Hair Loss
Biology and Pathology

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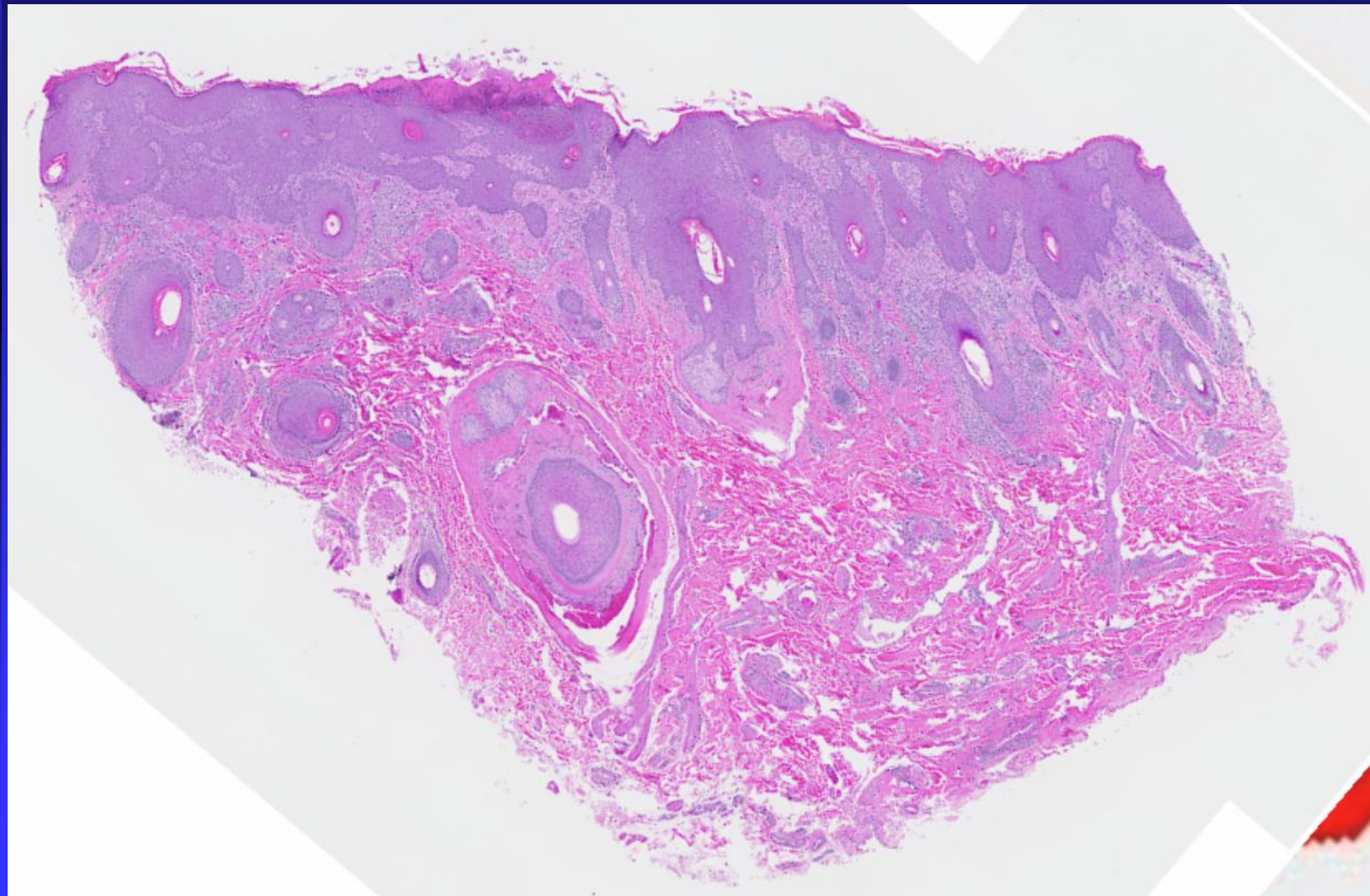
Case

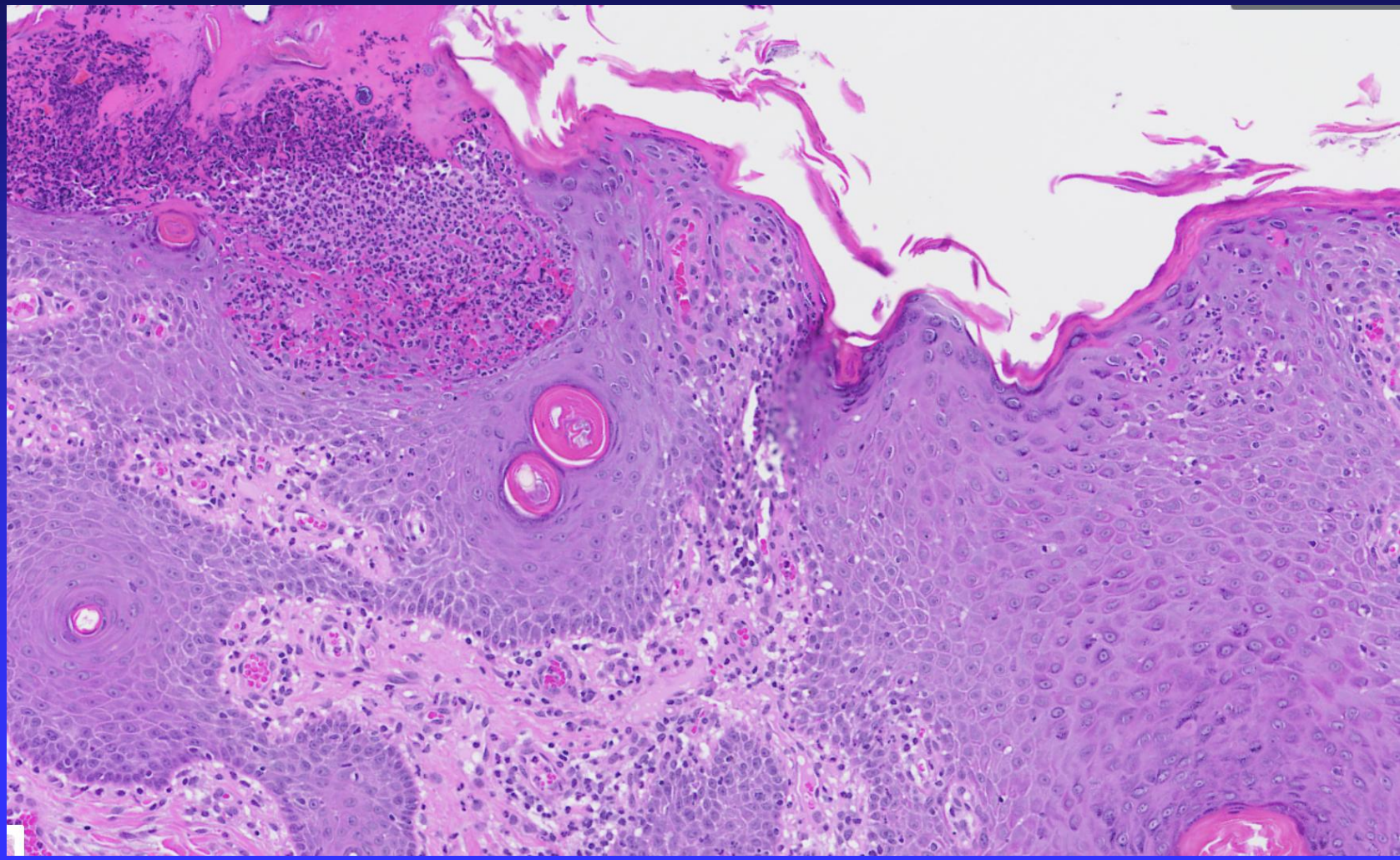
- 8 yr old male. Intermittent crusting and erythema of the nares, epistaxis and moist dermatitis of the philtrum since 6/2023. He has been observed rubbing the area.
- Staphylococcus aureus (3+) and Staphylococcus epidermidis (2+) were isolated on aerobic cultures of the skin and are present superficially within a subcorneal pustule. Good response to cephalexin and diphenhydramine.

- Just bacterial? Could this be psoriasis also?

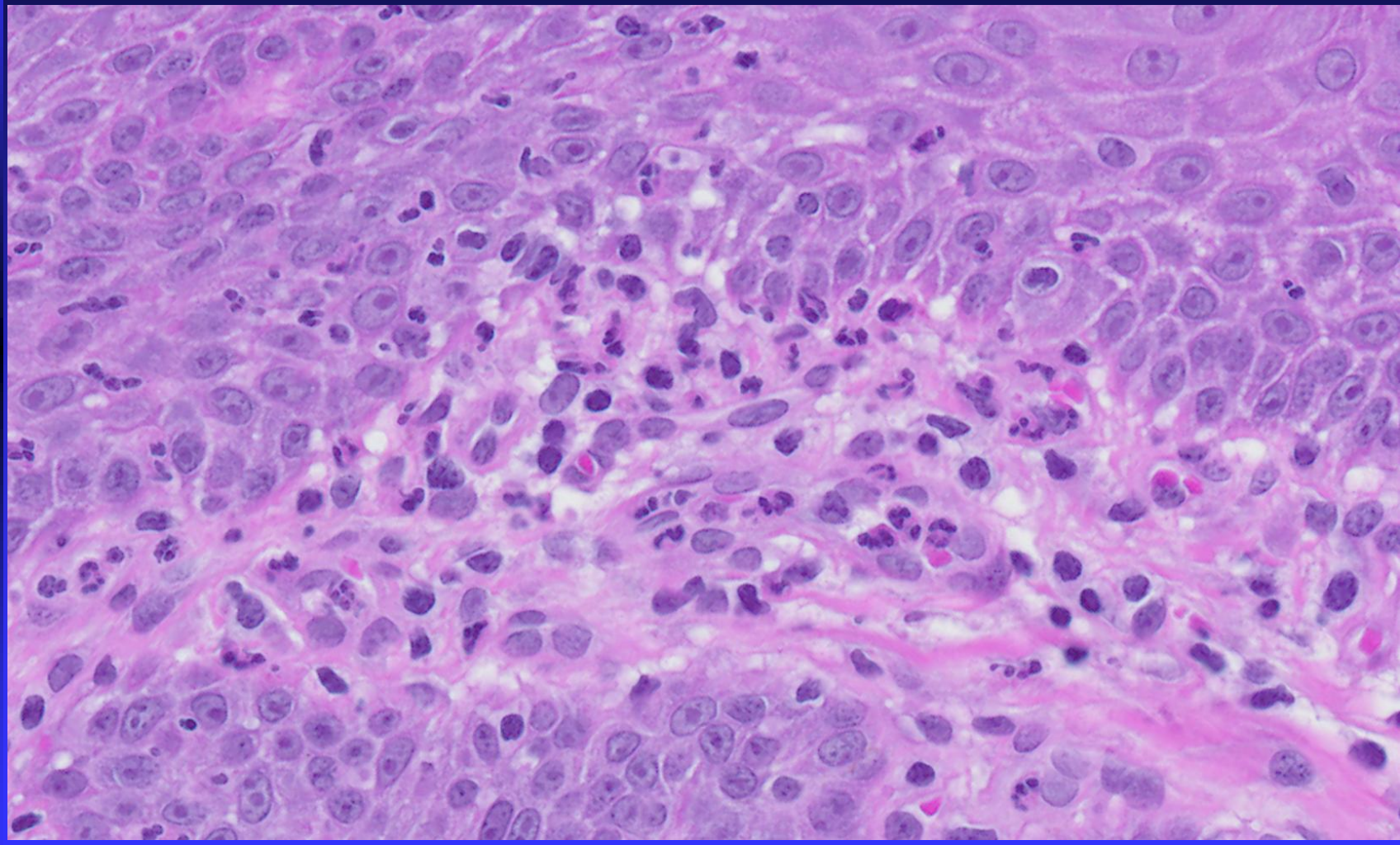
Case



Case



Case

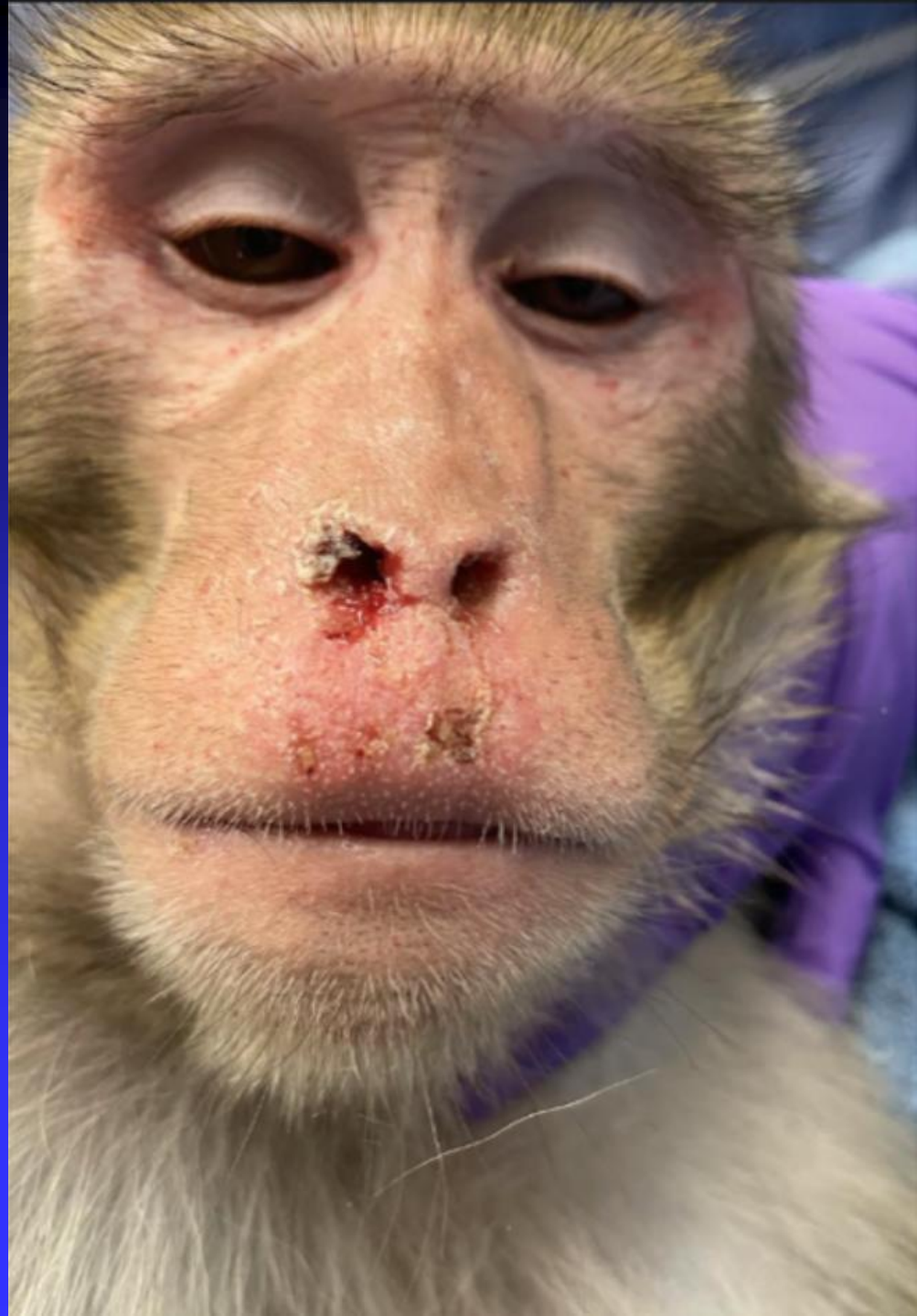


Case

- Spongiotic with some LSC?
- Impetigo?
- Psoriasis?

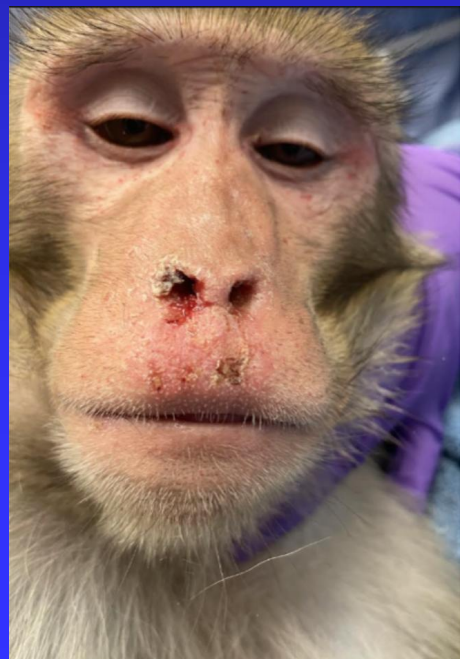
- He lives in public housing in a group setting. Often seen outside of the facility alone.

Case



Case

- Oregon Primate Center
- Many problems with spongiotic dermatitis
  - Difficult to identify exposure
    - Food?
    - Cleaning chemical?
  - Alopecia often secondary



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Kamberov YT et al. Comparative evidence for the independent evolution of hair and sweat gland traits in primates. J Hum Evol 125:99-105, 2018.

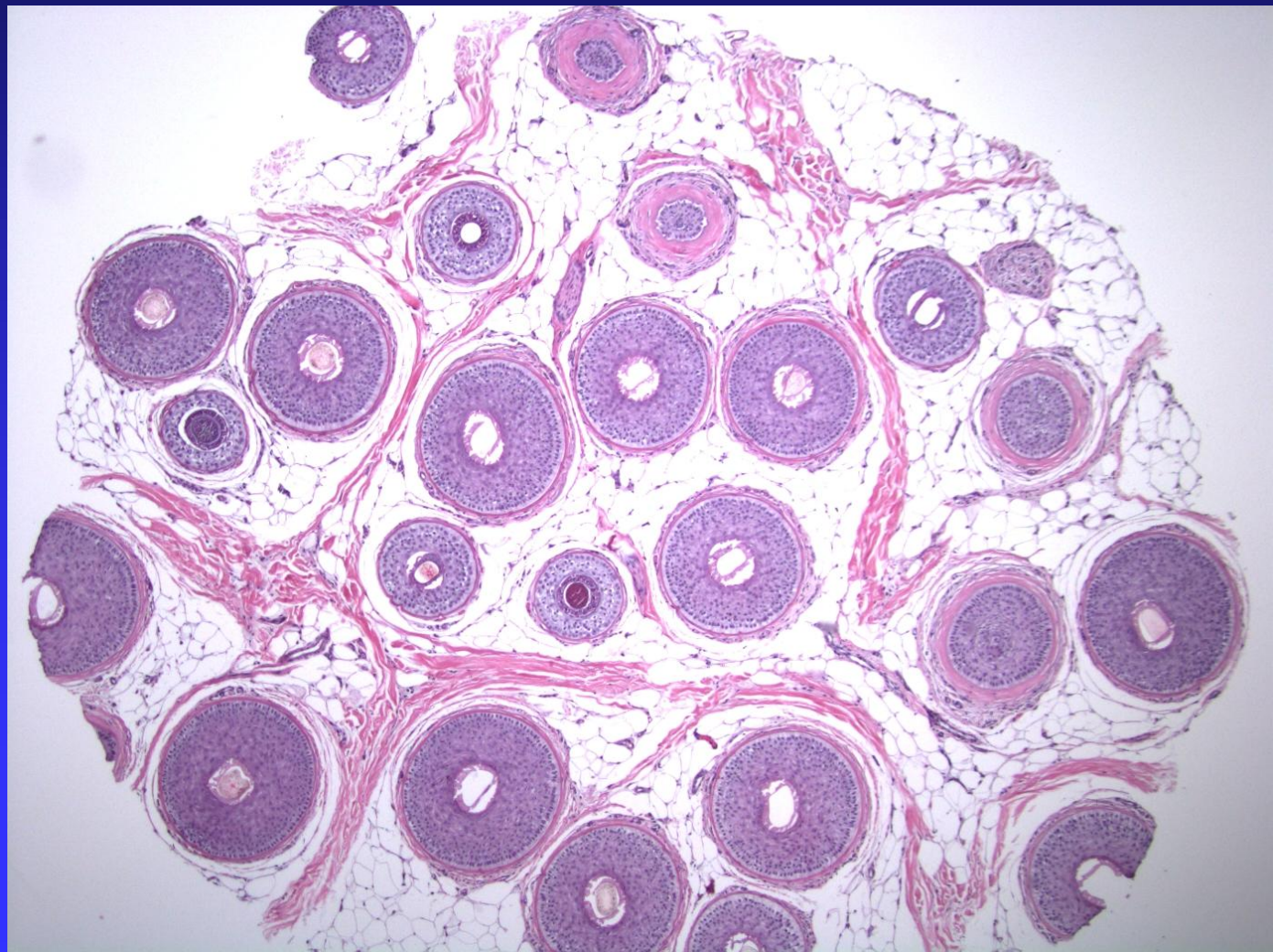
Illustration adapted from *Science*

- Size
- Growth cycle
  - (Anagen/catagen/telogen)
- Density

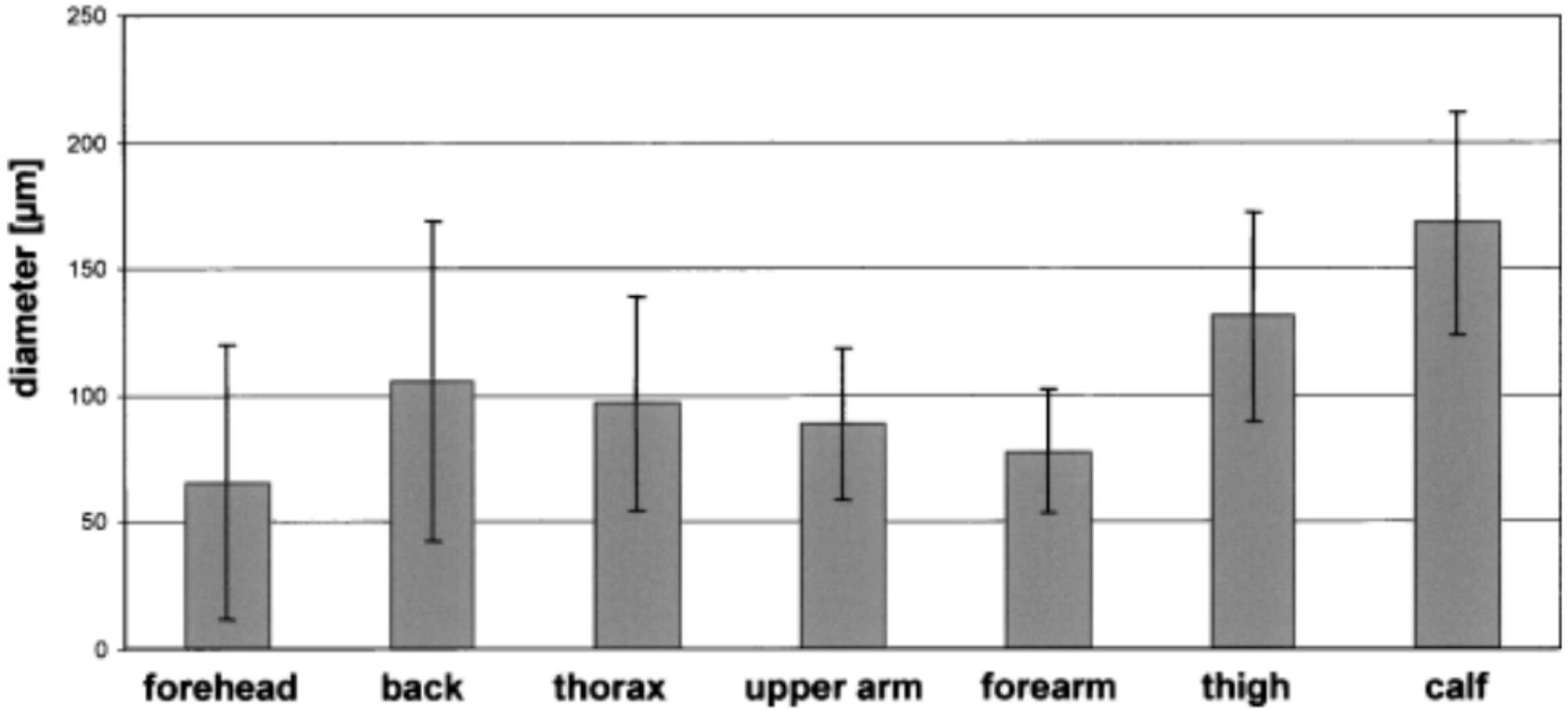
Normal Follicular Size

- 4:1 Terminal:Vellus
  - Terminal
    - Bulbs in subcutis
    - Thicker than 0.06mm
  - Vellus or Miniaturized
    - ½ diameter of terminal (0.03mm)

Normal



Size on anatomic sites

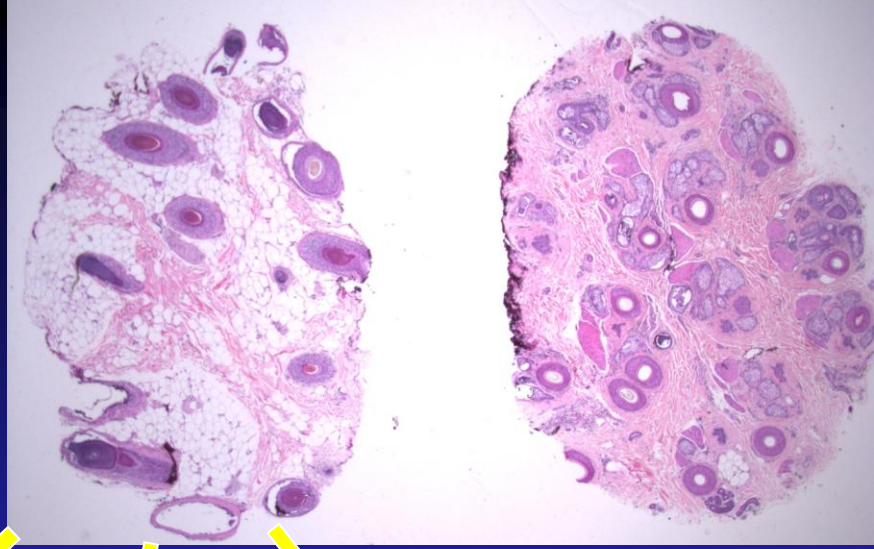


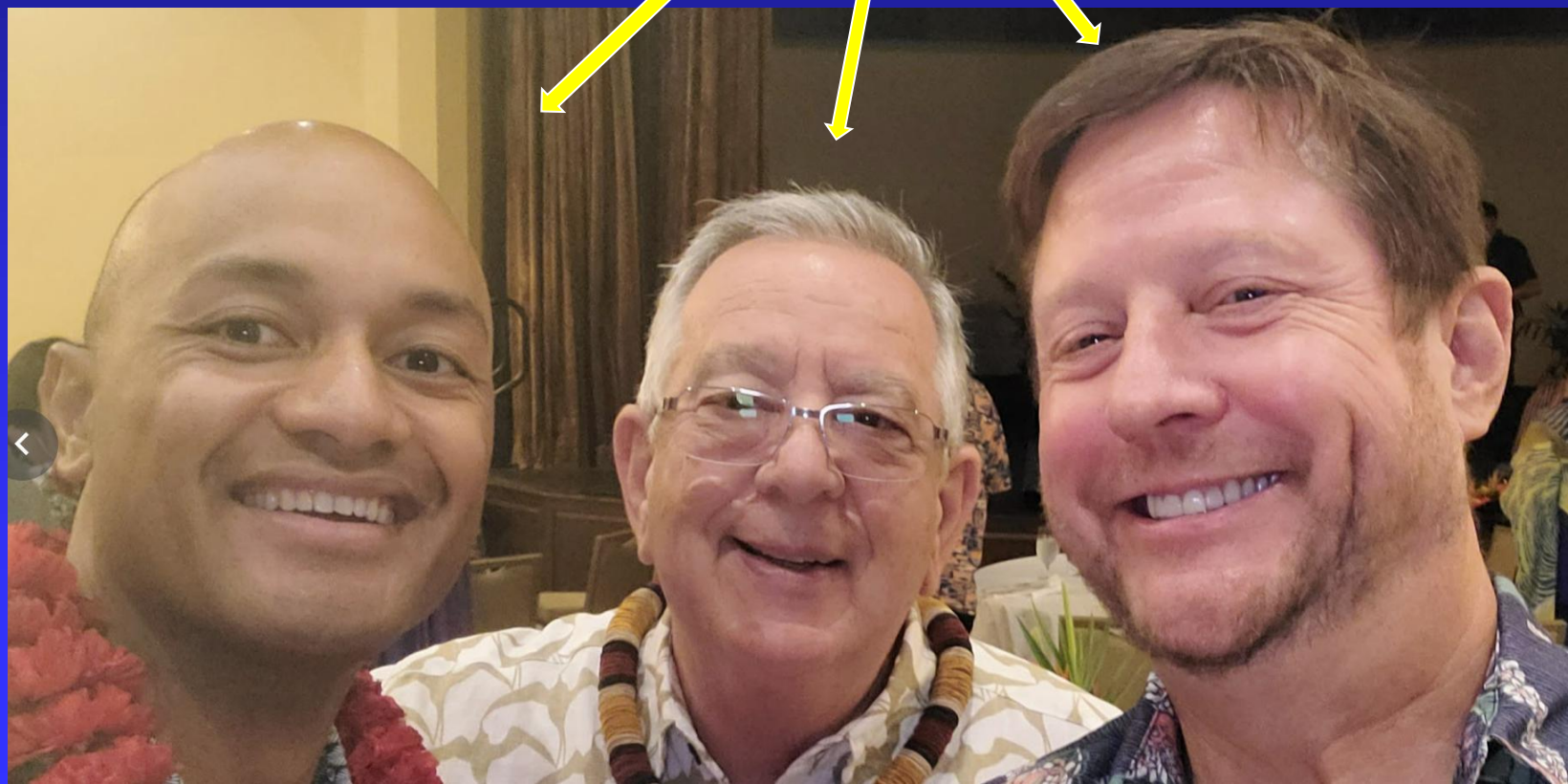
Otberg N et al. Variations of Hair Follicle Size and Distribution in Different Body Sites. J Invest Dermatol 122:14-19, 2004.

Size in disease

Zhou, C., Li, X., Wang, C. *et al.* Alopecia Areata: an Update on Etiopathogenesis, Diagnosis, an
Management. *Clinic Rev Allerg Immunol* **61**, 403–423 (2021). https://doi.org/10.1007/s1201
021-08883-0

Miniaturization
?Pathologic?

