

Hair Loss Disorders

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Some slides courtesy
E.J. Mayeaux, Jr., MD



Disclosure Statement:

- Co-Author,
 - *Dermatologic and Cosmetic Procedures in Office Practice*. Elsevier, Inc., Philadelphia. 2012.
 - *Cutaneous Cryosurgery*. Fourth Edition. CRC press 2014.

Objectives

- Recognize normal hair anatomy and physiologic changes in hair
- Evaluate the chief complaint of hair loss
- Utilize effective medical interventions for hair disorders

Life Cycle of a Hair

- Anagen phase (active growth) - 2-7 years
- Catagen (transitional/follicular regression) - 2-3 weeks
- Telogen (pre-shedding or rest) about 3 Months
- Hair released and shed at end of telogen
- > 85% of hairs of the scalp are in anagen
- Longer anagen phase = Longer hair

Life Cycle of a Hair

- We have all terminal hair follicles at birth
- Hair grows at 0.35 mm/day = 1 cm /month
- Each hair follicle's cycle is usually asynchronous with others around it
- We lose ~75-100 hairs a day
 - Same number of hairs enter anagen phase
 - Telogen hairs are characterized by a mature root sheath, or "club," at the proximal end

Hair Classification

- Terminal (large) hairs
 - Found on the head and beard
 - Larger diameters and roots that extend into sub q fat



Hair Classification

- Vellus hairs are smaller in length and diameter and have less pigment
- Intermediate hairs have mixed characteristics



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Alopecia Definition

- Partial or complete loss of hair from where it would normally grow. Can be total, diffuse, patchy, or localized

Celestino FS, Alopecia. In: Mengel MB, Schwiebert LP, eds Ambulatory Medicine. Stamford, Conn: Appleton & Lange; 1996:



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Classification of Alopecia

Scarring	Nonscarring
Neoplastic	Medications
Nevoid	Congenital
Injury such as burns	Infectious
Cicatricial – Inflammatory Systemic illnesses (LE)	Genetic (male pattern)
	Toxic (arsenic)
	Nutritional
	Traumatic
	Endocrine
	Immunologic
	Physiologic

General Evaluation of Hair Loss

- History
 - Shedding vs. thinning
 - Duration of problem
 - Pertinent family hx
 - Grooming practices
 - Medications
 - Serious past or current illnesses

Physical

- Pattern of hair loss
 - Patchy or localized = confined to several areas of the scalp leaving some areas unaffected
 - Diffuse implies uniform density decrease
- Examine the scalp for erythema, scale, pustules, bogginess, edema, loss of follicle openings, scarring or sinus tracts
- Check for follicular ostia and broken hairs
- Hair fragility
 - Squeeze and roll hair within a gauze pad
 - If fragile, short fragments remain on the pad

Evaluation

- Hair pull test
 - 50 - 60 hairs are grasped firmly in thumb & forefinger and steady traction applied as fingers dragged along the lengths of hairs
 - >6 hairs = loss
 - Examine microscopically
- May consider scalp punch biopsy
 - Trim hair, inject 1-3 cc of lido with epi, use a 4mm punch, place single suture
 - Attempt to get both affected and normal

Laboratory Studies

- TPab or RPR/VDRL
- KOH prep or PAS for fungal elements
 - Use in patchy hair loss
 - Hair shaft stubs from periphery of lesion
 - Can obtain culture for fungi

