Shape on Low Power

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  - Pink ball (see Chapter 6)
• Epidermal acanthosis
• Parakeratosis
• Full-thickness disorder of keratinocytes with atypical cells and mitoses
• Basal layer may focally appear normal (“eyeliner” sign) (arrow)
- Epidermal acanthosis
- Clear cells well-demarcated from the normal epidermis and adnexal keratinocytes
- Parakeratosis above clear cells

**Clear cell acanthoma**
• Epidermal acanthosis
• Parakeratosis
• Neutrophils in stratum corneum (asterisk)
• Hypogranulosis
• Thinned suprapapillary plates (long arrow)
• Dilated vessels in papillary dermis (short arrows)
**Key differences**

a Bowen disease: disordered keratinocytes and atypical mitoses

b Clear cell acanthoma: pale/clear keratinocytes well-demarcated from normal epidermis

c Psoriasis: confluent parakeratosis above thickened epidermis, neutrophils in stratum corneum, normal keratinocytes, thin suprapapillary plates, dilated vessels
- Lobular proliferation
- Normal-appearing keratinocytes with some arranged in squamous eddies
- Lobular proliferation
- Blue-gray hue to some of the keratinocytes
- Large, pink cytoplasmic inclusions (Henderson-Paterson bodies)

**Molluscum contagiosum**
- Lobular proliferation (can be reticulated)
- Uniform blue cells with interspersed ducts (arrows)
- Fibrotic or hyalinized stroma with dilated vessels
- Lobular proliferation
- Acanthosis of epidermis
- Pseudohorn cysts
- No ducts

**Seborrheic keratosis, acanthotic**
- Lobular proliferation
- Proliferation composed of pale/clear cells
- Peripheral palisading (long arrow) with thickened basement membrane (short arrow)
a Inverted follicular keratosis: squamous eddies of normal keratinocytes  

b Molluscum contagiosum: intracytoplasmic pink inclusions (Henderson-Paterson bodies)  

c Poroma: uniform blue cells with interspersed ducts, hyalinized stroma  

d Seborrheic keratosis: pseudohorn cysts  

e Trichilemmoma: pale/clear keratinocytes with peripheral palisading and thickened basement membrane  

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**Key differences**
- Reticulated proliferation
- Strands of basaloid cells in a fibrovascular stroma
- Some hints of palisading of cells (arrow)
• Reticulated proliferation
• Fibrotic stroma adjacent to the hair follicle has reticulated strands of epithelium
• This entity has overlap with trichodiscoma (most consider these a spectrum of the same entity)

Fibrofolliculoma
- Reticulated proliferation
- Sebaceous glands, basaloid proliferations (arrow) connect to the epidermis
- Apocrine glands may be seen deep
- Absent terminal hairs in mature stage

Nevus sebaceus of Jadassohn
- Reticulated proliferation
- Strands of banal keratinocytes, often pigmented
- Interspersed pseudohorn cysts
• Reticulated proliferation
• Strands of banal, round cells
• Interspersed ducts
Reticulated proliferation
- Pale cells in columns with "windows" of dermis in between
- Peripheral palisading

**Tumor of the follicular infundibulum**
Key differences

a Fibroepithelioma of Pinkus: strands of basaloid epithelium in fibrovascular stroma
b Fibrofolliculoma: hair follicle with adjacent fibrotic stroma and reticulated epithelium
c Nevus sebaceus: proliferation of epidermis connecting to sebaceous lobules and basaloid proliferations
d Seborrheic keratosis, reticulated: reticulated strands of banal keratinocytes, often pigmented; interspersed pseudohorn cysts
e Syringofibroadenoma: strands of uniform, round cells with interspersed ducts
f Tumor of the follicular infundibulum: pale cells in columns with “windows” of dermis in between
- Central pore
- Invaginated epidermis is acanthotic
Central pore