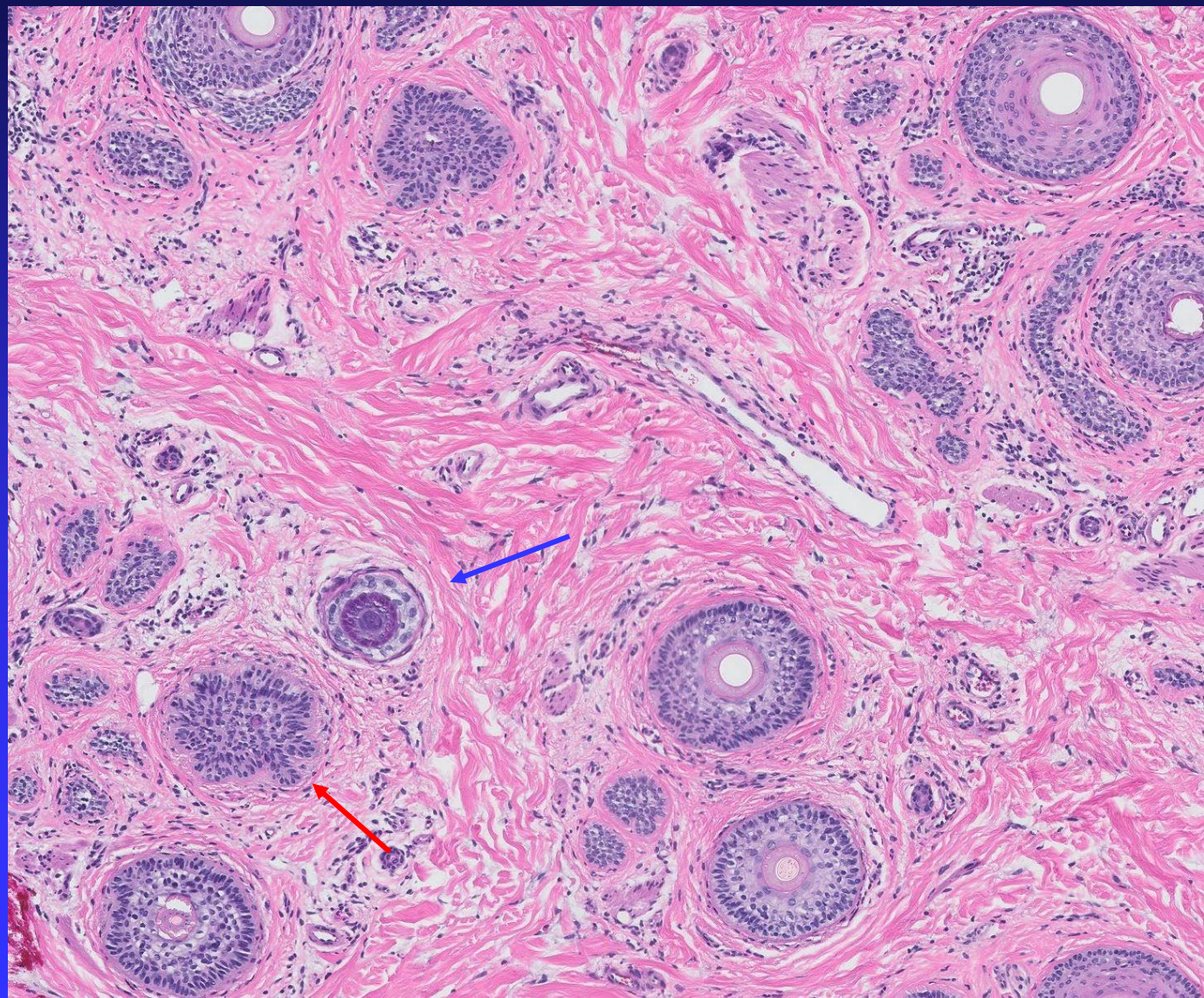




Miniaturization
Two primary diagnoses

- Female/male pattern hair loss
  - Androgenetic (<60 years)
  - Senescence (>60 years)
- Alopecia areata

Alopecia areata?



Alopecia Areata-like Pattern

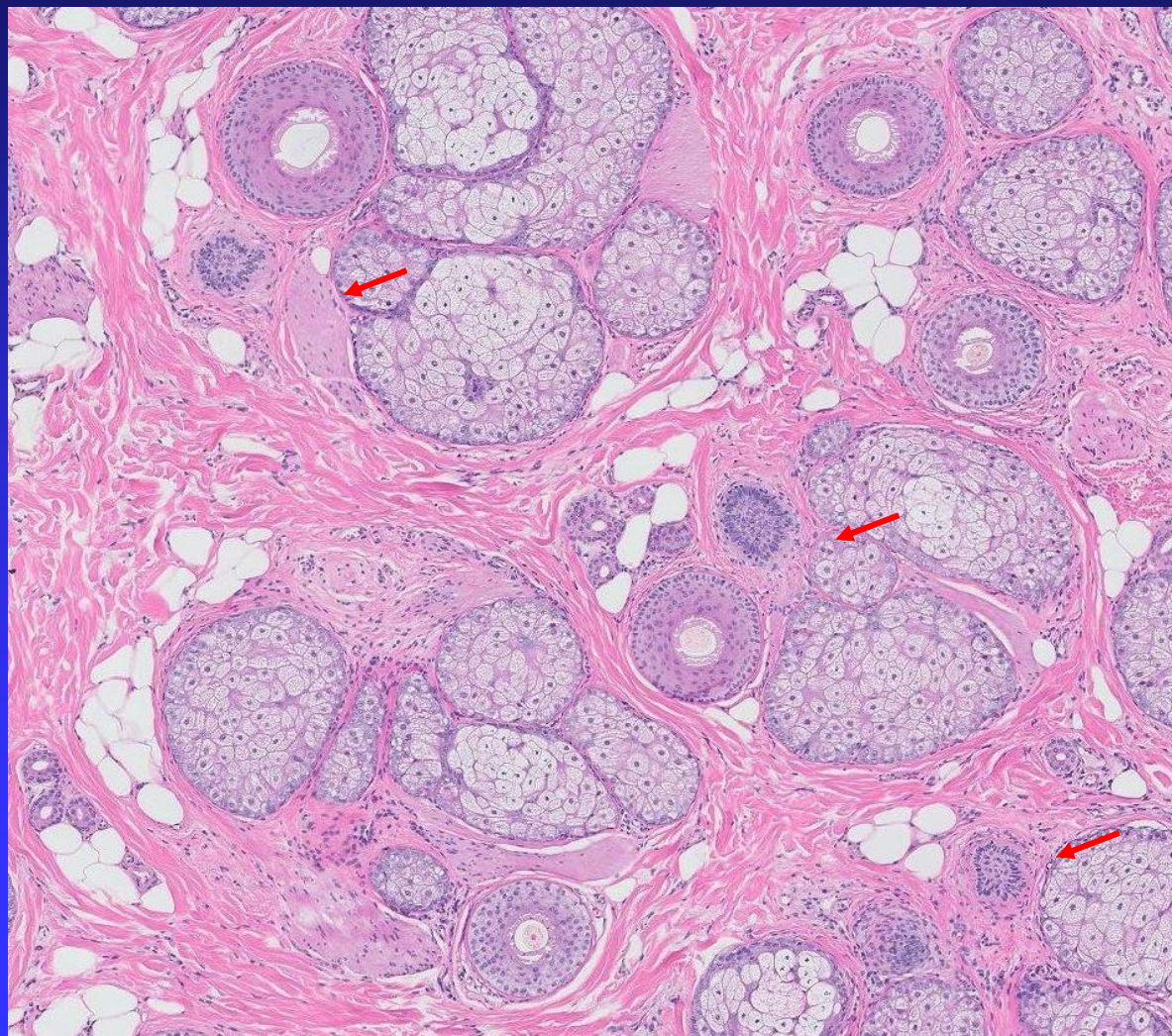
- Psoriasis
- Pattern hair loss with seb derm
- Lupus erythematosus
- Syphilis
- Permanent chemotherapy induced alopecia (pCIA)
- Systemic amyloidosis
- Linear morphea (en coup de sabre)

Science. 1998 Jan 30;279(5351):720-4. doi: 10.1126/science.279.5351.720.

Alopecia universalis associated with a mutation in the human hairless gene

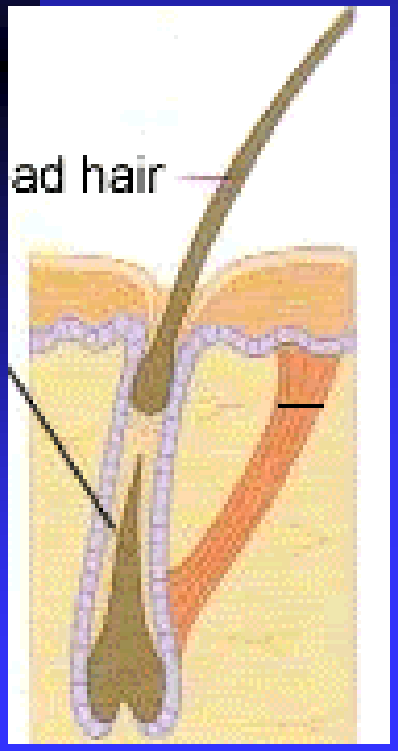
W Ahmad [1], M Faiyaz ul Haque, V Brancolini, H C Tsou, S ul Haque, H Lam, V M Aita, J Owen, M deBlaquiere, J Frank, P B Cserhalmi-Friedman, A Leask, J A McGrath, M Peacocke, M Ahmad, J Ott, A M Christiano

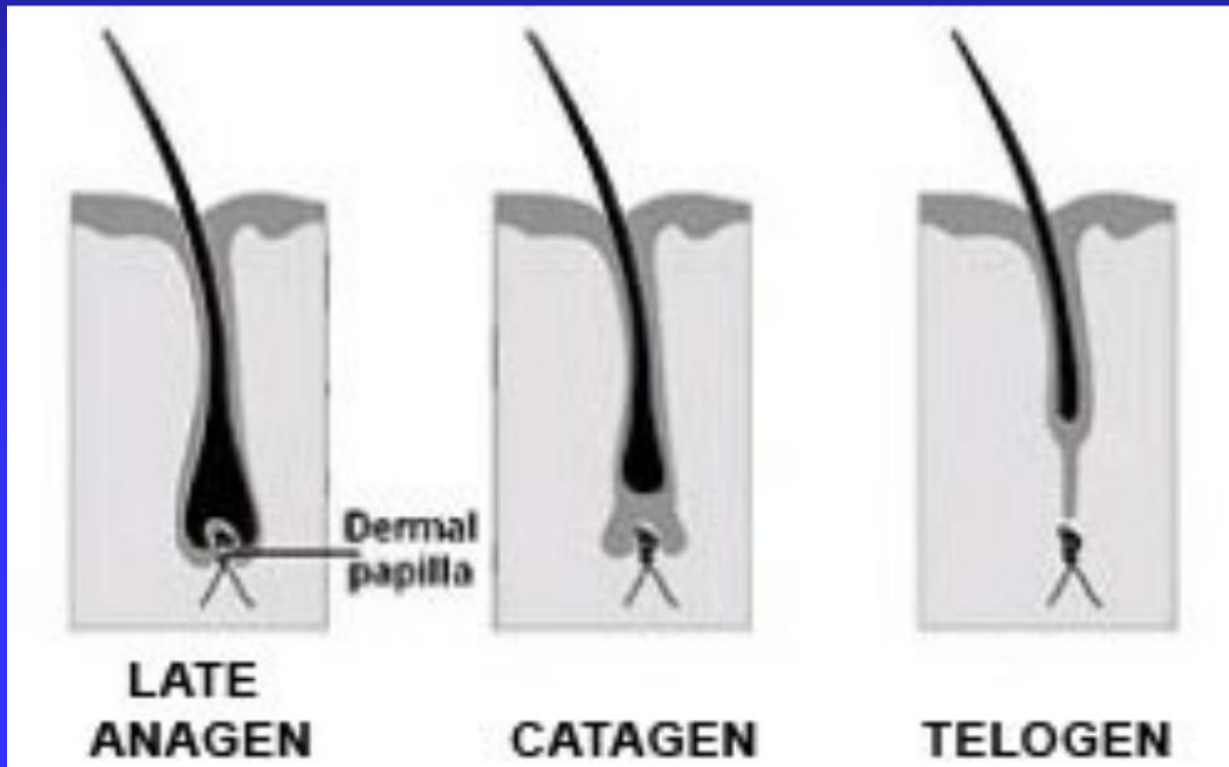
Cell cycle phases



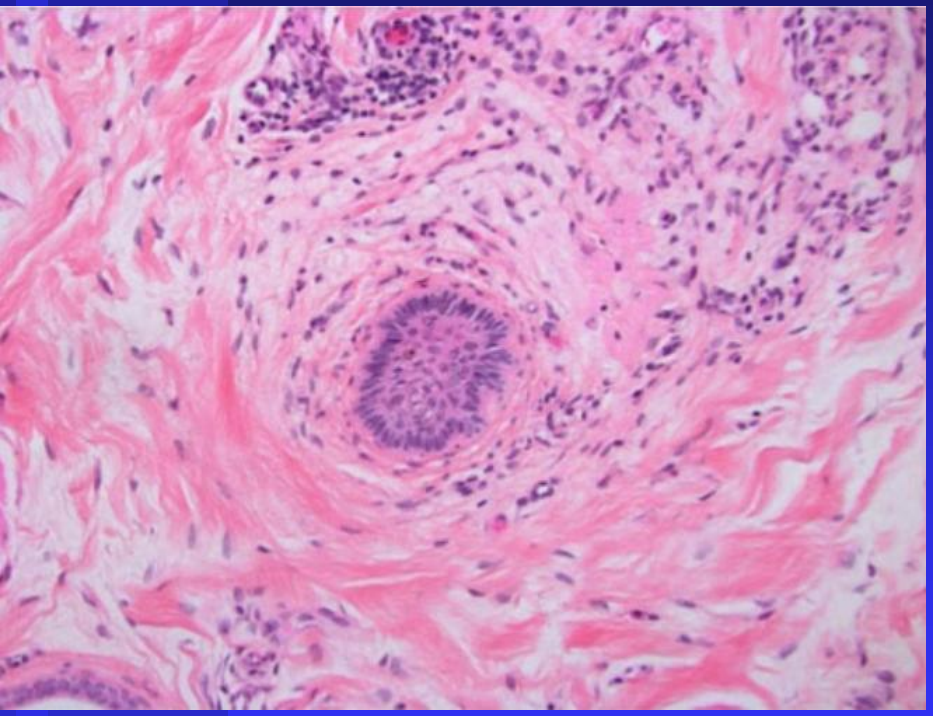
Meaning of catagen/telogen

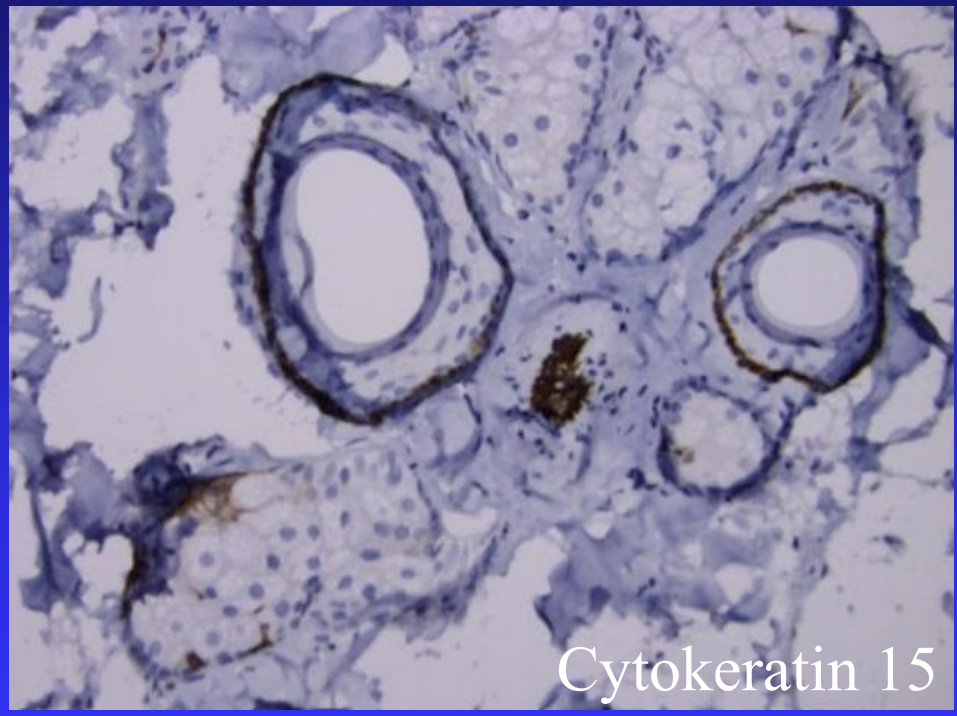
- Shorter growth cycle
- Stuck in catagen/telogen



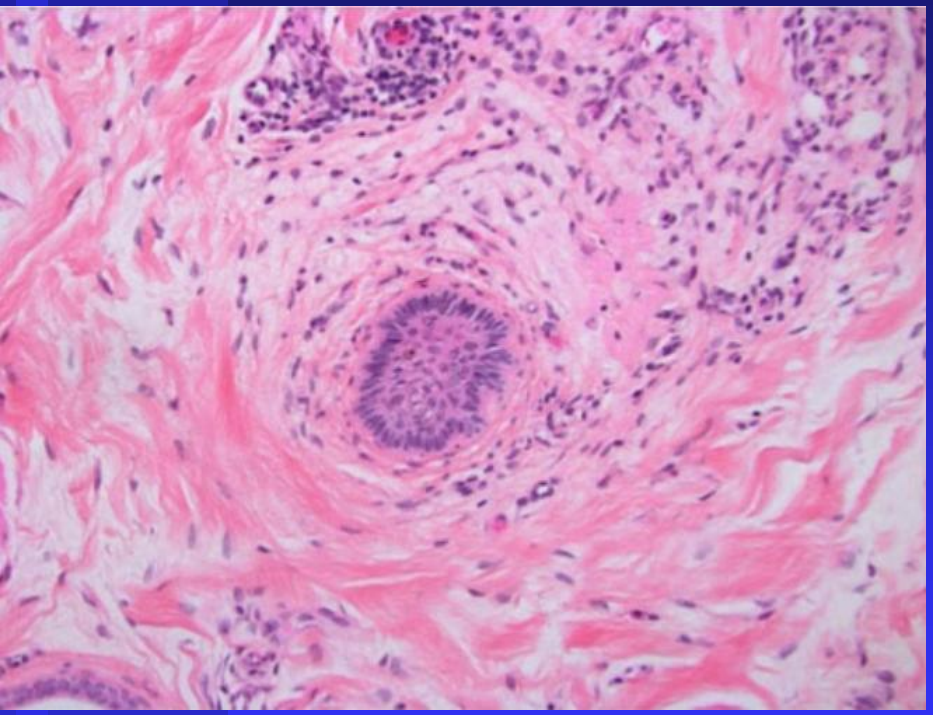


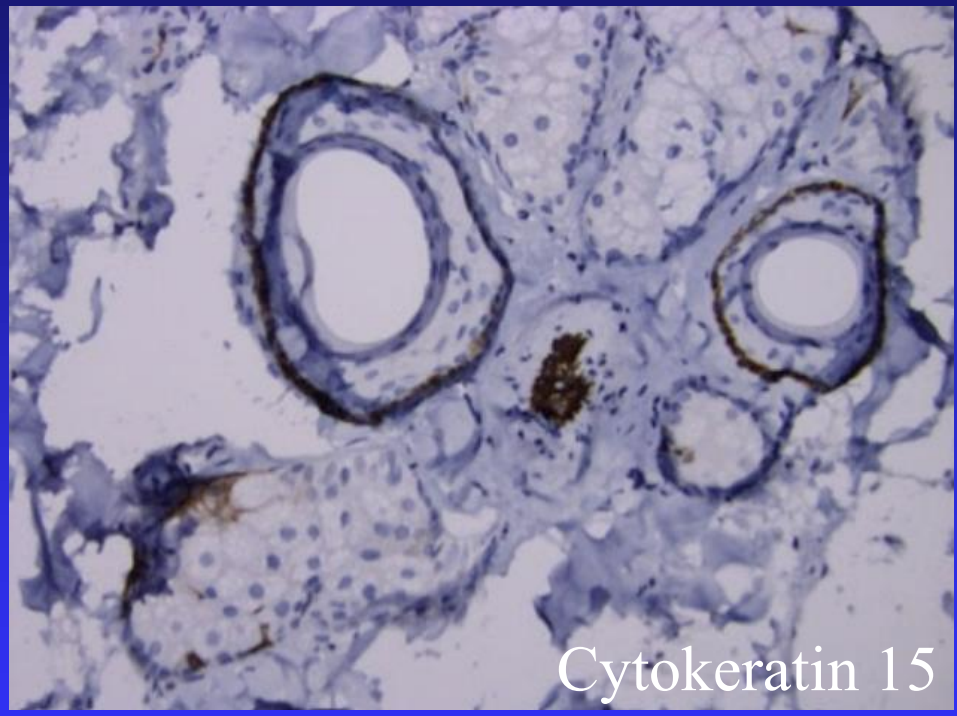
Anagen phase = Hair length





More catagen = Shorter hair





Evolution toward human hairlessness

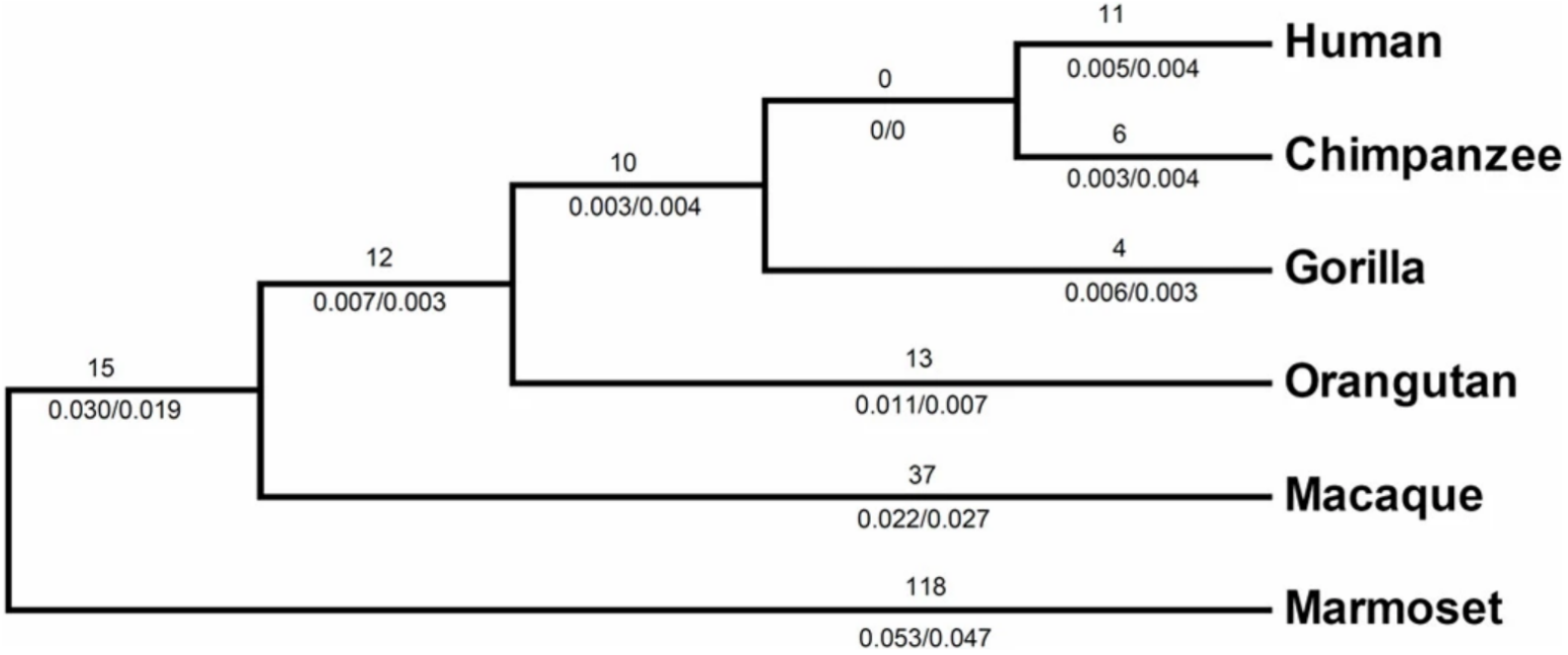
- Decreased hair cover
- Increased eccrine sweat gland density
- Increase subcutaneous fat thickness

Kamberov YT et al. Comparative evidence for the independent evolution of hair and sweat gland traits in primates. J Hum Evol 125:99-105, 2018.

Human Hairless Gene

Figure 2

From: Molecular evolution of *HR*, a gene that regulates the postnatal cycle of the hair follicle



Molecular evolution of *HR* in primates.

Ka and *Ks* values were estimated for each branch of the *HR* tree with the reconstructed sequences at ancestral nodes. Number above the lineage indicates the minimum number of amino acid replacements to explain differences among reconstructed sequences. *Ka/Ks* ratios are shown below branches. Branch lengths are drawn arbitrarily and do not reflect evolutionary time.

Hair density

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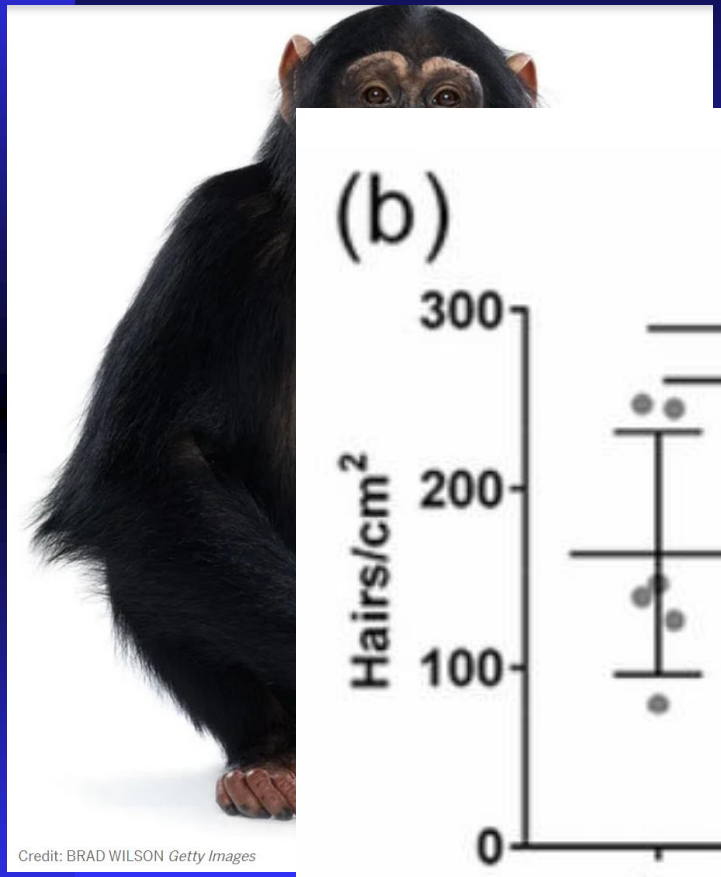
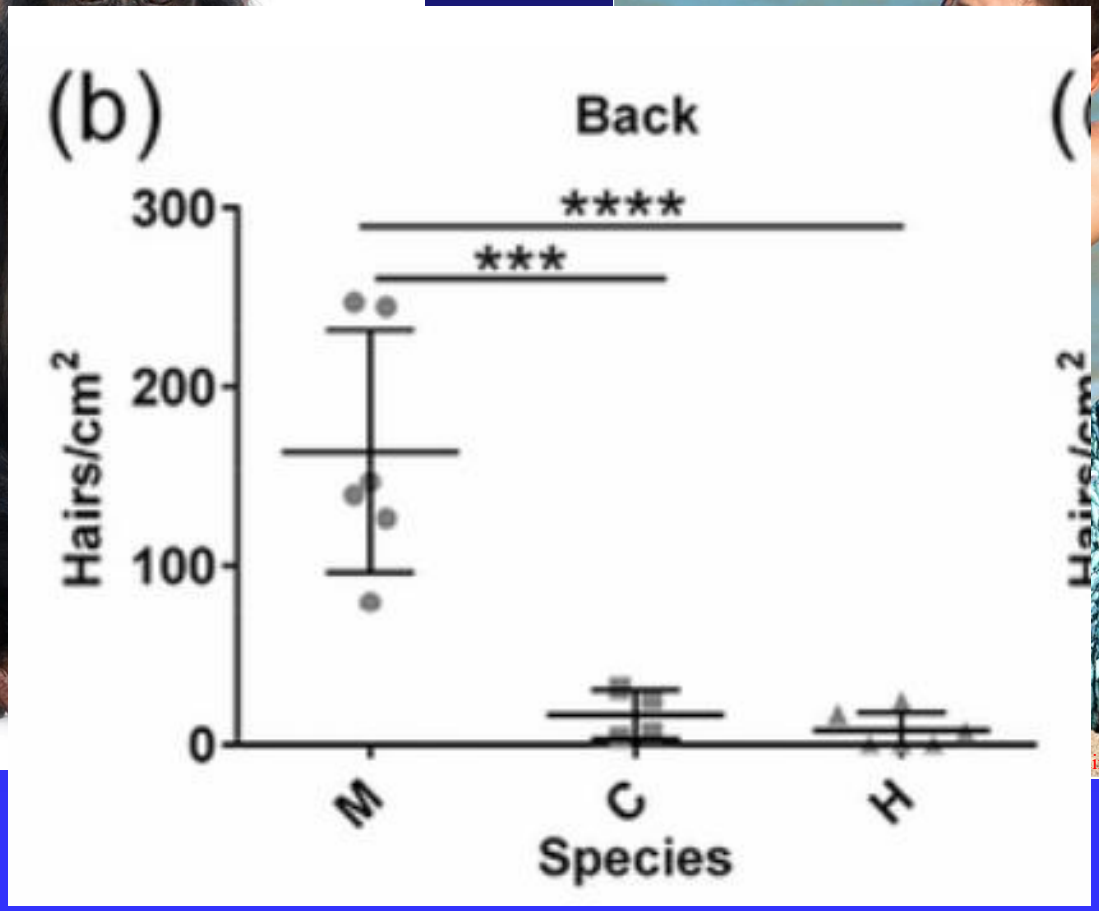
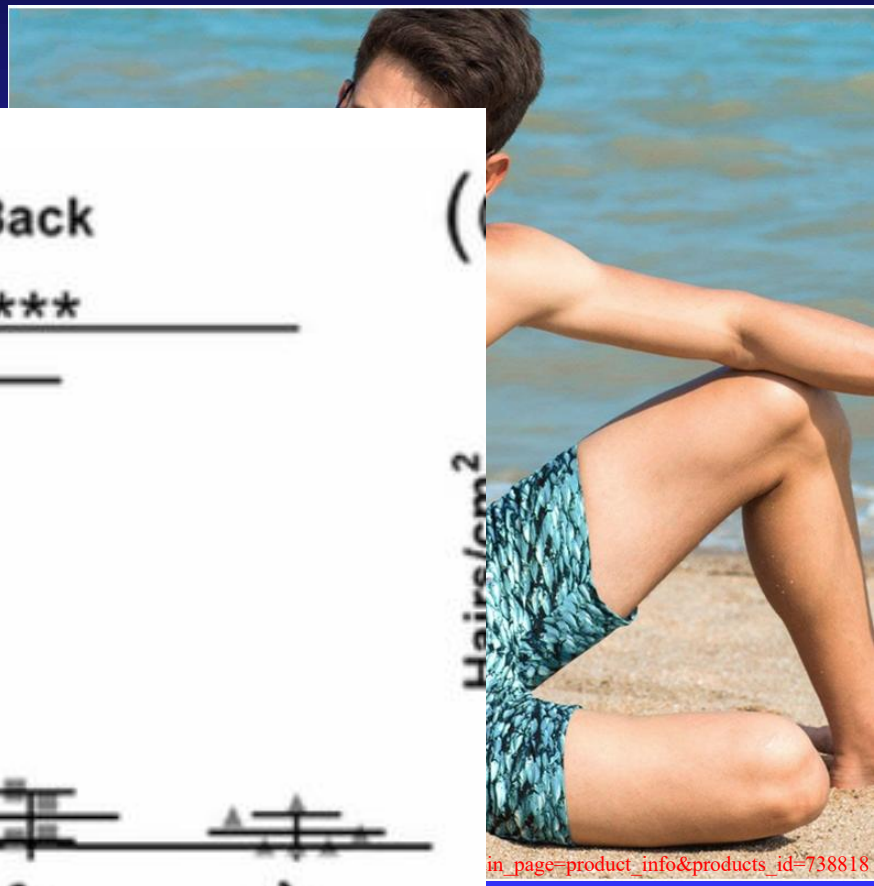
Kamberov YT et al. Comparative evidence for the independent evolution of hair and sweat gland traits in primates. J Hum Evol 125:99-105, 2018.

