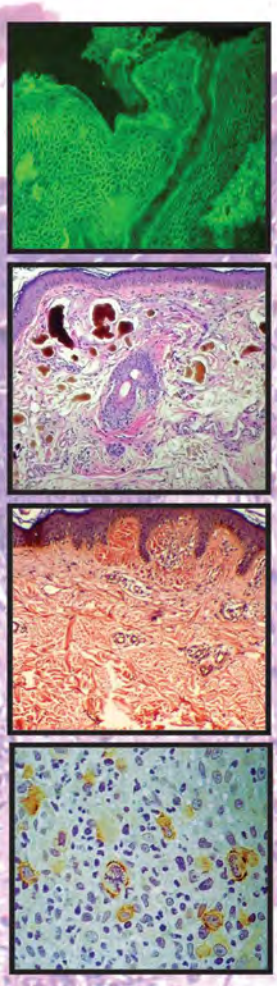
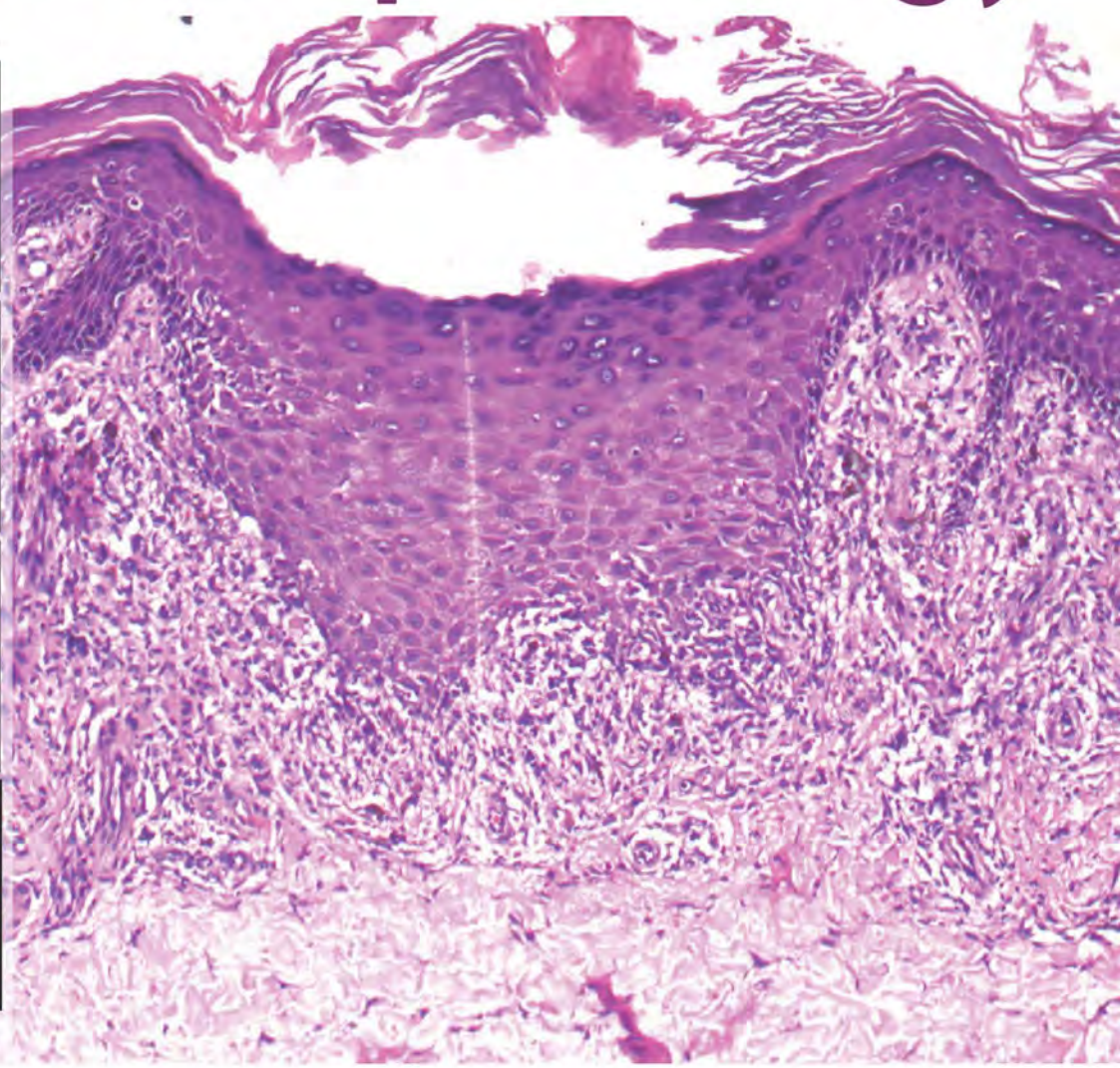
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Color Atlas of
Dermatopathology