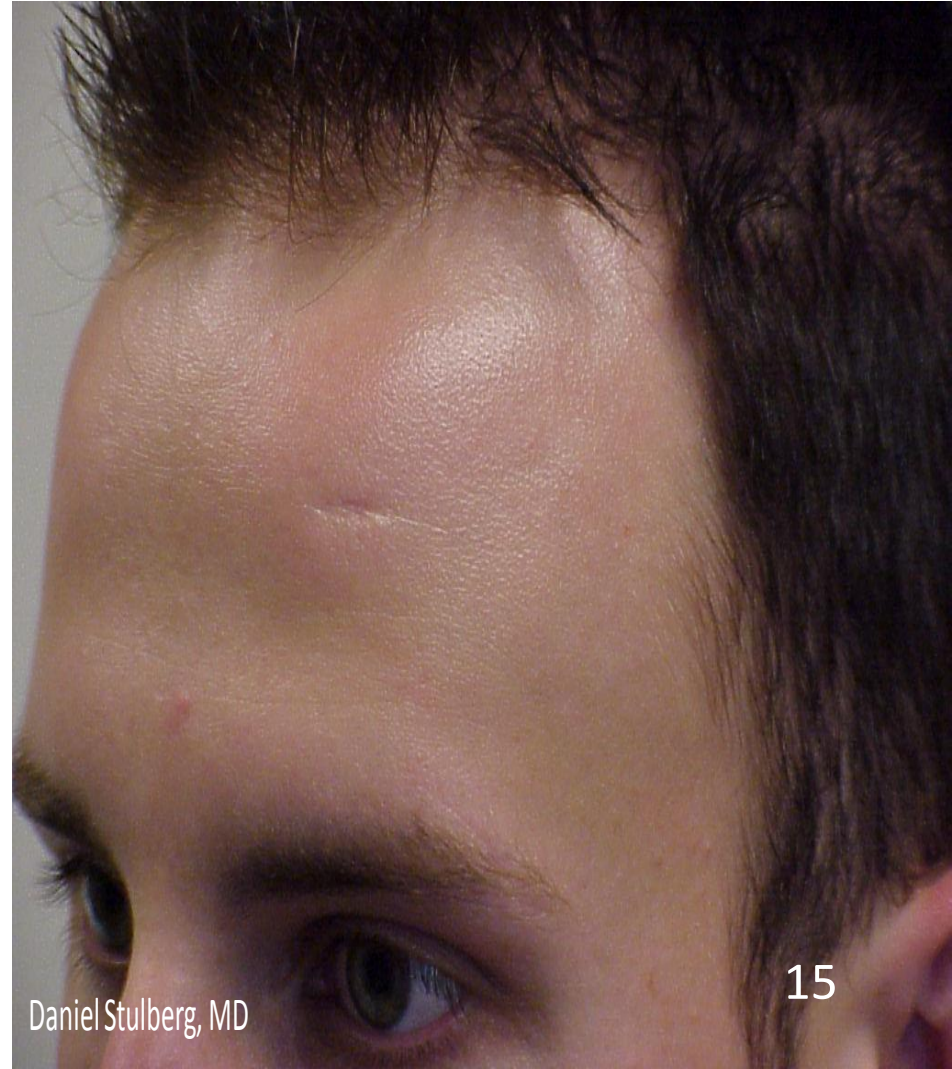
Androgenic/Androgenetic Alopecia

- Male pattern baldness
- Complain of thinning vs. shedding
- Affects 70-80% of men
- 30-50% of women
- Higher local levels Dihydrotestosterone
- Miniaturization of hair follicles



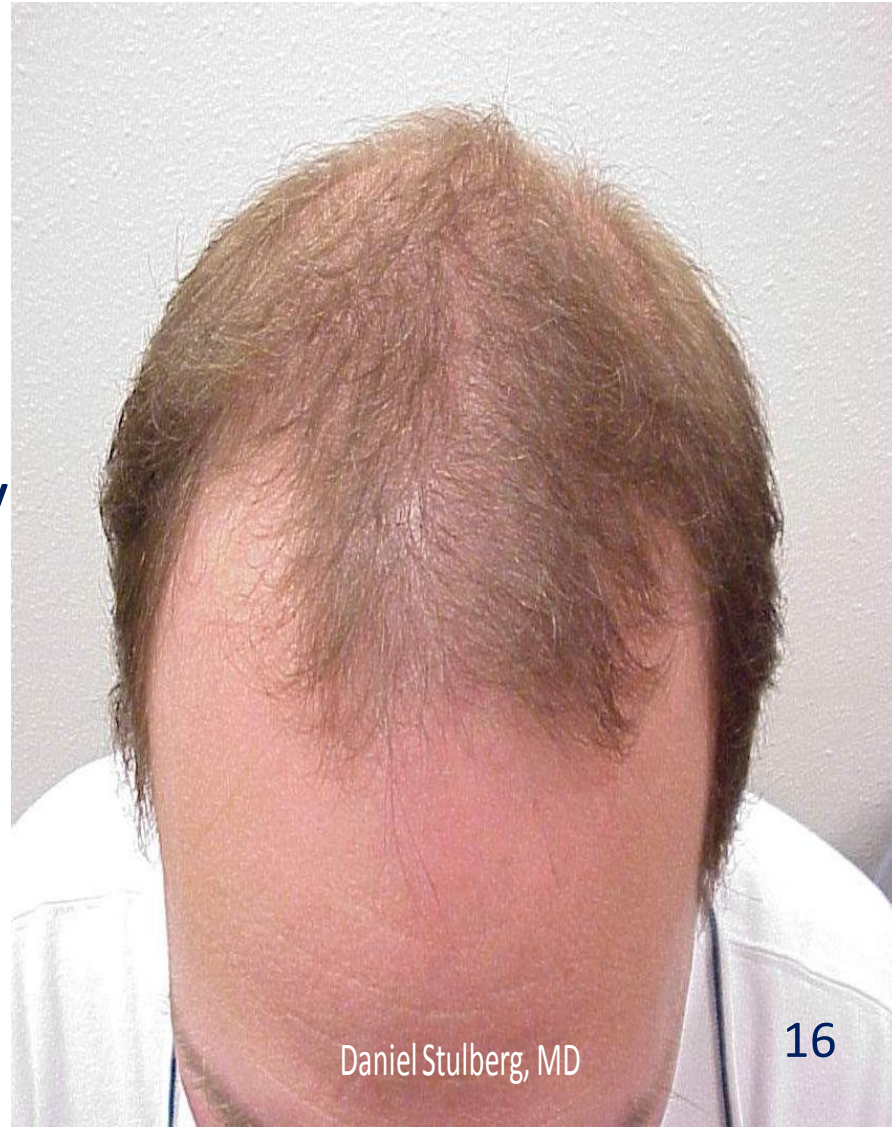
Androgenetic Alopecia

- Crown
- Frontal
- Temples
- Sparing of occipital and lower parietal fringe of hair