- Invaginated epidermis is acanthotic and has areas resembling outer root sheath with peripheral palisading around slightly pale cells
• Central pore
• Invaginated epidermis connects to a primary hair follicle
• Multiple secondary hair follicles radiating away from the central follicle
a Dilated pore of Winer: acanthotic epidermis
b Pilar sheath acanthoma: epidermal acanthosis and areas resembling outer root sheath
c Trichofolliculoma: primary follicle and surrounding secondary follicles
Elastosis perforans serpiginosa

- Epidermal perforation
- Elongated claw (epidermal rete) gripping thin, glassy, eosinophilic elastic fibers and debris
- Altered elastic fibers are thinner than the collagen fibers in the dermis
• Epidermal perforation
• Shallow cup-shaped architecture
• Pink collagen fibers extend vertically through epidermis
**Key differences**

- **Elastosis perforans serpiginosus:** elongated rete forming a claw (tortuous channel); case courtesy of Whitney High, MD, JD

- **Reactive perforating collagenosis:** shallow, broad cup-shaped architecture

- **Calcinosis cutis, perforating:** chunky, bluish material (see page 264) at the base of an ulcer

- **Granuloma annulare, perforating:** palisading histiocytes around collagen with mucin (see page 89)

**Note** Other entities may also perforate the epidermis, for example, chondrodermatitis nodularis helicis, pseudoxanthoma elasticum.
• Circular dermal islands
• Islands contain basaloid cells with a cribriform pattern of duct-like spaces filled with amorphous material
- Circular dermal islands
- Islands contain basaloid cells surrounded by a thick pink basement membrane (arrow)
- Islands arranged like a “jigsaw puzzle”
• Circular dermal islands
• Islands of epithelium with central flaky keratin (horn cysts)
• Interspersed basaloid cords
a Adenoid cystic carcinoma: cribriform pattern of duct-like structures
b Cylindroma: puzzle-like arrangement, thick/pink basement membrane
c Trichoadenoma: numerous horn cysts

Key differences
- Cords/tubules and comma shapes in dermis
- Numerous horn cysts (long arrow) in fibrotic stroma
- Tubules of two-layered epithelium (short arrow)
- Calcification often present
- Confined to dermis

**Desmoplastic trichoepithelioma**
- Cords/tubules and comma shapes in dermis and below
- Tubules of single-layered (“Indian filing” – long arrow) and multi-layered epithelium
- Some cells forming gland-like structures (short arrow)
- Other metastatic carcinomas may look like this – need clinical history; immunohistochemistry may be helpful

**Metastatic breast carcinoma**
• Cords/tubules and comma shapes in dermis
• Comma shapes with duct-like spaces
• Deeply infiltrative (fills dermis)
• Perineural involvement
- Cords/tubules and comma shapes in dermis
- Tubules of epithelium composed of basaloid cells with hints of peripheral palisading
- New collagen forming around islands (arrow)
- Deeply infiltrative

Morpheaform basal cell carcinoma
Syringoma

- Cords/tubules and comma shapes in dermis
- Restricted to upper dermis
- “Tadpoles” of epithelium with duct-like structures in heads (arrow)

- Darker cells at periphery, clear cells in center
- Eosinophilic cuticle lining lumina
- No horn cysts
Desmoplastic trichoepithelioma: horn cysts, no clear cells, circular areas of epithelium surround keratin

Metastatic breast carcinoma: single filing of atypical cells, deeply infiltrative

Microcystic adnexal carcinoma: like syringoma with tadpole-like structures but deeply infiltrative, perineural involvement

Morpheiform basal cell carcinoma: infiltrative cords of basaloid cells with hints of peripheral palisading; may have some duct-like structures (but less than c)

Syringoma: superficial tadpoles with clear cells

Key differences
- Space with a lining
- Lining composed of an inner layer of cells with decapitation secretion (long arrow) and a compressed layer of myoepithelial cells (short arrow)
Auricular pseudocyst

- Space with a lining
- “Lining” is not a true epithelial layer but is cartilage
- Centrally, there is degeneration of cartilage
• Space with a lining
• Lining composed of squamous or sometimes cuboidal/columnar epithelium often with squamous metaplasia
• Prominent lymphoid follicles in wall
• Space with a lining
• Lining composed of cuboidal/columnar epithelium with cilia (arrows)

