Chapter 3
Psoriasiform Dermatitis

Keywords Psoriasiform dermatitis • Psoriasis • Psoriasis vulgaris • Guttate psoriasis • Pustular psoriasis • Pityriasis rubra pilaris • Lichen simplex chronicus • Prurigo nodularis

The psoriasiform pattern is characterized by acanthosis (epidermal hyperplasia) (Fig. 3.1). As mentioned in the previous chapter, acanthosis and spongiosis often coexist, and the classification of a dermatitis as spongiotic or psoriasiform can be somewhat arbitrary. This chapter will focus on entities in which spongiosis is not typically a prominent feature.

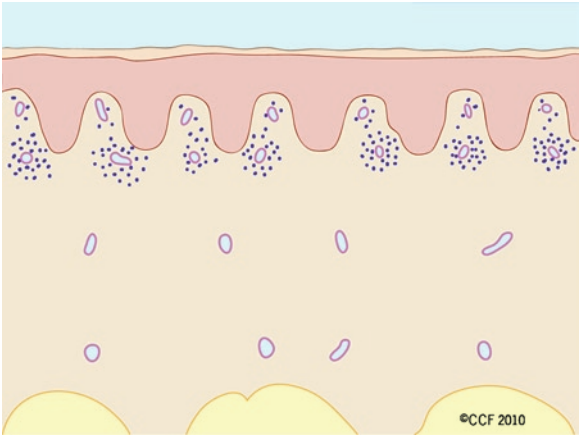

Fig. 3.1 *Schematic representation of psoriasiform dermatitis*. The psoriasiform pattern is typified by epidermal acanthosis with relatively little spongiosis. There is usually a superficial perivascular inflammatory infiltrate

Psoriasis

Psoriasis exists in three common clinical subtypes: psoriasis vulgaris (often referred to as just psoriasis), guttate psoriasis, and pustular psoriasis. Psoriasis vulgaris is the prototypical psoriasiform dermatitis.

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Psoriasis Vulgaris

Clinical Features

The common form of psoriasis usually presents in the second or third decade, but can present at any age. It presents as erythematous plaques with silvery scale. It commonly affects the extensor surfaces, scalp, gluteal cleft, and glans penis. Intertriginous areas can also be involved; this has been termed inverse psoriasis. Nail changes consisting of small pits and areas of yellow discoloration are frequently present. Psoriatic arthritis is seen in 1–5% of patients and its presence usually correlates with a more severe skin disease.

Microscopic Features

Classic psoriasis vulgaris shows prominent, often confluent, parakeratosis overlying the epidermis. The epidermis shows uniform acanthosis with suprapapillary plate thinning, and a diminished-to-absent granular layer (Fig. 3.2). Within the stratum corneum and/or epidermis there are collections of neutrophils and the scale has a "dry" appearance (Fig. 3.3). It is important to keep in mind that neutrophils in the stratum corneum do not have the classic appearance of neutrophils with multilobed nuclei and eosinophilic cytoplasm. Rather they have the appearance of hyperchromatic, somewhat squiggly nuclei. The papillary dermal blood vessels are dilated and tortuous (Fig. 3.4). Within the dermis, there is a superficial perivascular lymphocytic infiltrate. Some neutrophils may be present, but eosinophils are typically absent. Unfortunately, not all cases of psoriasis vulgaris have all of the classic features. Patients may have already had some therapy or self-treatment, thereby altering some of the histological features (Fig. 3.5). Some patients may have excoriated their skin lesions resulting in retention or even thickening of the granular cell

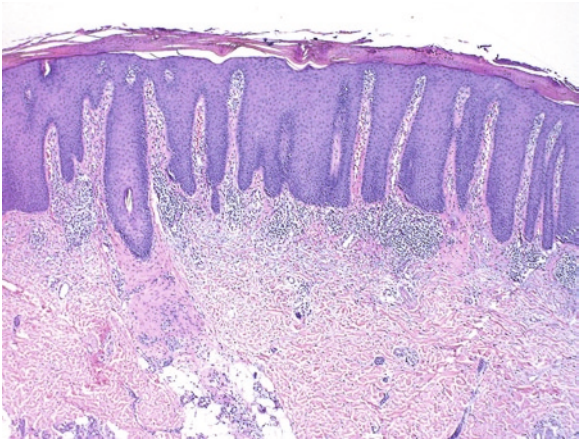

Fig. 3.2 *Psoriasis vulgaris* is characterized by confluent parakeratosis, a diminished granular layer and uniform acanthosis