Androgenetic Alopecia

- Multiallelic trait
- Obtain history of baldness in grandparents and 1st-degree relatives on both maternal and paternal sides of family



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Hair Case

- 45 year old woman
- Progressive hair loss
- No PMH
- No virilization/acne/voice changes/clitoromegaly



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Female Pattern Hair Loss

- Strong family history common
- Just like Male Pattern Baldness
- Follicular miniaturization
- No endocrine work up needed
- Minoxidil for women 2% (Rogaine) 1ml BID
- Minoxidil for men 5%
 - Prolongs anagen phase

Cochrane 10/16

- Minoxidil 2% = Minoxidil 5%
 - Increased 13.8 hairs/cm
 - Moderate to greatly increased hair growth 40-45% pts
- Finasteride - No help

Female Virilization

- Anabolic steroid use
- Ovarian
- Adrenal
- Hormone eval
- Consider imaging ovaries & adrenal glands

Androgenetic Alopecia Treatment

- Topical minoxidil or oral finasteride
 - ♂ Finasteride (Propecia) 1mg PO (5mg on \$4 plans can use ¼ tab)
 - ♂ Minoxidil 5% 1ml BID
 - ♀ Minoxidil 2 or 5% 1ml BID (Rogaine)
- No head to head comparisons
 - Both beneficial compared to placebo
 - Finasteride 66%, 39% age 18-40, 41-60 Inc hair growth JAAD 2012

Androgenetic Alopecia Treatment

- 5 alpha reductase inhibitors
 - Dec testosterone
 - Dec libido
 - ED
- Off label dutasteride
 - 5 alpha reductase inhibitor
 - 0.5mg QD
 - 6 month
 - males 18-49
 - 12.2 vs 4.7 hairs/cm increase

Androgenic Alopecia Treatment

- Surgical treatment
 - Micrografting
 - Platelet rich protein injections
 - 36 hairs/cm inc at 3 months Int J Mol Sci 2/17
 - Plugs
 - Scalp reduction

Hair loss Case

- 25 YO man no PMH
- Hair cut 1 week ago
- Noted patch of hair loss 3 days later
- No other sx



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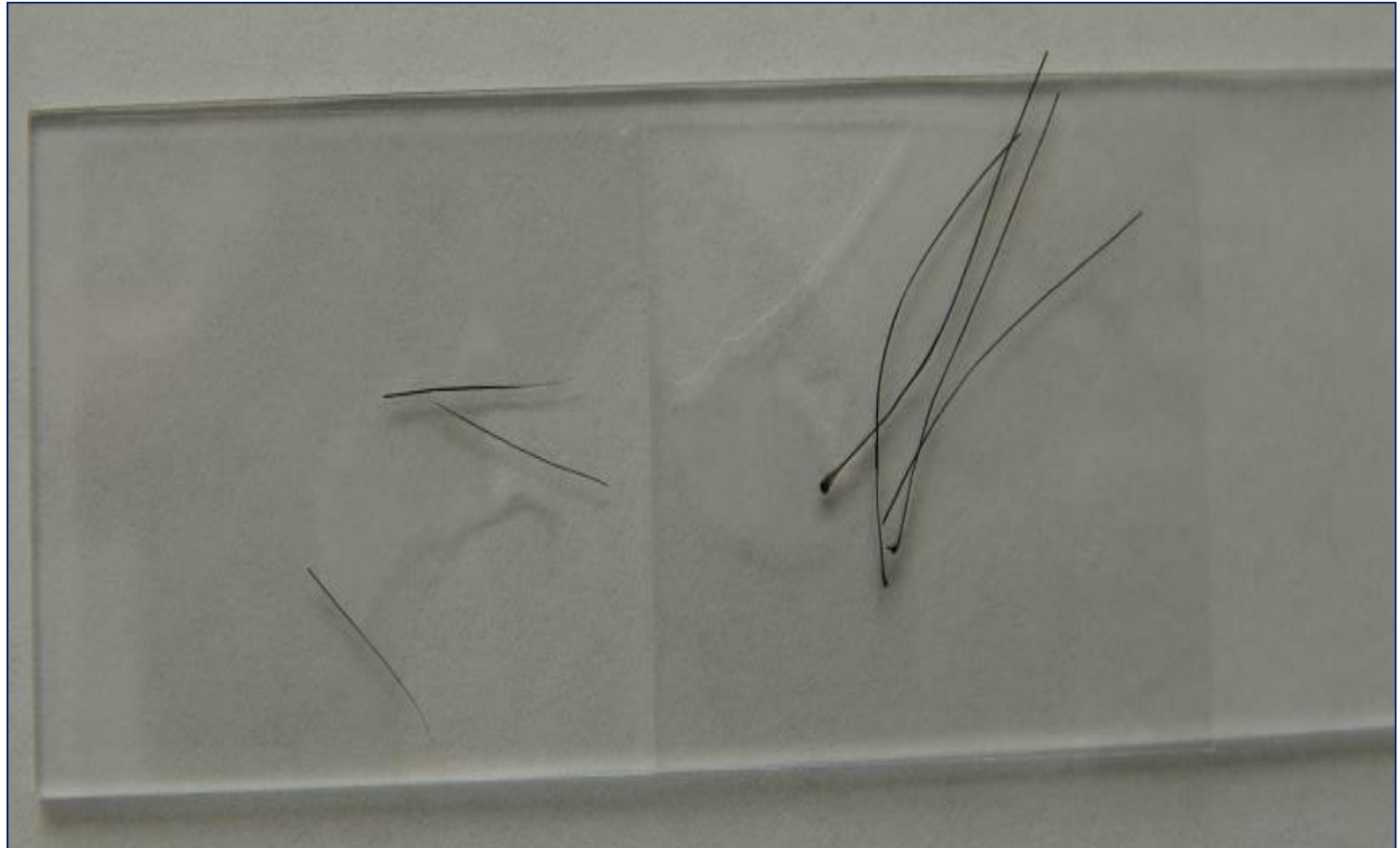
Different patient