Cutaneous ciliated cyst
• Space with a lining
• Spaces embedded in a fibrovascular stroma (endometrial stroma)
• Lining composed of crowded blue cells
• Hemosiderin deposits common in stroma
- Space with a lining
- Lining composed of squamous epithelium
- Walls contain adnexal structures

**Dermoid cyst**
• Space with a lining
• Lining composed of squamous epithelium with a granular layer (arrow)
• Cyst contents composed of flakes of keratin
- Space with a lining
- Lining composed of squamous epithelium without a granular layer
- Cyst contents composed of dense pink keratin

**Pilar cyst**
• Space with a lining
• Lining composed of layered epithelium with a bright pink crenulated keratin (arrow)
• Sebaceous glands in wall
Key differences

- Apocrine hidrocystoma: decapitation secretion
- Auricular pseudocyst: degeneration surrounded by cartilage
- Branchial cleft cyst: prominent lymphoid follicles in wall
- Cutaneous ciliated cyst: columnar epithelium with cilia; no structures in wall
- Cutaneous endometriosis: fibrovascular stroma with glands
Dermoid cyst: sebaceous glands and other adnexal structures in wall

Epidermal inclusion cyst: epithelium with granular layer, flakes of keratin in center

Glomuvenous malformation (glomangioma): monomorphous, cuboidal blue cells (see also glomus tumor on page 282)

Pilar cyst: epithelium without granular layer, dense keratin in center

Steatocystoma: crenulated keratin lining the cyst; sebaceous glands in wall

Note Bronchogenic cysts are uncommon, and are diagnosed by clinical history and the presence of columnar epithelium +/- cilia, +/- cartilage in wall; venous lakes are common and are composed of flattened endothelial cells with erythrocytes in the space.
- Papillated dermal tumor
- Disordered layers of epithelium in large papillations with some tubules
- Variable cytological atypia and mitotic figures
- Acral location

**Aggressive digital papillary adenocarcinoma**
- Papillated dermal tumor
- Nipple can sometimes be identified by fascicles of smooth muscle in dermis
- Circular islands, some cystic, and tubules
- Compressed myoepithelial cells at periphery of islands/tubules

- Decapitation secretion often evident
- Resembles syringocystadenoma papilliferum (stromal plasma cells [arrows]) or tubular apocrine adenoma

**Erosive adenomatosis of the nipple (nipple adenoma)**
• Papillated dermal tumor
• Finger-like projections have cores of collagen/fibroblasts (arrow)
• No connection to epidermis

Hidradenoma papilliferum
• Islands of epithelium with papillated projections
• With or without epidermal connection
• Duct-like spaces lined by eosinophilic cuticle
• Overlaps with tubular apocrine adenoma
Syringocystadenoma papilliferum

- Papillated dermal tumor
- Papillations contain numerous plasma cells (arrow)
- Tumor often connected to epidermis
- Papillated dermal tumor
- Evidence of decapitation secretion
- Overlaps with papillary eccrine adenoma
a Aggressive digital papillary adenocarcinoma: large tumor, atypical cells and mitoses piled up
b Florid papillomatosis (erosive adenomatosis) of the nipple (nipple adenoma): resembles syringocystadenoma papilliferum but fewer plasma cells; nipple may be identified by smooth muscle bundles in dermis
c Hidradenoma papilliferum: thin papillations with fibrovascular cores
d Papillary eccrine adenoma: islands of epithelium with papillated areas
e Syringocystadenoma papilliferum: fat papillations with plasma cells in cores
f Tubular apocrine adenoma: decapitation secretion and papillations within islands

Key differences
- Polypoid shape
- Acral skin (thick stratum corneum with stratum lucidum [long arrow])
- Dermal nerve bundles (short arrows)
• Polypoid shape
• May see a slight invagination of surface epidermis with underlying sebaceous glands
• Surface epidermis often slightly acanthotic and hyperpigmented