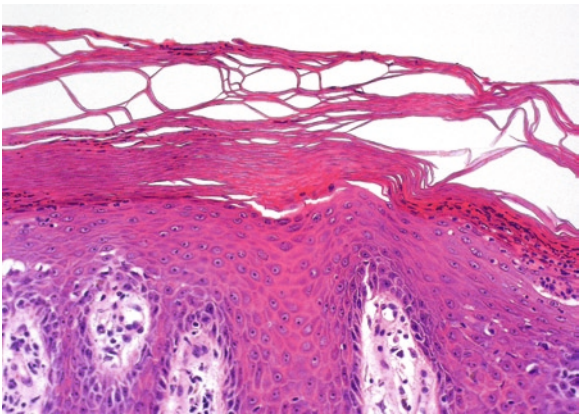

Fig. 3.3 *Psoriasis vulgaris*. The neutrophils in the stratum corneum and epidermis of psoriasis have dark, somewhat squiggly nuclei. The scale overlying the epidermis has a dry appearance without serum

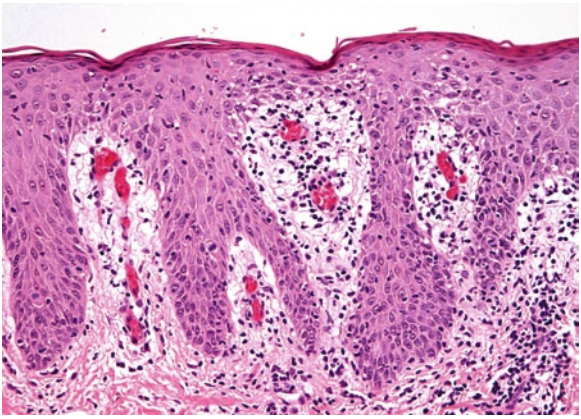

Fig. 3.4 *Psoriasis vulgaris*. This image demonstrates the suprapapillary plate thinning and dilated, tortuous papillary dermal blood vessels

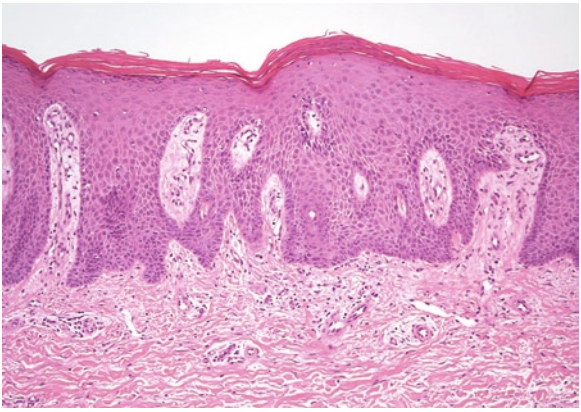

Fig. 3.5 *Partially treated psoriasis vulgaris*. In this case of psoriasis from a patient who has used some topical steroids prior to the biopsy, the epidermis had a partially recovered/retained granular layer and no collections of neutrophils were evident

Table 3.1 Key microscopic features: psoriasis vulgaris

- Parakeratosis
- Neutrophils in stratum corneum or epidermis
- Diminished or absent granular layer
- Uniform epidermal hyperplasia
- Suprapapillary plate thinning
- Dilated and tortuous papillary dermal blood vessels

layer. In such cases, a specific diagnosis may not be possible. Strategies to deal with this situation are outlined in the sample reports at the end of the chapter. See Table 3.1 for summary of microscopic features.

Differential Diagnosis

Eczematous dermatitis with the morphology of subacute or chronic spongiotic dermatitis can have overlapping features with psoriasis. Of the eczematous dermatitides, nummular dermatitis is more likely the clinical simulant in the eczematous dermatitis family, but other forms of eczema can also clinically mimic psoriasis. In eczematous dermatitis, eosinophils are often present in the inflammatory infiltrate; eosinophils are not a feature of psoriasis except in exceptional circumstances. The scale present in spongiotic dermatitis has a "wet" appearance with serum as opposed to the dry appearance in psoriasis. Furthermore, subacute and chronic spongiotic dermatitis lacks the suprapapillary plate thinning and the acanthosis is more irregular, and a retained granular layer is often present. The presence of neutrophils can help distinguish psoriasis, but secondary impetiginization can result in neutrophils in the stratum corneum of eczematous dermatitis. In such cases, the neutrophils are usually in association with serous fluid and bacterial organisms may be present. Interestingly, psoriasis rarely shows secondary impetiginization and the presence of bacteria in the stratum corneum would argue against the possibility of psoriasis. Langerhans cell microabscesses are a feature often present in contact dermatitis but not seen in psoriasis.

