes and usually develop in an area of damaged skin. The risk factors for squamous cell carcinoma (SCC) include:

- Chronic sun exposure causing actinic damage
- Irradiation
- Chronic ulceration/scarring.

The lesions usually occur in later life, and are more common in men than women. The tumour may metastasize if left untreated.

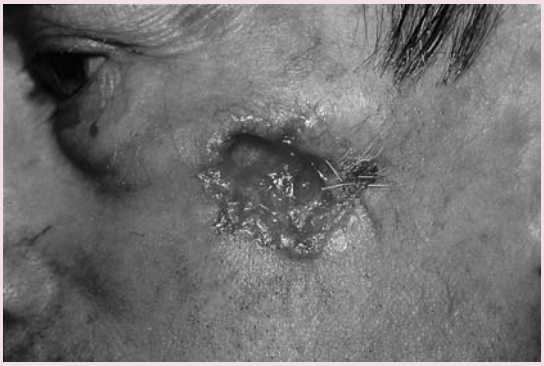


Fig. 7.28 Basal cell carcinoma.

Pathology

Cytology reveals keratinocytes, with a disordered and growth pattern and nuclear abnormalities (Fig. 7.29).

Clinical features

The lesions, which are usually found on sun-exposed sites, are keratotic nodules or plaques (Fig. 7.30). They often begin as small papules that can progress to ulcerated, crusted lesions.

Management

Surgical excision is the first line of management. Radiotherapy can also be used, although SCCs are relatively resistant to it compared to basal cell carcinomas. When metastasis occurs, regional lymph nodes are the most likely site for spread.

Premalignant epidermal tumours

Intraepidermal carcinoma (Bowen's disease)

Bowen's disease is a form of intraepidermal carcinoma (squamous carcinoma in situ) that can rarely become invasive. This form of cancer is commonest in elderly women. It usually presents on sun-exposed areas as a single scaly red patch or plaque with an irregular border, resembling psoriasis. The lesions gradually increase in size over time. They can be treated with topical 5-fluorouracil, cryotherapy or curettage.

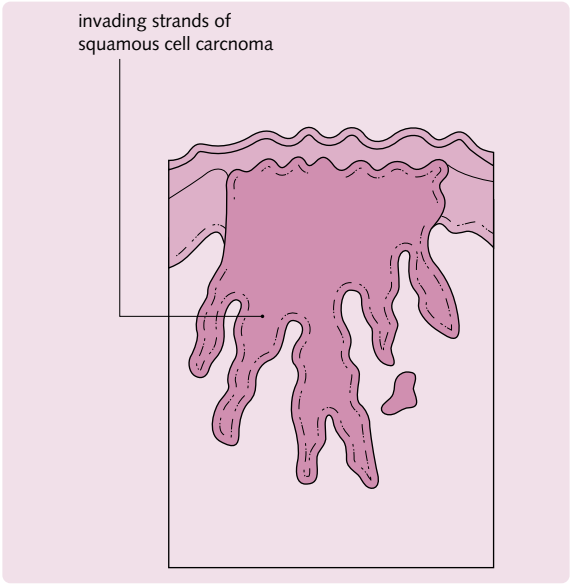


Fig. 7.29 Histopathology of squamous cell carcinoma. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

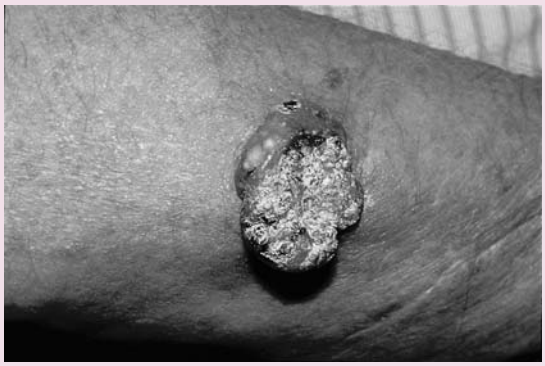


Fig. 7.30 Squamous cell carcinoma.

Keratoacanthoma

This is a rapidly growing tumour that arises in sun-exposed areas. It forms a dome-shaped papule, that can necrose and ulcerate, and grows to 2–3 cm in width. The lesion resembles a squamous cell carcinoma, but histologically is differentiated by a more symmetrical pattern. It may resolve spontaneously within a few months, but does scar. However, it is best to excise it in order to exclude squamous cell carcinoma and reduce scarring.

Cutaneous T-cell lymphoma

Also known as mycosis fungoides, this rare tumour is due to a lymphoma that develops in normal skin. It grows slowly, often following a relatively benign course. It presents insidiously with scaly plaques that are similar to those present in psoriasis or eczema, often developing on the buttocks. The lesions can come and go over years. Occasionally, nodules and ulcers develop within the plaques, and systemic disease results in spread of the tumour to lymph nodes and organs. It is diagnosed by skin biopsy. Early disease can be treated with topical steroids or PUVA to control plaque development. Advanced disease requires radiotherapy, chemotherapy and immunotherapy.

Kaposi's sarcoma

Kaposi's sarcoma is a multicentric tumour that arises from vascular and lymphatic endothelium and presents as purple nodules or plaques. The classic form mainly affects elderly men, with lesions developing on the lower limbs. The endemic form of the disease has a widespread cutaneous and lymphatic involvement with associated oedema, and affects men from central African countries. Kaposi's sarcoma can occur in immunosuppressed patients, notably those infected with HIV, following an aggressive course with systemic involvement of the skin, bowels, mouth and lungs.

All three forms can result from infection with herpesvirus 8.

Treatment of advanced disease requires radiotherapy, chemotherapy or immunotherapy.

DISORDERS OF SPECIFIC SKIN STRUCTURES

Sweat and sebaceous glands

Acne vulgaris

Pathology

Acne is one of the most common diseases of the skin. It can cause various lesions that result from chronic inflammation of the pilosebaceous apparatus, and affects chiefly those areas rich in sebaceous glands, mainly the face, shoulders and trunk. It commonly presents around puberty, and so appears in women earlier than in men, although both sexes are equally affected. Acne is essentially caused by excessive production of sebum, hyperkeratosis and blockage of the pilosebaceous duct, allowing colonization with *Propionibacterium acnes* to occur. This can lead to a release of inflammatory cytokines that results in inflammation of the lesions.

Clinical features

Lesions Comedones Comedones are either open or closed. Open comedones are dilated pores with a plug of keratin that contains melanin. Closed comedones are small cream-coloured papules (whiteheads).

Other lesions Comedones progress to inflammatory papules, pustules and cysts (Fig. 7.31). Cysts are the most destructive lesions as they leave scars that may be 'ice-pick', keloidal or atrophic. The skin may also be excessively greasy (seborrhoea).

Complications

Lesions can rupture, causing deep dermal inflammation and scarring in the long term. Although acne itself is a relatively harmless disease, the psychological effects it has on young patients cannot be overestimated. Patients severely devalue their own self-image because of the disorder. Upon remission or successful treatment,

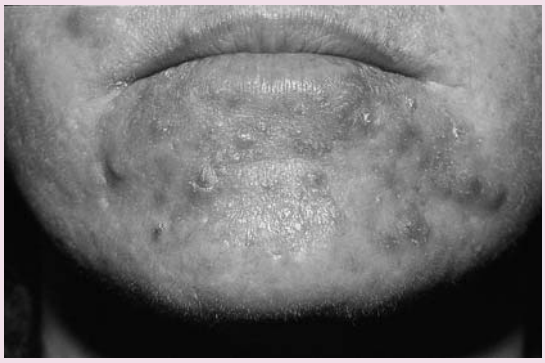


Fig. 7.31 Papulopustular acne.

the psychological symptoms of acne usually improve. The disease tends to improve spontaneously over some years, although in some cases it can persist into adulthood.

