Next to comedones, scars are the hallmark of acne. Permanent scarring is the most dreaded outcome of this disease. Scarring can be the natural consequence of inflammatory lesions, or the result of self-manipulation; the latter is too often overlooked. Both types may coincide. In this chapter only spontaneous scars will be discussed; a separate chapter is devoted to self-inflicted scars (p. 381). The spectrum of scars extends from invisible to severely mutilating.

### Pitted, Crateriform, and Ice-Pick Scars

These are typical examples of one variety of acne scars. Exclusively confined to the face, they are variably shaped crater-like depressions, pits, and ice-pick scars (reminiscent of steep-sided pits in a glacier from an ice pick). Pitted scars may become confluent to form broad, retiform, extremely ugly scars. The rim of the scar can be steep or shallow. This makes a real difference to the bearer. Steep rims throw shadows and cause the scars to be conspicuous. Beveled rims allow light to flood the base with light shadows only. These scars are less noticeable.

**Histopathology.** The picture is variable, but horn-filled canals are always seen, lined by an irregularly thickened epithelium budding off into ribbons. Signs of foreign-body granulomas are present, with mixtures of inflammatory cells. There are variable inflammatory changes, inevitably accompanied by a surrounding fibrosis. In short, scars are extremely pleomorphic, depending on their stage and on the severity of the preceding inflammatory lesion.

### Atrophic Scars

Small, flat atrophic scars can occur on the face. Much larger ones, several centimeters in size, may develop over the shoulder blades or anywhere on the upper parts of the back. Atrophic scars are the insignia of acne conglobata. Fresh ones are pink to red, older ones alabaster-white to yellowish. Some of them are cigarette-paper thin, wrinkled, and transparent. As the collagen bed is extremely thin and atrophic, the blood vessels are visible through the thin overlying tissue. All skin adnexa are completely wiped out by the fibrotic process. Under magnification, not a single opening of follicle remnants can be seen on the surface, or for that matter sweat glands.

**Histopathology.** Quite distinctive is the extremely flattened-out, thin epidermis, void of rete ridges. Within the dermis there are numerous ectatic lymph and venous vessels with fine horizontally arranged collagen bundles, numerous fibroblasts, and irregular foci of lymphohistiocytic cells. Remnants of arrector muscles of hair, nerves, clusters of debris, giant cells, calcification, or even bone formation are variably present. No adnexal structures remain.

### Hypertrophic Scars

Hypertrophic scars are also called fibrotic nodules. They are preceded by deep inflammatory nodules of acne conglobata, most common on the back, the shoulder, or over the sternum. The lesions are large, often 1–2 cm wide, dome-shaped, and elevated 5–10 mm above the surface. First they are fi-
ery-red, later becoming porcelain yellowish-white and very hard and lumpy. The surface is shiny, without follicular openings. With time these lesions flatten, a process that may take years. Itching is frequently reported.

Histopathology. A low-power view is diagnostic. The scar is exclusively composed of dense collagen bundles of varying size and in complete disarray. Most of the collagen is stratified horizontally. The skin adnexa have all been destroyed, and elastic fibers are absent or sparse. Vessels are scarce. This is the picture of extreme fibrosis.

Perifollicular Papular Scars

Perifollicular papular scars are elevated, firm, hard growths prevalent on the back, rarer on the chest, and absent on the face. The scars are round to oval, white, slightly elevated lesions. Several terms are used to describe them: papular acne scars, perifollicular elastolysis, post-acne anetoderma-like scars, and papular elastorrhexis. The latter has been mistaken for a connective tissue nevus. They resemble closed comedones, hence the name closed comedo-like scar. We prefer the term perifollicular papular scars. These are best seen when the skin is pinched together between the fingers. They are frequently mistaken for closed comedones. Puncturing the apex with a pointed scalpel differentiates them from comedones: Nothing comes out.

Histopathology. The extent of the scar is best visualized by staining of elastic fibers. The perifollicular papular scar is larger than it appears clinically. The elastic fibers are completely destroyed, and those surrounding it mark the borders of the scar. Generally, the adnexa have been destroyed, although sometimes a hair-bearing unit survives with a fine hair protruding, hence the name perifollicular papular scar. Fibrosis is evidenced by dense bundles of collagen with straggly vessels.

Calcified Scars

One of the late sequelae of severe inflammatory acne is calcification. Even bone formation (osteoma) may occur. The contents of these scars are not diagnosed clinically. Preferred sites are the face, especially the cheeks and chin, followed by the upper back. X-rays show many opacities, often an accidental finding. Sometimes calcified nodules can be suspected in a badly scarred face, when densities hard as stone are felt by palpation.

Histopathology. Small or large calcified nodules are dispersed throughout the corium. Multinucleated giant cells often bear calcified deposits. Osteoma cutis is described elsewhere (p. 559).

Keloids

Keloids are a terrible form of scars that occur more often in blacks than in Caucasians. Preferred sites are the sternum, breasts, lateral sites of the upper arms, shoulders, back of neck, and the V-shaped area of the back. Keloids do not arise spontaneously but start with trauma, often minor. In acne they follow inflammatory lesions which may simply be papulopustules but more often are inflammatory nodules in acne conglobata. Keloids are often mistaken for hypertrophic scars. The two are not interchangeable, as many seem to think. True keloids extend far beyond the original zone of inflammation. They are thick, raised, lobulated fibrotic plaques, with a strong tendency to recur after removal. They hardly flatten with time. Elevated, hard scars in white persons are almost always hypertrophic scars. The color is deep red to brownish, with a shiny surface. After many years they become skin-colored. No fine texture,