

Alopecia

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Non-Cicatricial Alopecia					
Disease (Synonyms)	Pathogenesis	Clinical features	Pathology	Treatment	Notes and Associations
Androgenic Alopecia (pattern baldness)	Androgen-dependent hereditary disorder; increased dihydrotestosterone with elevated 5-alpha reductase activity	Male: Frontotemporal recession and vertex balding; Female: Diffuse thinning over the vertex and parietal scalp; "christmas-tree"	Normal total number of hair follicles; increased number of vellus hairs	Finasteride, minoxidil, hair transplantation, spironolactone	Male: Hamilton-Norwood classification Female: Ludwig classification
Alopecia Areata	T-lymphocyte interaction with follicular antigens; HLA-A, B, C, and DR become expressed by follicle allowing T-cell cytotoxicity	Round, oval patches of hairloss; short-exclamation point hairs Variant: hair turning white (pigmented hairs lost)	Peribulbar lymphohistiocytic infiltrate; "swarm of bees"	Intralesional or topical corticosteroids, prednisone, topical immunotherapy	Totalis: entire scalp Universalis: whole body Ophiasis: band-like hair loss along periphery of scalp Associations: thyroid disease, vitiligo, type 1 diabetes mellitus, pernicious anemia, systemic lupus erythematosus
Temporal Triangular Alopecia	Congenital disorder	Present at birth or acquired during first decade; triangular patch of hairloss or vellus hairs in temporal region	Normal number of follicles; almost all vellus hairs	None, usually persistent	Frequently bilateral
Telogen Effluvium	Large number of hairs enter telogen phase simultaneously; reaction to physical or mental stressors	Women age 30 to 60y; thinning of the entire scalp; may also affect axillary and pubic hairs	Increased number of telogen hairs (>20%); normal total number of hairs	Spontaneous recovery occurs within 6 months	Associated causes: Post-partum, severe infection, chronic illness, hypothyroidism, post-febrile
Anagen Effluvium	Secondary to insult to hair follicle, impairing mitotic activity	Hair follicles broken off diffusely due to tapering of hair shafts	Normal hair follicles	No specific treatment	Associated with radiation therapy and chemotherapy agents; Other causes: mercury, boric acid, thallium, colchicine, severe protein deficiency
Trichotillomania	Compulsive hair pulling; self-induced	Children age 5 to 12y; patchy hair loss of scalp, eyebrows, and/or pubic hairs; varied lengths of regrowth; irregular borders	Incomplete disrupted follicular anatomy; trichomalacia and pigment casts; increased number of terminal catagen and/or telogen hairs	No specific treatment; hypnosis, behavioral modification, clomipramine, SSRIs.	
Pressure-Induced Alopecia	Pressure-necrosis of hair follicles with synchronized conversion of terminal hair follicles to catagen/telogen phase	Solitary, rough, oval patch at site of pressure, usually upper occiput	Early: Vascular thrombosis, dermal inflammation Later: Increased catagen and/or telogen hairs, pigment casts, trichomalacia	Usually complete hair regrowth occurs	Most commonly in women after lengthy surgery
Lipedematous Alopecia	Not clear	Women with darkly pigmented skin; thick boggy scalp and hair loss	Approximate doubling of scalp thickness with increased edema and expansion of subcutaneous fat layer	No specific treatment	Follicular structures appear normal +/- ectatic lymphatic vessels seen

Cicatricial Alopecia					
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Lichen Planopilaris	Unknown, related to lichen planus	Most common in Caucasian women; scattered foci of partial hair loss associated with perifollicular erythema, follicular spines and scarring	Lichenoid interface dermatitis of the superficial follicular epithelium; inflammation affects upper portion of hair follicle	Antimalarial drugs and corticosteroids; difficult to treat	Greater than 50% associated with cutaneous or oral lichen planus; Frontal fibrosing alopecia: Frontotemporal hairline recession and eyebrow loss in postmenopausal women associated with perifollicular erythema, especially along the hairline
Discoid Lupus Erythematosus	Chronic cutaneous lupus erythematosus	Most common in adult women; scalp lesions have alopecia with erythema, epidermal atrophy, dilated and plugged follicular ostia	Vacuolar interface alteration of epidermis and follicular epithelium; chronic inflammation with dermal mucin present	Topical, intralesional or oral steroids; systemic retinoids; antimalarial medication	50% of patients with discoid lupus have scalp involvement