Management

There are a variety of treatments for acne, listed in Figure 7.32. The patient should be advised to avoid picking the lesions and to wash the affected areas regularly to reduce greasiness.

Phototherapy is controlled exposure to light of a certain wavelength for a specific period of time. Different wavelengths and exposure times are used therapeutically in some skin conditions. For example, in acne vulgaris, blue light at 440 nm activates porphyrin rings in the *Propionibacterium acnes* bacterium, creating free radicals that damage and subsequently kill the organism.

Rosacea

Rosacea is a common, erythematous, inflammatory rash that affects the face. It can occur at any age, although it is most common in middle age. The aetiology is unknown; histology shows dilated dermal blood vessels, sebaceous gland enlargement and inflammatory cell changes.

Clinical features

The first sign of rosacea is facial flushing, which precedes the telangiectasia (dilated blood vessels), and papules and pustules on the nose, cheeks and forehead (Fig. 7.33). It occurs most commonly in middle age, although all age groups can be affected. Alcohol, sunlight, long-term topical steroid therapy and fluctuations in temperature can worsen the flushing.

Fig. 7.32 Treatment of acne vulgaris

Treatment	Comments
benzoyl peroxide cream	eradicates *P. acnes*; bleaches clothes; may cause irritation and contact allergies
tretinoin	treats comedones before they evolve, but may cause irritation
antibiotics	first-line: tetracycline; second-line: erythromycin and trimethoprim; anitibiotics are suppressive, not curative; they are thought to affect lipase-producing bacteria present in pilosebaceous follicles
anti-androgens	used in combination with an oestrogen in women only; anti-androgen suppresses sebum production
retinoids	isotretinoin reduces sebum production, inhibits *P. acnes* and is anti-inflammatory: women must not be pregnant and must take oral contraceptive pill throughout 6-month course as retinoids are teratogenic; side effects can be severe
triamcinolone acetonide	steroid injected into acne cyst to aid healing
non-drug therapies	excision, cryotherapy, removal of comedones using an extractor

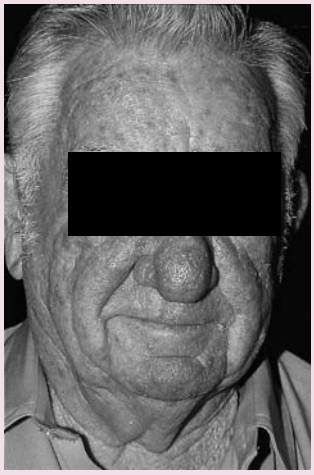


Fig. 7.33 Rosacea.

Complications

Complications include keratitis and hypertrophy of the sebaceous glands of the nose (rhinophyma), causing disfiguration. Blepharitis and conjunctivitis may also occur. Progressive disease can result in permanent facial erythema.

Management

Management aims to clear acute flares and slow disease progression. Long-term topical antibiotics such as metronidazole gel or clindamycin can be used. Topical steroid therapy should be avoided. If the rosacea proves resistant to these measures, oral antibiotics and isotretinoin can be used. Treatment improves the lesions but not the flushing or erythema. Plastic surgery can be used to correct rhinophyma.

Perioral dermatitis

This is a common perioral rash that tends to occur as a side effect of topical steroids. It presents as papules and pustules around the mouth and chin, with erythema and scaling. After withdrawing steroid therapy it is treated effectively with a 1–2-month course of low-dose oral tetracycline.

Others

Hidradenitis suppurativa

This term describes chronic inflammation of the apocrine sweat glands. Nodules, abscesses, cysts and sinuses develop in the axillae, groin and perineum, and may result in permanent scarring. Treatment depends on the severity of the condition and includes topical antiseptics, systemic antibiotics and excision of the affected glands.

Hyperhidrosis

Hyperhidrosis is excessive sweating caused by eccrine gland overactivity of unknown aetiology. It is exacerbated by heightened emotion. Aluminium chloride in alcohol is often used, applied to affected areas to reduce sweating.

Hair disorders

Alopecia

Classification

Hair loss or alopecia has a wide range of causes. It can be classified as:

- *Non-scarring* Hair loss with the scalp appearing normal. This may be androgen dependent (androgenetic alopecia), where the follicles are slowly converted from terminal to vellus hairs, and causes male pattern baldness (Fig. 7.34), being present to some degree in 80% of men by the age of 70 years. Androgenetic alopecia can also occur in women, but is usually less severe than in men.
- *Diffuse non-scarring alopecia* can also be caused by metabolic disorders such as hypothyroidism, iron or zinc deficiency. Telogen effluvium (e.g. following pregnancy) can result in diffuse non-scarring alopecia, as can the ingestion of certain drugs such as heparin and warfarin.
- *Localized non-scarring* Patchy hair loss may be caused by infection, especially tinea capitis, trauma or alopecia areata. In severe cases of alopecia areata complete hair loss can result. Alopecia areata is characterized by pathognomonic 'exclamation mark' hairs – short hairs with broken, splayed ends.
- *Scarring (cicatricial) alopecia* Scarring results from the permanent destruction of hair follicles, which can occur with burns, irradiation, infection such as shingles, kerion (occurring in tinea capitis) or tertiary syphilis, lichen planus, discoid lupus erythematosus and pseudopelade, a term used to describe the end-stage of an idiopathic destructive inflammatory process in the scalp.

Excess hair

Hirsutism

Hirsutism describes a male pattern of hair growth in a female. It can be idiopathic, presenting with

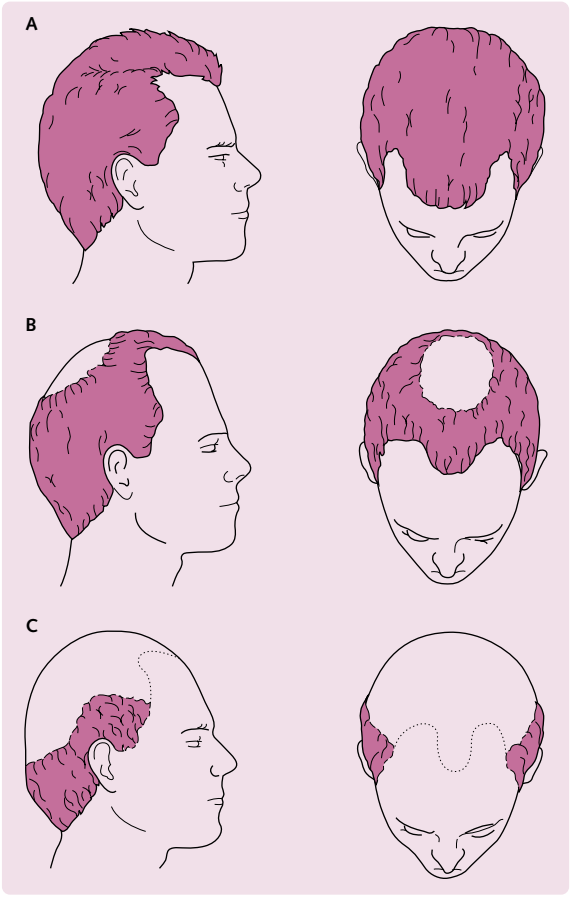


Fig. 7.34 Male pattern baldness. (**A**) Bitemporal recession; (**B**) vertex involvement; (**C**) most severe pattern of male baldness. (Adapted with permission from Gawkrodger DJ. Dermatology: an illustrated colour text, 2nd edn. Edinburgh: Churchill Livingstone, 1997.)

terminal hair development in the beard area and around the nipples, or more frequently drug induced. Other causes are listed in Fig.7.35. A full endocrine assessment is required if the woman has other features of virilization, such as a deep voice, clitoromegaly, dysmenorrhoea and acne. Sensitivity is required, as the condition is often very distressing to the patient.

