Chapter 27. BACTERIAL INFECTIONS OF THE SKIN

Organisms not ordinarily considered pathogenic may be the cause of secondary infections. The principal ones in this group are gram-negative bacilli, chiefly E. coli, Pseudomonas and Proteus. In the very same sense, the possibility of nonpathogenic normal skin residents assuming a pathogenic role cannot be excluded. An illustrative case in point is pseudofolliculitis of beard, in which normal skin micrococci cooperate with ingrown hairs to produce the disease. Attempts at too sharp differentiation of bacteria into pathogenic ("disease producing") and nonpathogenic has led to some confusion; it represents too great emphasis on the bacteria themselves and neglect of the marked variation of susceptibility of the tissues of the host.

The concept of virulence enables one to grasp in proper perspective the role played by the bacteria in inciting disease, making it at once evident that practically all organisms can, under appropriate circumstances, be pathogenic. In short, some are highly virulent, viz., certain streptococci and staphylococci, while others are of lowly virulence, viz., gram-negative coliform organisms. Gram-negative organisms are generally not recoverable from more than about 10 per cent of the general run of skin lesions. Their presence may be, and usually is, without clinical significance. Only persistent, chronic lesions are invaded by gram-negative bacteria, as a rule. Ulcers are particularly vulnerable. Moisture is a determining factor, for these organisms are easily killed by desiccation. Gram-negative organisms thrive under occlusive dressings. They are chiefly responsible for the malodor of ulcerative or eczematous lesions which have been occluded by fixed dressings, especially if these are covered by adhesive tape, plaster or other relatively impermeable material. In general, nothing is to be gained by taking steps to prevent the colonization of such lesions by gram-negative bacteria, provided the primary condition is being brought under control by proper treatment.

It must be clear from the very nature of secondary infections that the majority of these will have no characteristic morphology; the clinical features will chiefly reflect the qualities of the primary condition, whether this be a burn, fungal infection, insect bite, contact dermatitis, ulcer, etc. Hence, the secondary infections of pre-existing cutaneous lesions are for the most part nondescript and not truly classifiable morphologically, though some are true clinical entities with distinctive characteristics.

CLASSIFICATION OF SECONDARY BACTERIAL INFECTIONS

Nondescript Secondary Infections—infected complicating any pre-existing cutaneous lesion: a burn, abrasion, eczematous eruption, ulcer, fungal infection, insect bite, etc. The morphologic changes are those of the underlying disorder, plus minor to gross evidences of infection.

Clinical entities—diseases which are clinical entities by virtue of typical morphologic characteristics and course.

1. Secondary Folliculitis.

A. The follicular occlusion or retention triad:
   (1) Acne conglobata.
   (2) Hidradenitis suppurativa.
   (3) Dissecting cellulitis of scalp.
Section V. CUTANEOUS MEDICINE

B. Keloidal folliculitis (acne keloid).
2. DERMATITIS VEGETANS (pyoderma vegetans).
3. ACUTE INFECTIOUS ECZEMATOID DERMATITIS.
4. INTERTRIGO.
5. OTITIS EXTERNA (in some cases).
6. PILONIDAL CYST.
7. INFECTED ULCERS of rather specific types (tropical ulcers, phagedenic ulcers, etc.).
8. PSEUDOFOLLICULITIS OF THE BEARD.
9. BLASTOMYCOsis-LIKE PYODERMA.

1. Secondary Folliculitis

A. THE FOLLICULAR OCCLUSION TRIAD: (Acne conglobata, hidradenitis suppurativa, and dissecting cellulitis of the scalp).

These diseases comprise a generic group. Though not usually classified together, there is reason to believe that they are variants of the same pathologic process, for there are marked clinical and pathologic similarities. The initial and central pathogenic event linking these conditions is an innate tendency toward follicular hyperkeratoses, leading to occlusion of the follicular orifice and retention of products normally escaping through it. The clinical features common to all three are: multiple comedo formation, abscesses with communicating channels, discharging sinuses, and healing with a marked tendency toward hypertrophic or keloidal scars. Furthermore, two or more of these disorders may coexist in the same person.