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Cicatricial Alopecia (cont.)					
Disease (Synonyms)	Pathogenesis	Clinical features	Pathology	Treatment	Notes and Associations
Central Centrifugal Cicatricial Alopecia (hot-comb alopecia)	Follicular degeneration from premature desquamation of inner root sheath	Usually in African-American women; follicular loss mainly on the crown of the scalp	Premature desquamation of the inner root sheath; mononuclear infiltrate at the isthmus; loss of follicular epithelium with fibrosis	Doxycycline or minocycline with potent topical corticosteroid; if highly inflammatory, rifampin or clindamycin	Previously thought to be due to chemical hair relaxers
Aplasia Cutis Congenita	Congenital absence of skin and subcutaneous tissue; disruption of intrauterine skin development	Coin-sized defect or larger of alopecia, scalp >85% lesions	Atrophic, flattened epidermis; replacement of dermis with loose connective tissue; absence of adnexal structures	Cleansing and topical antibiotic ointment until healed; may need surgical repair	Adams Oliver syndrome: severe aplasia cutis congenita, cutis marmorata telangiectatica congenita, limb defects, and atrial septal defect Bart syndrome: aplasia cutis + epidermolysis bullosa
Follicular Mucinosis	Dermal-type mucin deposited in epithelial structures; source of mucin - follicular keratinocytes or cell-mediated immune response	Children and adults age 30-40y; Primary - pink plaques composed of grouped follicular papules on face and scalp; Secondary - more widespread, chronic, older age group	Mucin in the outer root sheath and sebaceous glands; disconnected keratinocytes; perifollicular lymphohistiocytic infiltrate	Primary- many resolve spontaneously; consider topical, intralesional, systemic steroids, PUVA, dapsone, antimalarials; Secondary - treat underlying disease	Secondary type associated with cutaneous T-cell lymphoma and atopic dermatitis
Acne Keloidalis	Unclear; possible foreign-body reaction to trapped hair shaft fragments	Most common in black men; follicular pustules and papules that may progress to firm, keloidal papules on occiput	Perifollicular, chronic inflammation at isthmus and lower infundibulum with lamellar fibroplasia	Chronic use of topical steroid or oral antibiotic; surgical excision	
Dissecting Cellulitis of the Scalp	Follicular hyperkeratosis, often with bacterial superinfection	Most common in black men; firm scalp nodules on crown and upper occiput; develop into fluctuant ridges with purulent discharge	Perifollicular mixed inflammatory infiltrate; chronic abscess with sinus tracts	Isotretinoin, intralesional corticosteroids, oral antibiotics, and surgical approaches	Follicular occlusion tetrad: acne conglobata, hidradenitis suppurativa, pilonidal cyst
Keratosis Follicularis Spinulosa Decalvans (Keratosis Pilaris Atrophicans)	X-linked recessive disorder of childhood; abnormality of follicular keratinization	Seen in childhood, often remits in puberty; alopecia involves the scalp, eyebrows, and eyelashes with perifollicular erythema and follicular hyperkeratosis	Follicular hyperkeratosis, atrophy of the follicle, and perifollicular fibrosis	Treatment with keratolytics, topical retinoids, topical and intralesional corticosteroids, oral retinoids - with limited success	Associated with eye abnormalities (corneal dystrophy); Chromosome Xp22.2-22.13
Traction Alopecia (End-Stage)	Prolonged traction by physical pressure	Most common in African-American women at 30-40y; several year history of bitemporal or frontal hair loss	Total number of terminal hairs markedly decreased; columns of connective tissue replace follicles	Permanent when traction is unrelenting (end-stage)	Associated with tight braids Biphasic form of hair loss - initially hair regrowth can occur
Pseudopelade of Brocq	End stage alopecia or clinical variant of various forms of cicatricial alopecia	Affects Caucasian adults; oval or irregularly shaped atrophic patches; "footprints in the snow"	Atrophy; perifollicular inflammation at level of infundibulum, loss of sebaceous epithelium, fibrosis with absent hair follicles.	Resistant to therapy	Not a distinct disease but a clinical pattern of end-stage scarring alopecias

Alopecia associated with infections					
Disease (Synonyms)	Pathogenesis	Clinical Features	Pathology	Treatment	Notes and Associations
Syphilis	Treponema pallidum	Patchy, non-scarring areas of hair loss	Follicular plugging; a sparse, perivascular and perifollicular lymphocytic infiltrate with plasma cells	Benzathine penicillin G, intramuscular injections	"Moth-eaten" alopecia; 7% secondary syphilis associated with alopecia
Tinea Capitis	Dermatophyte infection: Trichophyton (endothrix) and Microsporum (ectothrix)	"Black dot" -alopecia with pinpoint black dots; kerion - boggy lesions with crust, severe inflammatory reaction	Hyphae or arthroconidia within/around hair shafts; can also be diagnosed by KOH prep	Griseofulvin, terbinafine, itraconazole	T. tonsurans most common in US Kerion - T. mentagrophytes, T. verrucosum Favus - T. schoenleinii

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