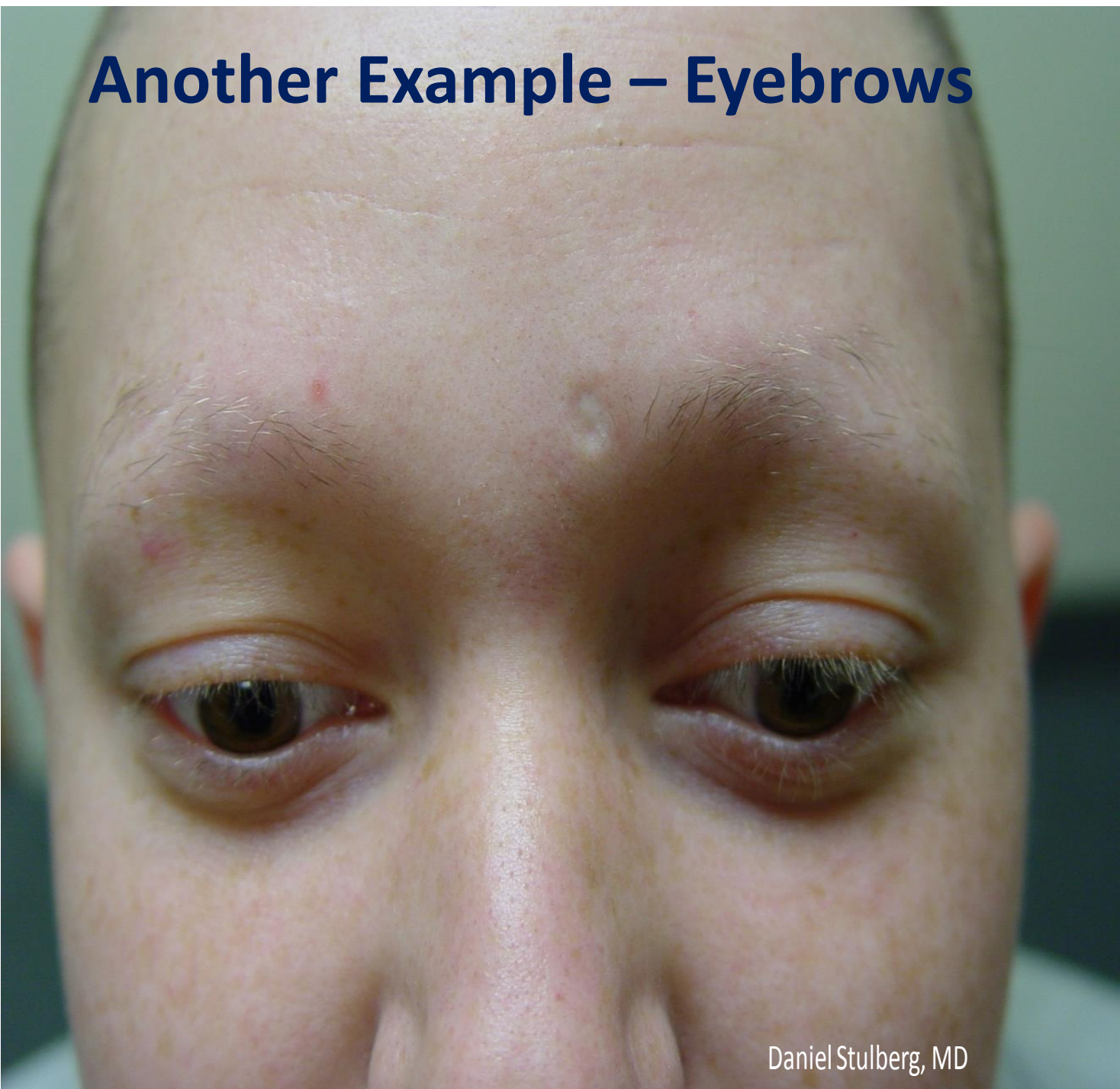
Pull Test

Exclamation Point
Hairs

Normal Anagen
Phase



Another Example – Eyebrows



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Another Example - Eyelashes



Alopecia Areata

- Focal patches
- Smooth base
- Easily pulled hairs at margin
- Non scarring
- Poss auto-immune
- Poss correlation with Vitiligo, thyroid dz, ?DM
- Often + Family HX
- Commonly starts in childhood



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4 yr old - Hair Loss at age 2 regrew now losing again