Skin and hair changes that occur in anorexia nervosa include the development of lanugo hair, soft vellus hairs over the body, in particular over the face and volar forearms. There may be a loss of hair from the scalp, as well as brittle nails, dry skin and a grey tinge to the skin.

Fig. 7.35 Other causes of hirsutism

Cause of hirsutism	Example of disease
endocrine	acromegaly
	Cushing's syndrome
	virilizing tumours
	congenital adrenal hyperplasia
ovarian	polycystic ovaries
iatrogenic	excess androgens
	excess progesterones
idiopathic	end-organ hypersensitivity to androgens

Hypertrichosis

This term describes excessive growth of terminal hairs at any site of the body. It can occur in anorexia nervosa, with drugs such as ciclosporin or minoxidil, and rarely as a sign of underlying malignancy.

Hypertrichosis lanuginosa acquisita is the development of lanugo hairs associated with malignancy. These patients usually have metastatic disease at the time of diagnosis and hence a poor prognosis. It is most associated with lung, colorectal and breast carcinoma.

Others

Dandruff

The normal scalp is layered with fine scales of keratin; dandruff is simply a physiological exaggeration of the normal exfoliative process. Certain conditions (e.g. seborrhoeic dermatitis and psoriasis) can produce severe scaling of the scalp that may be mistaken for dandruff.

Tinea capitis

Tinea capitis is a fungal infection of the scalp (sometimes called ringworm) that may cause alopecia. It is commoner in children, especially those of Afro-Carribbean origin. Its incidence is slowly decreasing in developed countries, with the majority of UK cases caused by *Trichophyton tonsurans*. It is spread by close contact. Mild disease may imitate simple dandruff. Characteristically there are circular, scaly patches with hair loss and pustule formation.

Nail disorders

Congenital disease

Nail–patella syndrome

Inherited in an autosomal dominant fashion, nail–patella syndrome is a disorder in which the nails and patella are rudimentary or absent. There may be other skeletal anomalies. Thirty per cent of sufferers develop glomerulonephritis.

Trauma

Subungual haematoma

These lesions occur when the nail has been subjected to trauma. However, the possibility of a malignant cause such as a melanoma should always be considered where a subungual haematoma persists over time.

Splinter haemorrhages

These are commonly due to trauma. However, they may be indicative of infective endocarditis, so a full and thorough systemic examination should be performed to look for other features.

Ingrown toenails

Ingrown toenails are nails that have become embedded in the lateral nail folds, sometimes forming inflamed or pus-filled ulcerations. This produces intense pain and discomfort.

Two factors contribute to ingrown toenails: ill-fitting shoes predispose to physical pressure and subsequent deformity of the nails. Also, if toenails are not trimmed carefully, spicules of nail are left which can damage the nail fold. The nail of the great toe is most often involved.

Ingrown toenails can be prevented by good nail-cutting technique, and are treated by inserting gauze under the ingrowing edges of the nail to separate them from the skin fold. If this does not work, or they recur, removal of the nail and portions of its germinal matrix may be required.

Other factors that can cause ingrown toenails are physical trauma to the nail bed, such as stubbing the toe or sports injuries, and abnormalities of the nail bed, which can lead to the nail growing in an irregular fashion.

Onychogryphosis

Chronic trauma predisposes to onychogryphosis, a condition in which the toenails become grossly thickened and hardened, and can progress to cause lateral curvature of the nails. It particularly affects the great toe. Psoriasis and fungal infection can also cause onychogryphosis. It is usually treated by chiropody.

Brittle nails

These are commonly caused by heavy exposure to detergents and water, but may also be caused by iron deficiency, hypothyroidism and digital ischaemia.

Undergrowing toenails (subungual exostosis)

Undergrowing toenails have a bony outgrowth (exostosis) from the dorsal surface of the distal phalanx that pushes the nail upwards. They are treated by excision of the exostosis.

Nail involvement in skin disease

Psoriasis

Psoriatic nail involvement includes:

- Pitting
- Thickening
- Onycholysis
- Discoloration
- Subungual hyperkeratosis.

Alopecia areata

Nail involvement can manifest as fine pitting and roughened nail surfaces.

Eczema

Nail features of eczema include:

- Coarse pitting
- Transverse ridging.

Lichen planus

In lichen planus there can be thinning of the nail plate, the development of longitudinal grooves, adhesions between the nail fold and the nail bed, or ultimately loss of the nail.

Infections

Tinea unguium (onychomycosis)

Fungal infection of the nails commonly presents as an uneven discoloration, spreading from the distal or lateral edge to involve the whole nail. As a result, the nail becomes thickened, yellow and crumbly, and subungual hyperkeratosis can be seen (Fig. 7.36). Crumbly white material can be found beneath the

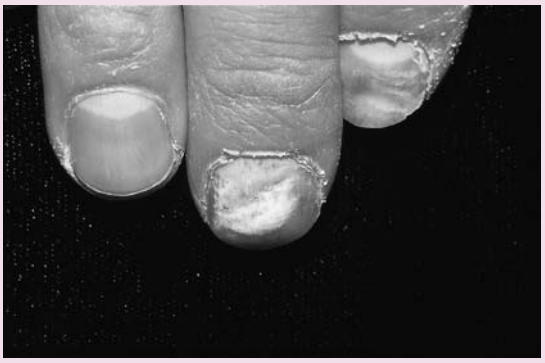


Fig. 7.36 Fungal infection of the nails.

nail and collected for diagnostic tests. Treatment is with oral terbinafine or itraconazole. Advanced infection can destroy the nail plate.

Chronic paronychia

This is often seen in wet-workers. The nail becomes boggy, the cuticle detaches, and pressure on the nail will cause pus to be extruded. Secondary involvement of the nail matrix can result in abnormal ridging of the nail, and the nail plate can become secondarily infected.

Management involves avoiding wet work by wearing rubber gloves, antiseptics, and antifungal creams such as clotrimazole.

Acute bacterial paronychia

Bacterial infection, usually staphylococcal, can arise at the junction of the posterior and lateral nail folds, with pus formation. Management requires oral antibiotics and sometimes drainage.

Tumours of the nails

Viral warts

Periungual warts are common. Treatment is the same as for warts elsewhere.

Periungual fibromas

These occur as a complication of tuberous sclerosis and are characterized by flesh-coloured papular tumours around the nails. They can be surgically removed.

Digital mucous cysts

These are found adjacent to the proximal fingernail fold; they contain mucin, a thick clear fluid, and are fluctuant. They can be treated with cryotherapy, steroid injection or excision.

Malignant melanoma

If a pigmented streak appears in the nail, biopsy must be performed to exclude a malignant melanoma. Biopsies must also be performed on all atypical or ulcerating lesions around the nail fold.

Nail changes in systemic disease

Nails often show non-specific changes in systemic disease, the most important of which is clubbing. Discoloration, koilonychia, onycholysis, pitting and ridging are also important signs of systemic disease (Fig. 7.37).

Vascular and lymphatic disorders

Disorders of cutaneous blood vessels

Definitions

- *Erythema:* redness of the skin caused by vasodilatation. It may be localized or generalized.
- *Flushing:* sudden onset of erythema owing to vasodilatation. It is caused by a number of factors, including emotion (blushing), the menopause, certain foods and drugs, rosacea, carcinoid syndrome and phaeochromocytoma.
- *Telangiectasia:* abnormal visible dilatation of dermal blood vessels. This can result from skin atrophy, excessive oestrogen levels, connective tissue disease, rosacea and venous disease, or they may be congenital. The lesions can be treated by cautery, hyfrecation and laser ablation.