Dermatophyte infections of the skin have collections of neutrophils in the stratum corneum like psoriasis (Fig. 3.6) but the acanthosis is more irregular and there are usually eosinophils in the infiltrate. Dermatophytosis lacks the suprapapillary plate thinning and may be more spongiotic. Special stains such as PAS or GMS will identify the fungal hyphae (Fig. 3.6). See also Chap. 12.

Seborrheic dermatitis has histologic similarities. Seborrheic dermatitis has psoriasiform hyperplasia and prominent parakeratosis that often contains neutrophils. The neutrophils and parakeratosis tend to be most prominent at follicular ostia (Fig. 3.7). Seborrheic dermatitis has a more restricted clinical presentation on the scalp, central face and central chest. In some cases, the clinical and histological overlap is such that the disease could be classified as a combination of psoriasis and seborrheic dermatitis, so-called sebo-psoriasis.

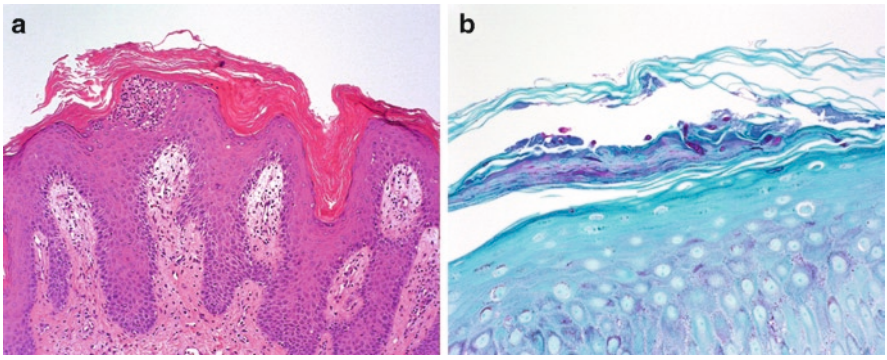

Fig. 3.6 *Dermatophyte infection resembling psoriasis*. (**a**) Similar to psoriasis, dermatophyte infections frequently have collections of neutrophils in the stratum corneum and psoriasiform hyperplasia. The granular layer is often intact and the dermis usually has some eosinophils as part of the infiltrate. (**b**) Fungal hyphae in the strum corneum highlighted by PAS stain

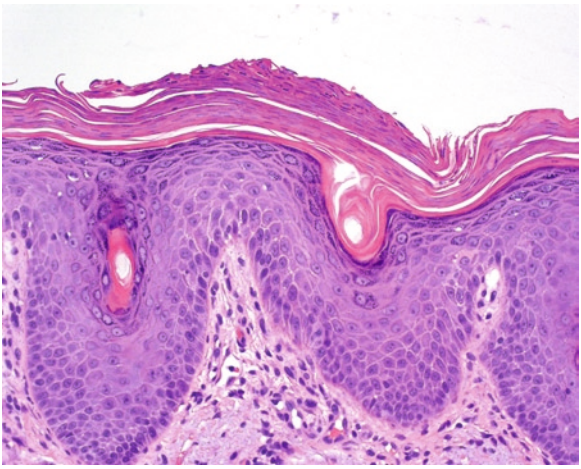

Fig. 3.7 *Seborrheic dermatitis*. There is psoriasiform hyperplasia and parakeratosis most conspicuous at follicular ostia

Pityriasis rubra pilaris (PRP) shares many similarities with psoriasis. Importantly, PRP lacks neutrophils and has alternating patterns of parakeratosis and hyperkeratosis. PRP is discussed in detail below.

Psoriasiform keratosis is a solitary benign cutaneous neoplasm that usually presents on the lower extremity of middle aged to older patients, but may present elsewhere. There is significant histological overlap such that it may be indistinguishable from psoriasis. Clinical presentation as a solitary neoplasm allows distinction.

The new class of biologic treatments (e.g., TNF-alpha inhibitors) can result in drug eruptions that histologically closely resembles psoriasis with confluent parakeratosis with neutrophils and uniform psoriasiform acanthosis. The presence of eosinophils in the dermis and knowledge of the clinical history help in the distinction (Table 3.2).