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Pradeep Mahajan

Foreword
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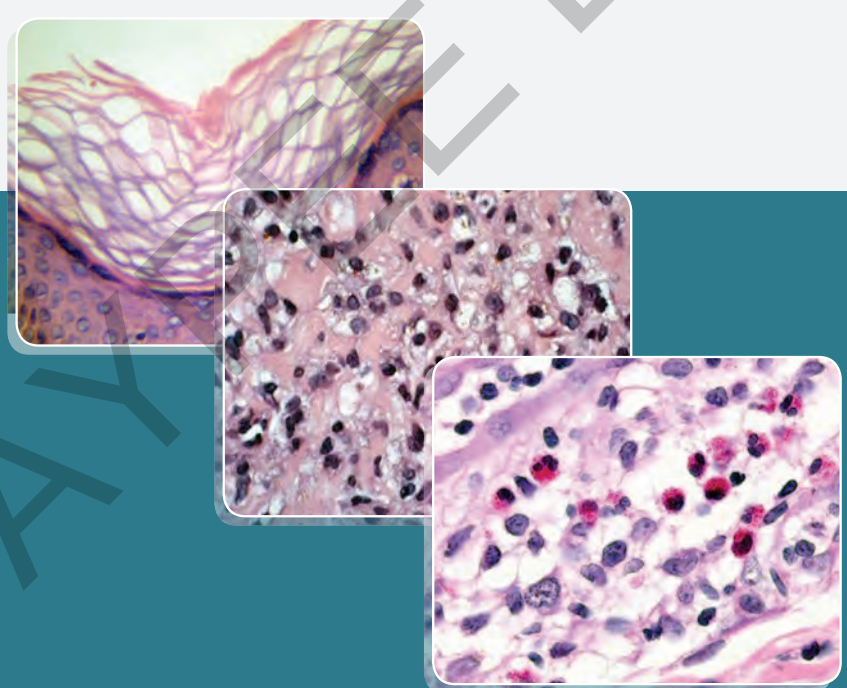
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2 Clues and Pitfalls in Diagnostic Dermatopathology

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2.1: Hyperkeratosis
2.2: Parakeratosis
2.3: Cornoid Lamellation
2.4: Papillomatosis
2.5: Church Spires
2.6: Acantholysis
2.7: Dyskeratosis
2.8: Dermal Polymorphonuclear Infiltrate
2.9: Epidermal Eosinophilic Infiltrates (Eosinophilic Spongiosis)
2.10: Dermal Eosinophilic Infiltrate
2.11: Foam Cells
2.12: Clues to Early Diagnosis of Mycosis Fungoides
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Venkataram Mysore, Pradeep Mahajan



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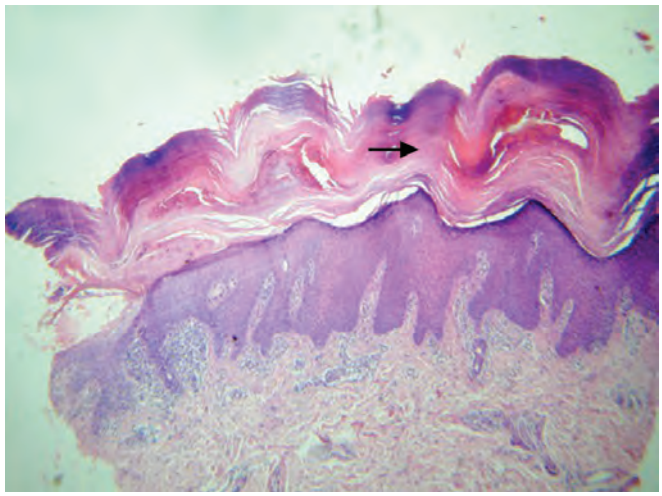


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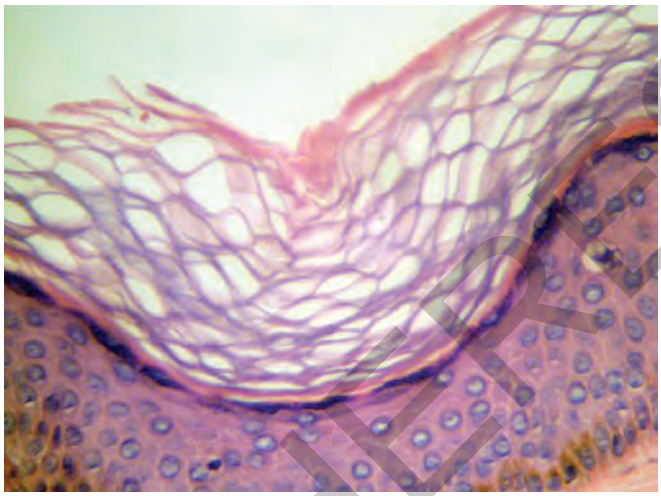