• May see mammary ducts or apocrine glands deep
• Dermis with numerous smooth muscle bundles (arrows)
• Polypoid shape
• Thin epidermis
• Vellus hairs (arrows)
• Cartilage not always present

• Differential diagnosis of numerous vellus hairs
  – Eyelid/earlobe/sometimes facial skin
  – Vellus hair nevus

Accessory tragus
• Polypoid shape
• Acral skin
• Fibrovascular stroma (thick collagen [arrows])

**Digital fibrokeratoma**
Key differences

- **Accessory digit**: nerve bundles in the dermis
- **Accessory nipple**: sebaceous glands, mammary ducts or apocrine glands, smooth muscle bundles in the dermis
- **Accessory tragus**: vellus hairs in the dermis
- **Digital fibrokeratoma**: collagen in the dermis

**Note** Other entities may also be polypoid; for example, intradermal nevus, neurofibroma, fibrous papule, etc.
- Square/rectangular shape
- Thick, pink smudgy collagen in dermis
- Plasma cells around vessels
- Atrophic or absent adnexal structures

Morphea
• Square/rectangular shape
• Altered, reddened collagen (necrobiosis) layered with inflammation
• Giant cells and plasma cells are prominent
- Square/rectangular shape
- Normal-appearing collagen bundles in dermis
- No increased mucin

**Normal back skin**
• Square/rectangular shape
• Slight widening of space between collagen due to mucin (arrow)
• No increase in fibroblasts
- Square/rectangular shape
- Slight widening of space between collagen due to mucin (long arrow)
- Increased fibroblasts (short arrows)

**Note** Lichen myxedematosus is histologically similar but clinically different.

**Note** Nephrogenic systemic fibrosis may show similar findings but may have deeper involvement.
Key differences

a Morphea: thickened bundles of collagen with loss of fenestrations between collagen bundles
b Necrobiosis lipoidica: reddened collagen sandwiched between layers of inflammatory cells (giant cells, plasma cells)
c Normal back: normal-sized collagen bundles, no increased mucin
d Scleredema: mucin between collagen
e Scleromyxedema: mucin and increased fibroblasts
- Palisading of histiocytes around amorphous white-gray substance with a feathery edge
• Palisading of histiocytes around altered collagen, basophilic mucin (long arrow)
• Lymphocytes around vessels (short arrow)
- Palisading of histiocytes and bizarre, multinucleated giant cells around foci of necrosis
- Scattered Touton giant cells
- Cholesterol clefts, plasma cells, and/or lymphoid follicles may be present

_Necrobiotic xanthogranuloma_
• Palisading of histiocytes around central pink fibrin
• The reaction is often deep
Key differences

- **a** Gout: central white-gray feathery material
- **b** Granuloma annulare: central altered collagen interspersed with blue mucin
- **c** Rheumatoid nodule: central pink fibrin
- **d** Necrobiosis lipoidica: altered “red” collagen surrounded by giant cells, plasma cells (see page 83)
- **e** Necrobiotic xanthogranuloma: bizarre, multinucleated giant cells; Touton giant cells
• Pseudoepitheliomatous hyperplasia above abscesses
• Yeast forms (arrow) that classically show broad-based budding
- Pseudoepitheliomatous hyperplasia above abscesses
- Brown-colored septate rounded “hot cross buns” (Medlar bodies, sclerotic bodies, copper pennies) (arrow)
• Pseudoepitheliomatous hyperplasia above abscesses
• Large (~80-200 micron) spherules containing endospores (arrows)
Key differences

- **A** Blastomycosis: ~8–30 micron yeast form (arrow)
- **B** Chromomycosis: ~5–12 micron Medlar bodies
- **C** Coccidioidomycosis: ~80-200 micron spherules with endospores

**Note** Paracoccidioidomycosis (~6–60 micron Mariner’s wheel; an uncommon infection in the United States), sporotrichosis (organisms usually not evident in biopsies), and tuberculosis verrucosa cutis may also show this pattern.