Table 3.2 Practical tips: psoriasis vulgaris

- Confluent parakeratosis is an important clue to the diagnosis of psoriasis vulgaris
- The "dry" nature of the parakeratotic scale is a clue to psoriasis
- Neutrophils in the stratum corneum should always prompt consideration of psoriasis or a dermatophyte infection (consider fungal stains)
- Psoriasis does not have eosinophils in the dermal infiltrate
- In excoriated/partially treated psoriasis vulgaris, the granular layer may be retained
- In psoriasis involving acral surfaces, the granular layer is almost always partially retained
- In cases where the diagnosis of psoriasis is suspected but the histologic features are insufficient for an unequivocal diagnosis, sign the case out descriptively as "psoriasiform dermatitis, see note" (see sample reports at the end of the chapter)

Psoriasis Variants

There are two important variants of psoriasis, guttate and pustular psoriasis. Although they are variants of psoriasis, they tend not to have significant psoriasiform hyperplasia because of their rapid onset.

Guttate Psoriasis

Clinical Features

Guttate psoriasis is characterized by a rapid onset of numerous small plaques. There is often a history of antecedent (streptococcal) pharyngitis.

Microscopic Features

Guttate psoriasis is characterized by discrete mounds of parakeratosis with associated collections of neutrophils overlying the epidermis (Fig. 3.8). In some cases, neutrophils may not be conspicuous. The epidermis typically does not have pronounced acanthosis, owing to the rapid onset of disease. The papillary dermal blood vessels are often dilated similar to the vulgaris variant. Again, eosinophils are not a feature (Table 3.3).

Differential Diagnosis

The closest histologic mimic of guttate psoriasis is pityriasis rosea. Collections of neutrophils on the mounds of parakeratosis allow for distinction of guttate psoriasis. If neutrophils are not present, a specific diagnosis may not be possible, but the clinician can be guided by the comment in your report (see sample reports at the end of the

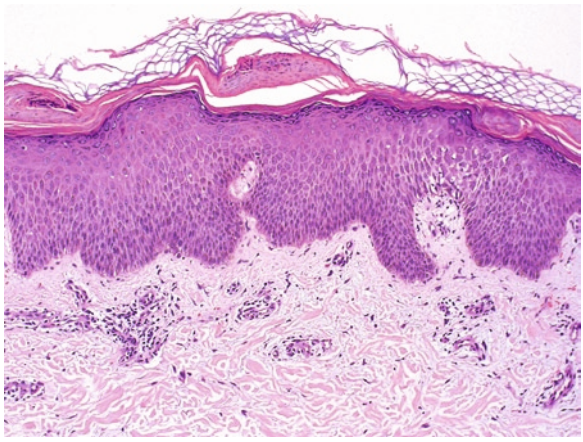

Fig. 3.8 *Guttate psoriasis* is characterized by mounds of parakeratosis with collections of neutrophils. The epidermis may be mildly spongiotic or relatively unremarkable

Table 3.3 Key microscopic features: guttate psoriasis

- Discrete mounds of parakeratosis with collections of neutrophils
- Epidermal changes less pronounced than psoriasis vulgaris

chapter). An eczematous dermatitis could also be considered in the histologic differential diagnosis. The same comments regarding eczematous dermatitis as discussed in the section on psoriasis vulgaris apply. See Table 3.4.

Table 3.4 Practical tips: guttate psoriasis

- Mounds of parakeratosis with neutrophils should prompt consideration of guttate psoriasis
- Neutrophils not always present; when absent also consider pityriasis rosea
- Clinical history of antecedent pharyngitis helpful (likely will require phone call)

Pustular Psoriasis

Clinical Features

Pustular psoriasis is characterized by a widespread rapid onset of numerous pustules. It can be associated with pregnancy or discontinuation of systemic steroids in patients with psoriasis.

Microscopic Features

This variant is typified by large collections of neutrophils in the epidermis and/or stratum corneum (Fig. 3.9). Because of the rapid onset, there is often no significant acanthosis and the granular layer is only partially diminished or normal (Table 3.5).