FIGURE 2.1.2

2.1: Hyperkeratosis

2.1.1: Compact hyperkeratosis (*Low power view*)

2.1.2: Basket weave hyperkeratosis (*High power view*)

2.2: Parakeratosis (*High power view*)

2.3: Cornoid lamellation (*Low power view*)

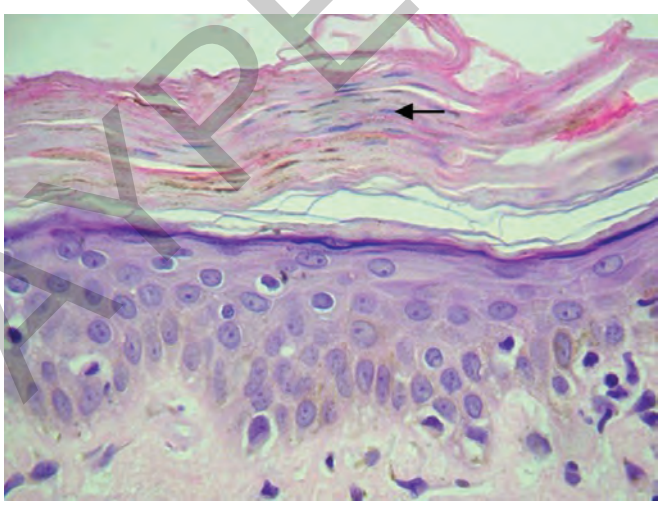


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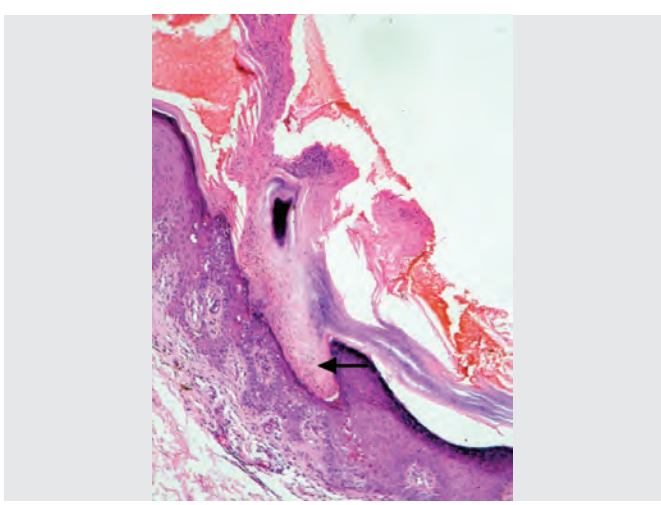


FIGURE 2.3

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INTRODUCTION

- Histopathological findings under the microscope many a times differ from the classic reaction patterns and may not be diagnostically specific always.
- Some useful points may assist in reaching a correct diagnosis.
- Dr A Bernard Ackerman has contributed to many of these clues than anyone else.
- But remember that these are not the absolute criteria for diagnosis.

2.1: Hyperkeratosis (Figs 2.1.1 and 2.1.2)

Thickened stratum corneum to more than 1/3rd of the total thickness of epidermis is referred to as hyperkeratosis.

Orthokeratosis is hyperkeratosis with normal stratum corneum and stratum granulosum. It may be basket weave as in retention type of ichthyosis (ichthyosis vulgaris) or compact as in lichen simplex chronicus.

2.2: Parakeratosis (Fig. 2.2)

Retention of nuclei in stratum corneum is parakeratosis, which indicates delayed maturation process and altered keratinization.

There is diminished or absent granular layer which accompanies parakeratosis (the only condition in which parakeratosis is seen with normal granular layer is axillary granular parakeratosis).

Parakeratosis is:

1. Focal and scattered as in dermatitis.
2. Focal and cap-like as in lichen nitidus.
3. Alternating with hyperkeratosis and vertically arranged: as in viral warts, inflammatory linear verrucous epidirmal nevus (ILVEN), psoriasis.
4. Horizontally alternating as in actinic keratosis.
5. Horizontal as well as vertical alternating as in PRP.
6. Punctate as in pityriasis lichenoides chronica.
7. With polymorphonuclear cells, as in psoriasis.

2.3: Cornoid Lamellation (Fig. 2.3)

It is keratin filled invagination of the epidermis at an angle from the center of which arises a parakeratotic column.

Seen in:

- Porokeratosis
- Verruca vulgaris
- Actinic keratosis
- Porokeratotic eccrine duct nevus.

2.4: Papillomatosis (Fig. 2.4)

Gross hyperplasia of epidermis, with elongated dermal papillae pushing up the epidermis, in the form of finger like processes is papillomatosis.

It is seen in various conditions like:

Inflammatory diseases: Verrucous skin lesions, such as verrucous tuberculosis, subcutaneous fungal infections, pemphigus vegetans, pyoderma vegetans, milker's nodule, viral warts, and acrokeratosis verruciformis of Hopf.