Hair density







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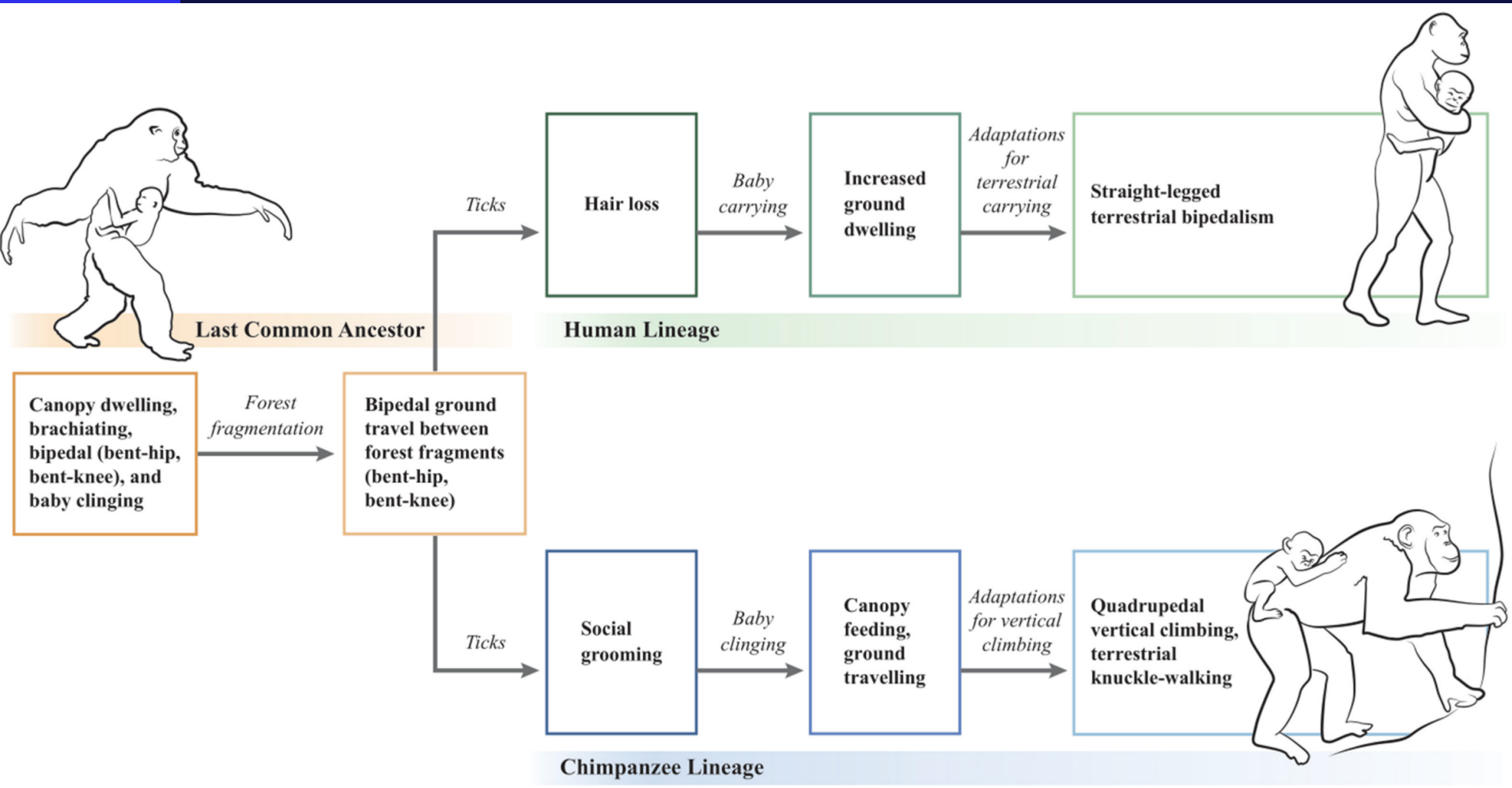
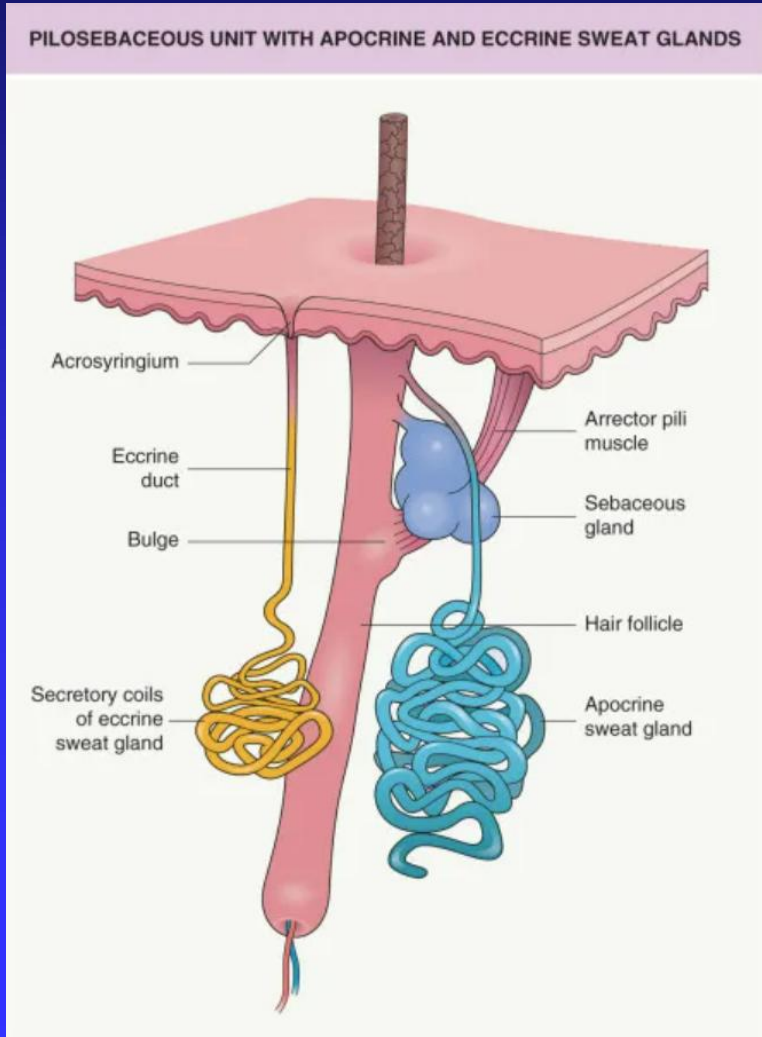


Brown JG. Ticks, Hair loss, and non-clinging babies: a novel tick-based hypothesis for the evolutionary divergence of humans and chimpanzees. *Life* 11(5):, 135, **2021.**

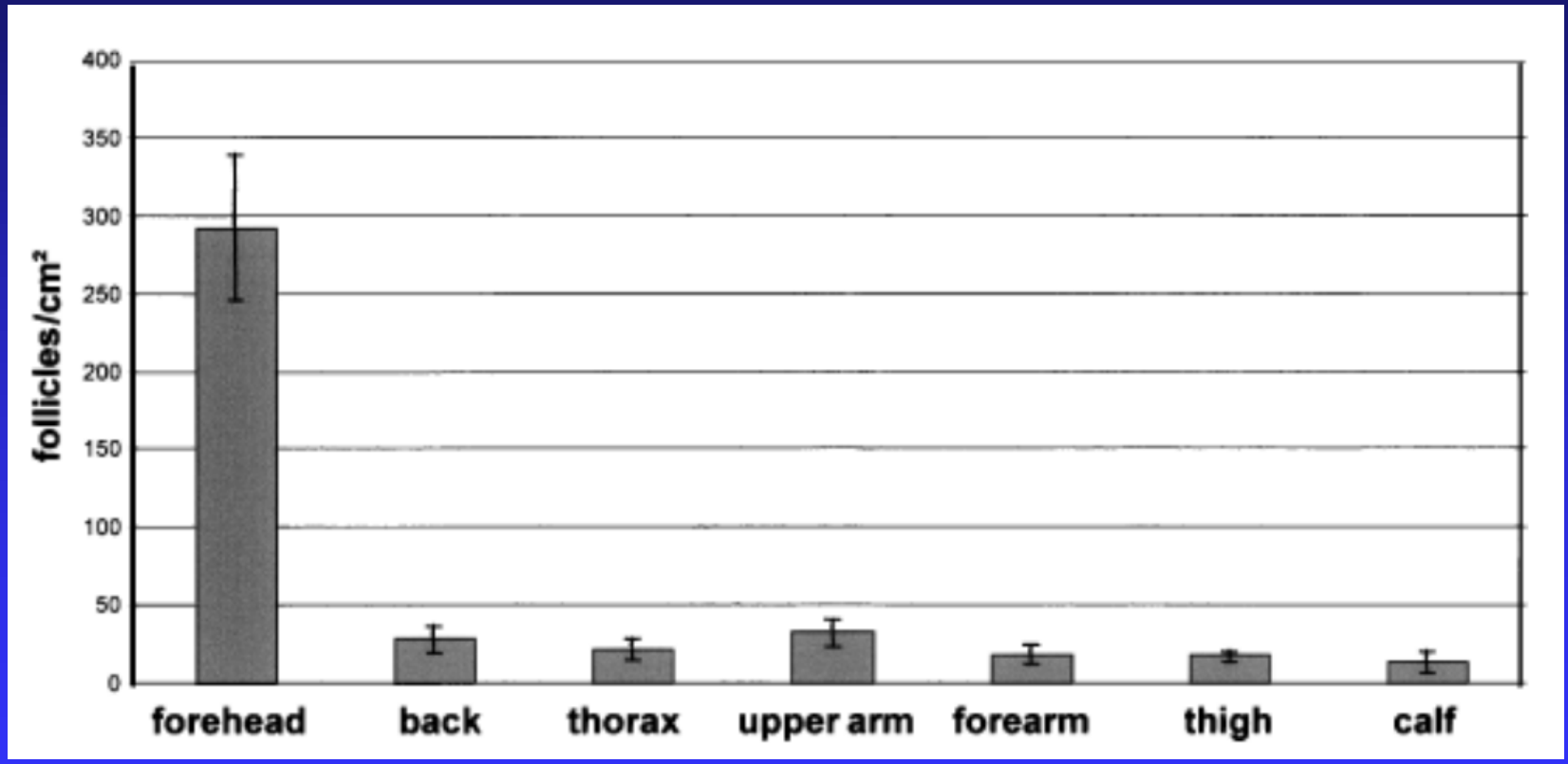
Why evolve to less hair cover?

- Temperature Regulation
  - Changing behavior
    - Hunting in the day—safer
    - Allows for adaptation to diverse climates
  - Fire—temperature control better
  - Clothing

2.5x higher density of eccrine glands on forehead

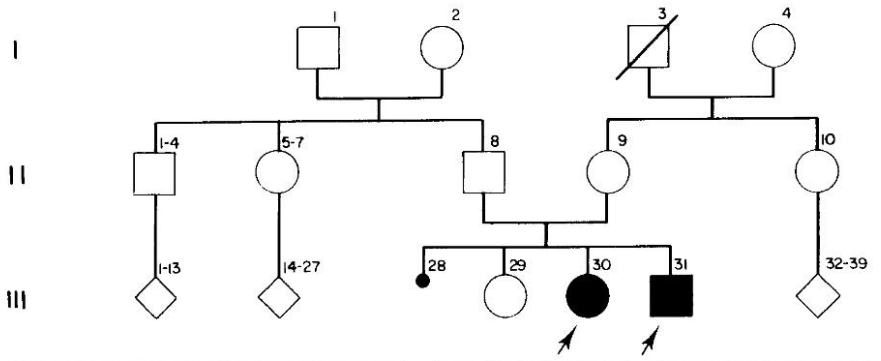


Follicular density varies with anatomic site



Otberg N et al. Variations of Hair Follicle Size and Distribution in DifferentBody Sites. J Invest Dermatol 122:14-19, 2004.

HR Mutation



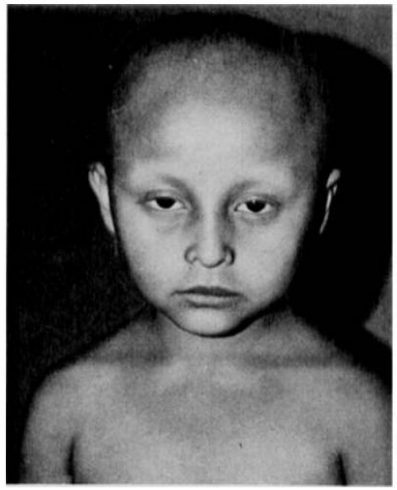


Fig. 1. Family A. Pedigree and facial appearance of the propositi. The girl (left) was more severely affected.

Autosomal recessive inheritance of atrichia congenita

J. M. CANTÚ, J. SÁNCHEZ-CORONA, A. GONZÁLEZ-MENDOZA, R. MARTÍNEZ Y MARTÍNEZ AND D. GARCÍA-CRUZ

Divisiones de Genética y Hematología y de Patología Experimental, Subjefatura de Investigación Científica, Unidad de Investigaciôn Biomédica, Centro Médico de Occidente, Instituto Mexicano del Seguro Social, Guadalajara, Jalisco, Mexico

Two families, each with two sibs presenting atrichia congenita, were studied. Histopathological studies of scalp biopsies from affected areas revealed absence of hair follicles. The pedigree data were interpreted as corroborative of a previously postulated autosomal recessive pattern of inheritance.

- Size of hair
- Anagen/catagen—length
- Density

Cantu JM et al. 17(3):209-12, 1980

Science. 1998 Jan 30;279(5351):720-4. doi: 10.1126/science.279.5351.720.

Alopecia universalis associated with a mutation in the human hairless gene

W Ahmad [1], M Faiyaz ul Haque, V Brancolini, H C Tsou, S ul Haque, H Lam, V M Aita, J Owen, M deBlaquiere, J Frank, P B Cserhalmi-Friedman, A Leask, J A McGrath, M Peacocke, M Ahmad, J Ott, A M Christiano

Unintended consequence of evolution?

Advances in Anthropology, 2015, 5, 274-281
Published Online November 2015 in SciRes. http://www.scirp.org/journal/aa
http://dx.doi.org/10.4236/aa.2015.54021

Scientific Research Publishing

Evolution of Long Head Hair in Humans

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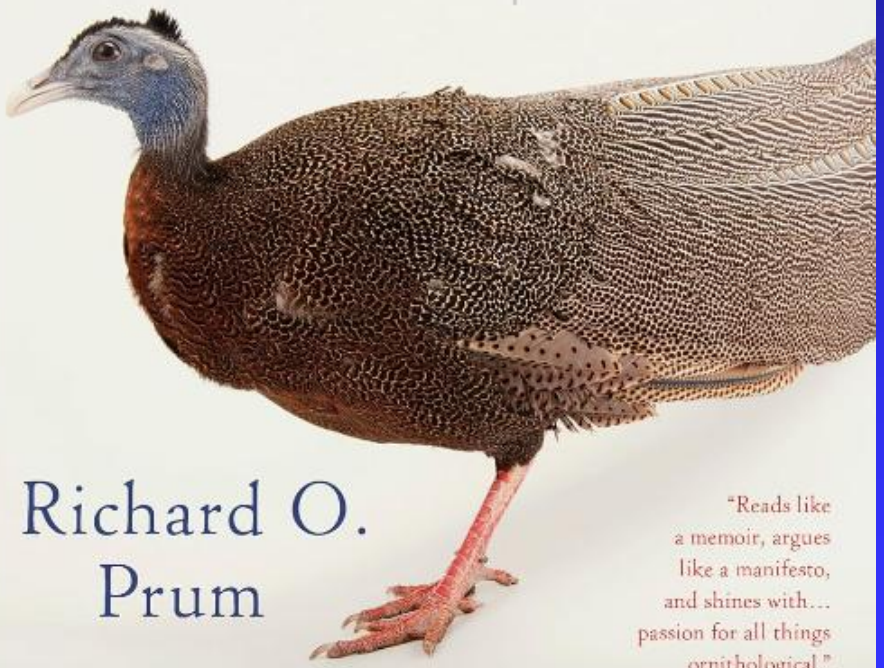
Received 26 September 2015; accepted 3 November 2015; published 6 November 2015

The Evolution of Beauty

How Darwin's Forgotten Theory of Mate Choice Shapes the Animal World



Richard O. Prum

"Reads like a memoir, argues like a manifesto, and shines with... passion for all things ornithological."
—*Science*

Conclusion

- What we see in the microscope:
  - Size
  - Density
  - Cell cycle
- Evolution: Temperature control, infestation control, and behavioral change
- Hypothesis: Some hair loss diseases are unintended consequences of evolution

Lichen Planopilaris (LPP)

- Mini-Epidemic?
  - Hair loss clinicians observing increased incidence.
  - Traditionally West Coast > East Coast

Lichen Planopilaris Increasing Incidence

- ?Nanoparticle?
  - Sunscreen?
  - Lichen planus—Metals, especially dental implicated
    - Gold, mercury—dental*
    - Nail LP associated with +metal patch test**

*Sasaki G et al. J Dermatol 23:890, 1996.
**Nishizawa A et al. J Eur Acad Dermatol Venerol 27:e231, 2013.

Br J Dermatol. 2016 Oct;175(4):762-7. doi: 10.1111/bjd.14535. Epub 2016 Jun 30.

Frontal fibrosing alopecia: possible association with leave-on facial skin care products and sunscreens; a questionnaire study.

Aldoori N[1], Dobson K[1], Holden CR[1], McDonagh AJ[1], Harries M[2], Messenger AG[3].

Author information

Abstract

BACKGROUND: Since its first description in 1994, frontal fibrosing alopecia (FFA) has become increasingly common, suggesting that environmental factors are involved in the aetiology.

OBJECTIVES: To identify possible causative environmental factors in FFA.

METHODS: A questionnaire enquiring about exposure to a wide range of lifestyle, social and medical factors was completed by 105 women with FFA and 100 age- and sex-matched control subjects. A subcohort of women with FFA was patch tested to an extended British standard series of allergens.

RESULTS: The use of sunscreens was significantly greater in the FFA group compared with controls. Subjects with FFA also showed a trend towards more frequent use of facial moisturizers and foundations but, compared with controls, the difference in frequencies just failed to reach statistical significance. The frequency of hair shampooing, oral contraceptive use, hair colouring and facial hair removal were significantly lower in the FFA group than in controls. Thyroid disease was more common in subjects with FFA than controls and there was a high frequency of positive patch tests in women with FFA, mainly to fragrances.

CONCLUSIONS: Our findings suggest an association between FFA and the use of facial skin care products. The high frequency of sunscreen use in patients with FFA, and the fact that many facial skin care products now contain sunscreens, raises the possibility of a causative role for sunscreen chemicals. The high frequency of positive patch tests in women with FFA and the association with thyroid disease may indicate a predisposition to immune-mediated disease.

Frontal fibrosing alopecia in men: an association with facial moisturizers and sunscreens

DOI: 10.1111/bjd.15311

Dear Editor, Frontal fibrosing alopecia (FFA) was first described by Kossard in 1994 in six postmenopausal women.[1] FFA remained rare during the 1990s, but in the last 10–15 years it has become increasingly common, a phenomenon observed worldwide. The recent onset and apparently rising incidence of FFA suggest involvement of environmental factors in the aetiology. We previously reported a questionnaire study in women with FFA that asked about a wide range of medical, social and environmental exposures. The results suggested an association between FFA and leave-on facial products, including moisturizers and sunscreens.[2] However, although the regular use of moisturizers was greater in women with FFA, these products are used by most women and we were unable to show a significant difference in their use between women with FFA and similarly aged controls. The use of primary sunscreens was significantly greater among women with FFA than in controls, but we were not able to assess whether patients were also exposed to sunscreens from other sources.

We have therefore repeated our questionnaire study in men with FFA, as we anticipated that their use of leave-on facial skincare products would be lower than in women.

As FFA is rare in men, patients were recruited from across the U.K. and one case was recruited from Belgium. In all cases the diagnosis was made by a clinician with special expertise in hair disease, and it was supported by histology in most cases. The clinical diagnosis was based on scarring alopecia affecting the frontal hairline causing recession of the hairline. Additional features included loss of eyebrows, follicular erythema of the frontal hairline and loss of sideburn and beard hair. Male controls aged 35–80 years were recruited from three sites (Sheffield, Salford and Glasgow). The patients completed a questionnaire similar to that used in our female study, but inviting more detailed information on the use of facial skincare and hair care products. Male patients with FFA were asked about the timing and distribution of hair loss, but otherwise the questionnaires completed by both groups were identical.

Seventeen men with FFA and 73 controls were recruited. The mean age of onset of hair loss in the patients with FFA was 54·5 years (range 35–77). All had loss of hair from the frontal hairline, and 16 (94%) had lost eyebrows. Twelve men (71%) reported loss of hair from the beard and 13 (76%) reported loss of hair from the limbs. All men with FFA reported using facial moisturizers, compared with 40% in the control group. Facial moisturizers were used at least twice a week by 94% of patients with FFA, but by only 32% of controls ($P < 0·001$) (Table 1). Sixteen patients reported using moisturizers for a period consistent with their use prior to the onset of FFA. The use of primary sunscreens by men with FFA was significantly more common than by controls. Overall 35% of men with FFA reported using a sunscreen at least twice a week all year round, compared with 4% of controls ($P = 0·0012$).

When moisturizers containing sunscreen chemicals were included in the analysis, at least 71% of men with FFA applied a product containing a sunscreen at least twice a week all year

Table 1 Reported use of skincare and hair care products by patients with frontal fibrosing alopecia (FFA) and controls

	Patients with FFA	Controls	P-value
Number of patients	17	73	
Age (years), mean (range)	63·1 (42–80)	59·1 (37–79)	
Age at onset of hair loss (years), mean (range)	54·5 (35–77)		
Facial moisturizer[a]	16 (94)	23 (32)	< 0·001
Primary sunscreen[b]	6 (35)	3 (4)	0·0012
Sunscreen[b]	12 (71)	8 (11)	< 0·001
Facial cleanser[a]	4 (24)	5 (7)	0·066
Facial scrub[a]	0	0	
Facial mask[a]	0	0	
Aftershave[a]	7 (41)	28 (39)	1·00
Shampoo[a]	13 (76)	62 (85)	0·27
Conditioner[a]	4 (24)	13 (18)	0·73
Hair spray[a]	1 (6)	2 (3)	0·48
Hair mousse[a]	0	0	
Hair gel[a]	2 (12)	10 (14)	1·00
Hair dye[c]	2 (12)	3 (4)	0·26

Values are n (%) unless stated otherwise. [a]Twice a week or more frequently. [b]Twice a week or more frequently all year round. [c]At least once a year. Sunscreen includes exposure to sunscreen chemicals in primary sunscreens and moisturizers. Analyses were performed after excluding subjects who failed to answer the question. Frequencies in the FFA and control groups were compared using Fisher's exact test.

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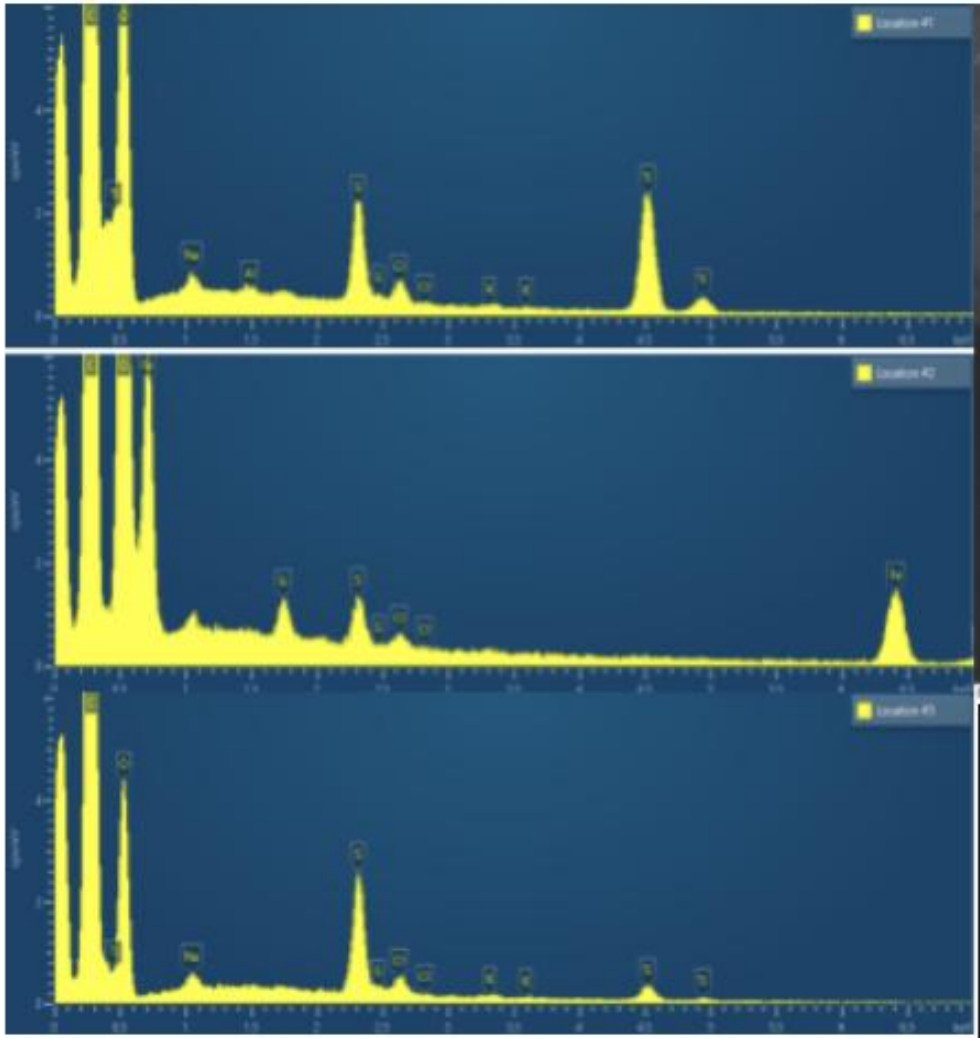
Debroy Kidambi A *et al.* Br J Dermatol 177:260-1, 2017.



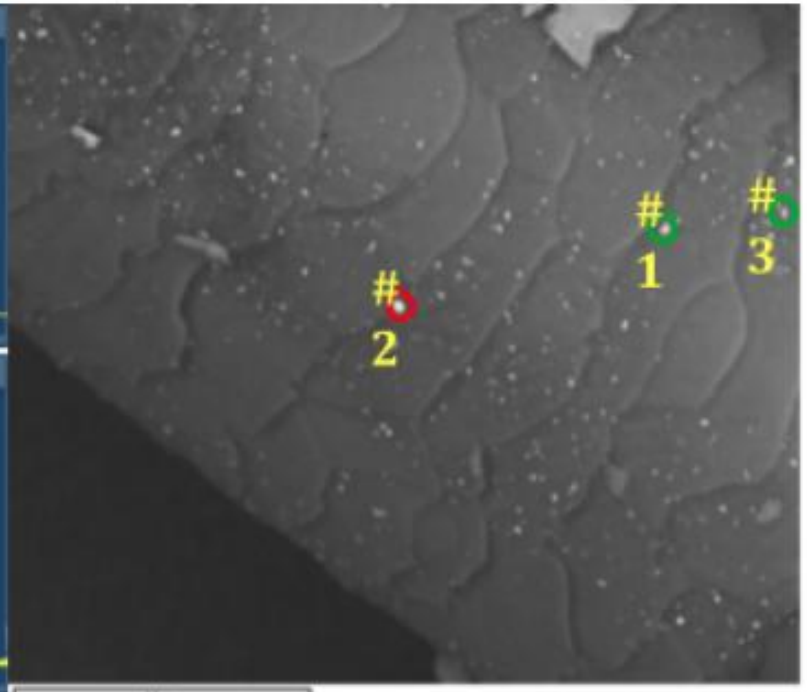
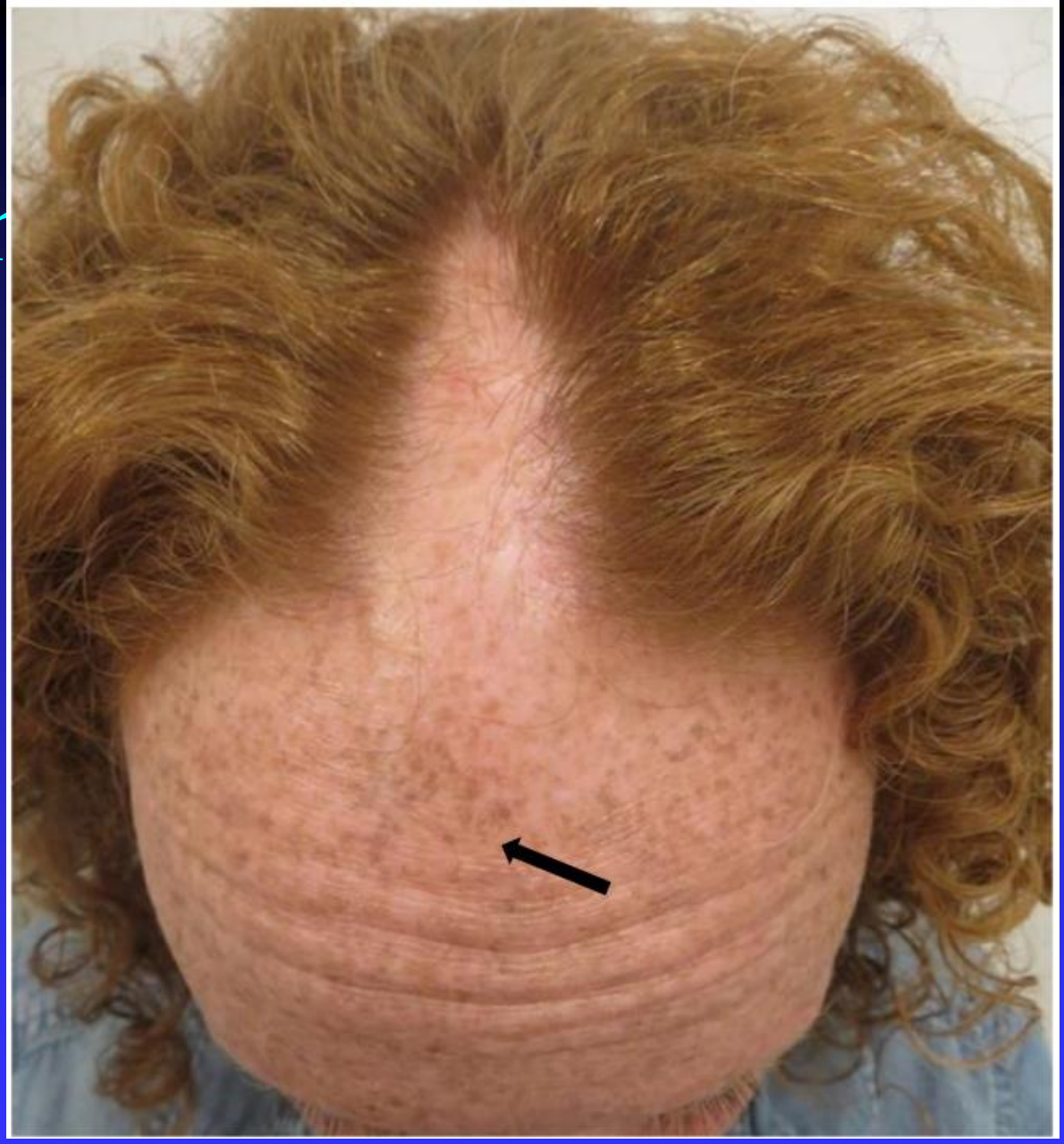


Fig. 1 Right: a backscattered electron image taken from one of typical hair shafts with SEM showing the presence of particles with brighter contrast on a hair shaft; Left: EDX spectra collected from particle 1-3 showing the presence of Ti species on particle 1 and 3.

EDX=Energy Dispersive X-ray Analysis

Sur



Mirmirani, P., & Vanderweil, S. G. (2020). Frontal fibrosing alopecia with involvement of the central hair part: distribution of hair loss corresponding to areas of sunscreen application. *Dermatology Online Journal*, 26(11).

FFA Causation

Meta-Analysis > Arch Dermatol Res. 2023 Oct;315(8):2313-2331.
doi: 10.1007/s00403-023-02604-7. Epub 2023 Apr 4.

Frontal fibrosing alopecia and personal care product use: a systematic review and meta-analysis

Olivia Kam [1], Sean Na [2], William Guo [3], Christina I Tejeda [3], Tara Kaufmann [3]

Nine studies
1,248 FFA patients
1,459 controls.

FFA Causation (9 studies)

- Sunscreen OR 3.02
  - 4.61 (men)
  - 2.74 (women)
- Facial moisturizer
  - 5.07 (men)
  - 1.58 (women)

Kam O, Na S, Guo W, Tejeda CI, Kaufmann T. Frontal fibrosing alopecia and personal care product use: a systematic review and meta-analysis. Arch Dermatol Res. 2023 Oct;315(8):2313-2331.