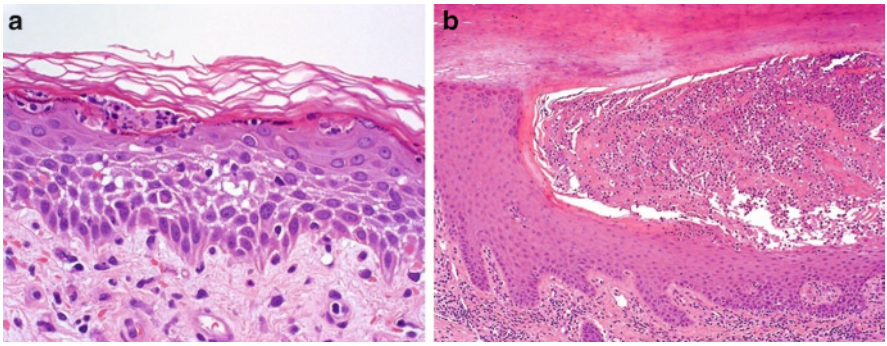

Fig. 3.9 *Pustular psoriasis*. (**a**) Early lesions may show small intraepidermal pustules with little epidermal change. (**b**) In more established lesions, the pustules are characterized by large collections of subcorneal/intraepidermal neutrophils. In more established lesions, the epidermis still often lacks changes seen in psoriasis vulgaris

Table 3.5 Key microscopic features: pustular psoriasis

- Large collections of neutrophils in stratum corneum or epidermis
- Less epidermal change than psoriasis vulgaris
- No eosinophils

Differential Diagnosis

Infections, such as dermatophytosis and candidiasis are in the differential diagnosis because of the collections of neutrophils. PAS or GMS stains can help resolve this question. Both dermatophyte and yeast infections usually have some eosinophils in the differential diagnosis.

Acute generalized exanthematous pustulosis (AGEP) is a peculiar form of drug eruption and can show striking resemblance to pustular psoriasis, but the presence of eosinophils (Fig. 3.10) and the history of new medications (e.g., vancomycin) can help distinguish it from pustular psoriasis (Table 3.6).

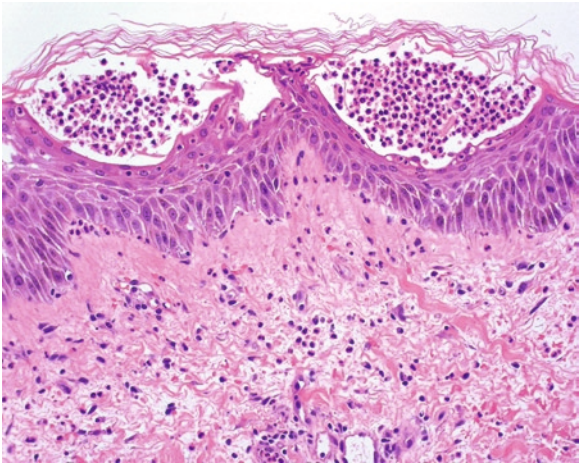

Fig. 3.10 *Acute generalized exanthematous pustular dermatosis (AGEP).* Within the epidermis there are large pustules consisting of collections of neutrophils. The inflammatory infiltrate in the dermis contains neutrophils, lymphocytes and eosinophils

Table 3.6 Practical tips: pustular psoriasis

- Rule out a fungal infection with PAS or GMS stains
- Eosinophils are not a feature of pustular psoriasis; if present consider fungal infection or AGEP/pustular drug eruption
- Patients often have history of psoriasis

Pityriasis Rubra Pilaris

Clinical Features

The most common form, or classical PRP, presents in adults and is characterized by small follicular papules, confluent perifollicular erythema with islands of spared skin, and palmoplantar keratoderma. Patients may also have yellow discoloration of nails.

Microscopic Features

The epidermis shows psoriasiform hyperplasia with a maintained to thickened granular layer and follicular plugging (Fig. 3.11). There is prominent hyperkeratosis and parakeratosis that is characterized by the so-called "checkerboard" pattern in which the parakeratosis alternates with zones of hyperkeratosis, both vertically and horizontally (Fig. 3.10). There are no collections of neutrophils in the epidermis. Within the dermis, there is frequently a mild, superficial, perivascular lymphocytic infiltrate that may rarely include eosinophils (Table 3.7).