Tumors: Seborrheic keratosis, hypertrophic form of actinic keratosis, some cases of intradermal nevi, epidermal nevi, nevus sebaceous.

2.5: Church Spires (Fig. 2.5)

Refer to hyperkeratosis and papillomatosis with elevations of epidermis resembling church spire.

Seen in:

- Acrokeratosis verruciformis of Hopf
- Seborrheic keratosis
- Verruca vulgaris.

2.6: Acantholysis (Fig. 2.6)

It is loss of cohesion (due to loss of intercellular bridges) of keratinocytes leading to seperation of cells with formation of clefts and/or bulla.

Acantholytic cells appear rounded with central condensed nucleus.

Acantholysis may be:

1. Primary:
   a. Pemphigus vulgaris—suprabasal
      Pemphigus foliaceous—subcorneal
   b. Hailey-Hailey disease
   c. Darier's disease
   d. Transient acantholytic dyskeratosis
   e. Warty dyskeratoma.
2. Secondary to cell degeneration; in subcorneal pustular dermatosis, viral blisters (herpes simplex and zoster).
3. Neoplastic acantholysis: some cases of actinic keratosis, squamous cell carcinoma.

2.7: Dyskeratosis (Fig. 2.7)

Abnormal and premature individual cell keratinization of cells, which appear as deeply pinkish cells, with small dark nucleus.

Seen in:

a. *Acantholytic dyskeratosis*: in Hailey-Hailey disease, Darier's disease (corps ronds and grain).
b. *Neoplastic dyskeratosis*: Bowen's disease, actinic keratosis, and squamous cell carcinoma.
c. Genodermatoses such as incontinentia pigmenti.

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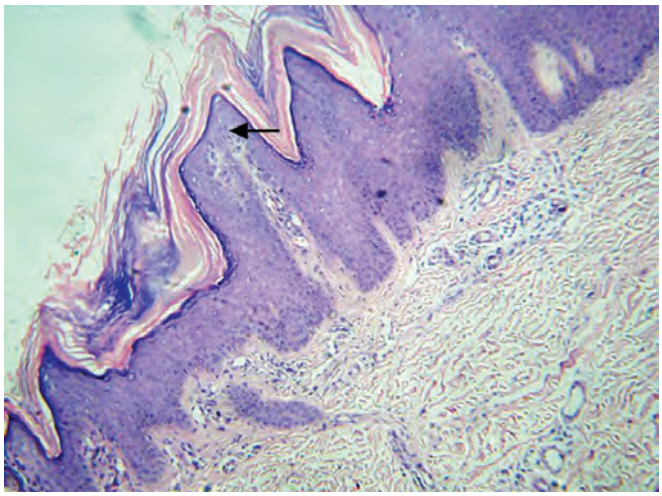


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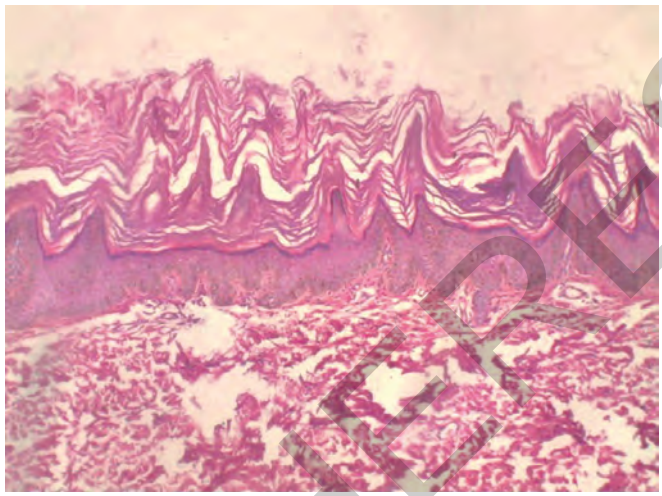


FIGURE 2.5

2.4: Papillomatosis (*Low power view*)
2.5: Church spires (*Scanner view*)
2.6: Acantholytic cells (*High power view*)
2.7: Dyskeratotic cells (*High power view*)