No FFA association (9 studies)

- Facial cleanser, toner, aftershave
- Foundation
- Shampoo, conditioner, mousse, gel, dye, straightening/rebonding, perming

Kam O, Na S, Guo W, Tejeda CI, Kaufmann T. Frontal fibrosing alopecia and personal care product use: a systematic review and meta-analysis. Arch Dermatol Res. 2023 Oct;315(8):2313-2331.

Meta-Analysis > JAMA Dermatol. 2025 Mar 1;161(3):310-314.
doi: 10.1001/jamadermatol.2024.6434.

Epistasis of ERAP1 With 4 Major Histocompatibility Complex Class I Alleles in Frontal Fibrosing Alopecia: A Genome-Wide Association Study Meta-Analysis

- 6668 included patients
  - 1585 FFA (European female)
  - 5083 controls.

FFA Genomic Associations

- Genome-wide significant associations at 4 genomic loci
  - HLA-A*11:01, HLA-A*33:01, HLA-B*07:02, and HLA-B*35:01.
  - ERAP1 gene mutation at 5q15

Rayinda T, Dand N, McSweeney SM, Christou E, Ung CY, Stefanato CM, Fenton DA, Harries M, Palamaras I, Tidman A, Holmes S, Koutalopoulou A, Ardern-Jones M, Kaur M, Papanikou S, Chasapi V, Vañó-Galvan S, Saceda-Corralo D, Melián-Olivera A, Azcarraga-Llobet C, Lobato-Berezo A, Bustamante M, Sunyer J, Starace MVR, Piraccini BM, Wiss IP, Senna MM, Singh R, Hillmann K, Kanti-Schmidt V, Blume-Peytavi U, McGrath JA, Simpson MA, Tziotzios C. Epistasis of ERAP1 With 4 Major Histocompatibility Complex Class I Alleles in Frontal Fibrosing Alopecia: A Genome-Wide Association Study Meta-Analysis. JAMA Dermatol. 2025 Mar 1;161(3):310-314.

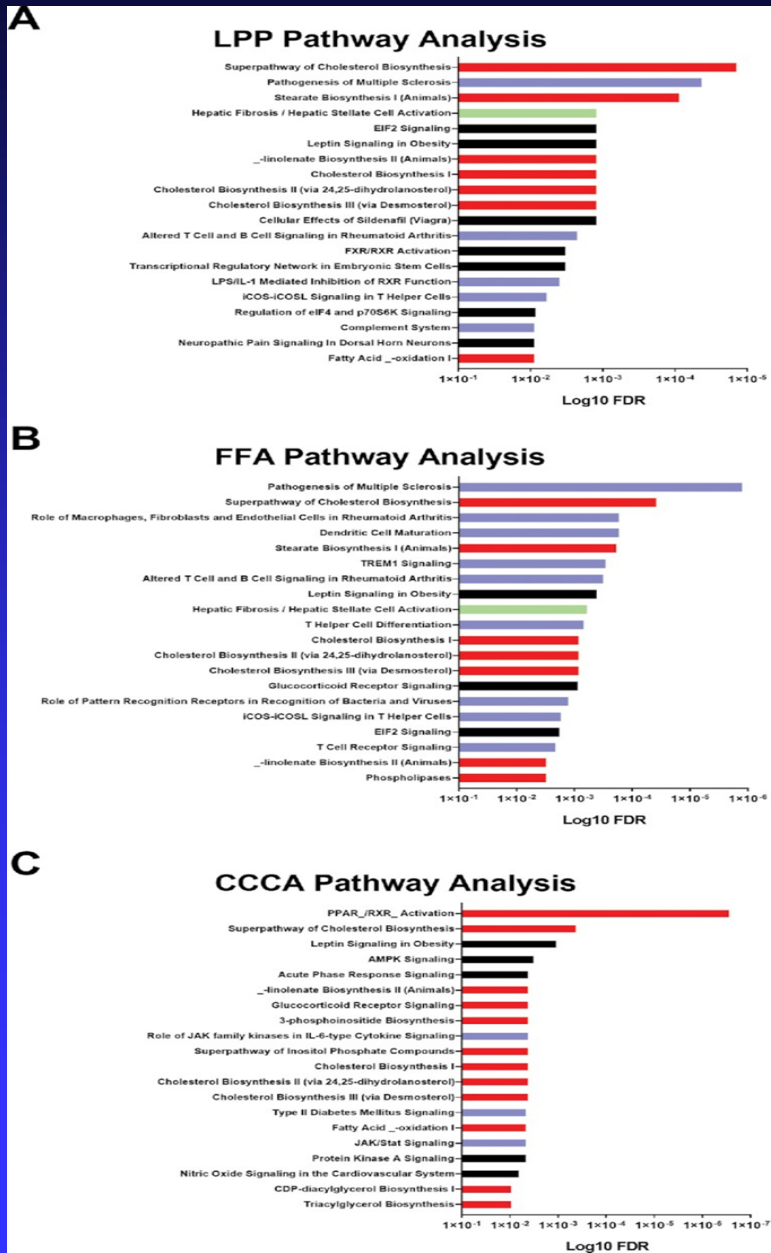
FFA Causation (Summary)

- Sunscreen (men and women) and Facial moisturizer (men)
- Genetic predisposition
  - (40% with association with 4 genomic loci)
    - HLA-A*11:01, HLA-A*33:01, HLA-B*07:02, and HLA-B*35:01.
    - ERAP1 gene mutation at 5q15

Hypothesis:
All caused by same chemical?

- Lichen planopilaris
- Frontal fibrosing alopecia
- Fibrosing alopecia in a pattern distribution
- Central centrifugal cicatricial alopecia
- Lichen planus pigmentosus

Shared dysregulated pathways in cholesterol biosynthesis and ...



Eddy H C Wang, Isha Monga, Brigitte N Sallee, James C Chen, Alexa R Abdelaziz, Rolando Perez-Lorenzo, Lindsey A Bordone, Angela M Christiano, Primary cicatricial alopecias are characterized by dysregulation of shared gene expression pathways, *PNAS Nexus*, Volume 1, Issue 3, July 2022, pgac111.

Hypothesis

- Does sun protection allow chronic inflammation to occur?
- If so, then different sunscreen products could promote LPP and FFA, especially in genetically-susceptible people.

FFA ‘Lesions’

Arch Dermatol. 1994 Jun;130(6):770-4.

Postmenopausal frontal fibrosing alopecia. Scarring alopecia in a pattern distribution.

Kossard S[1].

Author information Papers

Erratum in
Arch Dermatol 1994 Nov;130(11):1407.

Fibrosing (scarring) Alopecia in a Pattern Distribution
FAPD

Abstract

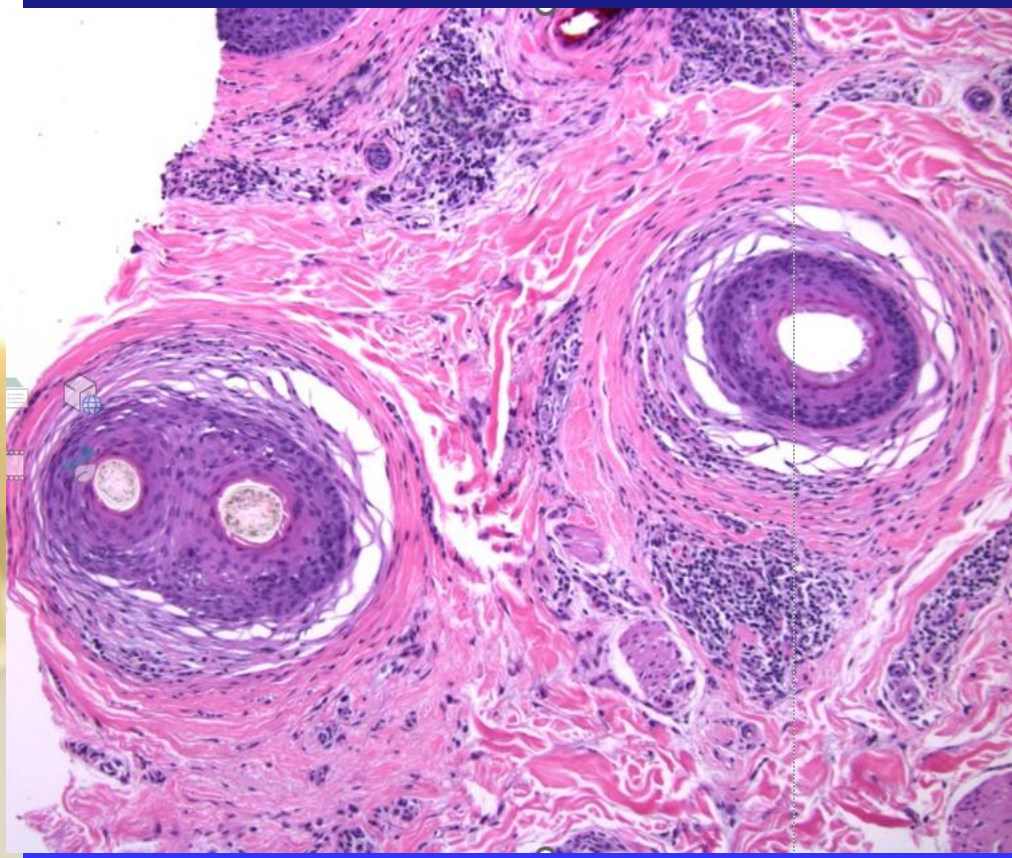
BACKGROUND: Recession of the frontal hairline is a common event in postmenopausal women. This has been shown not to be a marker of gross androgenization, and is usually a progressive nonscarring alopecia. Six postmenopausal women, who developed a progressive frontal scarring alopecia, were studied and their clinical associated with perifollicular erythema within the marginal hairline, producing a frontal fibrosing alopecia extending to the temporal and parietal hair margins. Scalp biopsy specimens from the frontal hair margin showed perifollicular fibrosis and lymphocytic inflammation concentrated around the isthmus and infundibular areas of the follicles. Immunophenotyping of the lymphocytes showed a dominance of activated T-helper cells. Clinical review of all six cases showed a progressive marginal alopecia without the typical multifocal areas of involvement seen in lichen planopilaris or pseudopelade. None of the patients had mucous membrane or skin lesions typical of lichen planus. Hormonal studies, in five patients, showed no elevated androgen abnormalities.

CONCLUSIONS: Progressive frontal recession in postmenopausal women may show clinical features of a fibrosing alopecia. The histologic findings are indistinguishable from those seen in lichen planopilaris. However, the absence of associated lesions of lichen planus in all six women raises the possibility that this mode of follicular destruction represents a reaction pattern triggered by the events underlying postmenopausal frontal hairline recession.

J Eur Acad Dermatol Venereol. 2018 Jun;32(6):e218-e220. doi: 10.1111/jdv.14748. Epub 2018 Jan 15.

Is there a pathogenetic link between frontal fibrosing alopecia, androgenetic alopecia and fibrosing alopecia in a pattern distribution?

A C Katoulis [1], K Diamanti [1], D Sgouros [1], A I Liakou [1], E Bozi [1], G Avgerinou [2], I Panayiotides [3], D Rigopoulos [2]



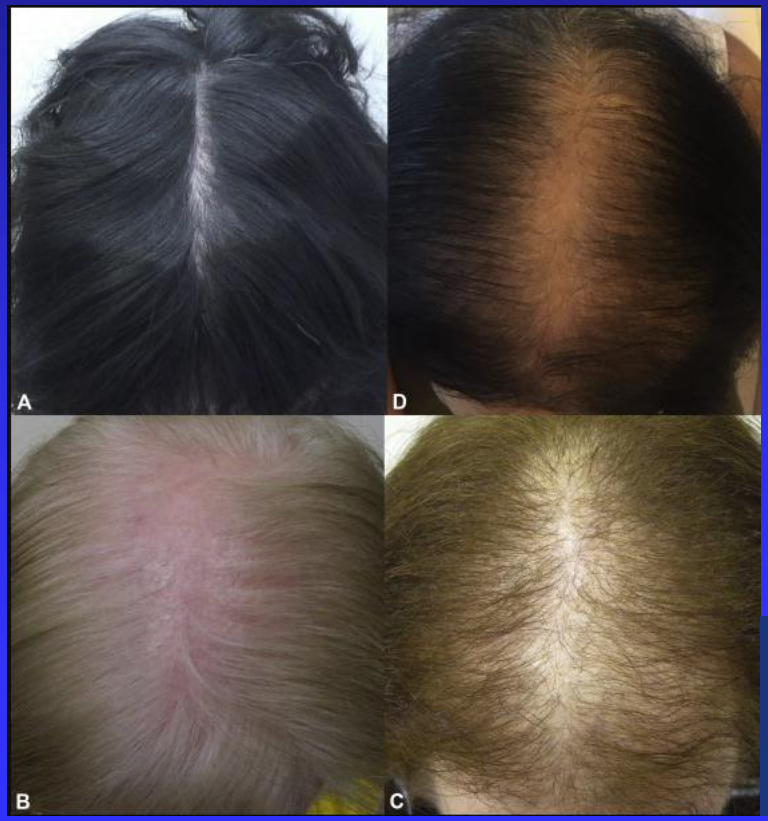
Hair Root Touch-up Dye

5A/MEDIUM ASH BROWN

WATER, C12-15 PARETH-3, AMMONIUM HYDROXIDE, OLETH-10, DILINOLEIC ACID, COCAMIDE MEA, LINOLEAMIDOPROPYL DIMETHYLAMINE DIMER DILINOLEATE, STEARETH-21, BEHENTRIMONIUM CHLORIDE, POLYQUATERNIUM-22, SODIUM SULFATE, FRAGRANCE, RESORCINOL, ERYTHORBIC ACID, p-PHENYLENEDIAMINE, CARAMEL, p-AMINOPHENOL, m-AMINOPHENOL, IRON OXIDES, MICA, SODIUM SULFITE, N,N-BIS(2-HYDROXYETHYL)-p-PHENYLENEDIAMINE SULFATE, 1-NAPHTHOL, SODIUM METASILICATE, EDTA, SARGASSUM FILIPENDULA EXTRACT, HYPNEA MUSCIFORMIS EXTRACT, GELLIDIELA ACEROSA EXTRACT, TITANIUM DIOXIDE.

Fibrosing alopecia in a pattern distribution (FAPD)

- Older women with FPHL/senescence and diffuse LPP



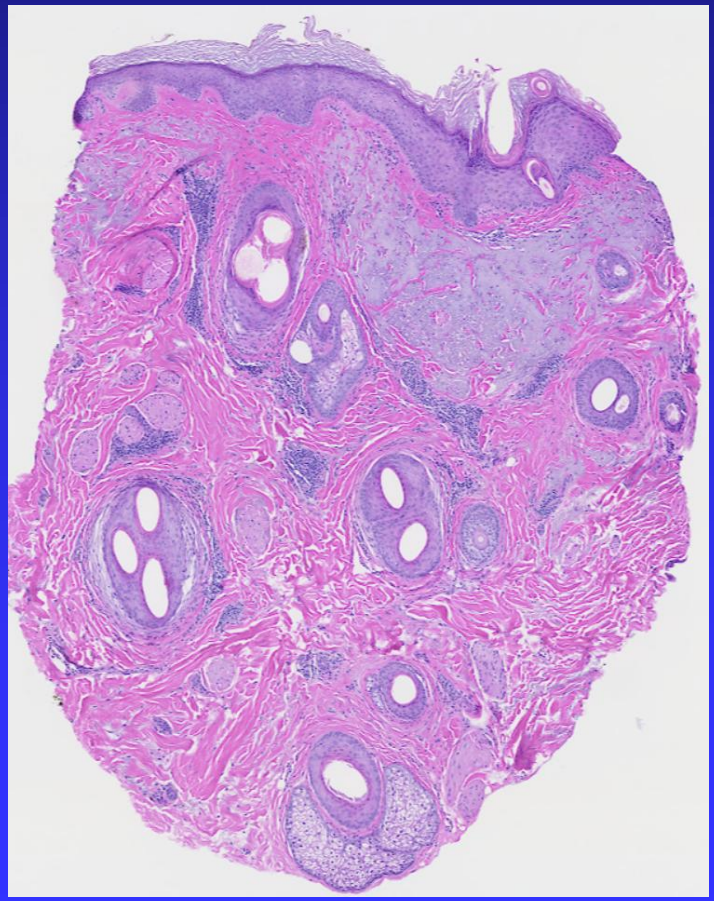
Fibrosing alopecia in a pattern distribution

Jacob Griggs, BA • Ralph M. Trüeb, MD • Maria Fernanda Reis Gavazzoni Dias, MD • Maria Hordinsky, MD • Antonella Tosti, MD

Published: January 08, 2020 • DOI: https://doi.org/10.1016/j.jaad.2019.12.056

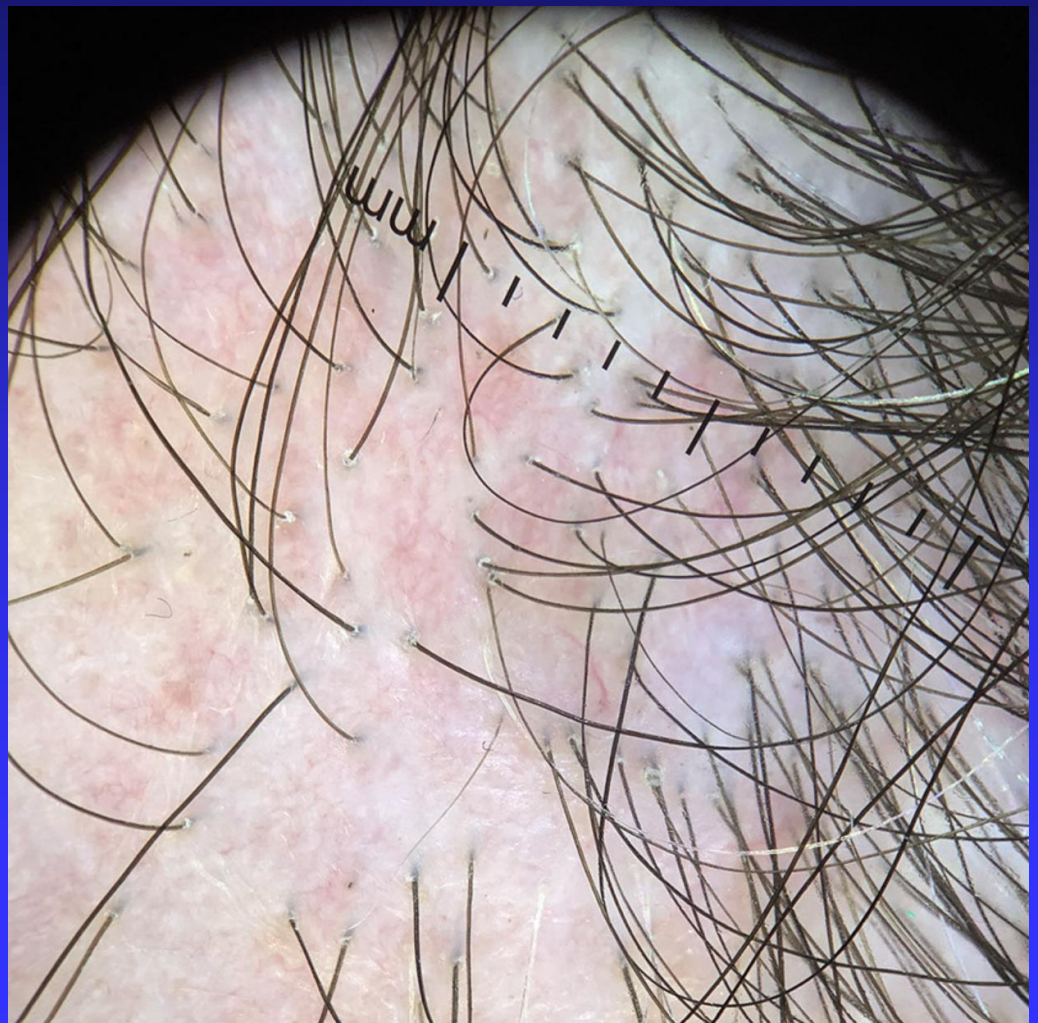
Fibrosing alopecia in a pattern distribution (FAPD)