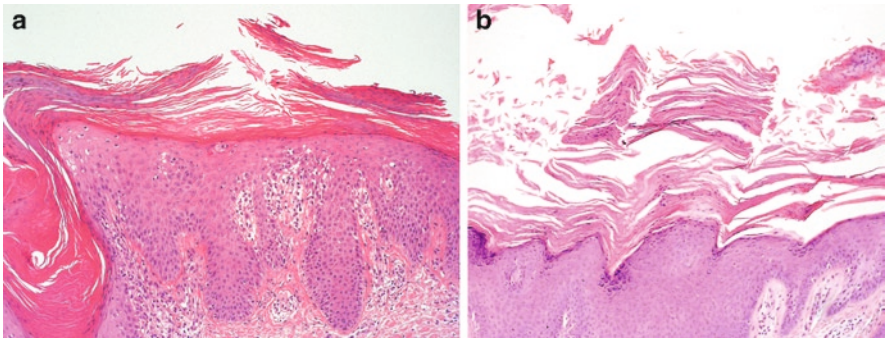

Fig. 3.11 *Pityriasis rubra pilaris (PRP)*. (**a**) Similar to psoriasis, there is uniform psoriasiform hyperplasia with hyperkeratosis and parakeratosis. Note the follicular plugging on the left side of the image. (**b**) The checkerboard pattern in the stratum corneum is characterized by zones of compact hyperkeratosis and parakeratosis that alternates vertically and horizontally

Table 3.7 Key microscopic features: pityriasis rubra pilaris (PRP)

- Psoriasiform hyperplasia but normal or thickened granular layer
- Follicular plugging
- Checkerboard pattern of hyperkeratosis and parakeratosis

Differential Diagnosis

Unlike psoriasis, PRP lacks the neutrophils in the epidermis or stratum corneum, and does not have suprapapillary plate thinning or a diminished granular layer. Chronic spongiotic dermatitis may show overlap, but it lacks the checkerboard pattern of parakeratosis. Follicular plugging can help distinguish PRP form psoriasis and chronic spongiotic dermatitis. Seborrheic dermatitis has follicular plugging, but often has neutrophils and a very different clinical presentation (Table 3.8).

Table 3.8 Practical tips: pityriasis rubra pilaris (PRP)

- Biopsies of early lesions of PRP may be inconclusive. If there is a clinical suspicion of PRP, and the biopsy specimens do not show characteristic morphology, a comment stating that a repeat biopsy from the most developed area of the eruption may help establish a diagnosis.
- Biopsies from the follicular papules are often relatively non-specific. The presence of follicular plugging even in the absence of a checkerboard pattern is suggestive in the appropriate clinical context.
- The checkerboard pattern of parakeratosis is often subtle.

Lichen Simplex Chronicus and Prurigo Nodularis

Clinical Features

Lichen simplex chronicus and prurigo nodularis are related entities that are the result of persistent scratching or rubbing. Lichen simplex chronicus presents as pruritic, scaly plaques and prurigo nodularis as pruritic nodules. The lesions may be ulcerated secondary to excoriation. As both are related to excoriation, it is important to remember that these lesions are only seen where the patient can reach. Common locations include nape of the neck, scalp (especially prurigo nodularis), shin, forearms, dorsal feet, and perianal/genital areas.

Microscopic Features

In lichen simplex chronicus, the epidermis shows prominent hyperkeratosis, with or without focal parakeratosis, hypergranulosis, and psoriasiform hyperplasia (Fig. 3.12). Within the dermis, there is fibrosis of the papillary dermis that is characterized by vertically oriented thick collagen fibers (so-called "vertical streaking"). Prurigo nodularis shows similar histologic features, but the epidermis may have a more pseudoepitheliomatous appearance or psoriasiform hyperplasia (Fig. 3.13). The dermal inflammatory infiltrate in both is typically sparse (Table 3.9).

Differential Diagnosis

Chronic spongiotic dermatitis shows less prominent psoriasiform hyperplasia and does not have the vertical streaking of the papillary dermal collagen. Eosinophils

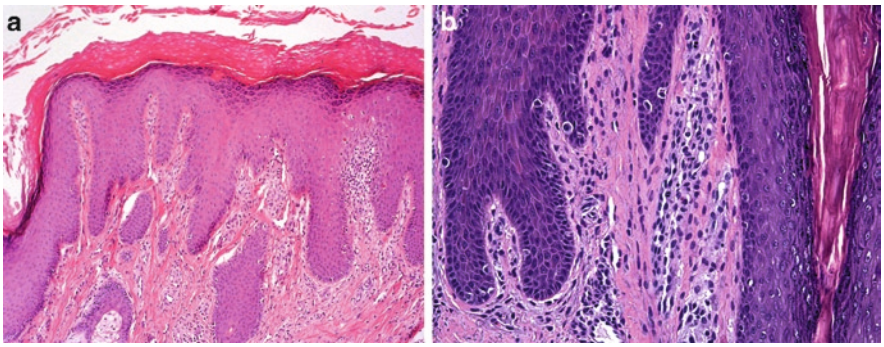

Fig. 3.12 *Lichen simplex chronicus*. (**a**) The epidermis resembles acral skin with compact hyperkeratosis, a thickened granular layer and acanthosis. The inflammatory infiltrate is typically sparse. (**b**) The papillary dermis is fibrotic with characteristic thick, vertically oriented collagen bundles