Telangiectases are visibly dilated venules, and spider naevi are visibly dilated arterioles. They can occur in a state of oestrogen excess, and so can be present in pregnancy and in those taking the contraceptive pill. They can also occur in liver disease, as the liver's ability to break down oestrogen is impaired, resulting in raised oestrogen levels. In men this can also result in hypogonadism and gynaecomastia.

- *Purpura:* this describes a discoloration of the skin caused by the extravasation of blood cells. It can be caused by a number of factors, including vessel wall defects, defective dermal support, clotting defects or idiopathic pigmented purpura.

Fig. 7.37 Nail changes in systemic disease

Nail change	Causes
Beau's lines (tranverse grooves)	severe systemic illness
brittle nails	iron deficiency, hypothryoidism, loss of blood supply to nails, exposure to water and chemicals
colour change	drugs, cyanosis, infection, trauma, renal failure, tobacco staining, psoriasis
clubbing	bronchial carcinoma, fibrosing alveolitis, asbestosis, infective endocarditis, congenital cyanotic defects, inflammatory bowel disease, thyrotoxicosis, biliary cirrhosis
koilonychia (spoon-shaped nail)	iron-deficiency anaemia, lichen planus, chemical exposure
nail-fold telangiectasia (dilated capillaries)	connective tissue disorders
onycholysis (separation of nail from bed)	psoriasis, fungal infection, trauma, thyrotoxicosis, drugs (tetracyclines)
pitting	psoriasis, eczema, alopecia areata, lichen planus
ridging (transverse and longitudinal)	eczema, psoriasis, lichen planus

Raynaud's phenomenon

This is caused by paroxysmal spasm of the arteries supplying the fingers and toes, and mainly affects women. The resulting ischaemia causes the fingers to turn white and then blue, owing to cyanosis caused by pooled, deoxygenated blood in capillaries. They finally turn red, due to reactive hyperaemia as reperfusion ensues. There is associated numbness and paraesthesia. It is usually brought on by cold and relieved by warmth. The duration of attacks is variable, and between attacks the digits and their blood supply are normal. In persistent cases trophic changes can occur. Where the phenomenon occurs alone without any underlying disorder it is known as Raynaud's disease. Other causes of Raynaud's phenomenon include:

- Connective tissue disease
- Hyperviscosity of blood, e.g. cryoglobulinaemia, polycythaemia
- Vasoconstriction caused by the use of vibrating tools
- Toxins and drugs, particularly β-blockers.

As the phenomenon is often precipitated by cold, patients are advised to keep their hands warm and to avoid circumstances and occupations in which they are exposed to cold for prolonged periods. They should avoid smoking and β-blockers should be stopped. Nifedipine and diltiazem may also help.

Livedo reticularis

This is cyanosis occurring in a marble pattern on the skin. It is caused by reduced arteriolar flow and poor skin circulation. Reversible livedo is usually induced by cold and is seen in children, whereas fixed livedo is usually caused by vasculitis and requires further investigation.

Chilblains

These are painful, pink–purple inflamed swellings on the fingers, toes and ears, which are cold to the touch. The lesions may last for weeks and may be complicated by ulceration. Chilblains are much less common since the introduction of central heating.

Lymphatic disorders and the skin

Lymphoedema

Lymphoedema is a chronic, non-pitting oedema that affects the limbs, caused by a disruption of lymphatic drainage of the affected limb. It can be classified as a primary or secondary disorder.

Primary lymphoedema is caused by a genetic deficiency of lymphatic vessels and usually presents in adolescence. Secondary lymphoedema is usually due to obstruction to lymphatic drainage, recurrent infection (e.g. cellulitis), or damage from surgery or radiotherapy.

In chronic cases the skin can become dimpled and thickened. Lymphoedematous areas are at increased risk of infection, and where there is recurrent infection long-term antibiotic prophylaxis is required to prevent further damage.

Lymphangitis

Lymphangitis is an inflammation of lymphatic vessels, most frequently seen as a complication of infection such as cellulitis. It causes a tender red line that extends proximally from a focus of infection. It is treated with intravenous antibiotics. It can also be seen as a complication of malignancy permeating lymphatic channels.

Leg ulcers

Aetiology

Leg ulcers can be caused by venous disease, arterial disease, vasculitis or neuropathies (Fig. 7.38). The most common type in the Western world are venous ulcers. These affect 1% of the adult population and are twice as common in women as in men.

Pathology

Venous ulcers These are caused by valvular incompetence in the perforating veins of the legs. This causes chronic venous hypertension, which leads to increased permeability. As a result, fibrin seeps through the vessel walls and is deposited adjacent to the capillaries. This interferes with oxygen and nutrient exchange, and ultimately leads to ulceration. Ulcers usually present in middle age and later life. Risk factors for the development of venous ulcers include obesity and previous deep vein thrombosis (DVT). The first signs are a feeling of heaviness in the legs caused by oedema. There may be an associated discoloration of the skin, pain, venous eczema, and fibrosis of the dermis and subcutis (lipodermatosclerosis). Minor trauma can be enough to provoke ulceration in predisposed individuals. Ulcers usually affect the area between the lateral and medial malleoli (Fig. 7.39). Ulcers are initially exudative, but may then enter a granulomatous, healing phase, which can take many weeks or months; some larger venous ulcers never heal. On healing, dermal fibrosis can cause the affected area to be irreversibly disfigured.

With appropriate treatment, 80% can heal within 26 weeks. Treatment requires compression bandages and elevation of the leg to reduce venous pressure. However, it is vital that Doppler studies are performed to exclude arterial disease before compression therapy is used. Supportive treatments include antibiotics for secondary infection and analgesia for pain.

Arterial ulcers Arterial disease affecting the leg leads to ischaemia and cyanosis, increasing the likelihood of arterial ulcers developing. These are painful lesions that appear well demarcated and 'punched out', and form on the foot or mid-shin of a cold, pale limb. There may be reduced or absent arterial pulses in the foot and hair loss from the leg. There may be a history of cardiovascular risk factors, in particular high blood pressure, intermittent claudication, ischaemic heart disease (IHD) or smoking. Doppler ultrasound confirms the diagnosis. Treatment requires maintenance of a high standard of hygiene around the

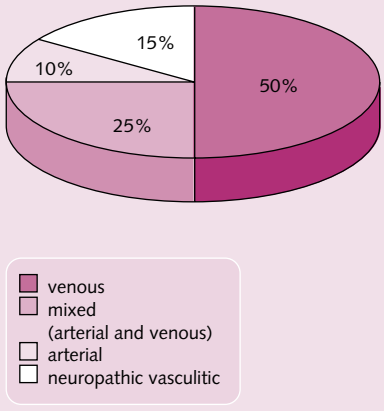


Fig. 7.38 Percentages of leg ulcers caused by venous disease, arterial disease, vasculitic disease or neuropathy.

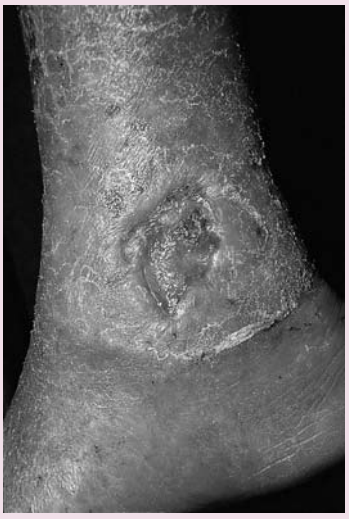


Fig. 7.39 Venous ulcer.

wound and appropriate analgesia. Surgery may be required to improve arterial flow.