- Older women with FPHL/senescence and diffuse LPP

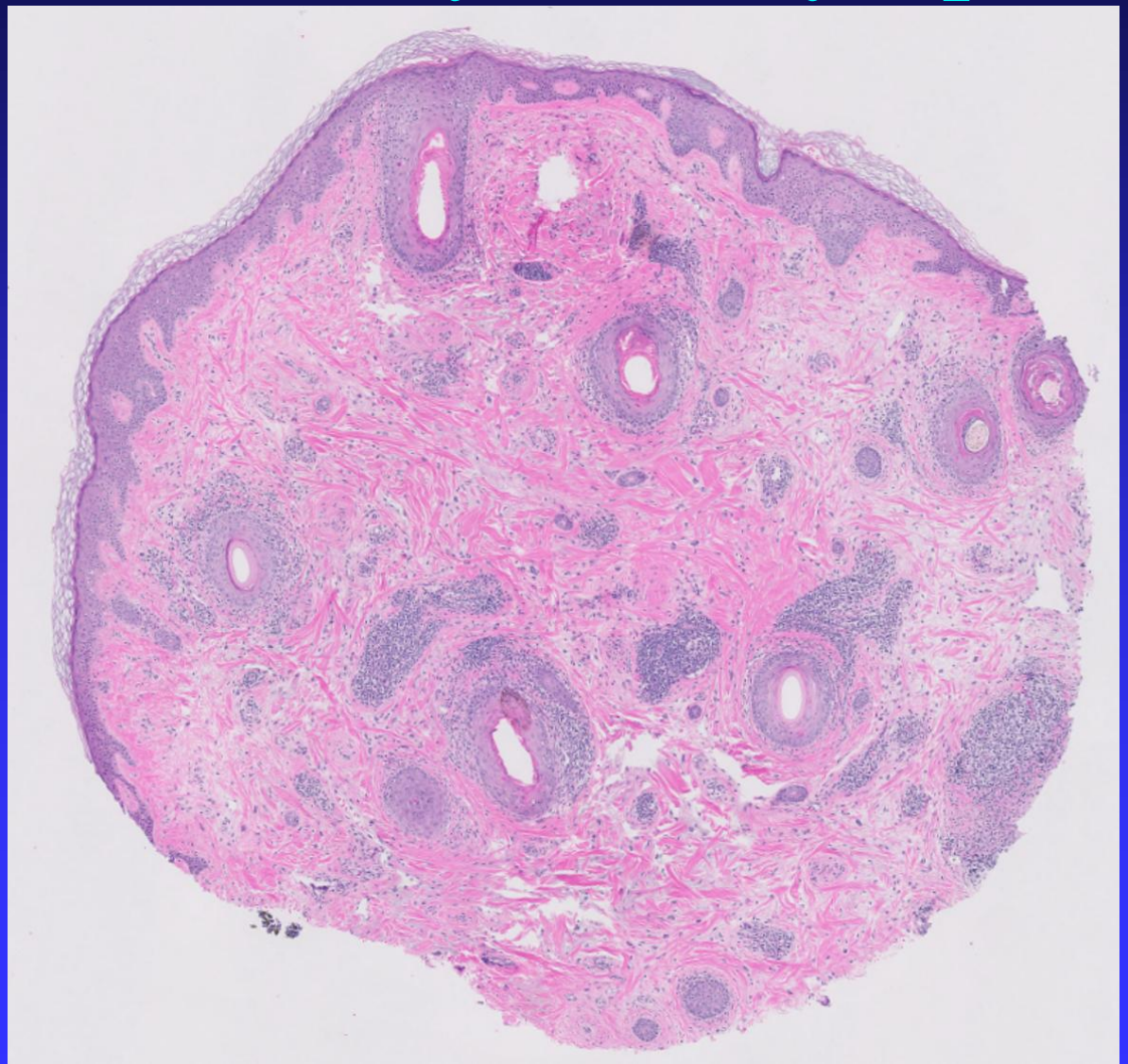


Patient with only FFA symptoms

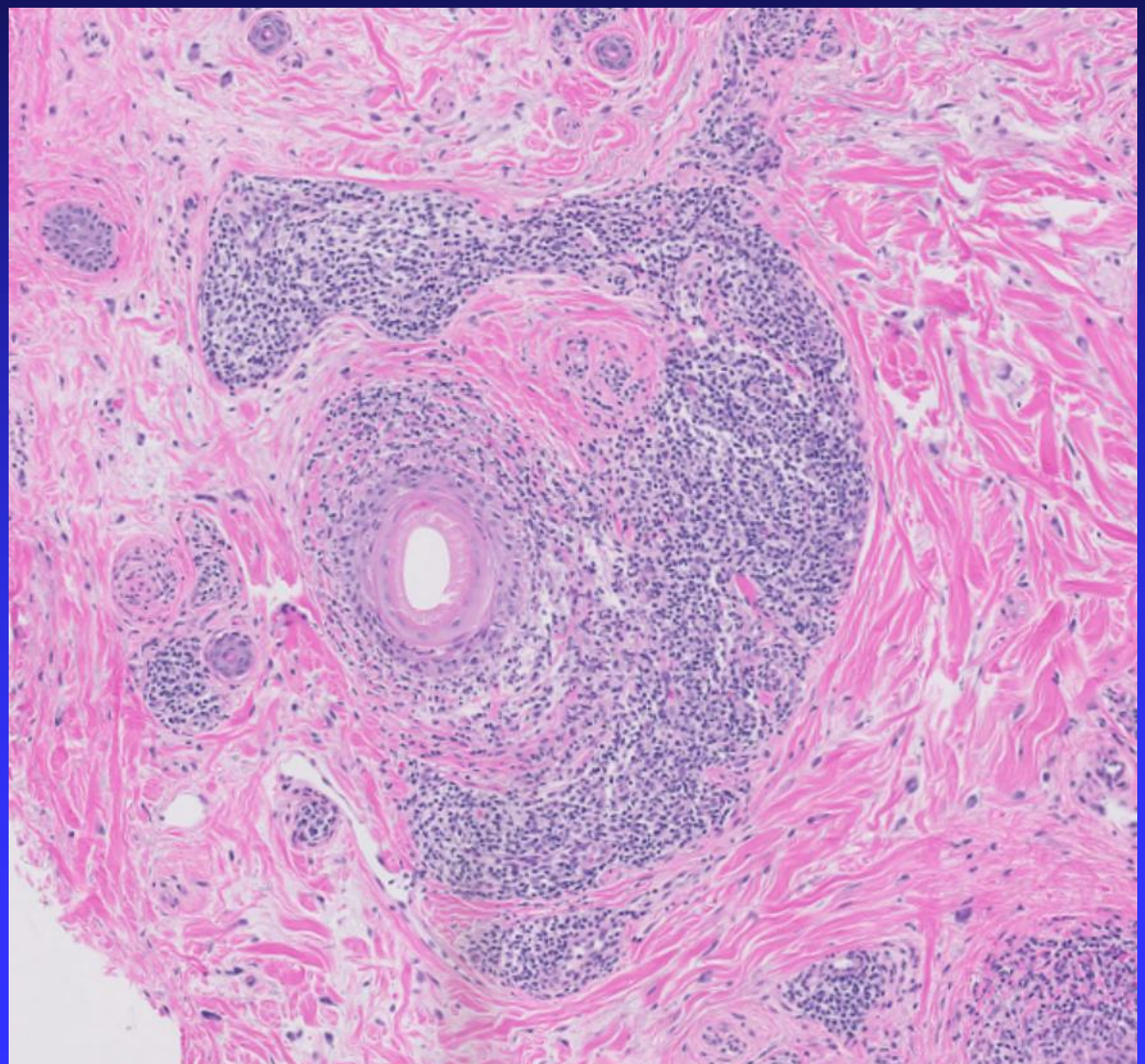
Patient with only FFA symptoms



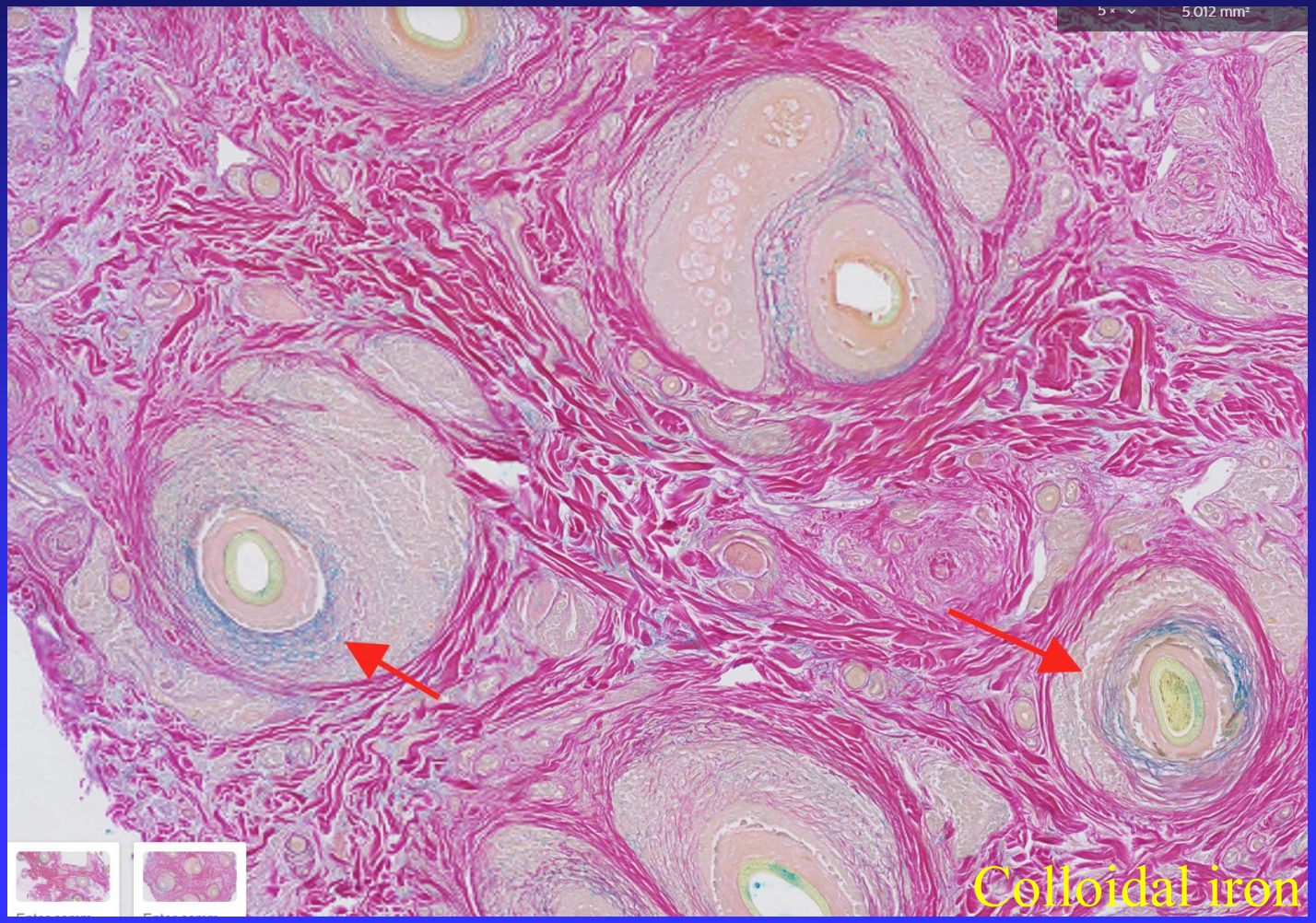
Patient with only FFA symptoms



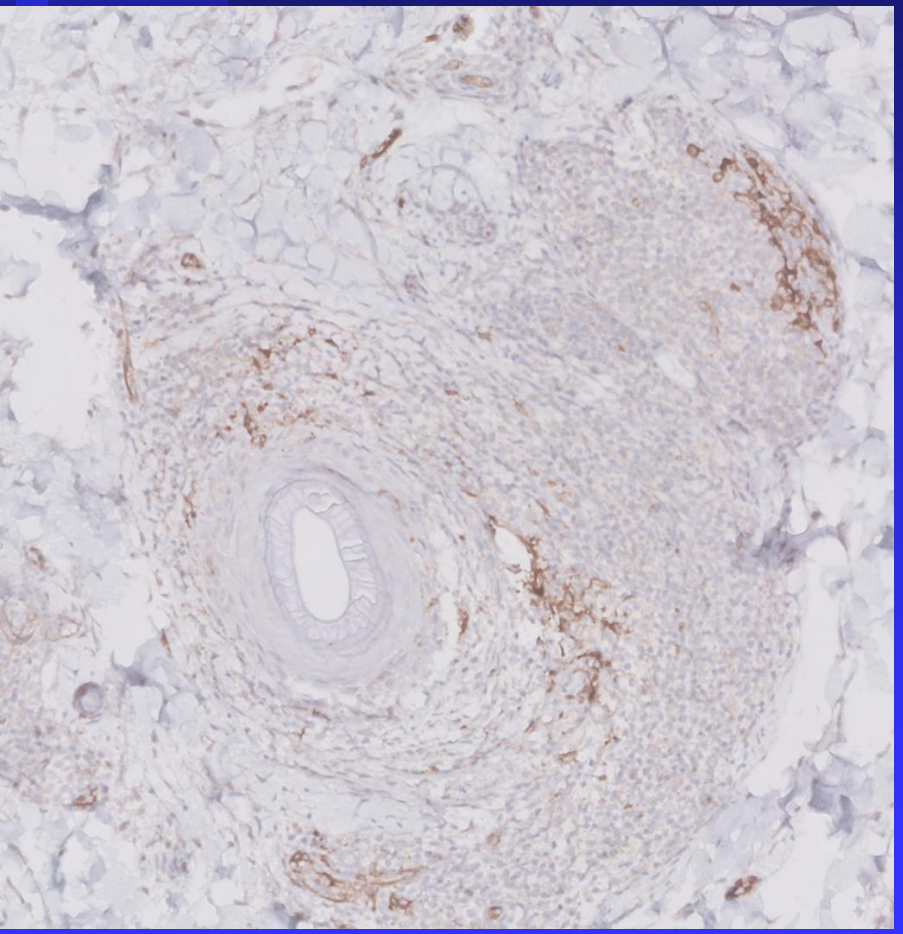
Patient with only FFA symptoms

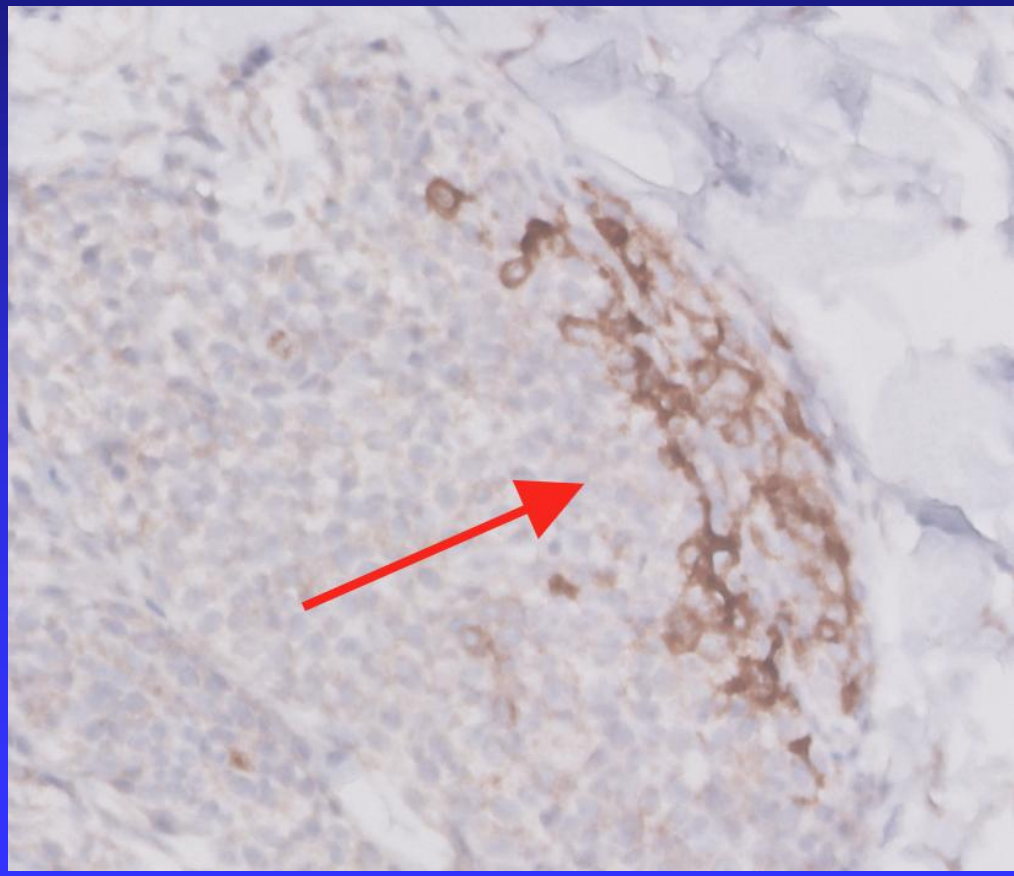


No significant perifollicular fibromyxoid scarring



CD123 “Clusters”

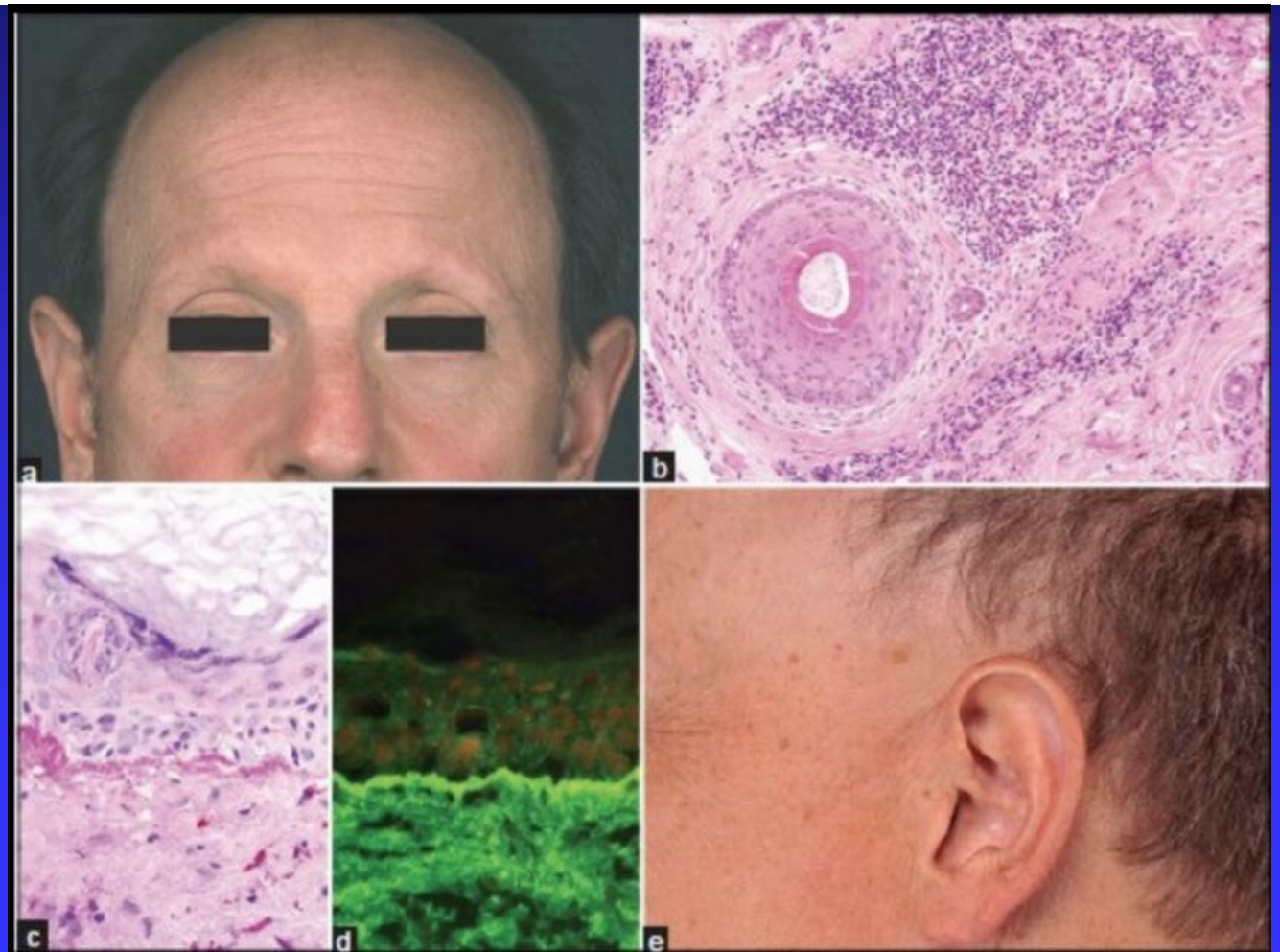




Case Reports > Int J Trichology. 2013 Oct;5(4):217-9. doi: 10.4103/0974-7753.130420.

Frontal fibrosing alopecia and lupus overlap in a man: guilt by association?

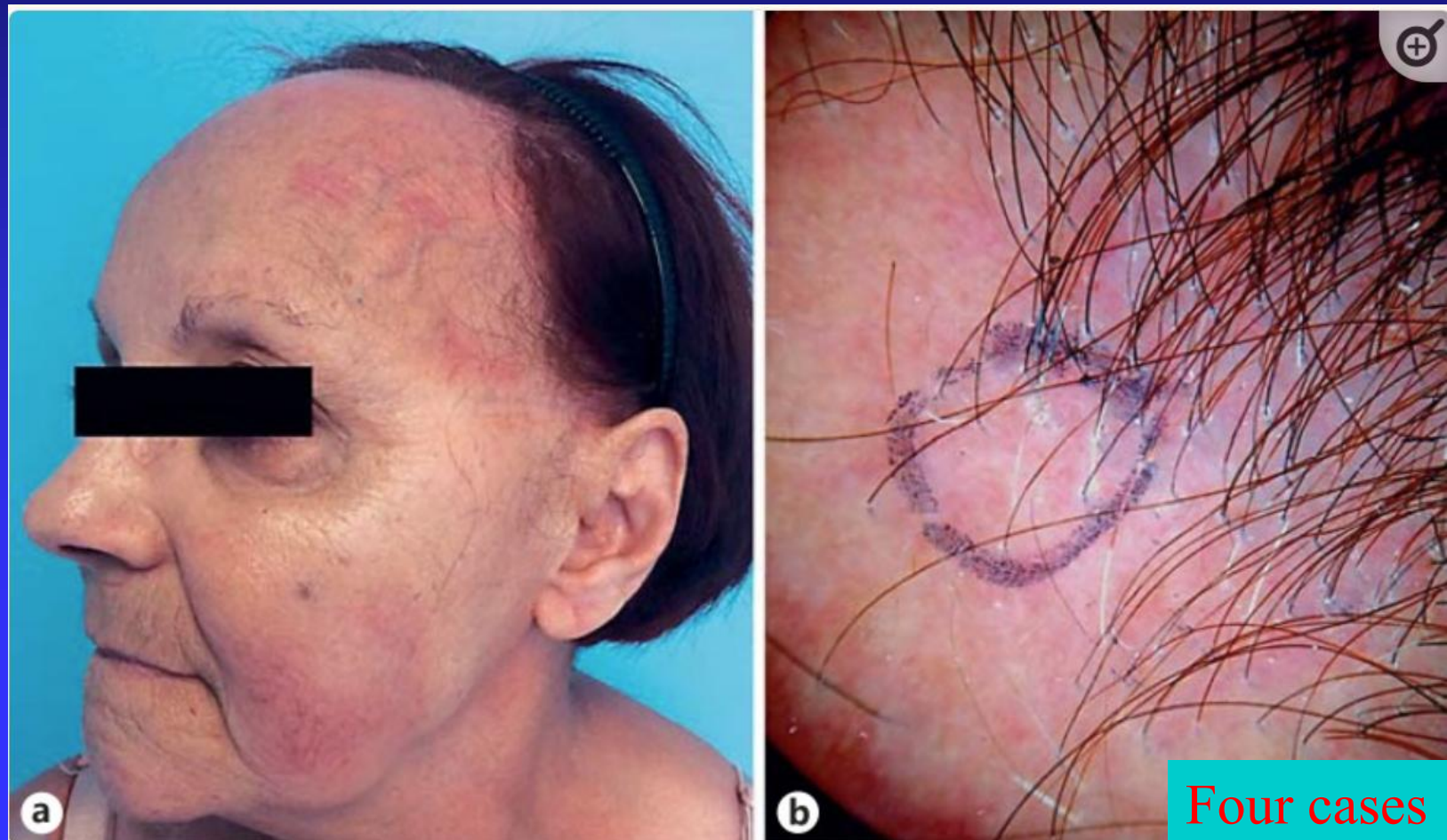
Sabrina Khan [1], David A Fenton [2], Catherine M Stefanato [1]



Skin Appendage Disord. 2017 Jan; 2(3-4): 162–165.
Published online 2016 Nov 12. doi: 10.1159/000452925
PMCID: PMC5264358
PMID: 28232926

Frontal Fibrosing Alopecia Coexisting with Lupus Erythematosus: Poor Response to Hydroxychloroquine

Letícia Arsie Contin, Elisa Raquel Martins da Costa Marques, and Leandro Noriega*



Four cases

Alopecic LE does not look anything like LPP histologically

Lymphocytic
- Chronic cutaneous lupus erythematosus
- Lichen planopilaris
  - Classic lichen planopilaris
  - Frontal fibrosing alopecia
  - Graham-Little syndrome
- Classic pseudopelade (Brocq)
- Central centrifugal cicatricial alopecia
- Alopecia mucinosa
- Keratosis follicularis spinulosa decalvans

Neutrophilic
- Folliculitis decalvans
- Dissecting cellulitis/folliculitis (*perifolliculitis capitis abscedens et suffodiens*)

Mixed
- Folliculitis (acne) keloidalis
- Folliculitis (acne) necrotica
- Erosive pustular dermatosis

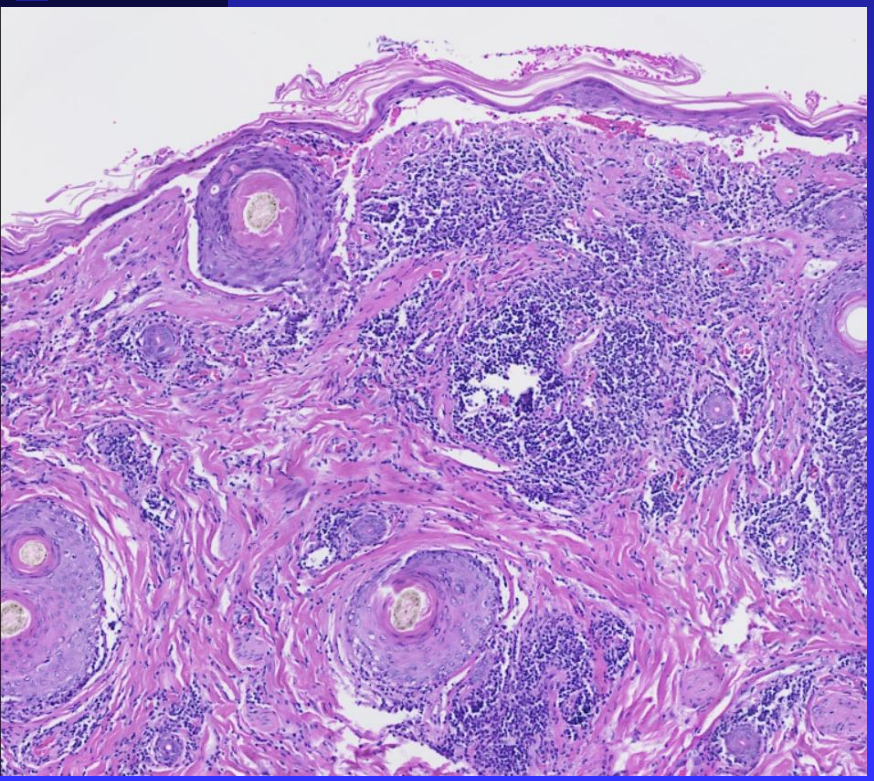
Nonspecific

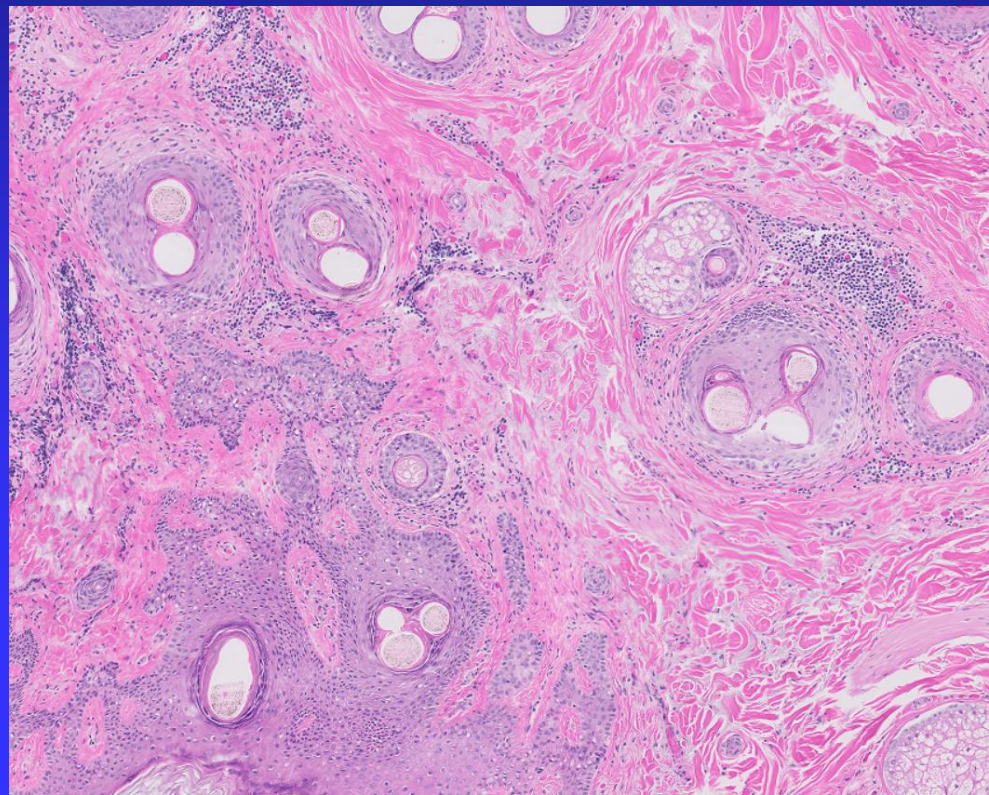
Summary of North American Hair Research Society (NAHRS)-sponsored Workshop on Cicatricial Alopecia, Duke University Medical Center, February 10 and 11, 2001

Elise A. Olsen, MDa • Wilma F. Bergfeld, MDb • George Cotsarelis, MDc • Vera H. Price, MDd • Jerry Shapiro, MDe • Rodney Sinclair, MDf • Alvin Solomon, MDg • Leonard Sperling, MDh • Kurt Stenn, MDi • David A. Whiting, MDj the members of the Workshop on Cicatricial Alopecia* • Show less

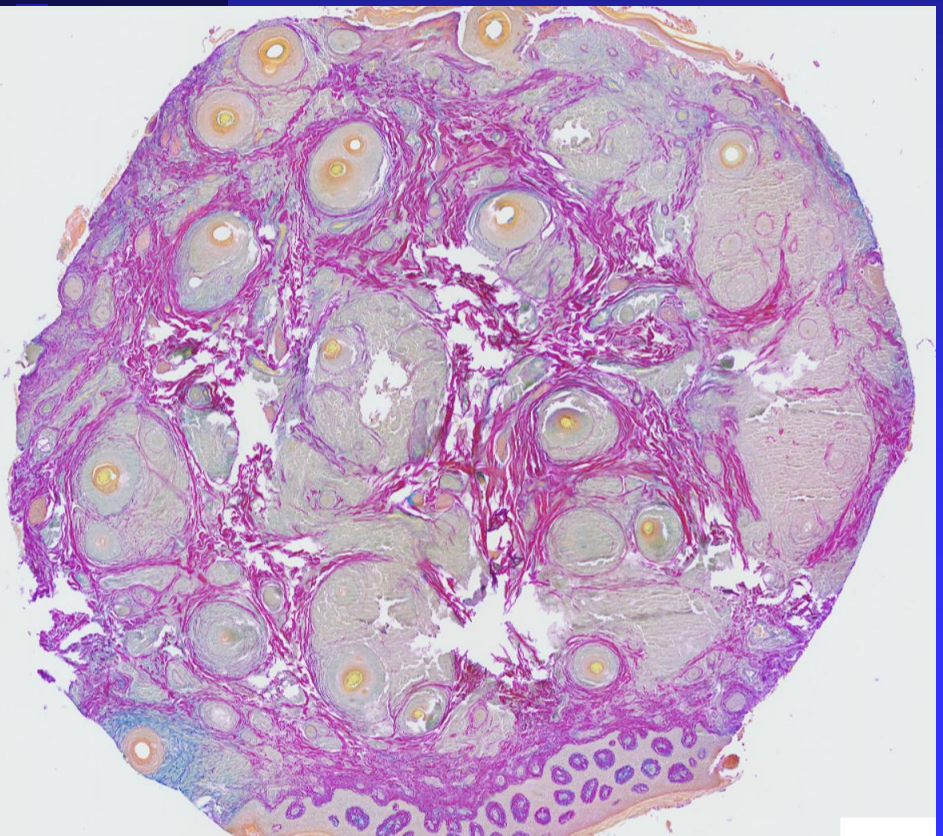
DOI: https://doi.org/10.1067/mjd.2003.68

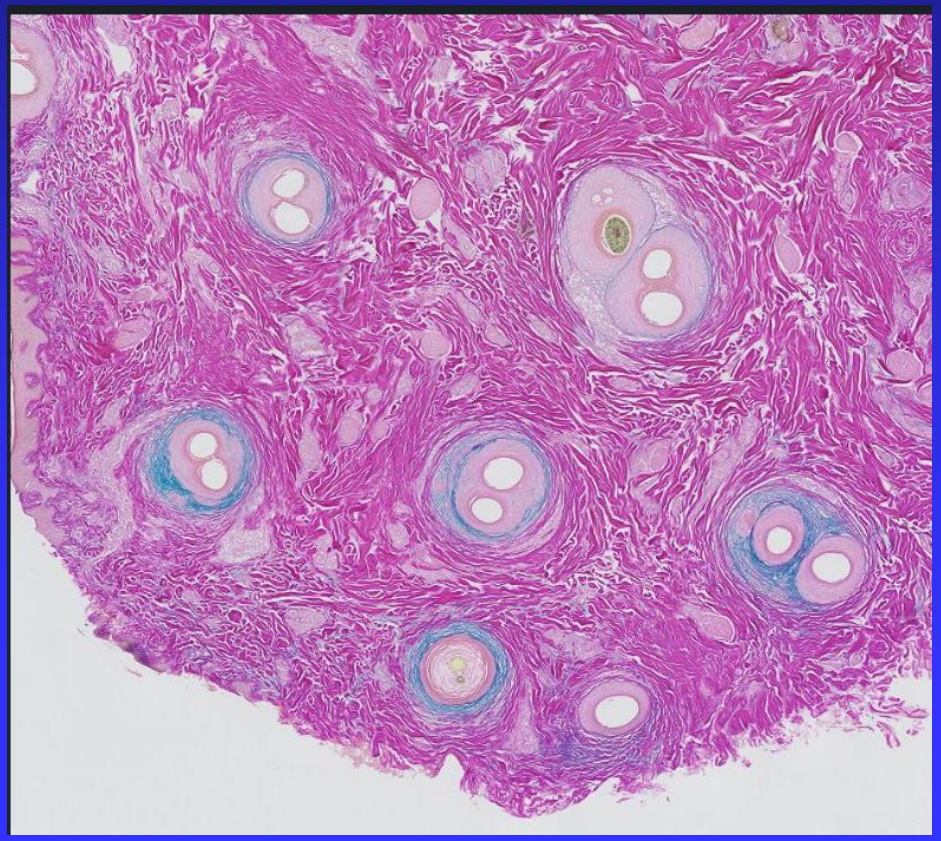
Alopecic LE does not look anything like LPP histologically





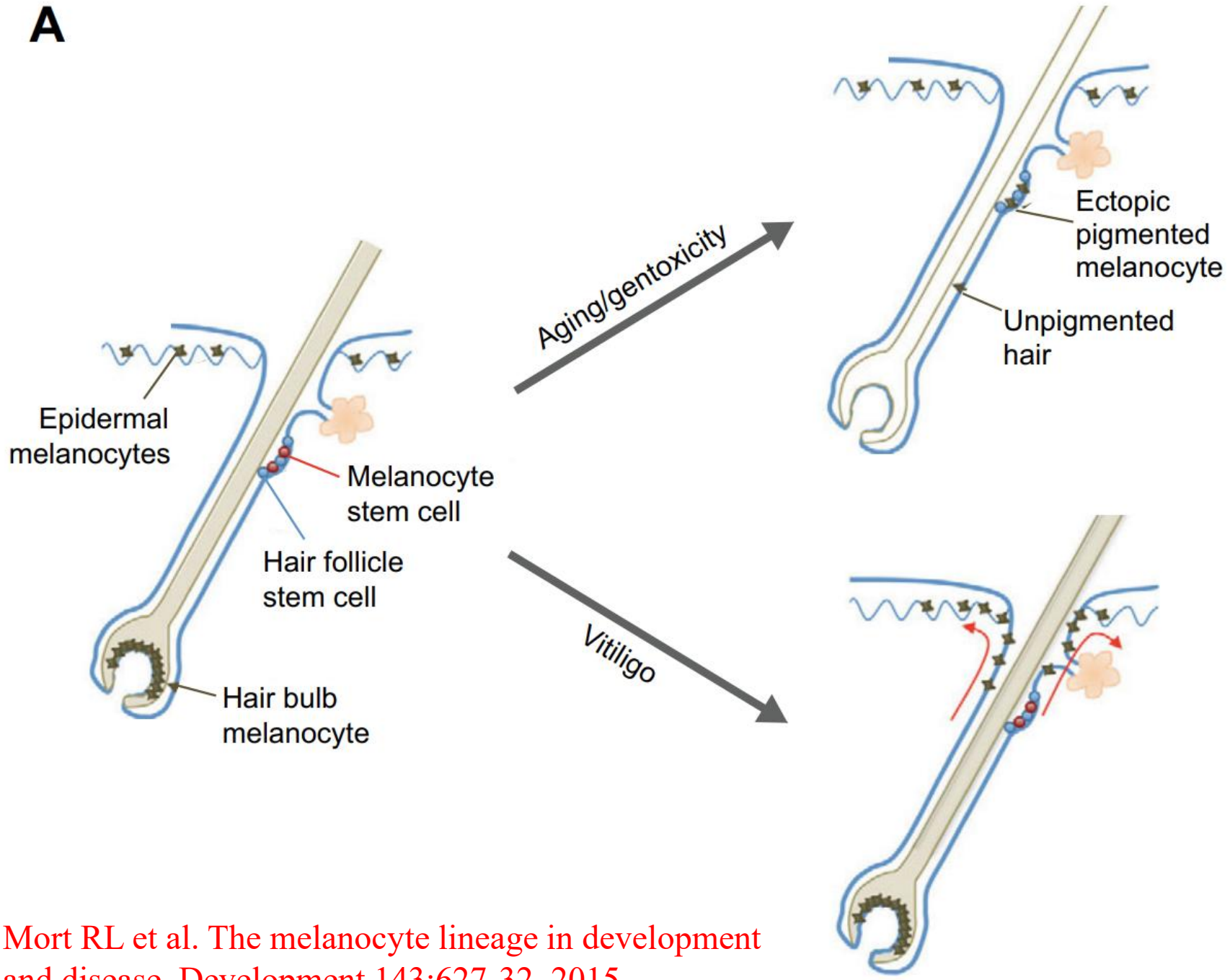
Alopecic LE does not look anything LPP histologically





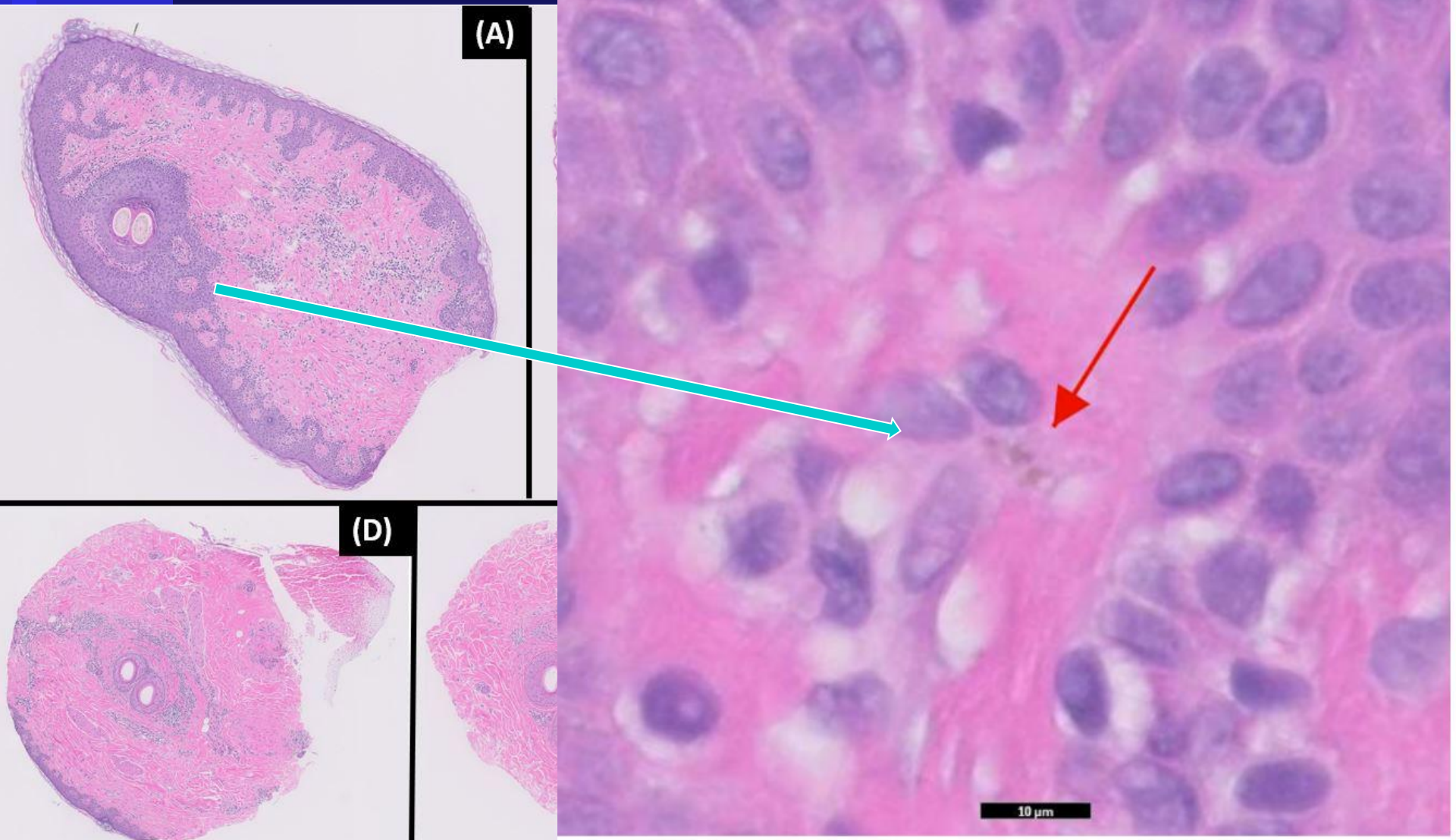
Vitiligo and FFA

De Souza B, Burns L, Senna MM. Frontal fibrosing alopecia preceding the development of vitiligo: A case report. JAAD Case Rep 6(2):154-55, 2020.



Mort RL et al. The melanocyte lineage in development and disease. Development 143:627-32, 2015.