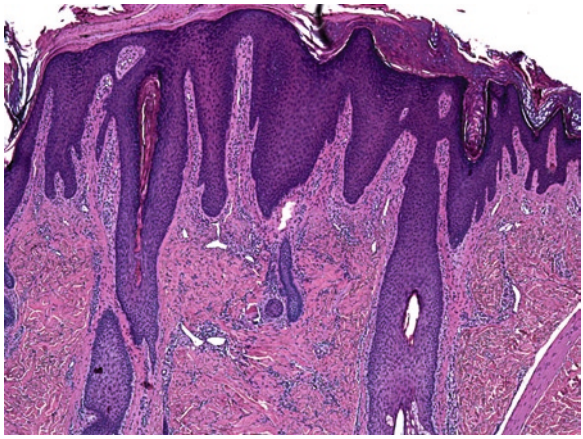

Fig. 3.13 *Prurigo nodularis* has significant histologic overlap with lichen simplex chronicus. The epidermis often, but not always, has a pseudoepitheliomatous growth pattern

Table 3.9 Key microscopic features: lichen simplex chronicus/prurigo nodularis

- Compact hyperkeratosis
- Acanthosis with thickened granular layer
- Vertically oriented, thickened collagen bundles in superficial dermis
- Sparse inflammatory infiltrate

are also a typical component of the inflammatory infiltrate. As a caveat, lichen simplex chronicus may be superimposed on a pre-existing chronic spongiotic dermatitis such as a long standing contact dermatitis or atopic dermatitis (Fig. 3.14).

The psoriasiform hyperplasia seen in lichen simplex chronicus can cause confusion with psoriasis. The confluent parakeratosis and diminished granular layer of psoriasis vulgaris distinguish it from lichen simplex chronicus and prurigo nodularis.

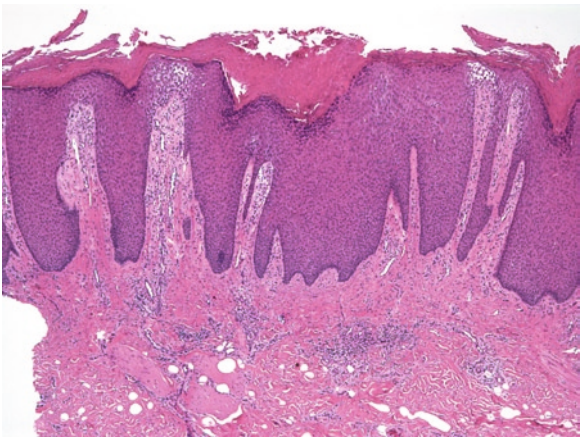

Fig. 3.14 *Spongiotic dermatitis with superimposed features of lichen simplex chronicus*. In long standing cases of eczematous dermatitis (e.g., atopic dermatitis), there may be coexisting features of a spongiotic dermatitis and lichen simplex chronicus/prurigo nodularis secondary to persistent excoriation. Although the architecture of this lesion is reminiscent of lichen simplex chronicus, the spongiosis and degree of inflammatory infiltrate is more in line with a spongiotic dermatitis

For prurigo nodularis, the differential diagnosis can include squamous cell carcinoma. Prurigo nodularis can show reactive atypia, but lacks atypical mitotic figures or pleomorphism and often presents as multiple lesions. The vertical fibrosis of prurigo nodularis helps identify this diagnosis. Squamous cell carcinoma will have a desmoplastic stromal response not seen in prurigo nodularis, and does not have the vertical collagen bundles of prurigo nodularis (Table 3.10).