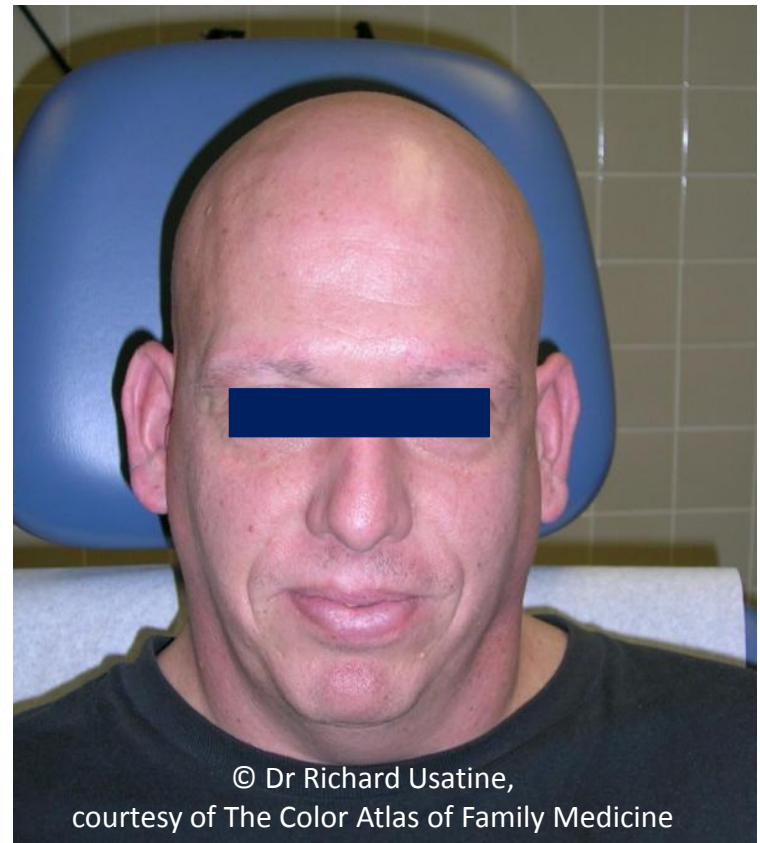
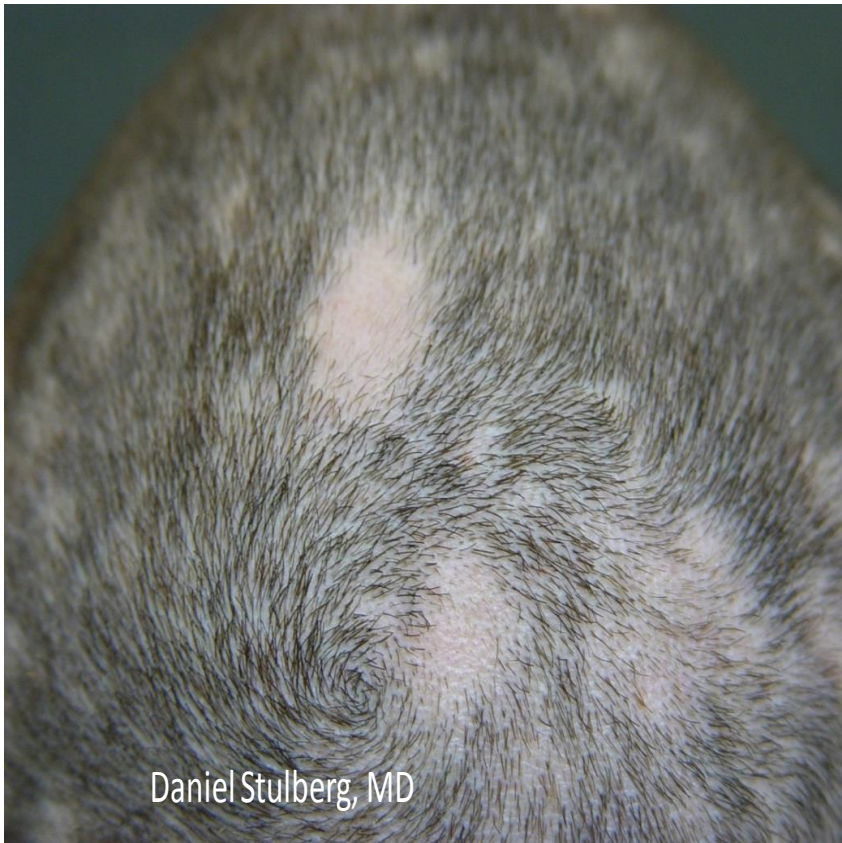
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Alopecia Areata

- Usually circumscribed patches
 - Total scalp (Totalis)
 - Entire body (Universalis)



Alopecia Areata

Poorer prognosis with

- Severe disease (esp. Totalis/Universalis)
- Nail pitting, splitting
- Peripheral scalp disease
- Onset before puberty
- Duration >1 yr.
- Ophiasis pattern

Ophiasis pattern



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Alopecia Areata Treatment - EBM

