## Shape on Low Power

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- Polypoid shape
- Acral skin [thick stratum corneum with stratum lucidum (long arrow)]
- Dermal nerve bundles (short arrows)

Shape on Low Power | Polypoid


- 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)


## Accessory nipple



- 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

6 Shape on Low Power | Polypoid


- Polypoid shape
- Acral skin
- Fibrovascular stroma [thick collagen (arrows)]



## Polypoid shape

- a Accessory digit: nerve bundles in the dermis
- b Accessory nipple: sebaceous glands, mammary ducts or apocrine glands, smooth muscle bundles in the dermis
- c Accessory tragus: vellus hairs in the dermis
- d Digital fibrokeratoma: collagen in the dermis
- Note Other entities may also be polypoid, e.g. intradermal nevus, neurofibroma, fibrous papule

8 Shape on Low Power | Square/rectangular


- 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

10 Shape on Low Power | Square/rectangular


- 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


## Scleromyxedema



## Square/rectangular shape

- 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) (see also p. 39)
- c Normal back: normal-sized collagen bundles, no increased mucin



## Square/rectangular shape (cont.)

- d Scleredema: mucin between collagen
- e Scleromyxedema: mucin and increased fibroblasts


## Key differences



- Regular epidermal acanthosis
- Parakeratosis
- Full-thickness disorder of keratinocytes with atypical cells (short arrows) and mitoses
- Basal layer may appear normal ("eyeliner" sign) (long arrow)

- Regular epidermal acanthosis
- Clear cells well demarcated from the normal epidermis and adnexal keratinocytes

- Regular epidermal acanthosis
- Parakeratosis
- Neutrophils in stratum corneum (asterisk)
- Hypogranulosis



## Regular epidermal acanthosis

- a Bowen's 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


## Key differences



- Pseudoepitheliomatous hyperplasia above abscesses
- Yeast forms (arrow) that classically show broad-based budding

Shape on Low Power | Pseudoepitheliomatous hyperplasia above abscesses


- 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 $\mu \mathrm{m}$ ) spherules containing endospores (arrows)



## Pseudoepitheliomatous hyperplasia above abscesses

- a Blastomycosis: 8-30 $\mu \mathrm{m}$ yeast form (arrow)
- b Chromomycosis: 5-12 $\mu \mathrm{m}$ Medlar bodies
- c Coccidioidomycosis: 80-200 $\mu \mathrm{m}$ spherules with endospores
- Note Paracoccidioidomycosis (6-60 $\mu \mathrm{m}$ 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


## Key differences



- Proliferation downward from epidermis
- Strands of basaloid cells in a fibrovascular stroma often emanating from strands of squamous epithelium
- Some hints of palisading of cells (arrow)

- Proliferation downward from epidermis
- Fibrotic stroma adjacent to the hair follicle has reticulated strands of epithelium
- This entity has overlap with trichodiscoma (some consider these a spectrum of the same entity)

- Proliferation downward from epidermis
- Normal-appearing keratinocytes with some arranged in squamous eddies causing intraepithelial fenestrations

6 Shape on Low Power | Proliferation downward from epidermis


- Proliferation downward from epidermis
- 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



- Proliferation downward from epidermis
- Uniform blue cells with interspersed ducts (arrows)
- Fibrotic or hyalinized stroma with dilated vessels

Shape on Low Power | Proliferation downward from epidermis


- Proliferation downward from epidermis
- Proliferation composed of pale/clear cells
- Peripheral palisading (long arrow) with thickened basement membrane (short arrow)


## Trichilemmoma



- Proliferation downward from epidermis
- Pale cells in columns with "windows" of dermis in between
- Peripheral palisading



## Proliferation downward from epidermis

- a Fibroepithelioma of Pinkus: strands of basaloid epithelium in fibrovascular stroma
- b Fibrofolliculoma: hair follicle with adjacent fibrotic stroma and reticulated epithelium
- c Inverted follicular keratosis: squamous eddies
- d Nevus sebaceus of Jadassohn: proliferation of epidermis connecting to sebaceous lobules and basaloid proliferations


## Key differences



## Proliferation downward from epidermis (cont.)

- e Poroma: uniform blue cells with interspersed ducts
- f Trichilemmoma: pale/clear keratinocytes with peripheral palisading and thickened basement membrane
- $\mathbf{g}$ 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 (arrows)

- Central pore
- Invaginated epidermis connects to a primary hair follicle
- Multiple secondary hair follicles radiating away from the central follicle



## Central pore

- 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

Shape on Low Power | Palisading reactions


- 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)

38 Shape on Low Power | Palisading reactions


- Palisading of histiocytes around central pink fibrin
- The reaction is often deep


## Rheumatoid nodule



## Palisading reactions

- 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 collagen surrounded by giant cells, plasma cells (see also pp. 9 and 13)

- 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)

- Space with a lining
- "Lining" is not a true epithelial layer but is cartilage
- Centrally, there is degeneration of cartilage

Shape on Low Power | Space with a lining


- 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)

Shape on Low Power | Space with a lining


- 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

- 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

- Space with a lining
- Lining composed of layered epithelium with a bright pink crenulated keratin (arrow)
- Sebaceous glands in wall



## Space with a lining

- a Apocrine hidrocystoma: decapitation secretion
- b Auricular pseudocyst: degeneration surrounded by cartilage
- c Branchial cleft cyst: prominent lymphoid follicles in wall

50 Shape on Low Power | Space with a lining


## Space with a lining (cont.)

- d Cutaneous ciliated cyst: columnar epithelium with cilia; no structures in wall
- e Cutaneous endometriosis: fibrovascular stroma with glands
- f Dermoid cyst: sebaceous glands and other adnexal structures in wall