Table 3.10 Practical tips: lichen simplex chronicus/prurigo nodularis

- "Hairy palm sign": The epidermal changes of both these entities resemble acral skin because of the prominent hyperkeratosis and hypergranulosis. However, lichen simplex chronicus and prurigo nodularis typically present on hair bearing skin. The presence of follicles in what otherwise looks like acral skin is a clue to the diagnosis of lichen simplex chronicus or prurigo nodularis.
- Lichen simplex chronicus and prurigo nodularis have overlapping features. Sometimes it may not be possible to distinguish them. In this situation the clinical presentation as a plaque or nodule should guide the diagnosis.
- In lesions with a prominent inflammatory infiltrate, biopsies with features of lichen simplex chronicus/prurigo nodularis may be superimposed upon other inflammatory conditions such as atopic or contact dermatitis. A significant inflammatory infiltrate or eosinophils suggest the possibility of an underlying dermatitis with superimposed lichen simplex chronicus.
- Prurigo nodularis vs. squamous cell carcinoma
  - Vertically oriented collagen bundles favor prurigo nodularis.
  - Squamous cell carcinoma is not itchy. A call to the clinician to get some clinical history can help.
  - Multiple lesions favor prurigo nodularis (note: some lesions of prurigo nodularis may be solitary).

Sample Reports: Psoriasis

Example 1:

Clinical history: Rule out psoriasis.
Diagnosis: Psoriasis, see comment.
Comment: There is confluent parakeratosis with collections of neutrophils overlying, and epidermis with a diminished granular layer, uniform psoriasiform hyperplasia, and a superficial perivascular lymphocytic infiltrate. The papillary dermal blood vessels are dilated and tortuous.
Note to reader: This is for a classic case of psoriasis. If the features are not clear-cut, a descriptive diagnosis can be used (see below).

Example 2:

Clinical history: Rule out psoriasis, nummular dermatitis.
Diagnosis: Psoriasiform dermatitis, see comment.
Comment: There is parakeratosis with focal collections of neutrophils and hyperkeratosis overlying an epidermis that has psoriasiform hyperplasia. The granular layer is largely intact. Within the dermis, the papillary dermal blood vessels are dilated and there is a superficial perivascular infiltrate of lymphocytes. No eosinophils are seen. The differential diagnosis includes psoriasis and nummular dermatitis. Given the presence of neutrophils in the stratum corneum, the uniform psoriasiform hyperplasia, the dilated dermal blood vessels, and absence of eosinophils, I believe this is most consistent with partially treated or excoriated psoriasis.

Sample Report: Nummular Dermatitis

Clinical history: Rule out psoriasis, nummular dermatitis.
Diagnosis: Psoriasiform dermatitis, see comment.
Comment: There is parakeratosis with focal neutrophils overlying an epidermis with irregular psoriasiform hyperplasia and some spongiosis. The granular layer is thickened. Within the dermis, there is a perivascular infiltrate of lymphocytes with focal eosinophils. A PAS stain is negative for fungi. The differential diagnosis includes psoriasis vs. nummular dermatitis. The histologic features are most consistent with an eczematous dermatitis such as nummular dermatitis. The thickened granular layer and eosinophils argue against the possibility of psoriasis. Clinicopathologic correlation is recommended.
Note to reader: In this case, it would be acceptable to top line the diagnosis as either a spongiotic dermatitis or psoriasiform dermatitis.

Sample Reports: Prurigo Nodularis/Lichen Simplex Chronicus

Example 1:

Clinical history: Lesion, rule out SCC.

Diagnosis: Psoriasiform dermatitis, see comment.

Comment: There is thick compact hyperkeratosis overlying an epidermis with a thickened granular layer and irregular psoriasiform hyperplasia. Within the dermis there is a scant perivascular infiltrate and thickened, vertically oriented collagen bundles in the papillary dermis. The histologic features are most consistent with prurigo nodularis.

Example 2:

Clinical history: Rule out dermatitis.

Diagnosis: Psoriasiform dermatitis consistent with lichen simplex chronicus, see comment.

Comment: There is thick, compact hyperkeratosis overlying an epidermis with psoriasiform hyperplasia and a thickened granular layer. There is vertical fibrosis of the collagen bundles of the papillary dermis. Within the dermis, there is a mild perivascular lymphocytic infiltrate. The histologic features are consistent with lichen simplex chronicus.

Example 3:

Clinical history: Dermatitis, rule out eczema.

Diagnosis: Psoriasiform dermatitis with superimposed features of lichen simplex chronicus, see comment.

Comment: There is a thick, compact hyperkeratosis overlying an epidermis with psoriasiform hyperplasia and a thickened granular layer. There is vertical fibrosis of the collagen bundles and a moderately dense perivascular inflammatory infiltrate with lymphocytes and scattered eosinophils. The histologic features are most consistent with a chronic eczematous dermatitis with superimposed features of lichen simplex chronicus.

Note to reader: This report is from a case of an eczematous dermatitis that was persistently excoriated. Therefore there were features of both a chronic spongiotic dermatitis and lichen simplex chronicus.

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