Pigment incontinence in FFA



Lichen Planus Pigmentosus/FFA

- Mostly skin type >IV

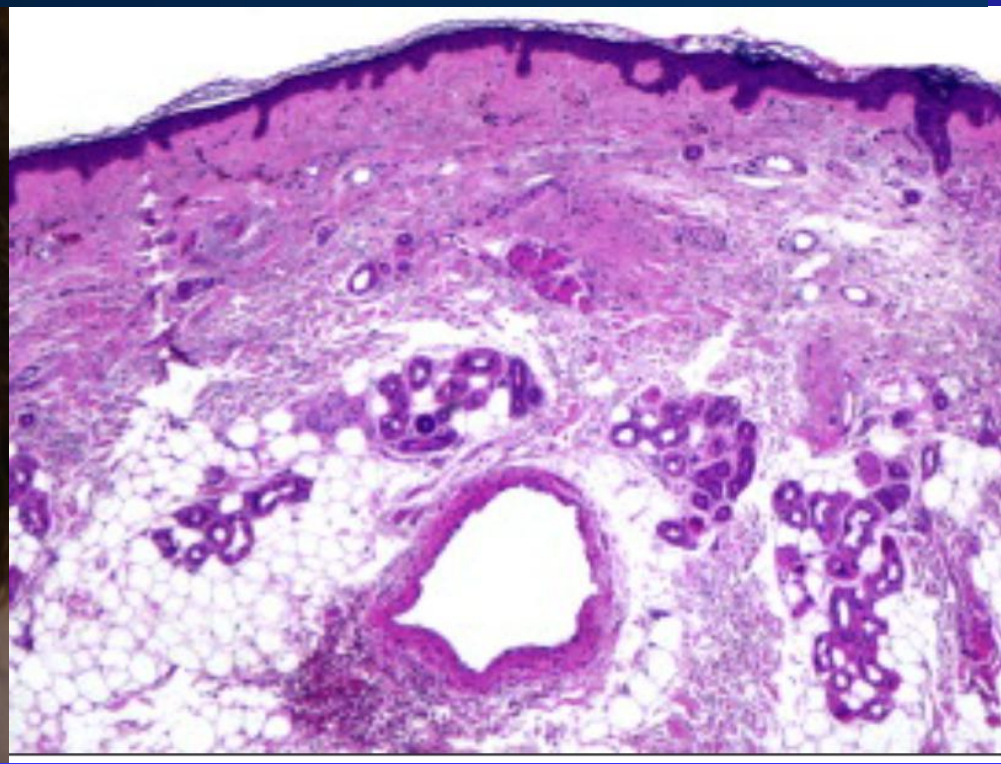
Verzi AE et al. Association of frontal fibrosing alopecia with facial papules and lichen planus pigmentosus in a Caucasian woman. Skin Appendage Disord 6:379-83, 2020.

LETTER | VOLUME 72, ISSUE 6, P1087-1088, JUNE 01, 2015

Depression of the frontal veins: A new clinical sign of frontal fibrosing alopecia

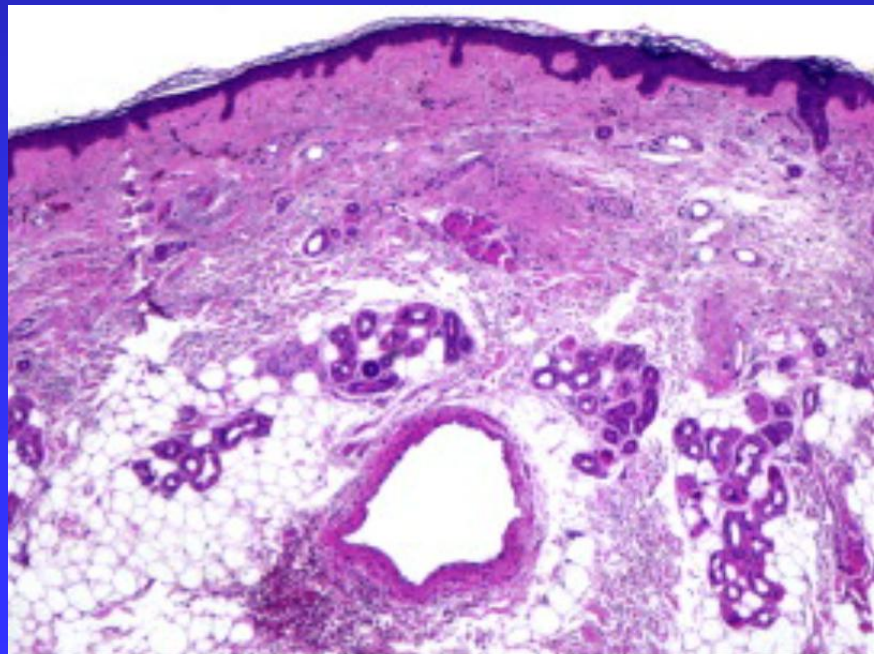
Sergio Vañó-Galván, MD, PhD • Ana Rita Rodrigues-Barata, MD • Marta Urech, MD • ...
John Paoli, MD, PhD • Jesús Cuevas, MD, PhD • Pedro Jaén, MD, PhD • Show all authors

DOI: https://doi.org/10.1016/j.jaad.2015.02.1129



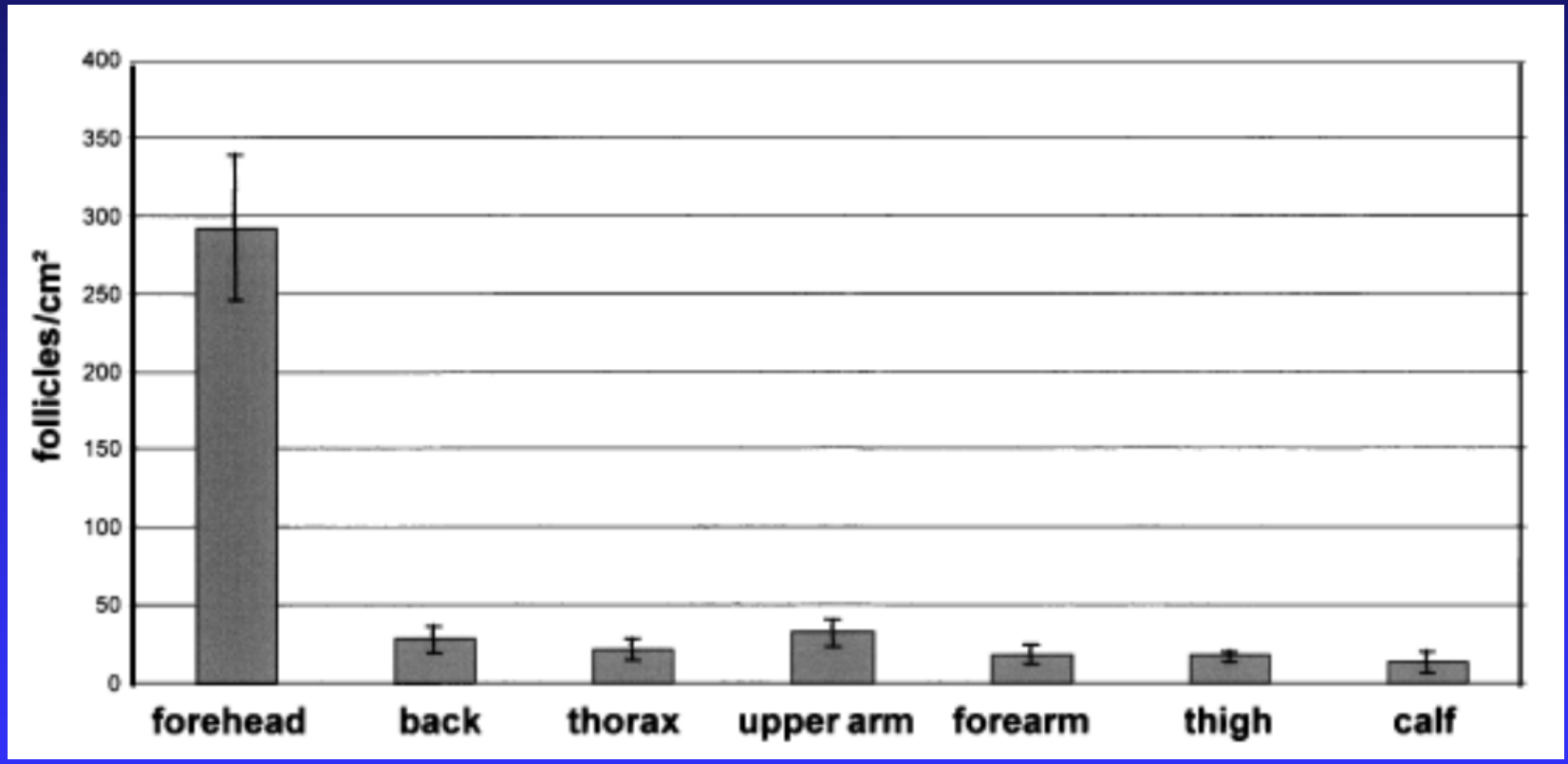
Prominent veins

- Forehead has most follicles on body
  - 292 versus 29 follicles/cm2 on the back
- Loss of follicles=Major architectural change



Otberg N et al. Variations of hair follicle size and distribution in different body sites. J Invest Dermatol 122:14-19, 2004.

Follicular density varies with anatomic site



Otberg N et al. Variations of Hair Follicle Size and Distribution in DifferentBody Sites. J Invest Dermatol 122:14-19, 2004.

Beard alopecia in FFA shows up after limb hair loss

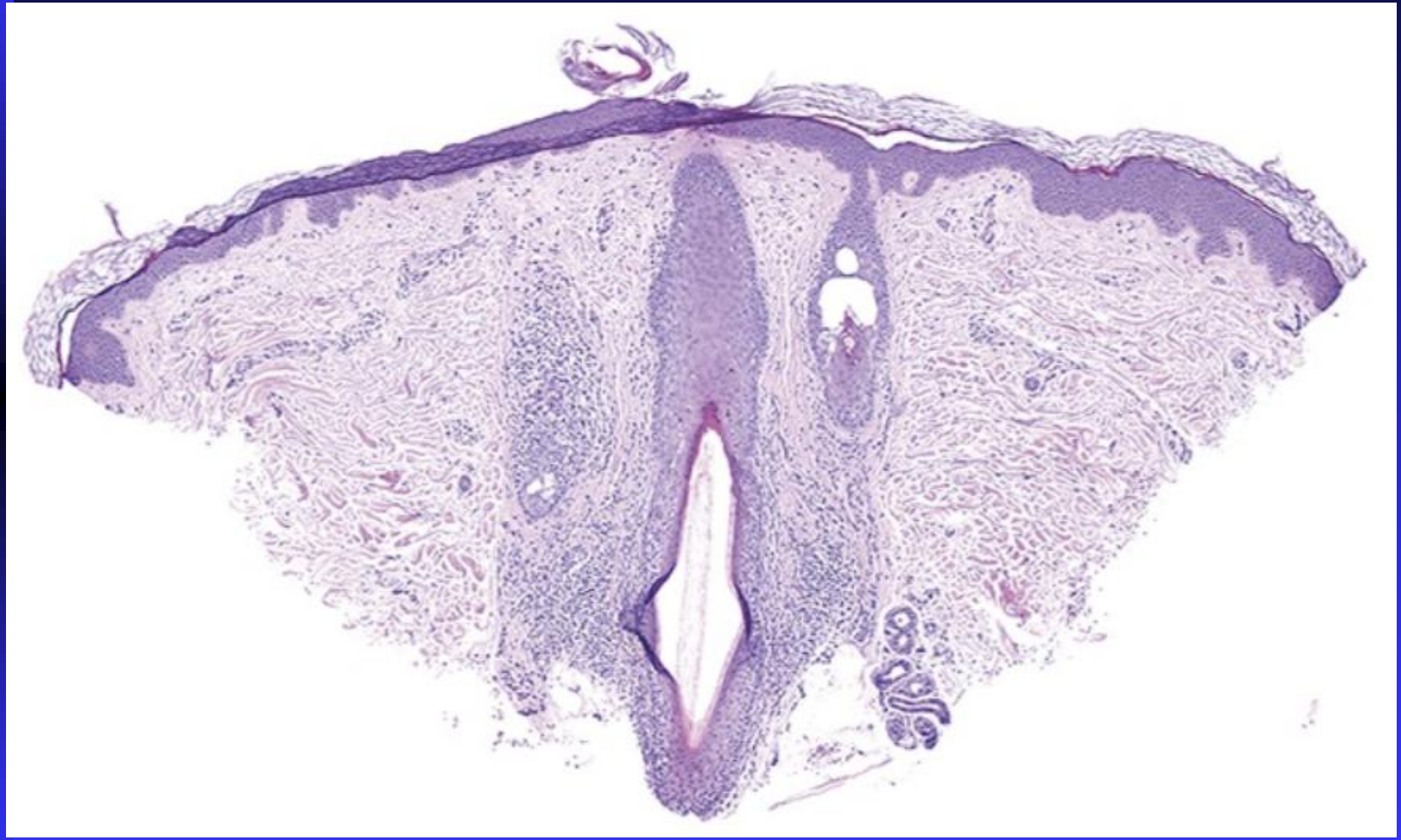
Salido-Vallejo R, Garnacho-Saucedo G, Moreno-Gimenez JC, Camacho-Martinez FM. Beard involvement in a man with frontal fibrosing alopecia. Indian J Dermatol Venereol Leprol. 2014 Nov-Dec;80(6):542-4. doi: 10.4103/0378-6323.144183. PMID: 25382516.

Frontal Fibrosing Alopecia Involving the Limbs Shows Inflammatory Pattern on Histology: A Review of 13 Cases

Miteva, Mariya MD **Author Information**

The American Journal of Dermatopathology: March 2020 - Volume 42 - Issue 3 - p 226-229
doi: 10.1097/DAD.0000000000001500

FFA Limbs



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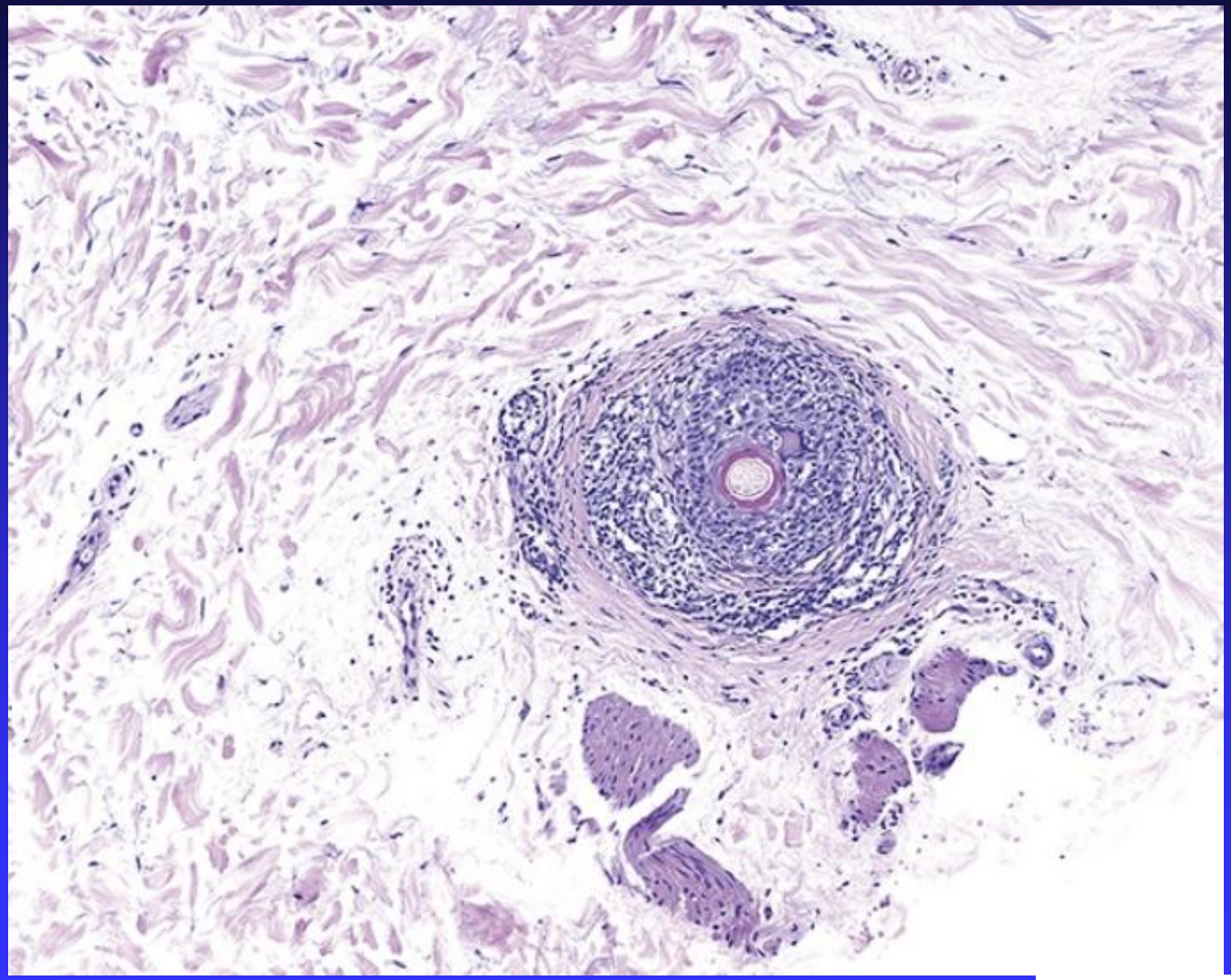

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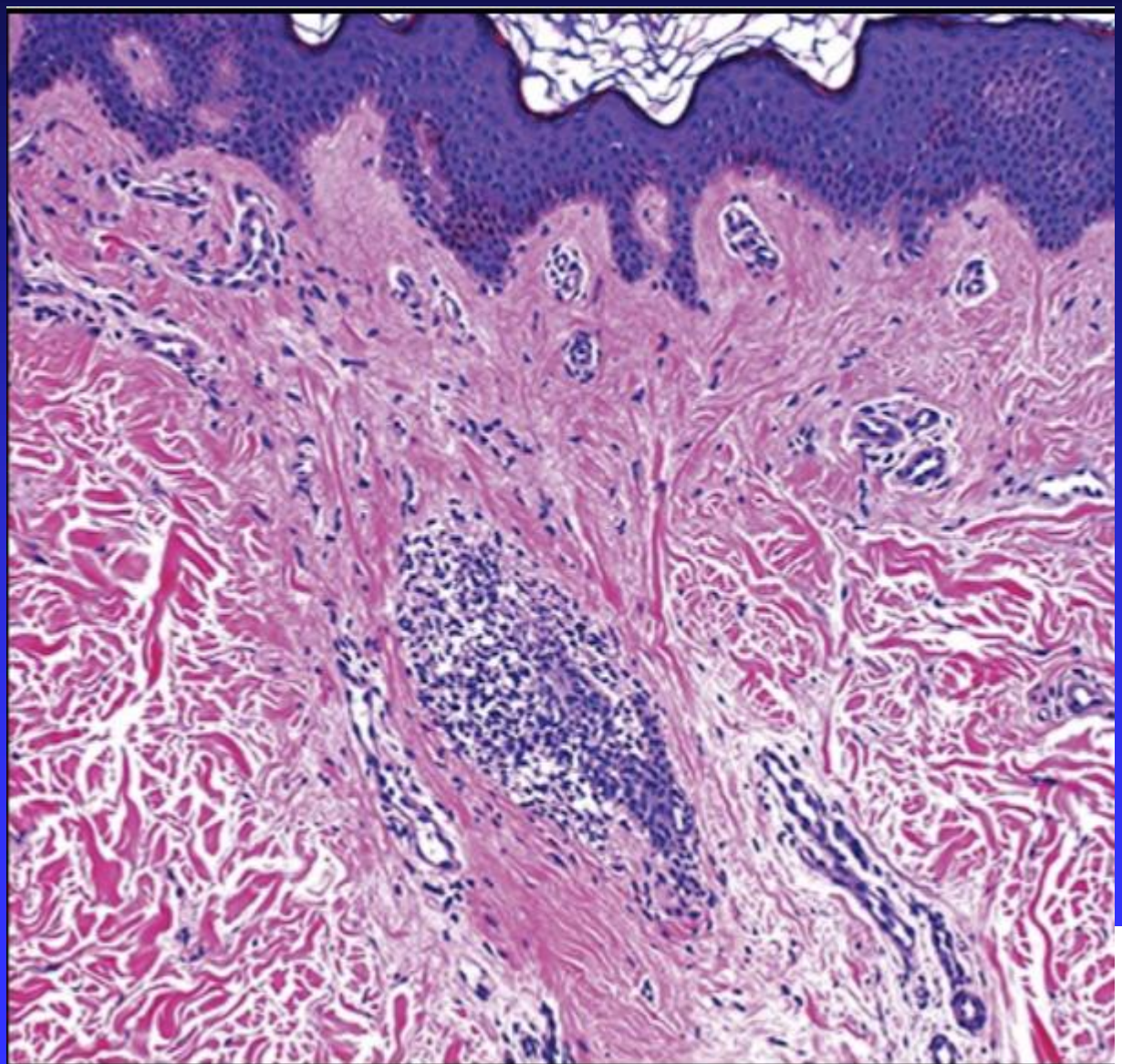

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doi: 10.1097/DAD.0000000000001500

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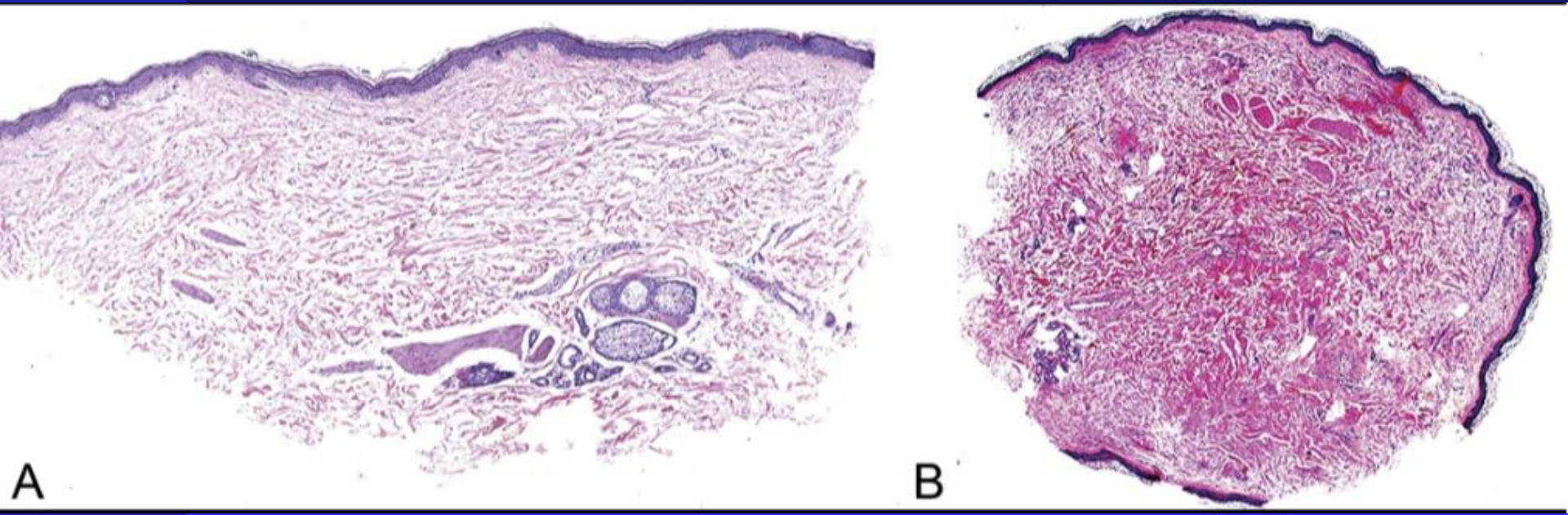

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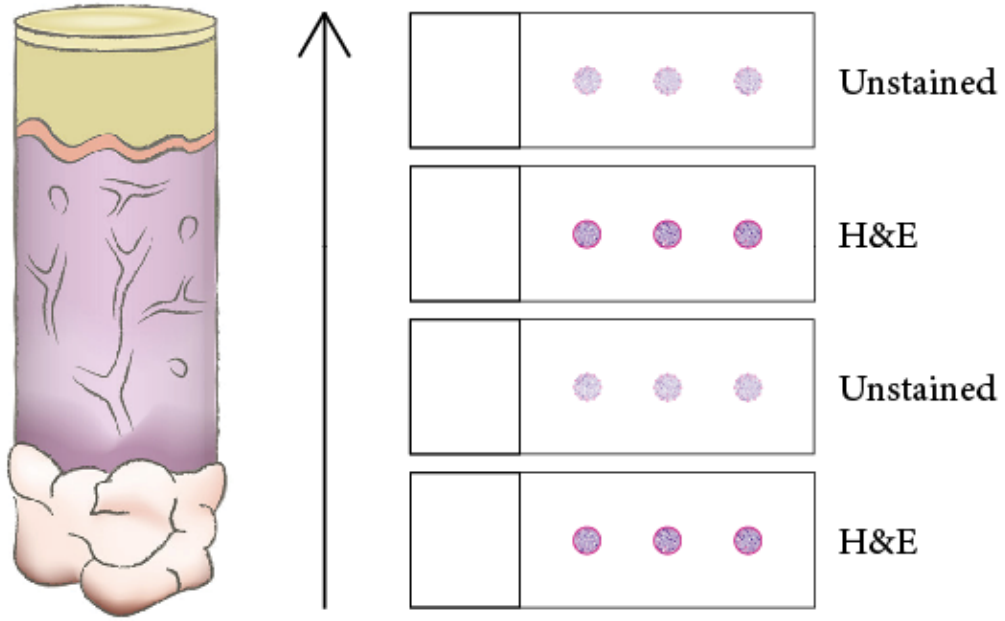
The American Journal of Dermatopathology: March 2020 - Volume 42 - Issue 3 - p 226-229
doi: 10.1097/DAD.0000000000001500

Summary of FFA Lesions

- FAPD—Likely same chemical cause in hair product (touch up dye)
- Lupus may present alone as FFA or in conjunction with LPP-like FFA
- Pigmentary alteration—multiple causes
- Beard FFA follows limb loss
- Limb/body biopsies are variable/challenging

A method for more precise sampling of the scalp and eyebrows in frontal fibrosing alopecia

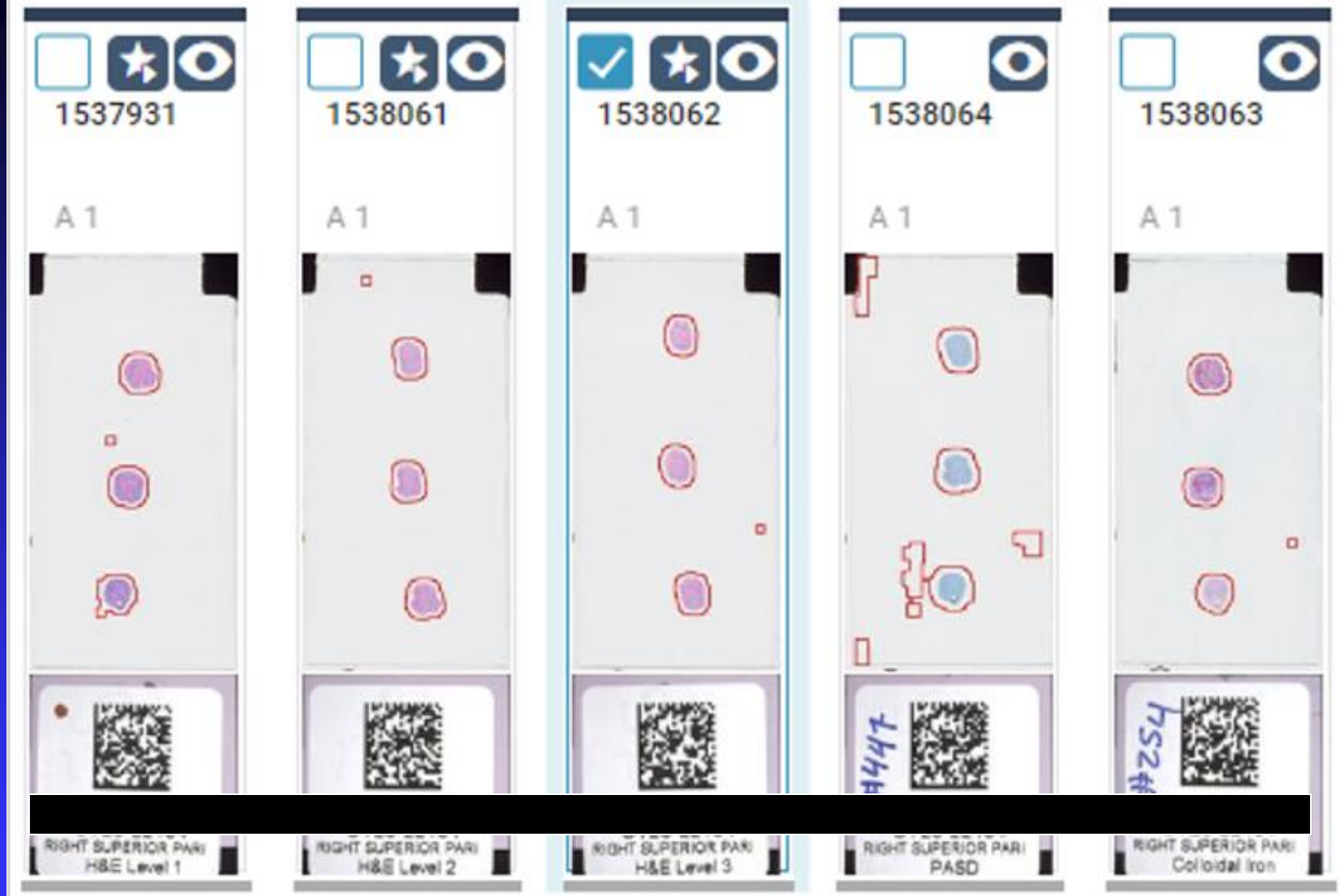
Curtis T. Thompson, MD,[a,b,c] and Antonella Tosti, MD[d]
Portland, Oregon, and Miami, Florida



Epi-down

6 slides total with 18 cross sections; 3 sections per slide

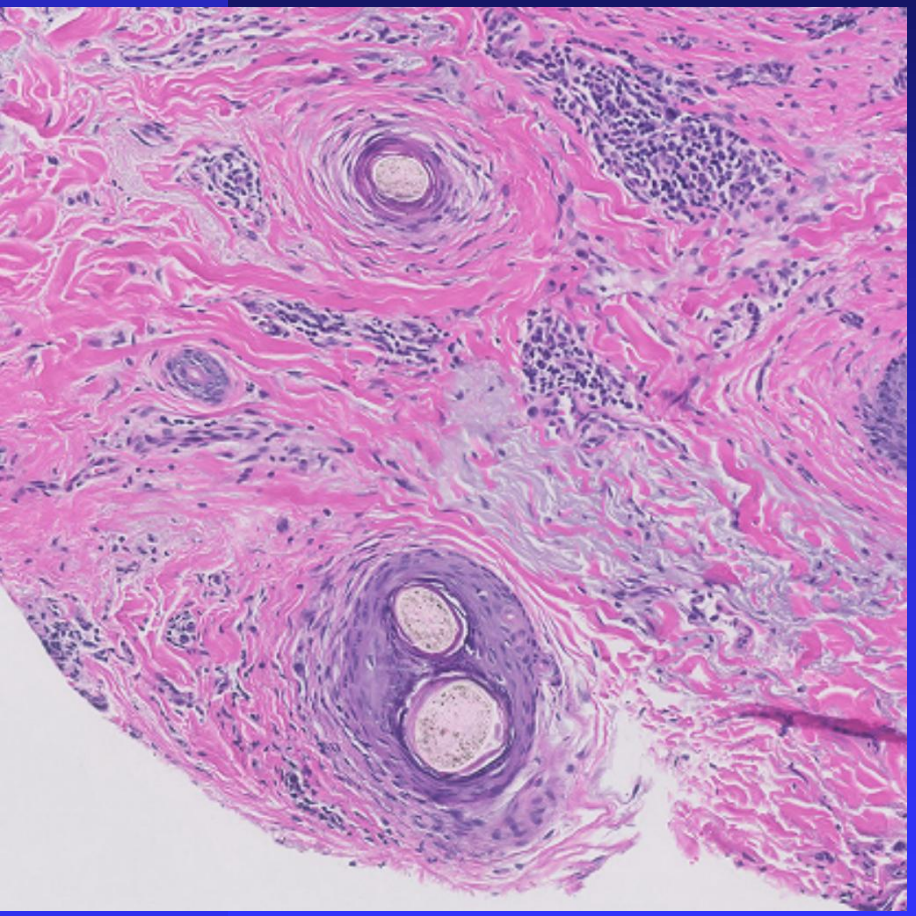
1. Tissue is embedded epidermis-down
2. Step through entire block on initial H&E stains
3. Obtain unstained slides