## Key differences



## Space with a lining (cont.)

- $\mathbf{g}$ Epidermal inclusion cyst: epithelium with granular layer, flakes of keratin in center
- h Pilar cyst: epithelium without granular layer, dense keratin in center
- i 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 the wall; venous lakes are common and are composed of flattened endothelial cells with erythrocytes in the space

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

- Cords and tubules in dermis
- Tubules of single-layered ("Indian filing", long arrow) and multilayered epithelium
- Some cells forming gland-like structures (short arrow)
- Other metastatic carcinomas may look like this - need clinical history; immunohistochemistry may be helpful

Shape on Low Power | Cords and tubules


- Cords and tubules in dermis
- Tubules of epithelium connect to islands of epithelium with duct-like spaces (arrow)
- Deeply infiltrative (fills dermis)
- Perineural involvement

- Cords and tubules in dermis
- Cords of epithelium composed of basaloid cells with hints of peripheral palisading
- New collagen forming around islands (arrow)
- Deeply infiltrative

Shape on Low Power | Cords and tubules


- Cords and tubules 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



## Cords and tubules

- a Desmoplastic trichoepithelioma: horn cysts, no clear cells, circular areas of epithelium surround keratin
- b Metastatic breast carcinoma: single filing of atypical cells, deeply infiltrative
- c Microcystic adnexal carcinoma: like syringoma with tadpole-like structures but deeply infiltrative, perineural involvement



## Cords and tubules (cont.)

- d Morpheaform basal cell carcinoma: infiltrative cords of basaloid cells with hints of peripheral palisading; may have some duct-like structures (but fewer than c)
- e Syringoma: superficial tadpoles with clear cells


## Key differences



- Papillated dermal tumor
- Disordered layers of epithelium in large papillations with some tubules
- Variable cytological atypia and mitotic figures
- Acral location

60 Shape on Low Power | Papillated dermal tumor


- Papillated dermal tumor
- Finger-like projections have cores of collagen/fibroblasts (arrow)
- No connection to epidermis

- Papillated dermal tumor
- Islands of epithelium with papillated projections
- With or without epidermal connection

- 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



## Papillated dermal tumor

- a Aggressive digital papillary adenocarcinoma: large tumor, atypical cells, and mitoses piled up
- b Hidradenoma papilliferum: thin papillations with fibrovascular cores


## Key differences



## Papillated dermal tumor (cont.)

- d Syringocystadenoma papilliferum: broad papillations with plasma cells in cores
- e Tubular apocrine adenoma: decapitation secretion and papillations within islands

66 Shape on Low Power | Circular dermal islands


- 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"

Shape on Low Power | Circular dermal islands


- Circular dermal islands
- Islands of epithelium with central flaky keratin (horn cysts)



## Circular dermal islands

- a Adenoid cystic carcinoma: cribriform pattern of duct-like structures
- b Cylindroma: puzzle-like arrangement, thick/pink basement membrane
- c Trichoadenoma: numerous horn cysts

Shape on Low Power | (Suggestion of) vessels



- (Suggestion of) vessels
- Numerous vessels with epithelioid ("hobnail") endothelial cells (arrow) surrounded by inflammation
- Clusters of epithelioid endothelial cells may mimic granulomas
- Eosinophils may be prominent

Shape on Low Power | (Suggestion of) vessels


- (Suggestion of) vessels
- Maze-like arrangement of vessels lined by atypical cells
- Deeply infiltrative

- (Suggestion of) vessels
- Superficial vessels surrounded by plasma cells and red-blue "clouds" of organisms that stain with silver

- (Suggestion of) vessels
- Superficial vessels surrounded by plasma cells and red-blue "clouds" of organisms that stain with silver

- (Suggestion of) vessels
- Fibrotic stroma
- Concentric fibrosis around vessels/adnexae (long arrow)
- Stellate fibroblasts (short arrow)

- (Suggestion of) vessels
- Vessels forming around other vessels (promontory sign)
- Vessels may be lined by inconspicuous endothelial cells

- (Suggestion of) vessels
- Lobules of dilated vessels embedded in loose stroma with inflammatory cells

- (Suggestion of) vessels
- Hyperkeratosis
- Variable spongiosis
- Small-caliber thick-walled capillaries in clusters in the upper dermis (arrows)
- Hemosiderin


## Stasis dermatitis



- (Suggestion of) vessels
- Somewhat wedge-shaped arrangement of vessels
- Hemosiderin (arrow) around the peripheral vessels



## (Suggestion of) vessels

- a Angioleiomyoma: well-circumscribed pink circle composed of cigar-shaped spindle cells and compressed to dilated vessels
- b Angiolymphoid hyperplasia with eosinophilia: dilated vessels with prominent hobnail endothelial cells surrounded by inflammation, +/- numerous eosinophils
- c Angiosarcoma: maze-like connection of vessels lined by atypical cells


## Key differences



## (Suggestion of) vessels (cont.)

- d Bacillary angiomatosis: dilated vessels surrounded by inflammation that includes plasma cells and ill-defined "clouds"
- e Fibrous papule: fibrotic stroma with stellate fibroblasts and dilated vessels
- f Kaposi's sarcoma: slit-like or angulated spaces dissecting through collagen; vessels around vessels



## (Suggestion of) vessels (cont.)

- g Pyogenic granuloma: clusters of dilated vessels surrounded by mixed inflammation
- $\mathbf{h}$ Stasis dermatitis: small clusters of capillaries in upper dermis with hemosiderin
- i Targetoid hemangioma: wedge-shaped area of increased vessels with hemosiderin at periphery


## Key differences