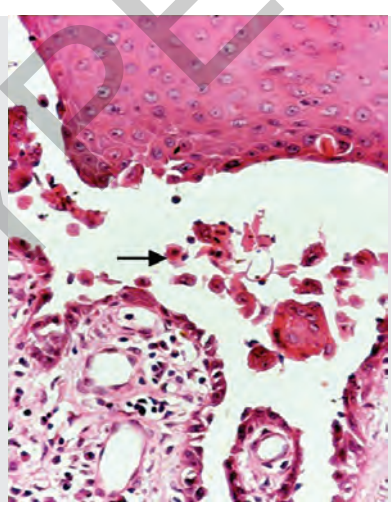


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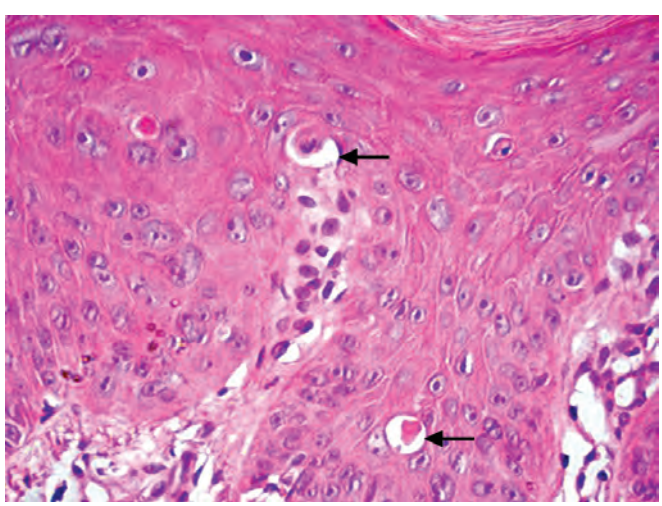


FIGURE 2.7

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2.8: Dermal Polymorphonuclear Infiltrate (Fig. 2.8):

a. Leukocytoclastic vasculitis
b. Sweet's syndrome
c. Dermatitis herpetiformis
d. Erythema nodosum in early stages
e. Erythema nodosum leprosum
f. All suppurative granulomas
g. Ruptured cyst
h. Infectious processes—furuncle, cellulitis, etc.

2.9: Epidermal Eosinophilic Infiltrates (Eosinophilic Spongiosis) (Fig. 2.9)

a. Pemphigus
b. Bullous pemphigoid
c. Insect bite reactions
d. Dermatophyte infections
e. Incontinentia pigmenti
f. Eosinophillic pustular folliculitis, etc.

2.10: Dermal Eosinophilic Infiltrate (Fig. 2.10)

a. Atopic dermatitis
b. Erythroderma, particularly atopic type
c. Parasitic infestations, such as scabies, onchocerciasis, larva migrans
d. Allergic granulomatosis of Churg Strauss
e. Eosinophilic fasciitis
f. Bullous pemphigoid, herpes gestationis
g. Granuloma faciale
h. Mycosis fungoides
i. Histiocytosis X-eosinophilic granuloma
j. Urticaria, urticaria pigmentosa, etc.

2.11: Foam Cells (Fig. 2.11)

a. Lepromatous leprosy
b. Xanthomas
c. Xanthogranuloma
d. Necrobiotic xanthogranuloma
e. Panniculitis—particularly of Weber Christian type
f. Histiocytosis X
g. Atypical fibroxanthoma
h. Involuting intradermal nevi
i. Tumors—atypical fibroxanthoma, sebaceous gland tumours, etc.

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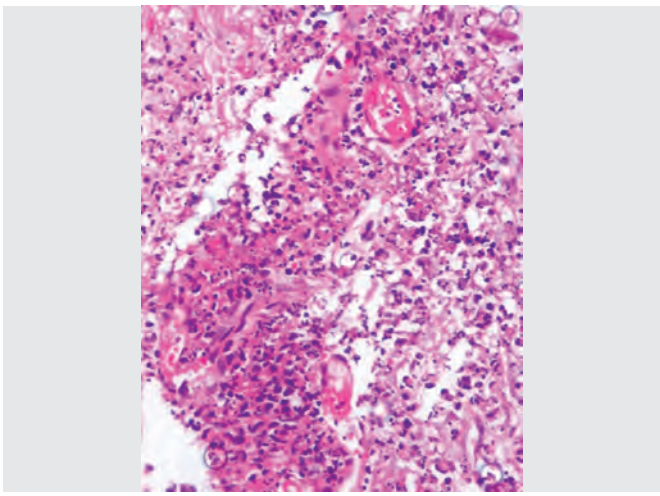


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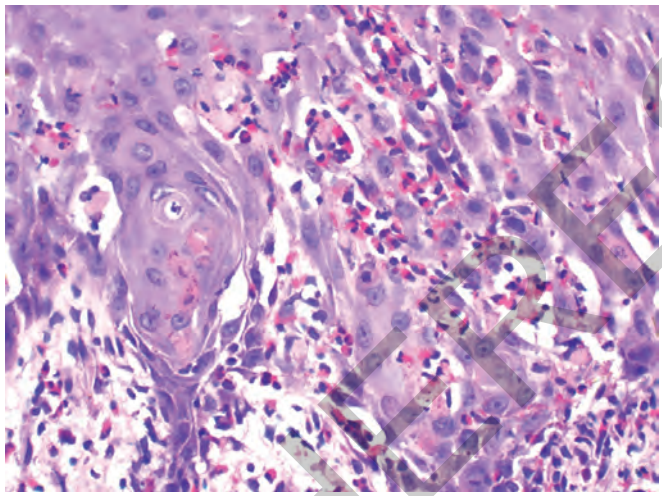