- Few treatments for alopecia areata have been well evaluated in RTCs. We found no RCTs on the use of diphencyprone, DNCB, intralesional steroids or dithranol, although they are commonly used. Although topical steroids and minoxidil are widely prescribed and appear to be safe, there is no convincing evidence that they are beneficial in the long term. Considering the possibility of spontaneous remission especially in the early stages, the option of not being treated may be an alternative way of dealing with this condition

Alopecia Areata Treatment

- Reassurance - 50-80% limited cases regrow
 - May ask for tx even for a small patch
- Minoxidil 5%
- Topical steroids
 - Clobetasol propionate 0.05% vs. hydrocortisone 1%
 - Age 2-16 >10% hair loss
 - 17/20 vs. 7/21 with 50% reduction in SA at 24wks
 - JAMA Dermatology 1/2014

Alopecia Areata Treatment

- Potent topical steroids
 - Fluocinolone acetonide cream 0.2% (Synalar)
 - Betamethasone dipropionate 0.05% (Diprosone)
 - Less effective than injection*
- Mild cases (<10% scalp) - intralesional steroids to decrease inflammation around the follicle
 - May pretreat with topical anesthetic cream
- Severe forms hard to treat - refer

*Devi M, Rashid A, Ghafoor R. Intralesional Triamcinolone Acetonide Versus Topical Betamethasone Velearate in the Management of Localized Alopecia Areata. *J Coll Physicians Surg Pak*. 2015 Dec. 25 (12):860-2

Alopecia Areata Treatment

- Intralesional steroids - triamcinolone acetonide (Kenalog) 2.5-10mg/ml
- Up to 4ml
- Inject while advancing needle using only enough to blanch the skin momentarily or 0.1 ml every 1cm
- Can repeat q 4-6 weeks
- Major side effect is skin atrophy



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Alopecia Areata Treatment



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Alopecia Areata Treatment

- Systemic steroids for larger areas
 - May lose hair when tapered or D/C
- Minoxidil 5% topically BID w/without steroids but success is varied and is slow
 - 8-45% success rates*
 - 5% distant hypertrichosis
- Topical immunotherapy with diphenylcyclopropenone (DPCP), squaric acid dibutylester (SADBE), or dinitrochlorobenzene (DNCB) is probably the most effective treatment

Alopecia Areata Treatment

- Off label
- Cyclosporine
- Methotrexate
- TNF alpha inhibitors adalimumab, etanercept
- Janus kinase inhibitors case reports
ruxolitinab, tofacitinib (Xeljanz- FDA for RA and PSa)
- Int J of Derm 3/2017