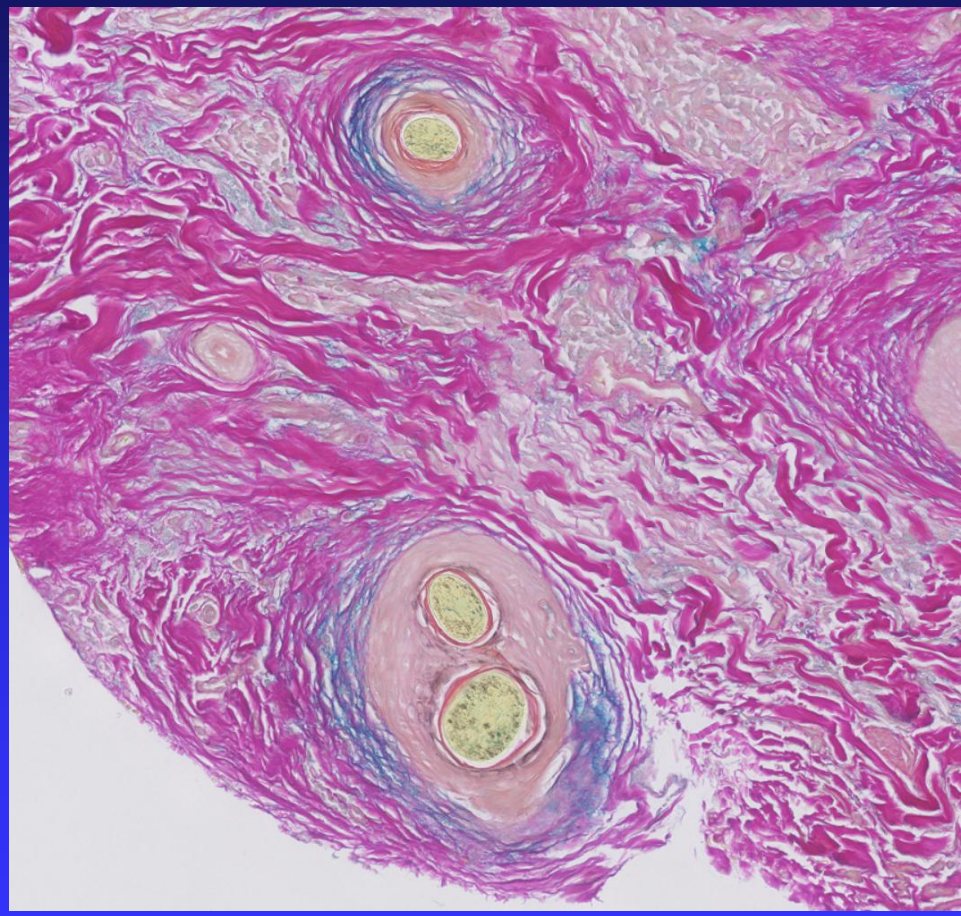


A method for more precise sampling of the scalp and eyebrows in frontal fibrosing alopecia

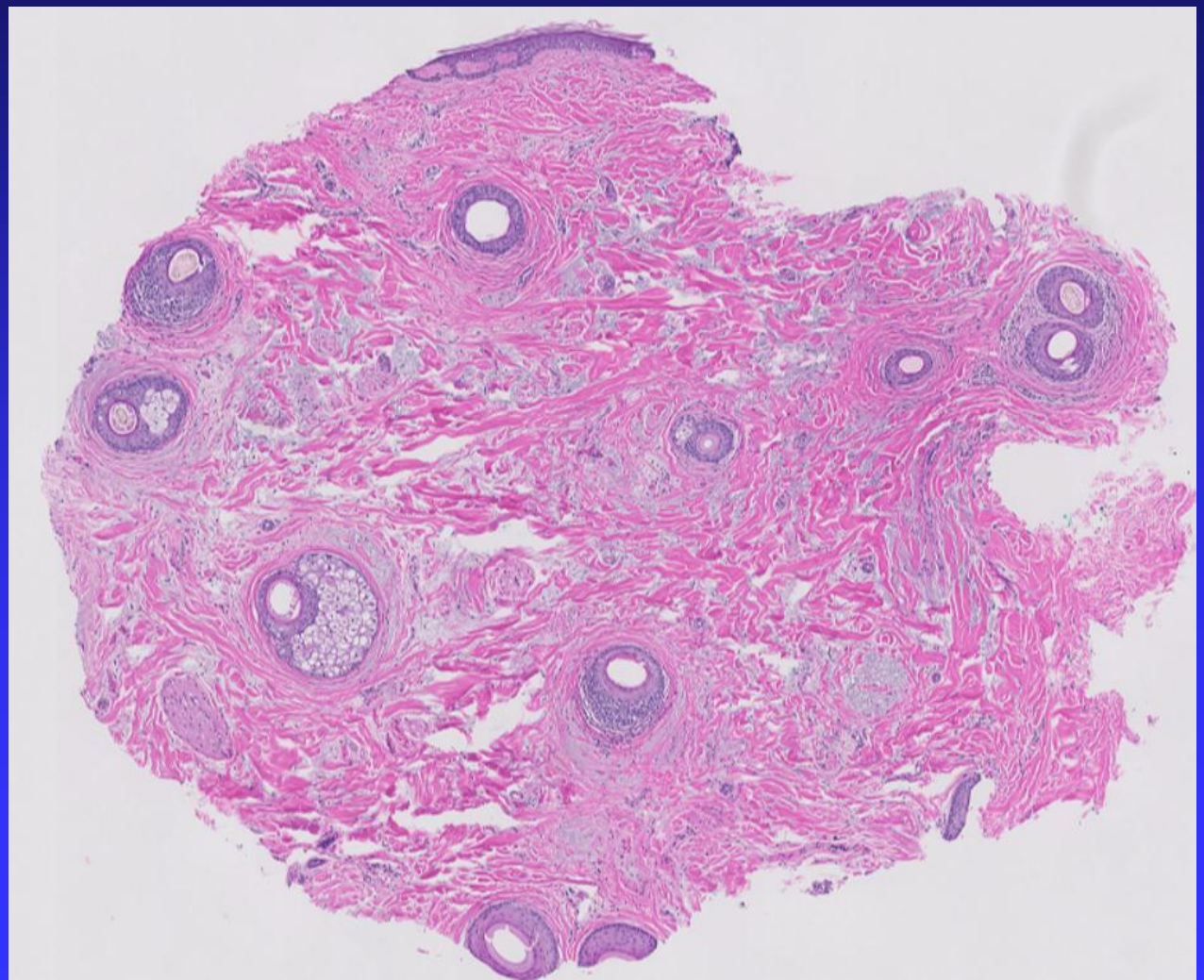
Curtis T. Thompson, MD,[a,b,c] and Antonella Tosti, MD[d]
Portland, Oregon, and Miami, Florida

Colloidal Iron finds subtle scarring in FFA

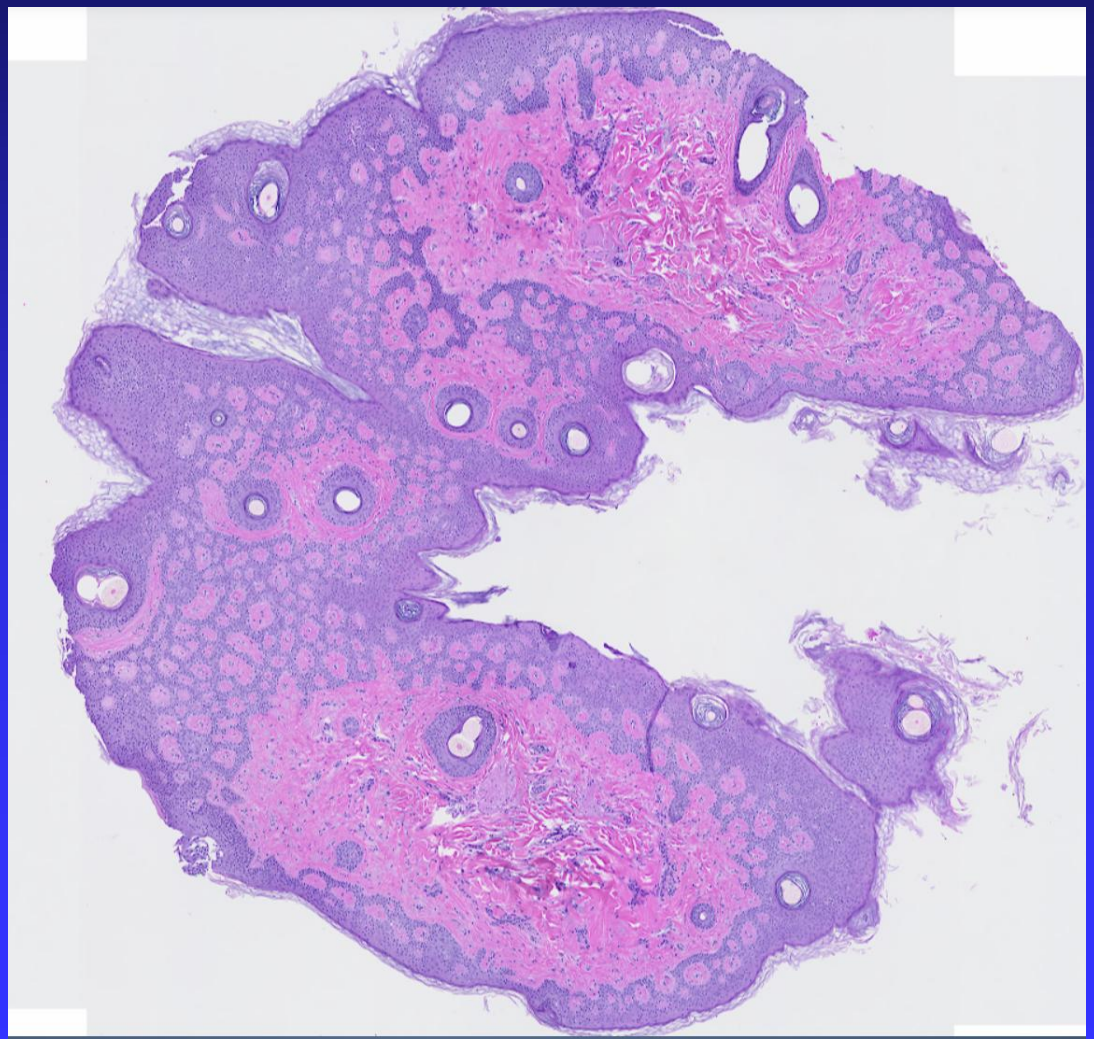


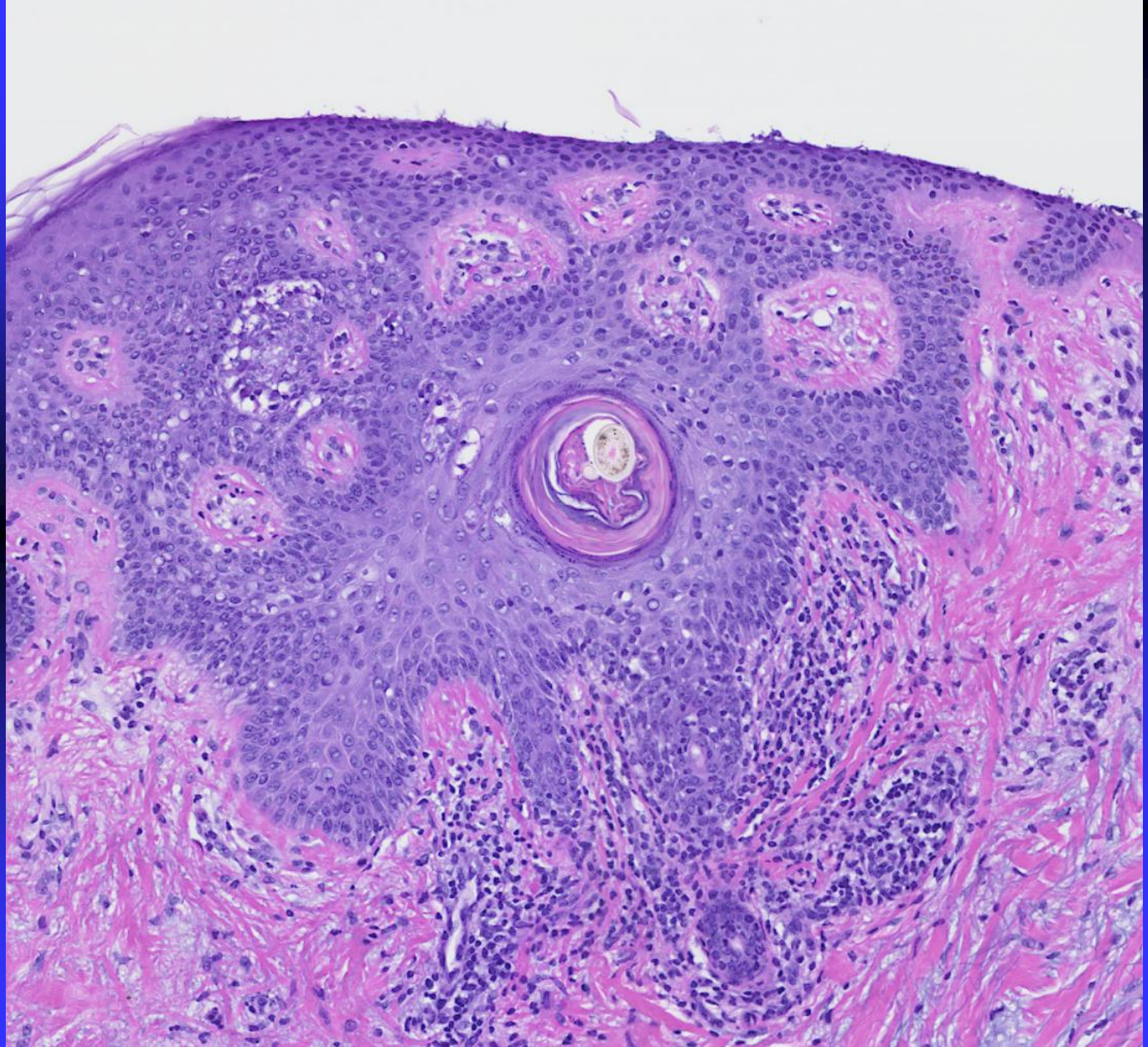


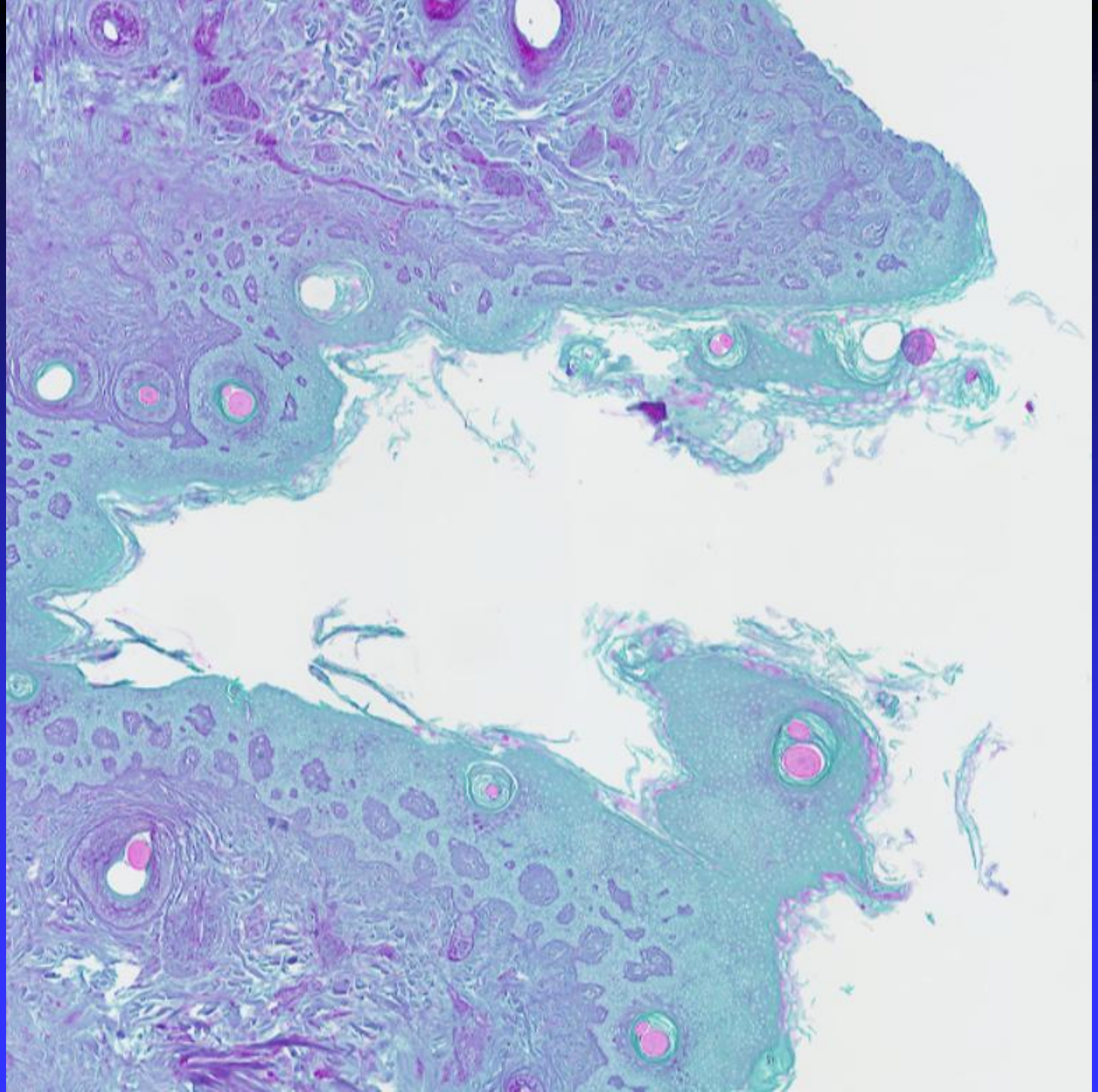
FFA always has a low follicular count/density

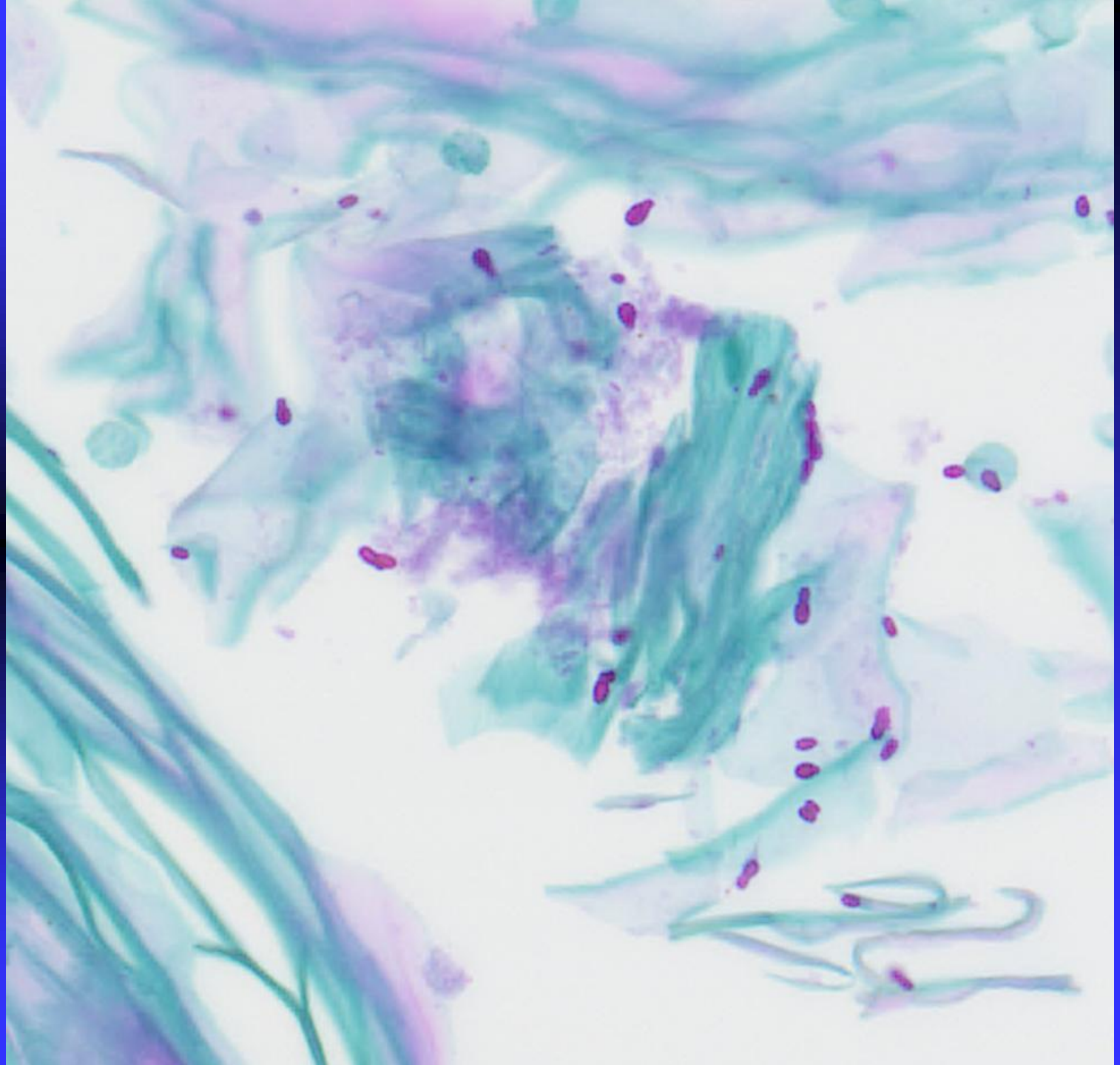


Hyperkeratosis (not parakeratosis) is a clue to seborrheic dermatitis on the scalp

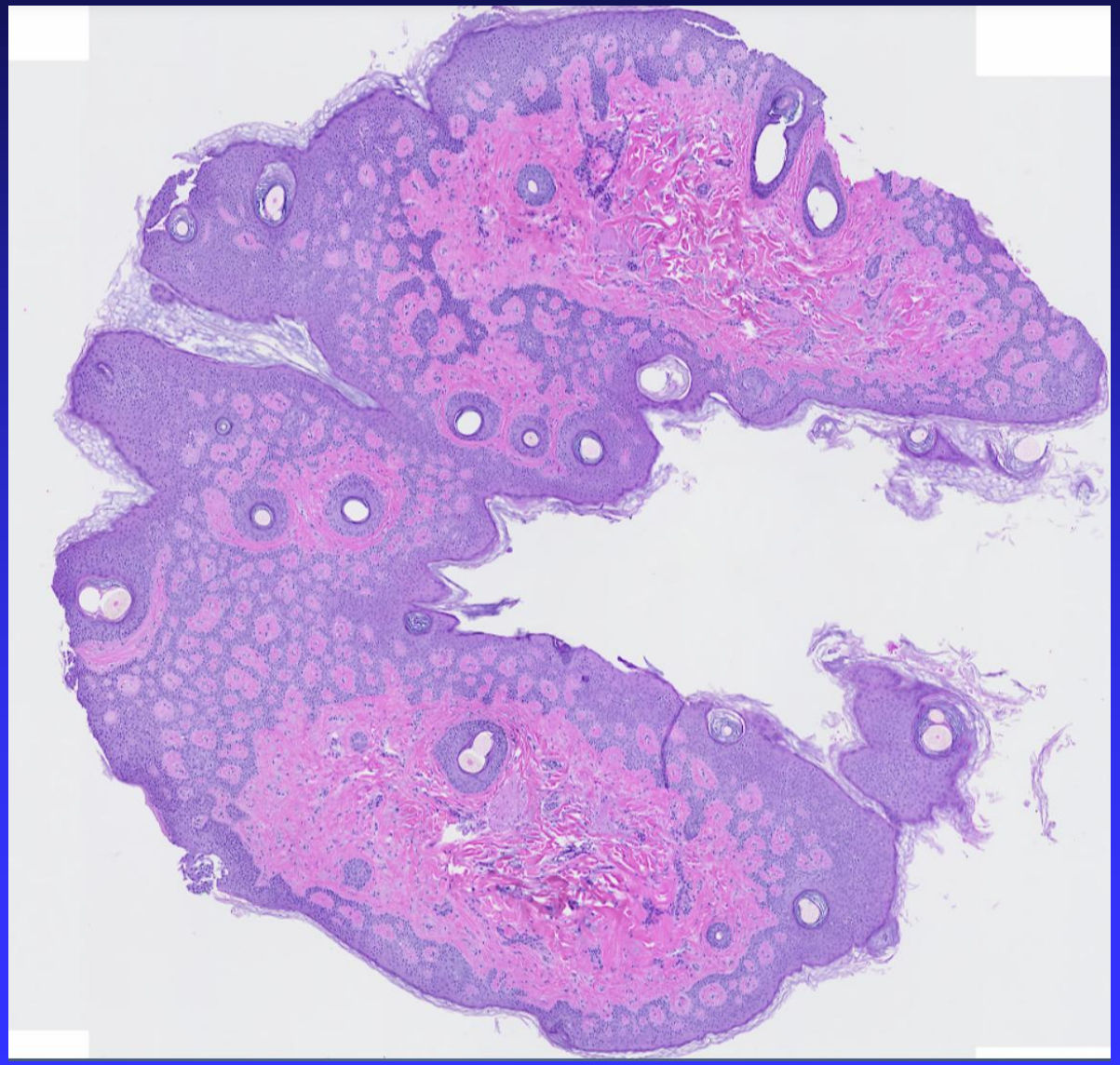




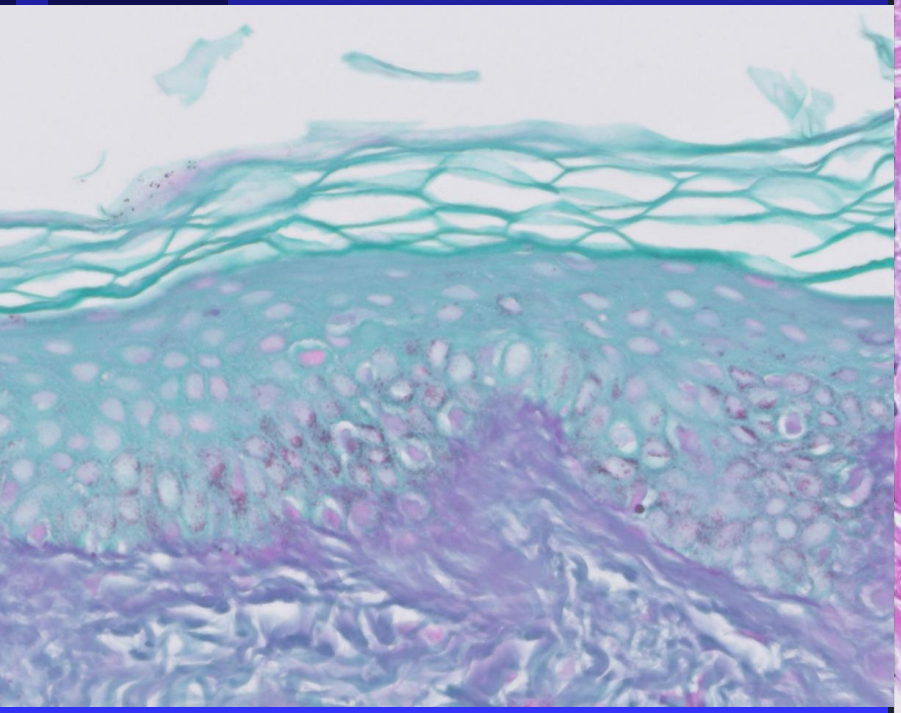


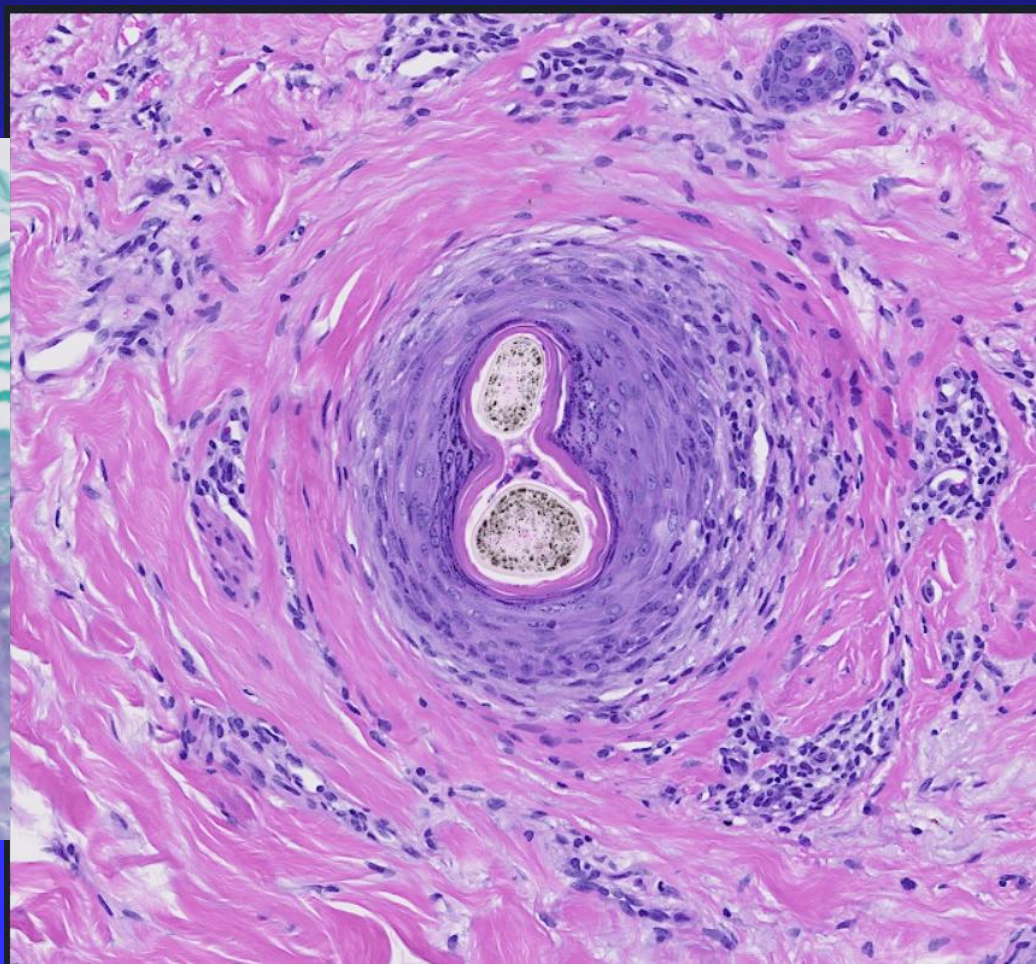


Seborrheic dermatitis—flaky orthokeratosis

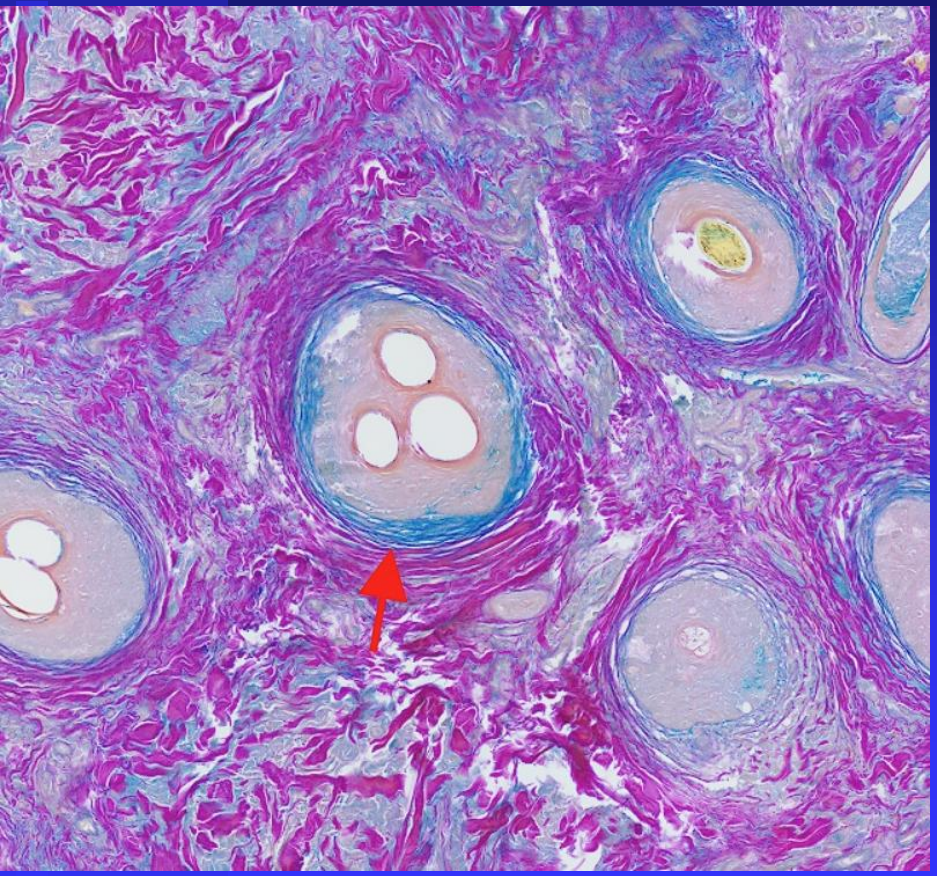


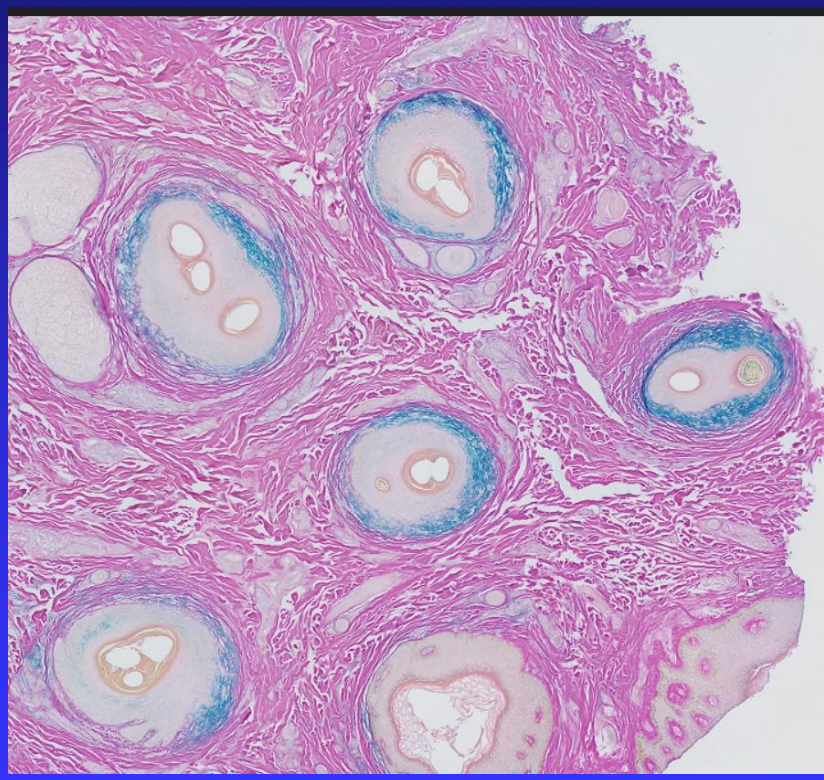
Lack of yeast (seborrheic dermatitis) with lymphocytes present is a clue to LPP/CCCA/FFA and to Folliculitis decalvans