FIGURE 2.9

2.8: Dermal polymorphonuclear infiltrate (*High power view*)
2.9: Epidermal eosinophilic infiltrates (eosinophilic spongiosis) (*High power view*)
2.10: Dermal eosinophilic infiltrate (*High power view*)
2.11: Foam cells (*High power view*)

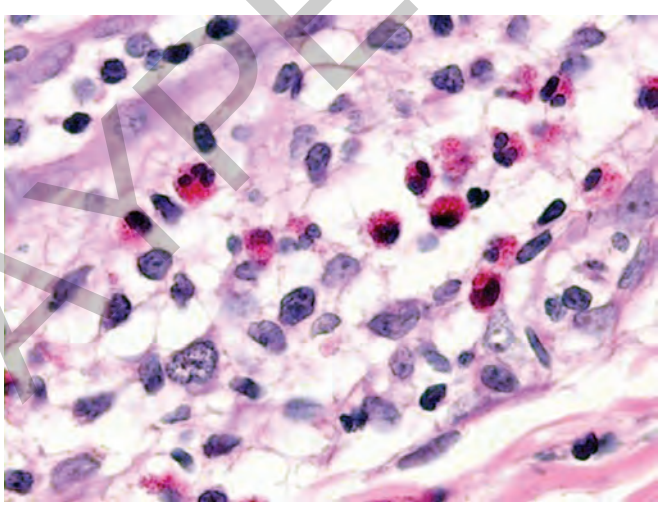


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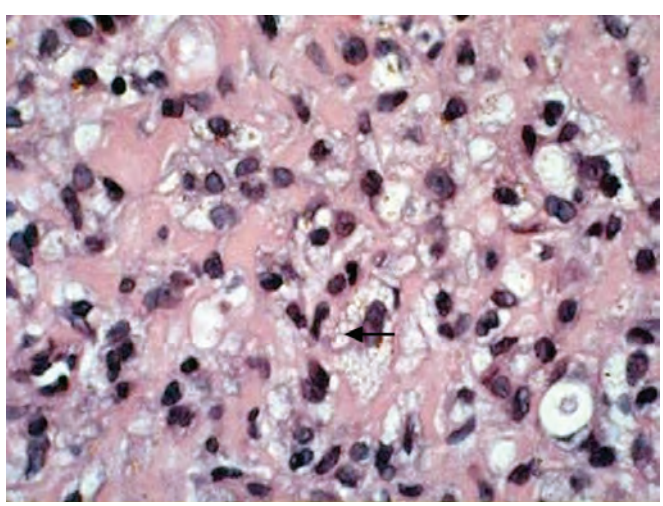


FIGURE 2.11

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2.12: Clues to Early Diagnosis of Mycosis Fungoides (Fig. 2.12)

a. Elongated mounds of parakeratosis
b. Lymphocytes in the epidermis surrounded by a clear halo
c. Lymphocytes lining the basal cell layer as a single row (Toy Soldier's appearance)
d. Epidermal lymphocytes larger than dermal
e. Vertical streaks of thickened collagen in papillary dermis.

2.13: Extravasated RBCs (Fig. 2.13)

Seen in:

- Vasculitis
- PPD (Pigmented purpuric dermatoses)
- Hemorrhagic fevers
- Pityriasis rosea
- Pityriasis lichenoides
- Hemorrhage related to biopsy.

2.14: Keratinocyte Pallor (Fig. 2.14)

Along with neutrophilic infiltrate in the epidermis is seen in:

- Nutritional deficiencies like pellagra, zinc deficiency.
- Necrolytic migratory erythema (Glucagonoma syndrome)
- Keratoacanthoma.

2.15: Increased Mitotic Activity (Fig. 2.15)

Psoriasiform tissue reaction pattern is seen in many different conditions including psoriasis and dermatitis (eczemas). Important differentiating point can be demonstration of increased mitosis in psoriasis.

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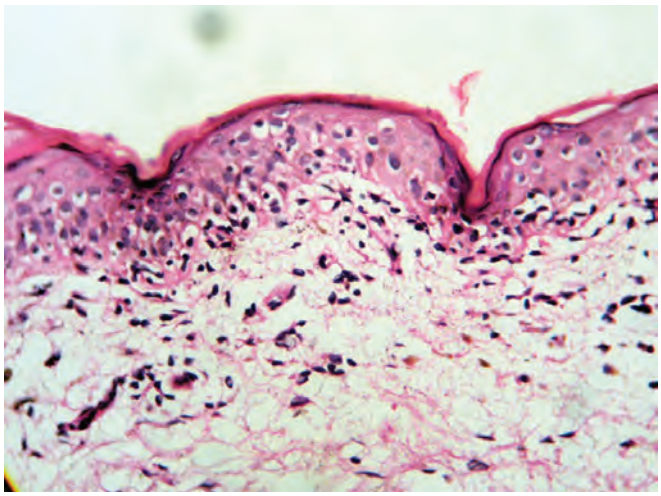