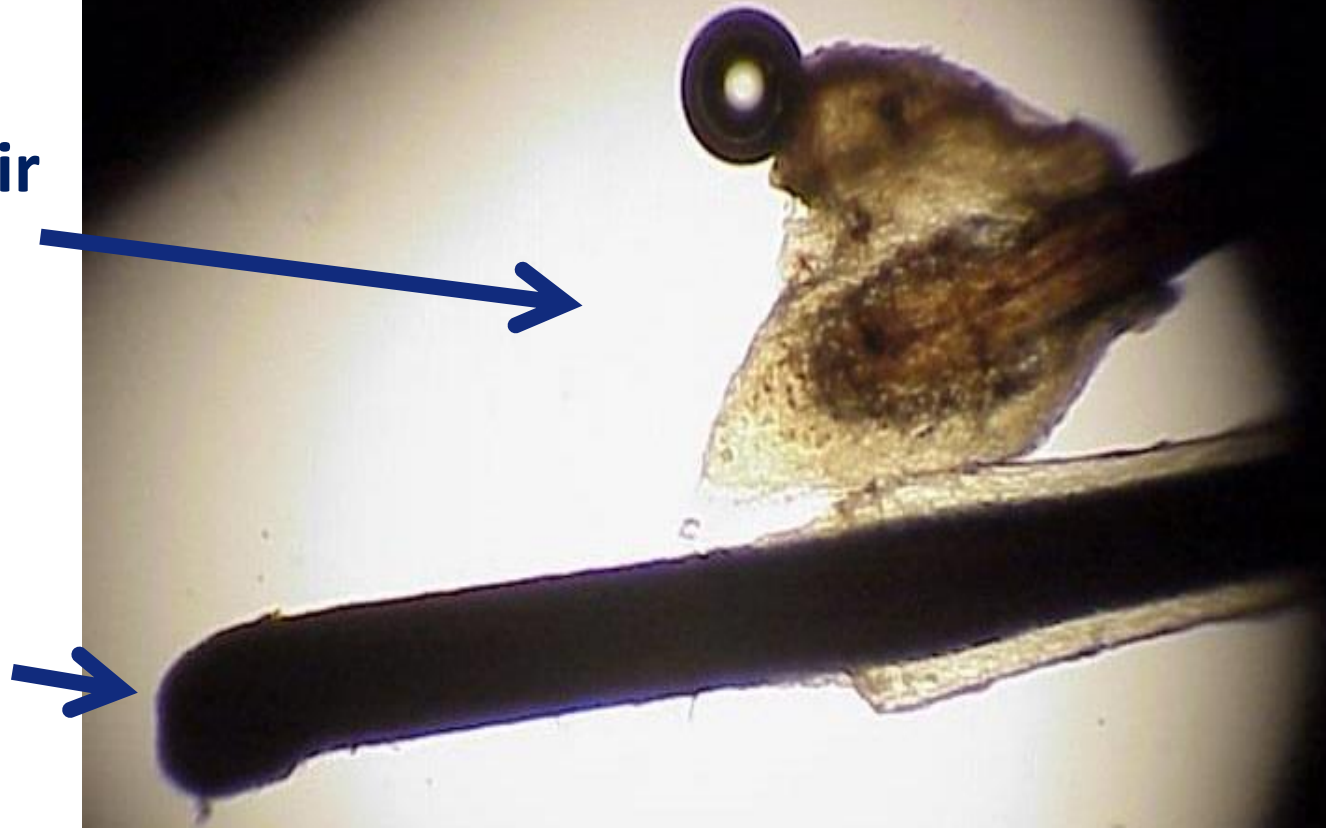
Hair Loss Case

- 25 YO G1P1 5.5 months s/p NSVD uncomplicated
- Losing hair diffusely following preg
- Clumps of hair in shower



**Anagen hair
bulb**

**Bulb in
telogen
phase**



Telogen Effluvium

- Acute hair loss (up to 20% at peak)
- Most common cause of diffuse hair loss
- Occurs 3-4 months after a trigger
 - Pregnancy, severe wt. loss, major illness, traumatic, psych events
- Women > men
- Non focal
- Mild or no visible thinning
- Anagen hairs precipitated into catagen
- At telogen hairs abruptly fall out

Telogen Effluvium

- Patients often do not associate with precipitating illness due to time interval
- Drugs can cause telogen effluvium
 - PTU, Tapazole, heparin, and warfarin
 - Hypervitaminosis A
- Pull test: > 5-6 telogen hairs
- Lab: TSH, iron studies, Tpb, RPR or VDRL
- No specific treatment

Hair Loss Case

- 15 yo many years of hair loss
- PMH Depression O/W denies
- Asymptomatic





Trichotillomania

- 2-3% of all people with hair loss
- Strange pattern
- No inflammation
- Varying length of hair
- HX depression, anxiety, hair twirling
- Frequent trichophagia, sometimes bezoars

Trichotillomania

- Mean onset age 13
- Dx usually by the pattern of loss, sometimes with unusual shapes
- Women > men



Trichotillomania - Broken hairs



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Trichotillomania

- Usually not scarring, but plucking over years may result in immune cell infiltrate
- Pluck test
 - Wear gloves if difficult to pluck
- Lab consider
 - TPab or RPR, TSH
- Treatment
 - Behavior modification
 - ? SSRI antidepressants



EBM Recommendation

- “No particular medication class definitively demonstrates efficacy in the treatment of trichotillomania. Preliminary evidence suggests treatment effects of clomipramine, NAC and olanzapine based on three individual trials, albeit with very small sample sizes.”
- Cochrane review – Pharmacotherapy for trichotillomania Rothbart, R et al November 2013
- Deepmala et al Clinical trials of N-acetylcysteine in psychiatry and neurology: A systematic review. Neurosci Biobehav Rev 2015 Aug;55:294-321

Traction Alopecia

- Unintentional traumatic hair loss
- Often seen in athletes and African-Americans when hair is placed in tight braids / styles
- Outermost hairs subjected to most tension
- Given time, a zone of alopecia results between braids and along scalp margin



Traction Alopecia

- Temporal, frontal and periauricular regions of scalp
- Rx = hair restoration techniques



Hair Loss Case

- 25-year-old African-American man
- Papular rash for 2 years following a short haircut
- Initially pustules, itching and inflammation
- Now slowly enlarging papules









Polytrichia

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Acne Keloidalis

- African descent
- Curly hair
- Inflammatory papules
- Avoid razors, short hair?
- Not keloid formers?
- Topical steroids
- Injected steroids
- Oral ABX
- Surgical

Madu P, Kundu RV. Follicular and scarring disorders in skin of color: presentation and management. Am J Clin Dermatol. 2014 Aug;15(4):307-21.

Scarring Alopecias

- Very heterogeneous group
- Trend to hair destruction in early or even mild stages of the disease
- Hair loss permanent
- Erythematous papules, pustules, scarring, loss of follicle openings
- Polytrichia



Lupus Alopecia

- Most common scarring alopecia
- Usually affects scalp
- Well circumscribed, erythematous infiltrated patches w/ follicular hyperkeratosis
- Later atrophic smooth depressed hypopigmented patches
- Bx = immune deposits
- Tx = treat lupus

Lupus Alopecia



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Scarring Alopecias

- Central centrifugal cicatricial alopecia
 - Midline and spreading
 - Systemic ABX and topical steroids
- Dissecting cellulitis
 - Isotretinoin
- Lichen Planopilaris
 - Assoc w LP, inflammation at follicles
- Frontal fibrosing alopecia
 - Immune suppression – Steroids, cyclosporin MTX et al

Child with patchy hair loss, scale and tender scalp



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Broken Hairs and Inflammation



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Tinea Capitis

- Patchy hair loss
- Scalp w/ scale
- Broken hair shafts
- Invasion of follicles and hair shaft
- Trichophyton Tonsurans – 90% in US – no fluorescence
- Less commonly Microsporum - fluoresces green
- Systemic antifungals griseofulvin plus selenium or ketoconazole shampoo
- Kerion –
 - Scarring
 - Steroids