Neuropathic ulcers These tend to occur on pressure areas of the foot owing to repeated, physical trauma, usually in those with neurological dysfunction that affects the patient's perception of pain or trauma. They particularly occur in diabetics with peripheral neuropathy. Optimal healing conditions require keeping the ulcer clean and minimizing further trauma.

Complications

Poor management of ulcers may cause them to enlarge and deepen, reducing the chances of them healing successfully. Complications include secondary infection, lymphoedema and contact dermatitis (sensitivity to topical medications). Rarely, malignant change to squamous cell carcinoma can occur with venous ulcers.

Management

Underlying risk and causative factors, such as obesity, cardiac failure, anaemia and arthritis, should be addressed. Elevation, exercise and a healthy, balanced diet should be advised to encourage normal blood flow.

Topical therapy includes antiseptics and deslough-ing agents. Hydrocolloid or gel dressings used with compression bandages increase granulation and promote healing of the ulcer.

Appropriate analgesia should be provided. Antibiotics should be used to treat secondary infection. Surgery is only helpful in younger patients and/or cases resistant to treatment, and in patients without significant comorbidity, such as cardiac failure.

Vasculitis and reactive erythemas

Vasculitis

This term refers to inflammation of the blood vessels. It can be caused by drugs, infection or connective tissue disease, but most cases appear to be idiopathic. Circulating immune complexes lodge in vessel walls and activate complement, causing damage to the vessel walls. This causes characteristic, palpable, often painful purpura at sites of vessel involvement. Vasculitis may be confined to the skin. However, it can also be a multisystem disorder affecting the vessels of the joints, kidneys, lungs, gut and nervous system (Fig. 7.40). There is often pyrexia and arthralgia. Cutaneous vasculitis can resolve spontaneously. General measures to alleviate symptoms include leg elevation, support stockings and analgesia. Systemic steroids and immunosuppressive agents are needed in some cases to control the disease process.

Erythema multiforme

This is an immune-mediated hypersensitivity reaction caused by infection, usually with *Herpes simplex* virus or *Mycoplasma*, or adverse drug reactions. It is characterized by target lesions consisting of erythematous rings that may blister. The rash occurs symmetrically, often involving the hands and feet. The mucous membranes may also be involved. Management is by treatment of the underlying cause.

Erythema nodosum

This is an inflammation of the dermis and subcutaneous tissues. It causes painful red–blue nodules on the calves and shins. It is more common

Fig.7.40 Types of vasculitis

	Clinical features
Henoch–Schönlein purpura	cutaneous signs accompanied by arthritis, abdominal pain and haematuria; it often follows a streptococcal infection and mainly affects children
nodular vasculitis	painful subcutaneous nodules are found on the lower legs
polyarteritis nodosa	an uncommon necrotizing vasculitis that affects middle-aged men; subcutaneous nodules develop, together with hypertension, renal failure and neuropathy
Wegener's granulomatosis	a rare and potentially fatal vasculitis; malaise, lung involvement and glomerulonephritis are accompanied by cutaneous vasculitis in 50% of patients
giant cell arteritis	affects the elderly, who present with scalp tenderness owing to temporal artery involvement, which can cause scalp necrosis; prednisolone should be given, or sight may be lost

in females and younger adults. Circulating immune complexes play an important role in the pathology. The causes of erythema nodosum include infection, drugs, inflammatory bowel disease and sarcoidosis. Arthralgia and fever often accompany the nodules. The condition usually clears spontaneously over 1–2 months. Treatment includes NSAIDs, elastic bandaging or hosiery and bed rest.

Sweet's disease

Sweet's disease is an acute, febrile neutrophilic dermatosis, which is characterized by annular red plaques on the face and limbs. The lesions are accompanied by fever and a raised neutrophil count. The disease often occurs in patients with an underlying malignancy, particularly leukaemias and lymphomas. Treatment with prednisolone is usually effective.

DISORDERS OF PIGMENTATION

Hypopigmentation

Vitiligo

Aetiology

This is a common disorder, probably autoimmune in aetiology, that leads to macules of pigment loss on the skin with no preceding symptoms (Fig. 7.41). It affects around 0.5% of the population and about 30% of patients have a positive family history. It is associated with pernicious anaemia, thyroid disease and Addison's disease. The onset is usually in childhood or early adulthood, and it affects both sexes equally.

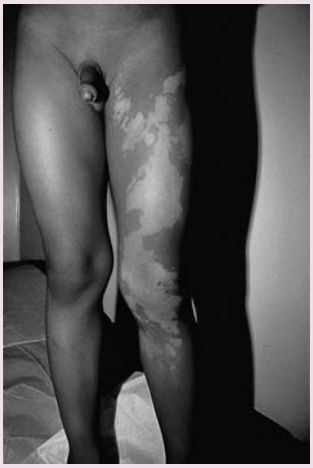


Fig. 7.41 Vitiligo.

Clinical features

The well-defined macules are usually symmetrical, and frequently affect the hands, wrists, face and neck, and the genitalia. The hair may also be depigmented. Vitiligo lesions may be precipitated by trauma and exacerbated by sun exposure. Repigmentation can occur spontaneously, but rarely occurs in chronic lesions.

Complications

As melanocytes are absent from lesions, care must be taken when skin is exposed to the sun as patients can burn easily.

Management

Camouflage cosmetics often prove unsatisfactory. Sunscreens must be used to protect lesions and prevent burning. Potent topical steroids and UV phototherapy may help to induce repigmentation. When vitiligo is nearly universal and very noticeable, it is worth considering inducing depigmentation of the remaining normal skin using 20% hydroquinone ointment.

Albinism

Albinism is a rare autosomal recessive disorder, with a prevalence of 1:20 000. Melanocytes fail to synthesize melanin, leading to a lack of pigment in the skin. The skin is universally pale, the hair is white and the eye lacks pigmentation, with the iris appearing pink. Patients suffer from photophobia, nystagmus and poor sight. As the body has no protection against UV rays, the sun should be strictly avoided as the risk of skin cancer is greatly increased; obsessive sun protection is necessary in circumstances where exposure is unavoidable.

Phenylketonuria

This is an autosomal recessive metabolic defect. The enzyme that converts phenylalanine into tyrosine is defective, leading to the accumulation of metabolites in the brain. If left untreated, mental retardation and choreoathetosis occur. The hair and skin are fair because melanin synthesis is impaired, and atopic eczema commonly develops. Management requires a diet with minimal phenylalanine content.

Hyperpigmentation

Freckles and lentigines

Freckles are small, light-brown macules in sun-exposed areas that darken with prolonged UV exposure. On stimulation by UV light the synthesis of

melanin is increased without affecting the number of melanocytes. Freckles are common and are frequently seen on the face in the summer months. Lentigines are brown macules that do not darken in the sun. However, they contain an increased number of melanocytes. No treatment is required, although they may respond to cryotherapy if removal is desired.

Chloasma

Induced by pregnancy or by taking the oral contraceptive pill, chloasma is a symmetrical facial pigmentation that often involves the forehead. It sometimes improves spontaneously, although sunscreens and camouflage cosmetics may help.

Drug-induced pigmentation

Pigmentation is a side effect of certain drugs such as phenothiazines, minocycline, amiodarone, clofazimine, chlorpromazine and antimalarials.

Other causes

Peutz–Jeghers syndrome is an autosomal dominant condition that causes lentigines to form around the lips and mouth, in association with benign small bowel polyps. Addison's disease leads to new melanocyte production through the production of excess adrenocorticotrophic hormone, resulting in pigmentation on the buccal mucosa, palmar creases, scars and flexures.