FIGURE 2.12

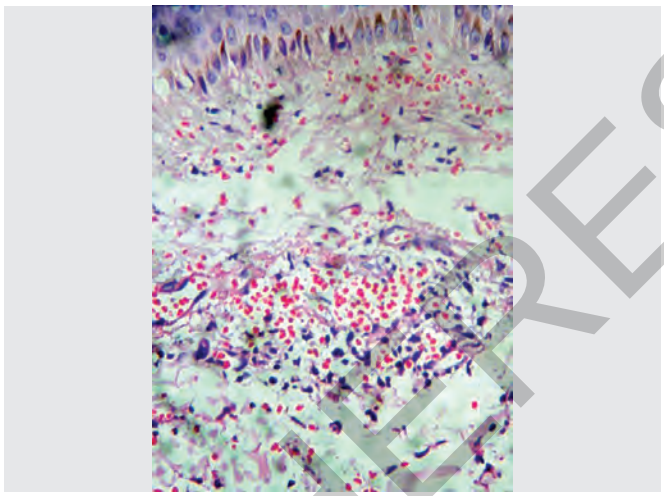


FIGURE 2.13

2.12: Clues to early diagnosis of mycosis fungoides (Toy soldier's appearence) (*Low power view*)

2.13: Extravasated RBCs (*Low power view*)

2.14: Pale keratinocytes below the stratum corneum (*Low power view*)

2.15: Increased mitotic activity (*High power view*)

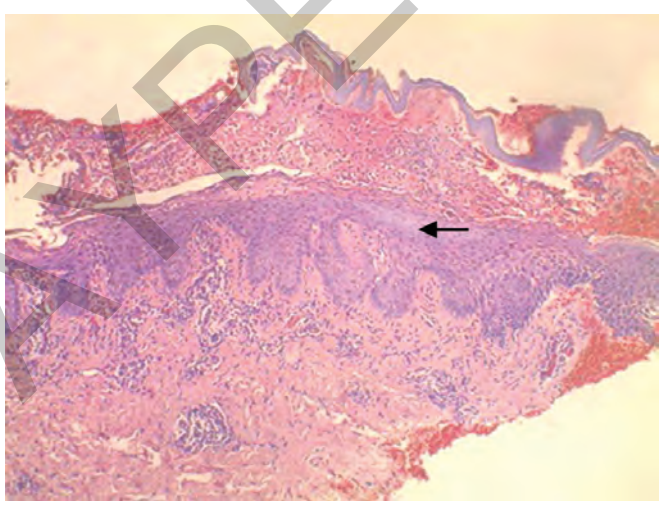


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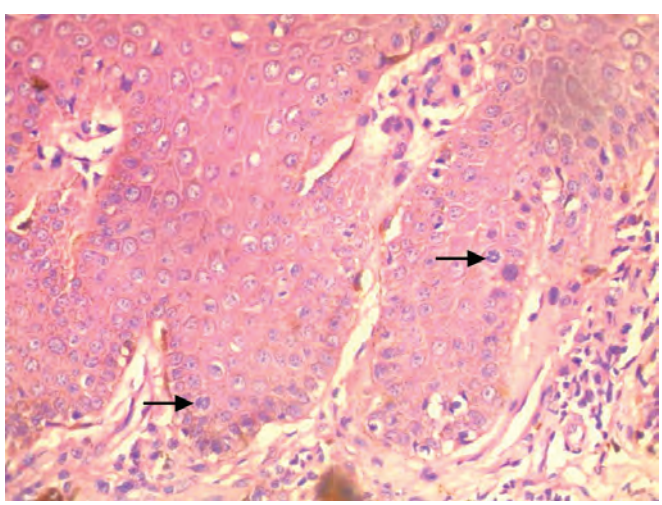


FIGURE 2.15

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2.16: Artifacts and Thermal Changes (Fig. 2.16)

One should be aware of biopsy procedural or processing or staining artifacts and should not consider them pathological changes.

Similarly, biopsy done by electric cautery or radiofrequency machines (skin biopsy procedure not recommended to be done by these devises) leads to histologic changes (like elongation of nuclei of keratinocytes and necrosis of dermal collagen) which can be confusing.

2.17: Special Stains

Crystal violet stain is supposed to be better for Amyloid than Congo Red and, Colloidal Iron for mucin than Alcian Blue (but in India, these stains are done very infrequently and only at a few centers).

Summary

- Dermatopathology is interesting field when a mathematical approach through algorithm is followed.
- There are many confusing differentials.
- However, with systematic approach when a diagnosis for a clinically perplexing case is offered by dermatopathology and it helps patient get rid of his/her distress, it is a rewarding and satisfying experience.