Tinea Capitis

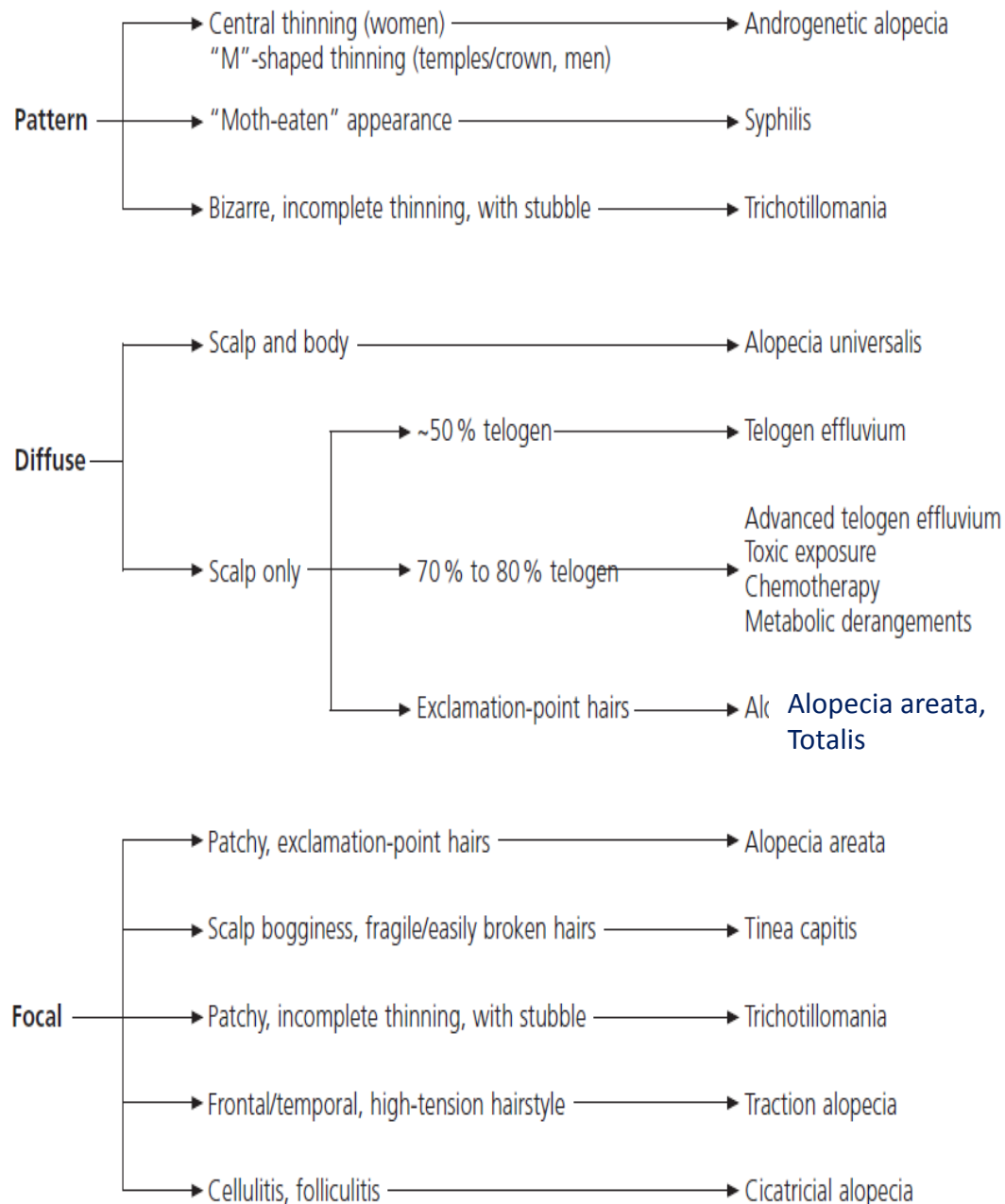
- Systemic antifungals
- Plus selenium
- AVOID ketoconazole PO
- Kerion –
 - Scarring
 - Steroids
- Adults:
 - Griseofulvin, 20–25 mg/kg/day × 6–8 weeks
 - Terbinafine, 250 mg/day × 2–8 weeks
 - Itraconazole, 5 mg/kg/day × 2–4 weeks
 - Fluconazole, 6 mg/kg/day × 3 weeks
- Children:
 - Terbinafine > 4YO 6 wks.
 - <25kg 125mg/day
 - 25-35 187.5mg/day
 - >35 250 mg/day
 - Other meds as above

Best Practices / Summary

- Reassurance or topical or injected steroids for Alopecia Areata
- Minoxidil for female and male pattern hair loss
- Systemic antifungals for tinea capitis
- Steroids or antibiotics for acne keloidalis
- Isotretinoin for dissecting cellulitis
- Refer for scarring alopecias

Pattern Approach

Appearance of Hair Loss and Possible Etiologies



Adapted from Springer, Brown and
Stulberg American Family Physician
7/1/2003