BLISTERING DISORDERS

Pemphigus

Pathology

This is a potentially fatal disease in which autoantibodies develop against a desmosomal protein, desmoglein 3, that holds cells together. It affects both sexes equally, and usually presents between youth and middle age. Circulating IgG autoantibodies bind to the skin's intracellular matrix, inducing the release of proteolytic enzymes from adjacent keratinocytes. This subsequently results in thin-walled, fragile blisters. Pemphigus is often associated with other autoimmune disorders.

Clinical features

The disease presents in half of patients as an eruption of shallow mucosal blisters, especially in the mouth. Further flaccid lesions can follow several months later on the face and trunk. Blisters are sore and invariably rupture, so patients often present with red, weeping skin erosions rather than blisters. This is in contrast to pemphigoid, where the blister walls are thicker and more robust. Lesions can be extended under gentle pressure (Nikolsky's sign). Diagnosis is by skin biopsy, immunofluorescence and the detection of serum autoantibodies, which can subsequently be measured and used to monitor disease activity.

Management

High-dose oral steroids are given to control the blistering, often for long periods, in which case they are used in conjunction with steroid-sparing immunosuppressant drugs such as azathioprine. Both the disease and the treatments can produce significant morbidity and occasional mortality.

Pemphigoid

Pemphigoid usually affects older people, in particular those over 60. It is characterized by a chronic eruption of large, tense-walled blisters, often associated with or preceded by widespread pruritus (Fig. 7.42).

Pathology

The pathology is similar to that of pemphigus, with autoantibodies produced against BP-1 antigen in hemidesmosomes. However, the autoantibodies are deposited at the basement membrane, resulting in a subepidermal split through the membrane. Serum autoantibodies are present in 70% of patients. Pemphigoid is diagnosed through skin biopsy and immunofluorescence.

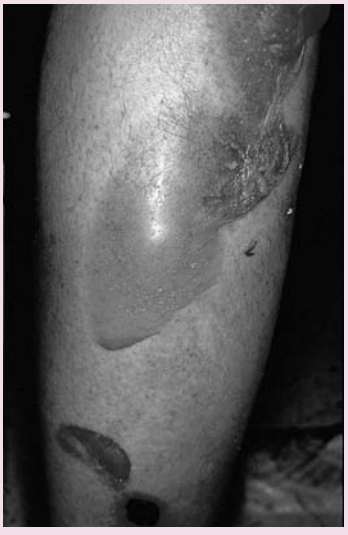


Fig. 7.42 Bullous pemphigoid.

Clinical features

Pemphigoid has three different patterns (Fig. 7.43).

Management

Oral prednisolone is prescribed at a lower dose than for pemphigus, and steroid-sparing agents such as azathioprine may also be used. The disease is self-limiting in half of all cases and is easier to control than pemphigus. Treatment can often be stopped after 2 years.

Dermatitis herpetiformis

Pathology

Dermatitis herpetiformis is an uncommon blistering disorder associated with gluten-sensitive enteropathy (coeliac disease). It causes a symmetrical eruption of intensely pruritic blisters.

Clinical features

The first sign of dermatitis herpetiformis is usually small, itchy vesicles that erupt on the scalp, elbows, knees and buttocks. They can present as crusted erosions (the blisters are frequently scratched off). Although small-bowel pathology is often present, gastrointestinal symptoms are uncommon. Dermatitis herpetiformis is diagnosed on skin biopsy and immunofluorescence. The condition responds to a gluten-free diet, which should always be implemented and maintained. Oral dapsone can control the skin disease, but treatment can be withdrawn when a gluten-free diet has been successfully established.

Fig. 7.43 Clinical patterns of pemphigoid

Type of pemphigoid	Clinical features
bullous	large, tense, itchy blisters that usually affect elderly patients; limbs, hands, feet commonly affected; 10% of patients have oral lesions; may occur on reddened or urticarial skin, may be localized to a single site (see Fig. 7.42)
cicatricial	predominantly affects mucosal surfaces, especially ocular and oral mucosa; causes scarring
pemphigoid (herpes) gestationis	bullous lesions that are associated with pregnancy; clears after delivery but may recur in subsequent pregnancies

INHERITED DISORDERS OF THE SKIN

The ichthyoses

The ichthyoses are a group of rare disorders characterized by excessive amounts of dry, scaly skin. The classification of ichthyoses is listed in Figure 7.44.

Management

Regular use of emollients and moisturizing creams is the mainstay of treatment. Neonatal ichthyoses must be managed in a paediatric intensive care unit, as fluid losses may be huge and thermoregulation is disturbed.

Keratoderma

This disorder is characterized by gross hyperkeratosis of the palms and soles, creating papular or nodular raised lesions. It can develop in association with other conditions, such as reactive arthritis, or it may be inherited. The typical diffuse pattern of hyperkeratosis is known as tylosis; in rare cases it is; associated with oesophageal carcinoma. Keratoderma is treated with keratolytics such as salicylic acid ointment or urea cream.

Epidermolysis bullosa

This describes a rare group of disorders in which there are genetic abnormalities of structural skin proteins, resulting in fragile skin. Minor injury or trauma induces blistering. The disease ranges in severity from simple epidermolysis bullosa (the most common type), which features blisters limited to the hands and feet, to junctional epidermolysis bullosa, a potentially fatal disorder where large blisters develop or areas of skin are absent at birth. Dystrophic epidermolysis bullosa causes severe blistering and deformity of the nails. There are two patterns of inheritance, autosomal dominant and autosomal recessive. Autosomal dominant forms follows a milder course than the recessive form, in which joint contractures and fusion of digits may occur. The disease is best managed in a specialized centre, and management relies on the avoidance of trauma and secondary infection.

Fig.7.44 Classification of ichthyoses

Type of ichthyosis	Mode of inheritance	Incidence	Clinical features
ichthyosis vulgaris	autosomal dominant	1 : 250 births	disorder of epidermal cornification; onset between 1 and 4 years; granular layer is reduced or absent; dry skin with white scales on back and extensor surface of limbs; palmar and plantar markings are increased
X-linked ichthyosis	X-linked	1 : 7000 births	onset is early; scales are dark and widespread, with face, neck and scalp all involved; caused by deficiency of steroid sulphatase
bullous ichthyosiform erythroderma/ epidermolytic hyperkeratosis	autosomal dominant	1 : 100 000	presents at birth; skin is red, moist and eroded in parts; erythema eventually replaced by scales; flexures particularly affected; hyperkeratosis develops in childhood
non-bullous ichthyosiform erythroderma	autosomal dominant	1 : 100 000	presents at birth; collodion baby (newborn with tight, shiny skin causing feeding difficulties and ectropion); progresses to reddening and thickening of skin with fine, white scales; acanthosis is present

Neurofibromatosis

Neurofibromatosis is a condition characterized by multiple neurofibromas and associated skin pigmentary abnormalities. Two forms are recognized: NF1 (von Recklinghausen's peripheral neurofibromatosis) and NF2 (bilateral acoustic central neurofibromatosis).

NF1 is common and is inherited in an autosomal dominant fashion, affecting 1 in 3000 births. Skin involvement includes:

- *Café-au-lait* spots—flat, coffee-coloured skin patches that appear within the first year of life, progressively increasing in size and number. Six or more macules more than 2.5 cm in diameter are diagnostic
- Freckling in the axillae, groin, base of neck and under the breasts, developing by the age of 10
- Fleshy skin tags
- Deep, soft dermal tumours, which may become pedunculated and may itch. Nodular neurofibromata are firm, well-demarcated nodules stemming from the nerve trunks that may become numb when they are pressed. Lisch nodules—pigmented hamartomas in the iris—can be visualized using a slit lamp.