1) ACNE CONGLOBATA. This is an unusually severe complication of acne, the hallmark of which is deep abscesses and draining sinuses. Acne does not progress to this stage except through secondary infection. It should be pointed out, however, that the milder pustular or cystic forms of acne do not usually arise on the basis of secondary infection. That there is an infective component in acne conglobata is rather well confirmed by the definite response of these lesions to vigorous parenteral therapy with antibiotics, although, of course, this does not cure the underlying disease. The management is that of grade IV acne.

2) HIDRADENITIS SUPPURATIVA. This disease is described in the section on disorders of the sweat glands.

3) DISSECTING CELLULITIS OF THE SCALP (Perifolliculitis abscedens et suffodiens*). The small nodules and draining abscesses which characterize this disease occur on the scalp of young adults predominantly. Typically, the nodules become fluctuant and finally rupture to produce a chronic draining sinus. Drainage may be intermittent. Close inspection often reveals comedo-like plugs or excessive horny material in the follicular orifices, the probable starting point of the disease. The follicular orifices in certain scalp areas may appear deeper than usual, dilated and choked with keratin. Polyrichia, the apparent emergence of two or three hairs from the same follicle, is a notable feature considerably more evident than in normal persons, though in itself it can scarcely be regarded as an abnormality. Actually, each follicle contains only a single hair but fusion of the follicles near the surface forms a common opening. Though such common orifices are larger than usual, the hairs are crowded within them, increasing the opportunity, especially if there is hyperkeratosis, of actual occlusion. Dandruff may be a prominent

* Fortunately an obsolete designation.
Chapter 27. BACTERIAL INFECTIONS OF THE SKIN

Incidental finding. There is a notable tendency toward burrowing, so that adjacent draining nodules become interconnected and the skin is undermined. Suppurative is copious. The process waxes and wanes inexplicably. Hair loss occurs to varying degrees and is chiefly a result of healing with keloid-like scar formation. The fibrotic residue is a conspicuous feature. The process is notoriously chronic, new lesions arising in different areas of the scalp. Unless checked, the process may involve most of the scalp.

Frequently there is a concomitant acne and/or hidradenitis suppurativa. Many types of organisms are recoverable, among which coagulase-positive micrococci predominate, especially in the early stages. Different organisms may be present at different times. Manual epilation of retained hairs, although tedious, is a helpful procedure. Halfway or casual measures have no place in the management of this disease; it is all or nothing. Parenteral antibiotic therapy, after determining the in vitro sensitivity of organisms recovered by culture, is decidedly helpful when given vigorously in large amounts during active periods. Not too much can be expected from purely local application of antibiotics; however, in combination with parenteral therapy, such measures are doubtless beneficial. When and if the process is arrested or diminished, daily use of local antibiotic ointments must be continued to reduce the bacterial population. Such ointments should be rubbed in thoroughly several times daily. Surgical procedures aimed at securing drainage by laying open interconnected abscesses and releasing pus from fluctuant nodules are imperative. Scrupulous cleanliness is obligatory, and frequent shampoos are sound practice.

B. KELOIDAL FOLLCULTIS (ACNE KELOID). The cardinal feature of this condition is the development of persistent hard follicular papules; these eventually fuse, and reparative activity leads to the formation of typical keloidal fibrous plaques, the hallmark of the disease. Follicular pustules and subcutaneous abscesses which may discharge and drain indolently are common accompaniments. The follicular papules are especially hard and bleed readily when incised. Chronicity is characteristic and, subsequently, vegetative and papillomatous changes may ensue. The back of the neck is the preferred site, although the lesions may extend up onto the occiput and, rarely, elsewhere on the scalp. Males, particularly Negroes, are the usual victims. A host of organisms, which are by no means constant even for the same individual, have been isolated. The affected individuals usually have bristly, coarse, recurred hairs; polytrichia (fusion of follicles at the surface to present a common opening from which two or three hairs emerge) is a common finding. This tendency and ingrown hair formation, which is not infrequent in these individuals, provide some clue to the pathogenesis of the disease. The lesions are often distinctly sycoform, and the relationship to pseudofolliculitis of the beard is further evidenced by its frequent coexistence. The condition is rather resistant to ordinary therapy, but much can be accomplished by a relentless therapeutic attack including surgical, mechanical, and pharmacologic measures. Abscesses should be drained. Manual epilation of ingrown or retained hairs is the single most effective measure. One or more hairs will be found to be trapped within the hard papules and others will be found growing into the skin, acting as foreign bodies. Infection is a sequel to the ingrowth of hairs or to the crowding of several hairs in a common follicular orifice. Though it can be controlled by antibiotic therapy to some extent, plucking of hairs before papule formation is advanced is the only way to do something about the basic cause of the disease. Antibiotic ointments should be vigorously rubbed into the area two to three times daily whether or
Chapter 37. DISEASES OF THE APOCRINE GLAND