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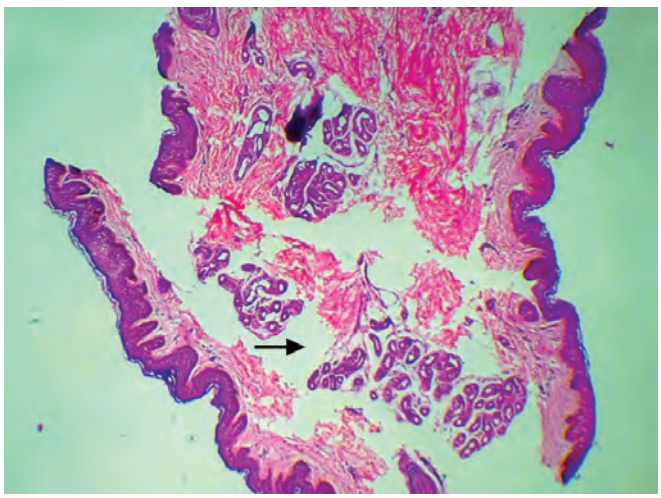


FIGURE 2.16.1

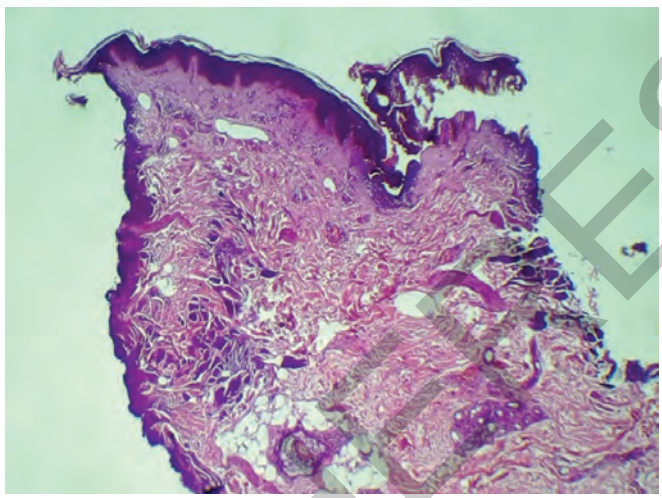


FIGURE 2.16.2

2.16: Artifacts and Thermal Changes

2.16.1: Artifacts—separation of epidermis from dermis during sectioning (*Scanner view*)

2.16.2: Artifacts—sectioning error with epidermis seen on side and top (*Scanner view*)

2.16.3: Radiofrequency changes—coagulated collagen (*Scanner view*)

2.16.4: Radiofrequency changes—elongation of keratinocytes and clefting (*High power view*)

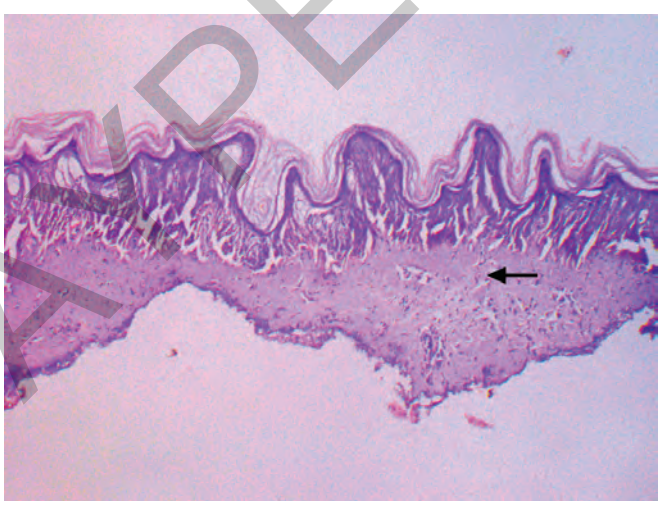


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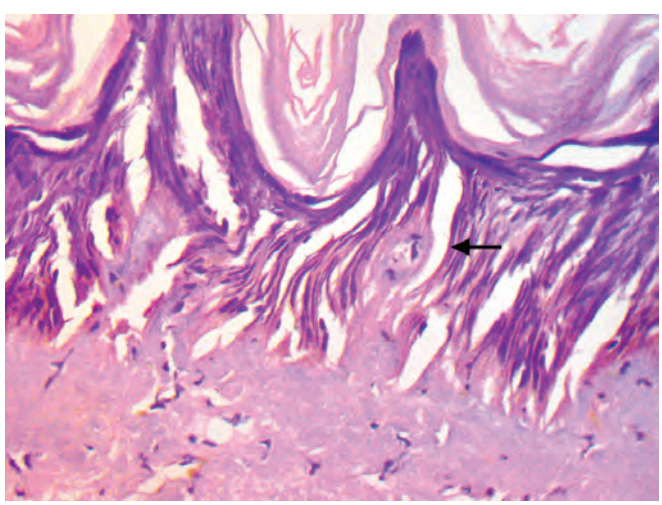


FIGURE 2.16.4

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