Potential complications include the development of malignancy (neurofibrosarcoma). Genetic counselling is an important part of management. Excision of some tumours may be required, depending on the site, the individual and their circumstances.

Tuberous sclerosis

This rare disorder is an autosomal dominant condition that varies in severity. It is characterized by hamartomas developing in organs and bone. Cutaneous features include:

- Ash-leaf patches—ovoid or elongated hypopigmented macules that fluoresce under Wood's light, presenting in infancy
- Adenoma sebaceum—an acne-like eruption of reddish papules or fibromas around the nose, presenting in late childhood and adolescence
- Periungual fibromata—fibrous pink nodules which arise from the nail bed
- Shagreen patches—firm, fleshy plaques sited on the trunk.

In addition to cutaneous features, there may be mental retardation and epilepsy.

Management is supportive, and involves genetic counselling and support groups.

Xeroderma pigmentosum

Caused by defective repair of UV-damaged DNA, this condition is characterized by photosensitivity that begins in infancy. The persistent damaged skin results in the development of skin tumours, from which patients can die as young as 30 years of age. Affected patients must avoid sunlight. The condition is very rare, and is autosomal recessive in inheritance.

Pseudoxanthoma elasticum

Pseudoxanthoma elasticum describes a group of disorders caused by abnormalities in elastin and collagen. It is characterized by loose, wrinkled skin that bears papules and is most often found in the flexures of the neck. The disorder is inherited in an autosomal recessive manner.

CONNECTIVE TISSUE DISORDERS

Systemic lupus erythematosus

Systemic lupus erythematosus (SLE) is an inflammatory multisystem disorder, a widespread vasculitis that affects the skin as well as the joints, kidneys, lungs and nervous system.

Aetiology

The aetiology is unclear. Ninety per cent of patients with SLE have circulating antinuclear antibodies detectable in their serum. SLE is associated with HLA B8 and DR3.

Pathology

There is a dysregulated immune response to cellular antigens that come to be expressed on the surface of apoptosing cells, resulting in the formation of antibody–antigen immune complexes within the blood vessels that are deposited in the basement membrane of the skin and the kidneys. Immune complexes, immunoglobulins and complement are deposited at the junction of the epidermis and dermis in the lesions (and in sun-exposed skin in SLE); these can be viewed by direct immunofluorescence. Patients develop annular lesions, which show epidermal atrophy, hyperkeratosis and basal layer degeneration. In SLE, lesions are accompanied by dermal oedema, inflammation, and occasionally vasculitis.

Clinical features

Skin involvement occurs in 75% of patients with SLE, the site and the nature depending on the variant of the disease. Involvement includes:

- An erythematous butterfly rash present on the face and the bridge of the nose
- Photosensitivity
- Annular lesions with a well-defined erythematous margin, becoming atropic and scaly, and associated follicular keratin plugs
- Diffuse alopecia
- Vasculitic lesions
- Purpura and urticaria.

Other systemic features (Fig. 7.45) must also be present for a diagnosis of SLE to be made.

In discoid lupus erythematosus the discoid lesions appear on the face, scalp or hands.

Palmar and plantar rashes and skin pigmentation can occur. Raynaud's phenomenon is common.

Complications

In addition to the systemic features listed in Figure 7.45, healed lesions can leave scarring and may lead to alopecia and hypopigmentation in pigmented skin.

Management

Patients should be advised to minimize sun exposure and sunscreen should be used to protect photosensitive skin. Active disease requires therapy with topical or oral steroids, or immunosuppressants.

Scleroderma

Scleroderma is a chronic multisystem inflammatory disease characterized by tightening, immobility, thickening and induration of the skin, especially over the fingers, limbs, trunk and face, and sometimes in a generalized distribution. There is excessive production of types I and III collagen that is

Fig. 7.45 Systemic features of systemic lupus erythematosus

System	Clinical features
musculoskeletal	arthritis
	tenosynovitis
cardiovascular	pericarditis
	endocarditis
respiratory	pneumonitis
	effusion
	infarction
central nervous system	psychosis
renal	glomerulonephritis
blood	anaemia
	thrombocytopenia

deposited in the microvasculature supplying the skin, as well as that supplying all the organs of the body. This results in inflammation and progressive fibrosis, and microvascular occlusion.

Scleroderma can be classified into localized and generalized according to the level of cutaneous and systemic involvement (also known as systemic sclerosis) (Fig. 7.46).

Localized scleroderma/morphoea

Localized scleroderma involves the skin, and possibly the bones and muscles underlying it, but spares the internal organs. Localized lesions may occur in a patchy or linear distribution and are often known as morphoea.

In linear scleroderma (morphoea) there is asymmetrical thickening of the skin that also affects the underlying bones and muscles, and can become severe enough to limit the range of movement of the area. It commonly affects the arms, legs and forehead.

In patchy morphoea, pale, indurated plaques develop a purple halo around them, leading to hairless and atrophic areas of skin. The disease may resolve spontaneously. It most commonly affects children and young adults.

Systemic sclerosis (generalized scleroderma)

In addition to skin and blood vessel involvement, the internal organs can also be involved in the disease. Cutaneous involvement includes:

- Raynaud's phenomenon: this occurs in almost all cases, and is the first manifestation of the disease in three-quarters of cases
- Resorption of finger pulps
- Tight, waxy and stiff skin on the fingers, forearms and calves, producing flexion deformities
- Perioral furrowing (microstomia) and characteristic 'beak-like' nose
- Telangiectasia.

It can be classified according to the pattern of involvement into CREST syndrome, limited systemic sclerosis and diffuse systemic sclerosis.

CREST is characterized by the presence of two or more of the following:

- **C**alcium deposition, usually in the fingers
- **R**aynaud's phenomenon
- (O)esophageal motility loss
- **S**clerodactyly (deformity of fingertips, with loss of finger pulps and bone deformity)
- **T**elangiectasia, commonly over the fingers, face and buccal mucosa.

In limited systemic sclerosis skin involvement is limited to the hands, face and neck, whereas diffuse systemic sclerosis involves the skin above the level of the wrists.

Systemic features, such as renal involvement, can be severe and may be fatal.

Management

Management aims to reduce morbidity and complications and is based mainly on education and support. Corticosteroids and immunosuppressants can be used to suppress the immune response. Collagen cross-link inhibitors can help to reduce the level of collagen formation. Oral vasodilators, e.g calcium channel blockers such as nifedipine, may aid Raynaud's phenomenon. Physiotherapy and skin lubricants can help to slow contracture development.

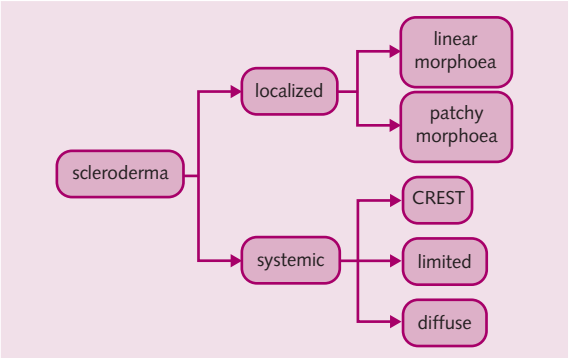


Fig. 7.46 Classification of scleroderma.

Dermatomyositis

Dermatomyositis is a rare disorder of unknown aetiology characterized by inflammation of the striated muscle. Cutaneous involvement distinguishes it from polymyositis and can cause:

- Lilac blue (heliotrope) discoloration around the eyelids, cheeks and forehead, with or without periorbital oedema
- Blue–red papules or linear lesions on the extensor surfaces of joints and fingers
- Pigmentation

- Nail-fold telangiectasia
- Photosensitivity
- Contractures.