INFECTIONS OF THE APOCRINE GLAND

Apocrinitis

This new term is employed to denote bacterial infection of isolated single apocrine glands. It occurs occasionally in otherwise normal skin, or it may develop after the use of deodorants in association with intertrigo or secondary to a dermatitis. The lesions appear as discrete tender masses deep in the skin. Erythema is often absent. They are easily distinguished from the superficial inflammatory pustular lesions of a folliculitis. Each lesion represents infection within a single apocrine gland. Ordinarily this occurs as a result of surface microflora being trapped within an occluded gland. Apocrine sweat serves as a fine milieu, and the bacterial growth is enormous. This leads to an inflammatory reaction on the part of the skin, but often the depth is so great that the vasodilatation is not evident. The occluded sweat gland may rupture, pouring the bacteria into the dermis, but further spread is generally averted by the leukocytic response and other defenses.

Treatment with hot compresses usually suffices, but a systemic antibiotic may be necessary.

Hidradenitis Suppurativa

Hidradenitis suppurativa is a severe chronic recurrent suppurative infection of the apocrine sweat glands. It seems to result from widespread apocrine poral

![Figure 423](image)

Figure 423. Hidradenitis suppurativa. This is a chronic bacterial infection of occluded apocrine glands. Note scarring and sinus drainage.
closure and secondary bacterial infection. Thus, in contrast to the benign, relatively harmless "apocrinitis" this is a most disabling chronic infection of all of the apocrine glands. It is seen in the axillae and groin, as a rule, and persists for many years. It may occur about the areolae or anus also. The process first appears as multiple tender reddish nodules which become fluctuant, suppurate, and form tortuous sinus tracts. Repeated exacerbations and the production of new nodules and tracts is the rule. Chronic boggy granulomatous masses develop in the midst of grotesque hypertrophic scarring. The patients may become asthenic and lose weight. Mild constitutional symptoms of infection may occur. Associated folliculitis and sebaceous cysts are seen at times. Furthermore, the underlying lymph nodes often become involved in this inflammatory process. Eventually, the process may burn itself out by destroying all of the apocrine glands in the body. The disease may occur in men or women, but is not seen before the age of puberty.

It seems apparent from histologic study that, although this disease begins as a localized infection of the apocrine glands, much of the chronicity and its features result from secondary bacterial invasion of the skin. As was noted in the chapter on bacterial infections, this process resembles chronic deep folliculitis of the scalp.

The differential diagnostic considerations include tuberculosis cutis colla

Chapter 424. Apocrinitis. The primary histologic finding is a bacterial infection within the occluded apocrine gland.
Chapter 37. DISEASES OF THE APocrine GLAND

liquativa, bromoderma, blastomycosis, acne conglobata and infected sebaceous cysts.

TREATMENT. The treatment of hidradenitis suppurativa is less than satisfactory. The bacterial determinants are often antibiotic-resistant and, furthermore, are trapped in multiple deep abscess pockets in which an adequate concentration of antibacterial agents is difficult to achieve. The infection is invariably of a mixed nature. Nevertheless, intensive chemotherapy is always indicated. Careful aerobic and anaerobic cultures and sensitivity tests may aid in selection of the most effective antibiotic.

Surgical drainage of the multiple abscesses is essential, although not often curative. If infected canals or sinuses are present, they should be opened throughout their length. The surface bacterial flora should be reduced by all possible means. Antibiotic creams may aid in preventing recurrences but have no value in the treatment of an acute episode. Hormonal therapy has been advised, since systemic hormonal changes seem to play a primary role in the pathogenesis of this disease. High doses of testosterone have been of definite help in some instances.

Finally, in the severe stubborn cases of hidradenitis suppurativa which have progressed for years and have shown no response to conservative measures, radical surgical excision of the affected apocrine areas must be seriously considered. Excision of the “vulnerable” skin and full thickness grafting is highly successful in the hands of experienced operators. However, the decision to employ this measure does not come easily.