Dermatomyositis can occur in association with malignancy. Further information can be found in Chapter 2.

SKIN MANIFESTATIONS OF SYSTEMIC DISEASE

Skin signs of endocrine and metabolic disease

Diabetes mellitus

Cutaneous features of diabetes mellitus include:

- Candidal or bacterial infection, caused by poorly controlled blood sugar levels
- Ulcers—caused by neuropathy or arteriopathy of the feet
- Eruptive xanthomas—associated with secondary hyperlipidaemia.

Diabetics are specifically affected by:

- Diabetic dermatopathy—flat-topped pigmented scars on the shins that are associated with diabetic microangiopathy
- Necrobiosis lipoidica—yellow–red atrophic plaques on the shins that are prone to ulceration
- Granuloma annulare—annular lesions found often on the hands and feet which tend to fade within a year.

Thyroid disease

Cutaneous signs of thyroid disease are listed in Figure 7.47.

Hyperlipidaemia

Hyperlipidaemia can manifest with xanthomas caused by lipid deposition in the skin. These can occur over tendons, around the eyes, in palmar creases, on extensor surfaces and on the buttocks. All patients with xanthomas should be investigated for hyperlipidaemia. The xanthomas are controlled by treating the underlying hyperlipidaemia.

Fig. 7.47 Cutaneous signs of thyroid disease

Thyrotoxicosis	Myxoedema
skin becomes soft and pink	alopecia
hyperhidrosis	coarse and thickened hair
alopecia	skin becomes dry, yellow and firm
pigmentation	asteatotic eczema
onycholysis	xanthomas
clubbing (Graves')	
pretibial myxoedema (Graves')	
palmar erythema	

Skin signs of nutritional deficiency and gastrointestinal disease

Malnutrition

Different forms of malnutrition lead to varying skin manifestations (Fig. 7.48).

Inflammatory bowel disease

The skin changes in Crohn's disease and ulcerative colitis are shown in Figure 7.49.

Skin signs of malignancy

Acanthosis nigricans

This is an uncommon condition associated with malignancy. It is characterized by thickening and pigmentation of the skin around the flexures and

Fig. 7.48 Cutaneous signs of malnutrition

Deficiency	Disease	Cutaneous signs
protein	kwashiorkor	altered pigmentation; desquamation; ulcers (with brown/red hair in Afro-Caribbeans)
vitamin C	scurvy	purpura; swollen, bleeding gums; indurated (woody) oedema
nicotinic acid	pellagra	scaly dermatitis; pigmentation
iron		alopecia; koilonychia; pruritus; angular cheilitis

Fig. 7.49 Skin changes in inflammatory bowel disease

Inflammatory bowel disease	Cutaneous signs
Crohn's disease	perianal abscesses; sinuses fistulae; erythema nodosum; Sweet's disease; pyoderma gangrenosum; aphthous stomatitis; glossitis
ulcerative colitis	erythema nodosum; Sweet's disease; pyoderma gangrenosum

neck. The skin becomes velvety and papillomatous, and warty lesions develop. Rarely, the condition may present in childhood, an inherited form of the disorder not associated with malignancy. It can also occur in younger, obese adults suffering from insulin resistance. When it presents in older patients, a carcinoma, most commonly of the gastrointestinal tract, should be excluded.

Paget's disease of the nipple

A unilateral plaque-like lesion on the nipple areola usually indicates the spread of an intraductal carcinoma of the breast. An eruption resembling eczema around the perineum or axilla may be caused by intraepidermal malignant spread. With both presentations, a skin biopsy should be performed to confirm the diagnosis.

Erythema gyratum repens

This is an extremely rare disorder that is caused by malignancy, usually of the lung or breast. Scaly concentric erythematous rings resembling wood-grain develop, which rapidly change their pattern.

Necrolytic migratory erythema

This extremely rare eruption is characterized by burning, erythematous, annular plaques, which usually begin in the perineum. It is caused by a glucagonoma, a glucagon-secreting tumour of the pancreas. It is associated with weight loss, anaemia, diabetes and angular stomatitis.

Secondary tumour deposits in skin

Skin metastases often present late in cases of malignancy, and so carry a poor prognosis. They usually appear as firm, pink nodules and are found most commonly on the scalp, umbilicus and trunk. Tumour tissue may metastasize to the skin from the following primary sites:

- Breast
- Gastrointestinal tract
- Ovary
- Lung
- Melanoma (primary cutaneous or ocular)
- Lymphomas and leukaemias may also involve the skin.

Conditions occasionally associated with malignancy

Other skin manifestations that may be associated with underlying malignancy, but also with more benign diagnoses, include:

- Generalized pruritus (jaundice)
- Acquired ichthyosis (lymphoma)
- Hyperpigmentation
- Pyoderma gangrenosum (lymphoma, leukaemia, myeloma)
- Dermatomyositis (carcinoma of the lung, breast, GI and GU tract)
- Erythroderma (lymphoma, leukaemia)
- Hypertrichosis (carcinoma of the ovary).

A careful history and examination should be obtained from all patients who present with the above where there is no obvious underlying cause.

Skin changes in pregnancy

Pregnant women may be affected by:

- Increased pigmentation, especially of the nipples
- Proliferation of melanocytic naevi and skin tags
- Development of spider naevi, abdominal striae (stretchmarks) and midline pigmentation (linea nigra)
- Pruritus
- Telogen effluvium may also occur in the postpartum period.

DRUG-INDUCED SKIN DISORDERS

Cutaneous drug reactions are common. Beware of a patient who claims to be 'allergic' to a drug,

Fig. 7.50 Mechanisms that produce drug-induced disorders

Mechanism	Example
excessive therapeutic effect	an overdose of anticoagulants may lead to subcutaneous bleeding and purpura
pharmacological side effects	dry lips and mucosa resulting from use of isotretinoin; bone marrow suppression with use of cytotoxic drugs
hypersensitivity	true allergy; may occur via any of the four skin type reactions
skin deposition of drug or metabolites	gold
facilitative effect	use of a drug upsets biological balance; use of wide-spectrum antibiotics may result in Candida, etc.
idiosyncratic reaction	reaction peculiar to individual

Fig. 7.51 Important drug reactions

	Toxic erythema	Erythema multiforme	Toxic epidermal necrolysis	Psoriasiform and bullous eruptions
aetiology	caused by drugs, scarlet fever and infection	drugs, viral/bacterial/ fungal infection, pregnancy, malignancy; immune mediated	drug-induced epidermal necrosis	lithium and chloroquine exacerbate psoriasis; β-blockers, gold and methyldopa may precipitate an eruption
clinical features	eruption, which may be morbilliform or urticarial; may be accompanied by fever or followed by skin peeling; eruption affects trunk more than limbs	target lesions, dermal oedema, inflammatory infiltrate, vasodilatation	intraepidermal split in skin; skin red, swollen and separates as in scalding	psoriatic eruption
complications	erythroderma, dehydration, hypothermia	erythroderma, mucosal ulceration and scarring	problems in fluid and electrolyte balance; mortality around 25%	
management	stop precipitating drug; clears up within 1–2 weeks	treat underlying cause; systemic steroids	in-hospital management in intensive care unit	stop precipitating drug; emollients if necessary

as true allergies are less common and a mild eruption may be the cause of such a statement. As always, a thorough history should be taken and the features documented in the patient's notes.

Mechanisms of drug-induced skin disorders

There are several mechanisms that produce a drug-induced skin disorder (Fig. 7.50). The four most important drug reactions are listed in Figure 7.51.