Folliculitis decalvans vs LPP





Folliculitis decalvans vs LPP

Folliculitis decalvans

Men under age 40

Lichen Planopilaris

Women over age 40

Folliculitis decalvans vs LPP

Folliculitis decalvans

Men under age 40

Lichen Planopilaris

Women over age 40

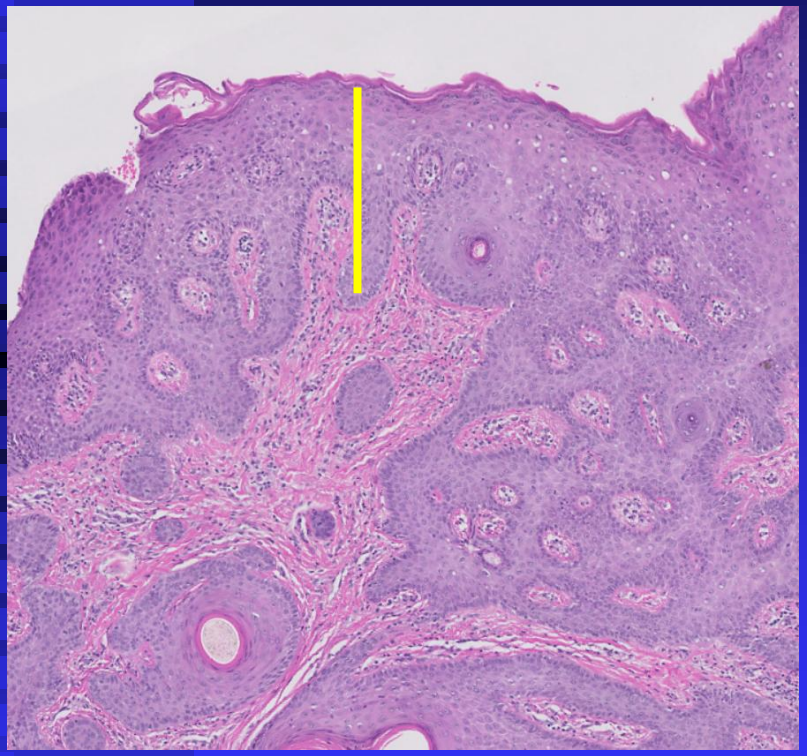
CCCA

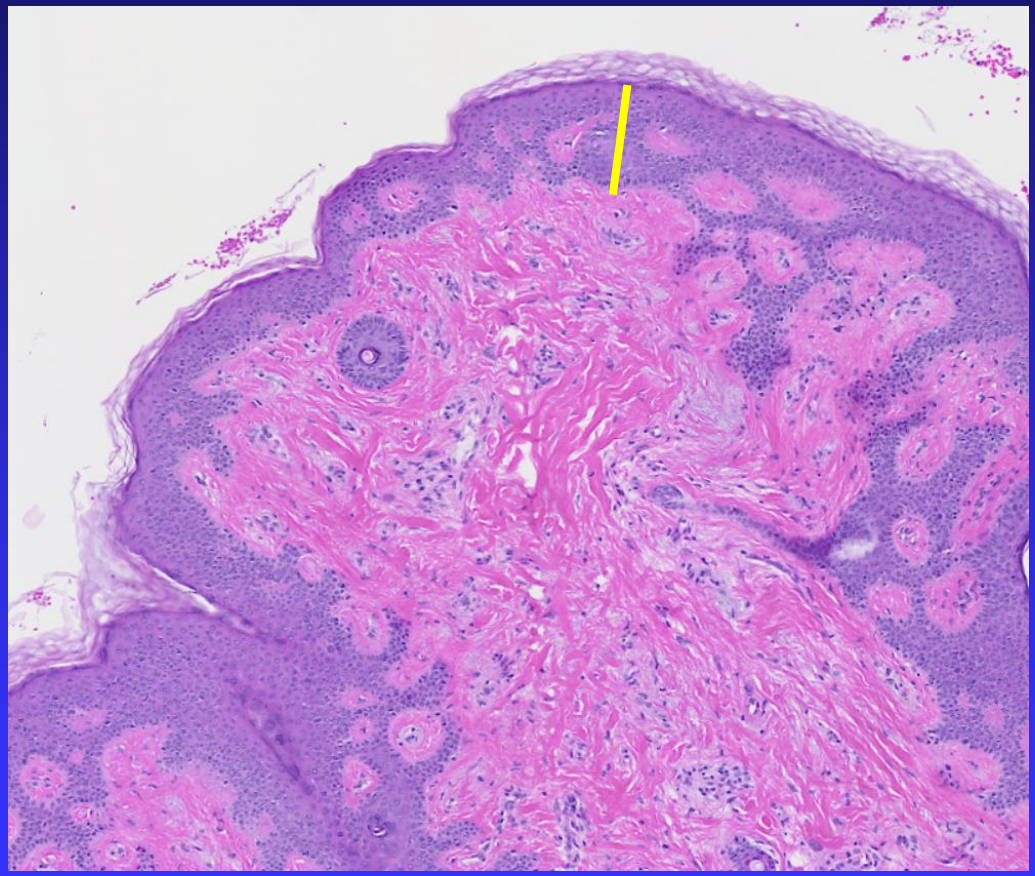
Women of African descent

Fibrosing alopecia in a pattern distribution (FAPD)

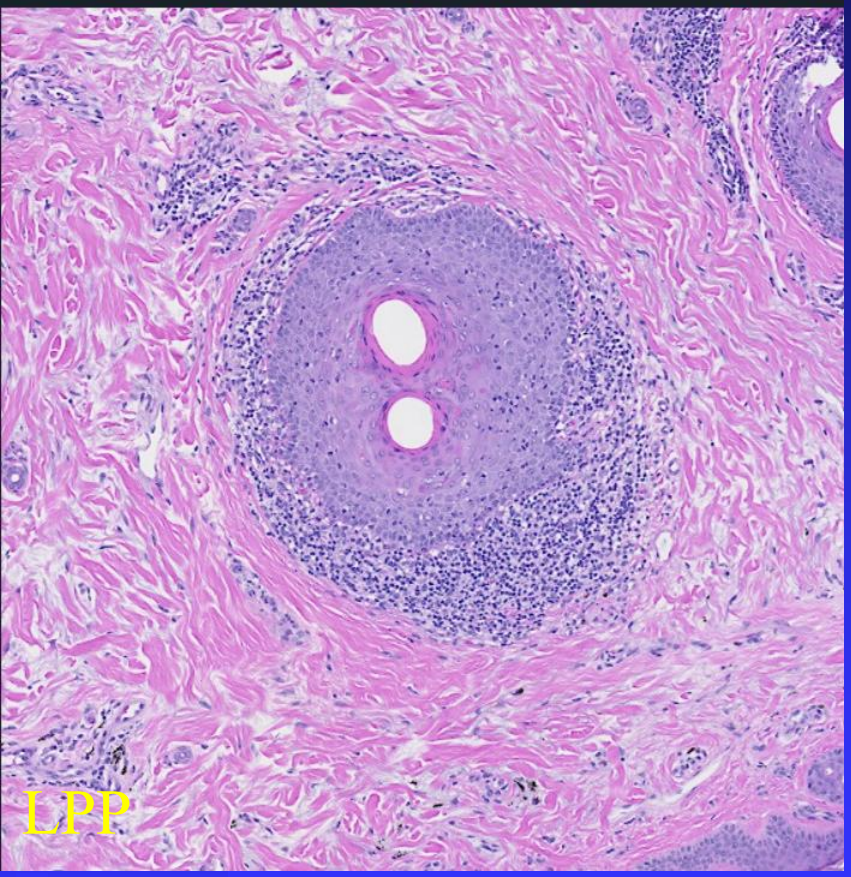
Postmenopausal women with pattern hair loss

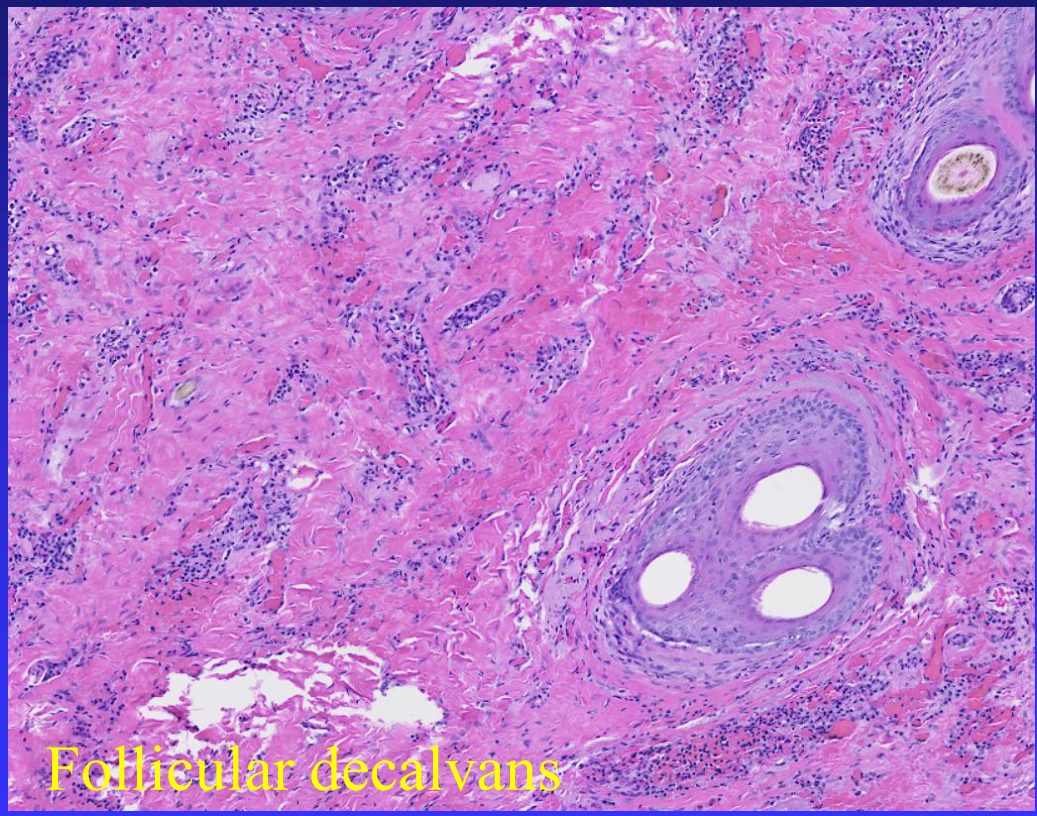
Folliculitis decalvans vs LPP



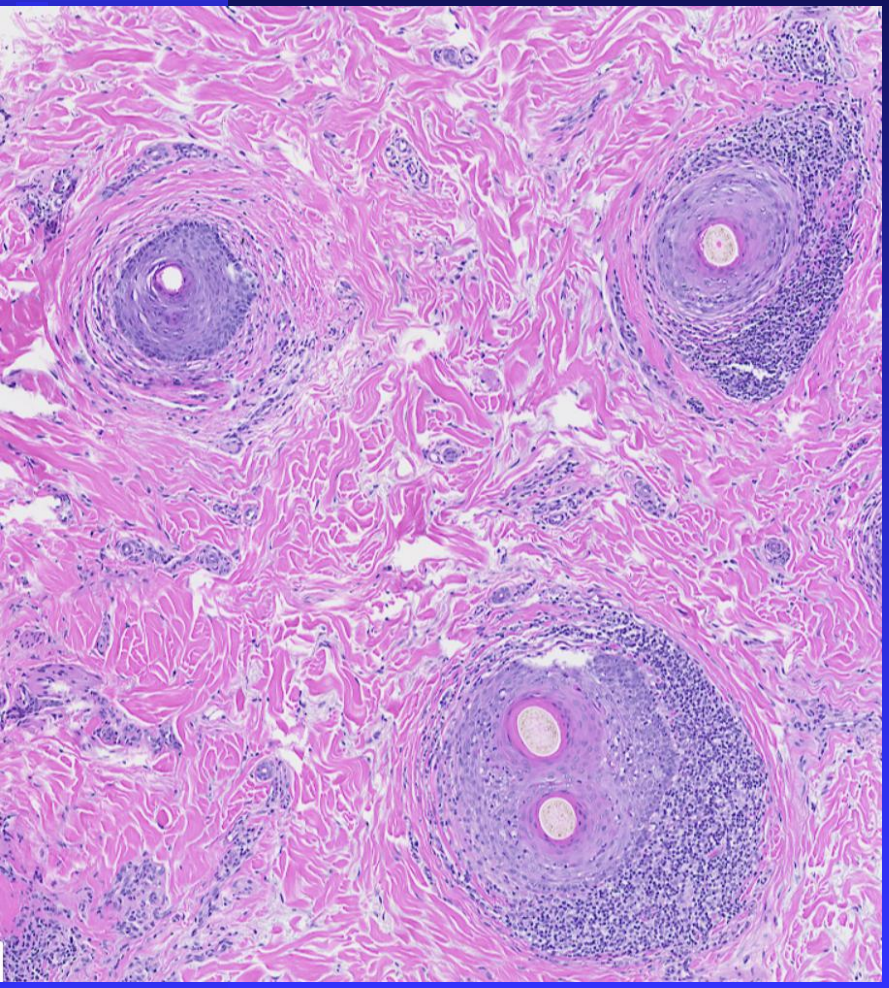


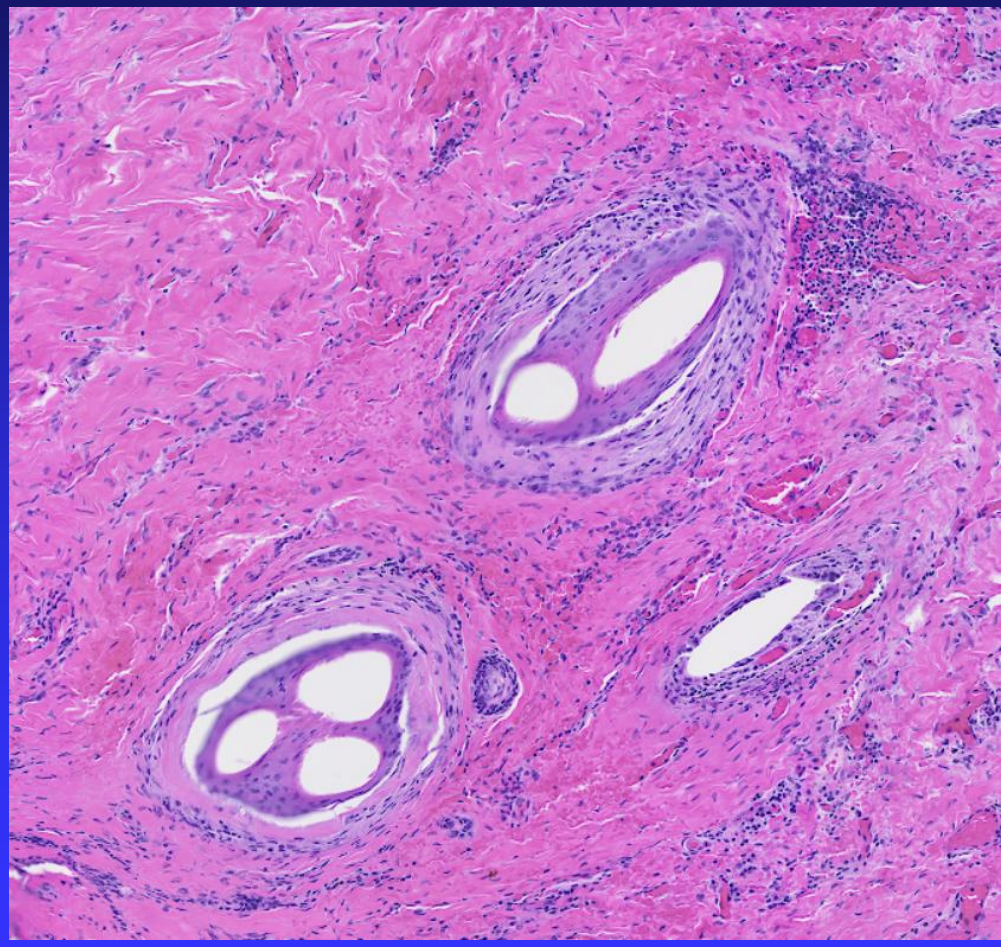
Perifollicular vs Interstitial



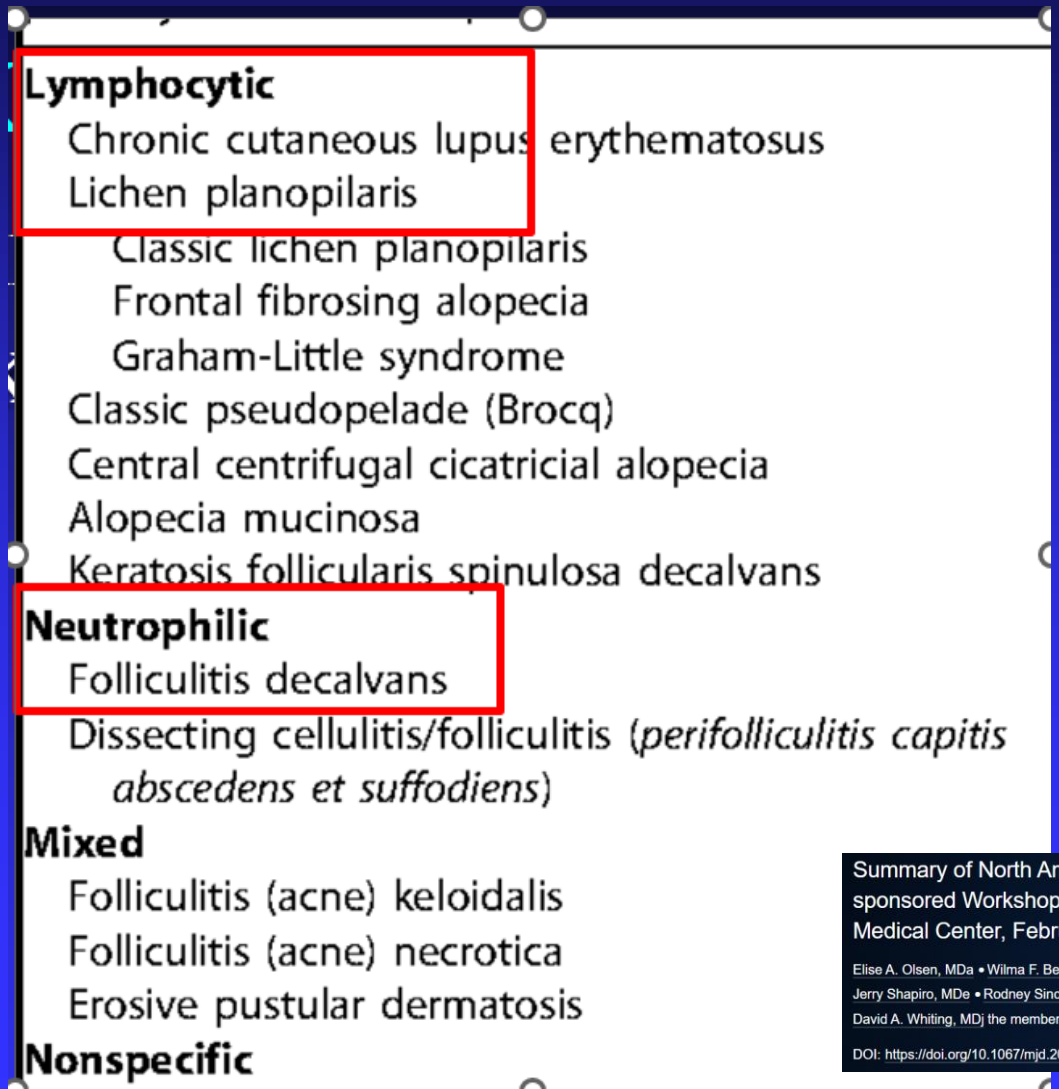


Tufted compound follicles





LPP vs Folliculitis decalvans



Lymphocytic
- Chronic cutaneous lupus erythematosus
- Lichen planopilaris
  - Classic lichen planopilaris
  - Frontal fibrosing alopecia
  - Graham-Little syndrome
- Classic pseudopelade (Brocq)
- Central centrifugal cicatricial alopecia
- Alopecia mucinosa
- Keratosis follicularis spinulosa decalvans

Neutrophilic
- Folliculitis decalvans
- Dissecting cellulitis/folliculitis (*perifolliculitis capitis abscedens et suffodiens*)

Mixed
- Folliculitis (acne) keloidalis
- Folliculitis (acne) necrotica
- Erosive pustular dermatosis

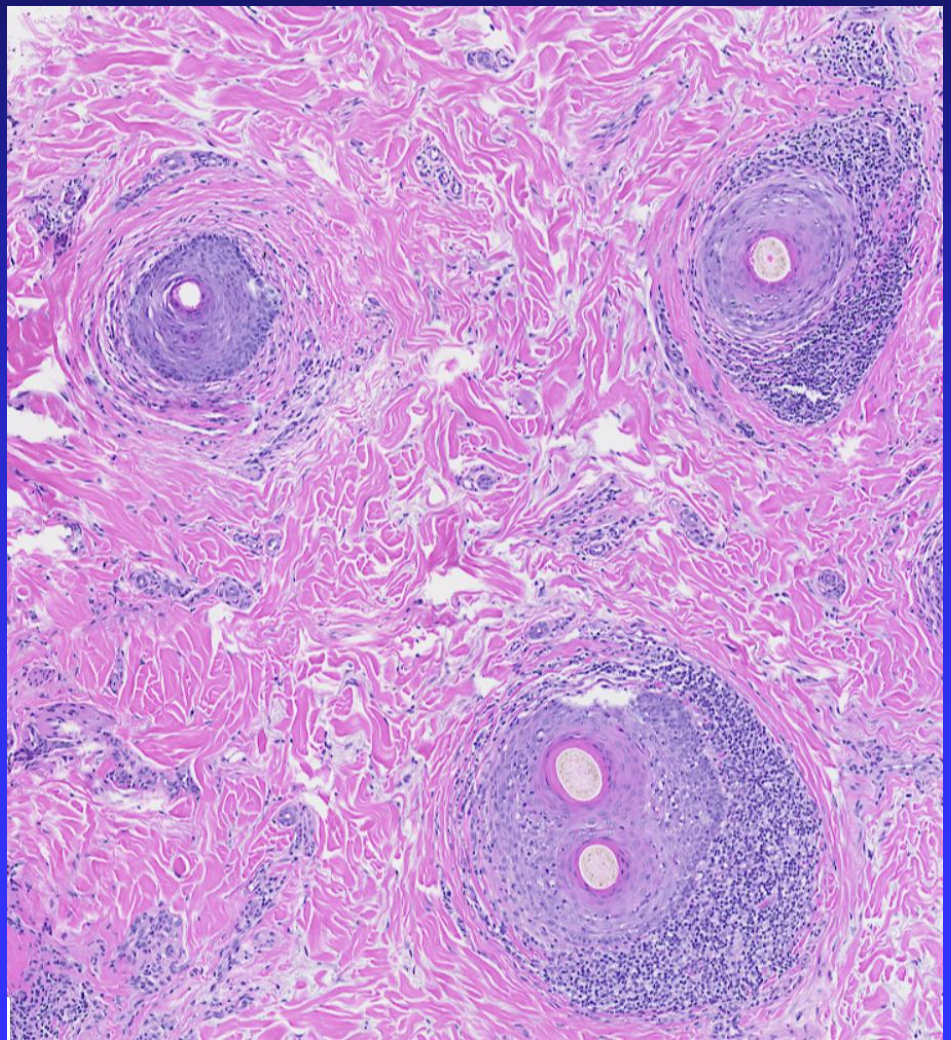
Nonspecific

Summary of North American Hair Research Society (NAHRS)-sponsored Workshop on Cicatricial Alopecia, Duke University Medical Center, February 10 and 11, 2001

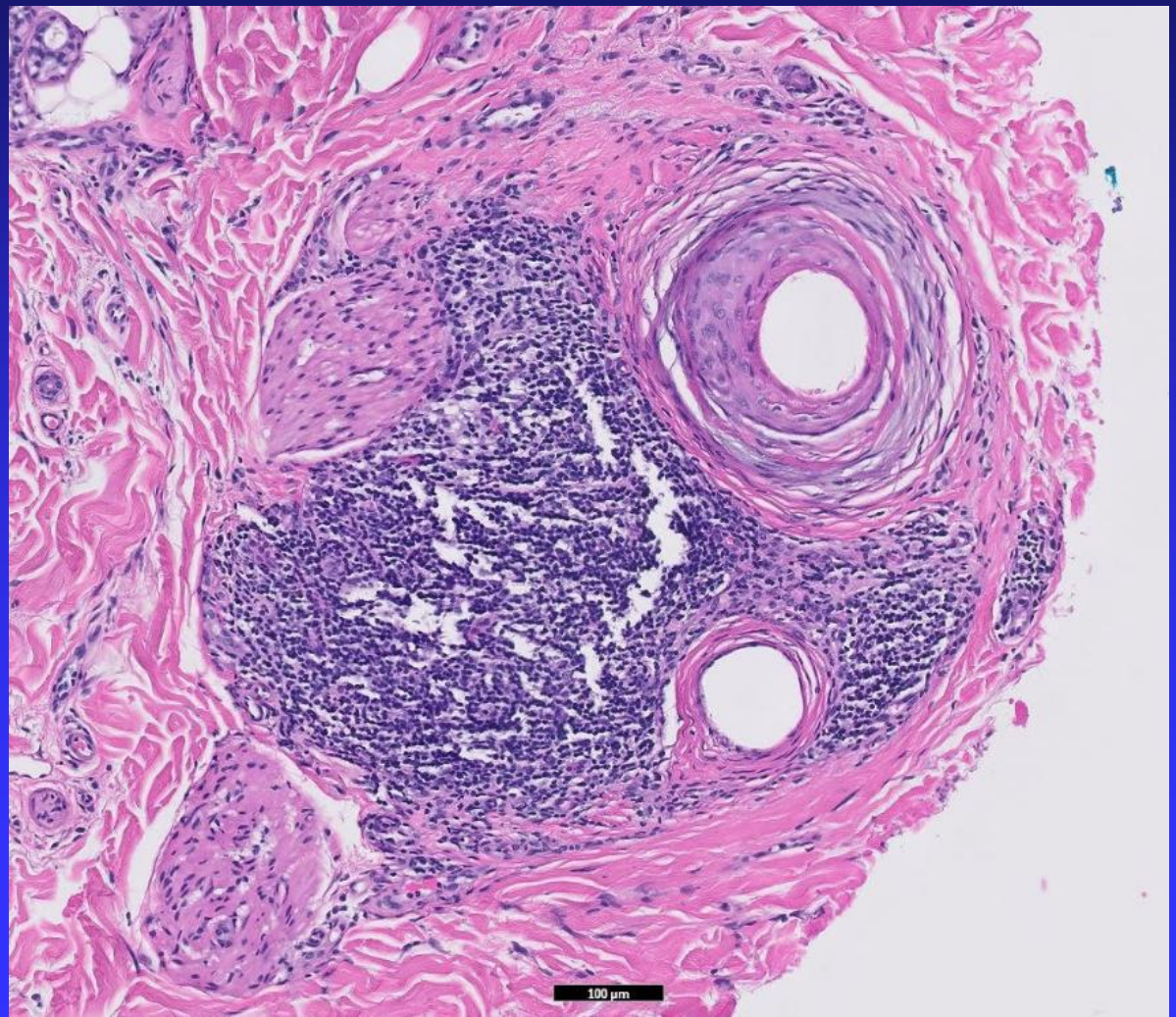
Elise A. Olsen, MDa • Wilma F. Bergfeld, MDb • George Cotsarelis, MDc • Vera H. Price, MDd • Jerry Shapiro, MDe • Rodney Sinclair, MDf • Alvin Solomon, MDg • Leonard Sperling, MDh • Kurt Stenn, MDi • David A. Whiting, MDj the members of the Workshop on Cicatricial Alopecia' • Show less

DOI: https://doi.org/10.1067/mjd.2003.68

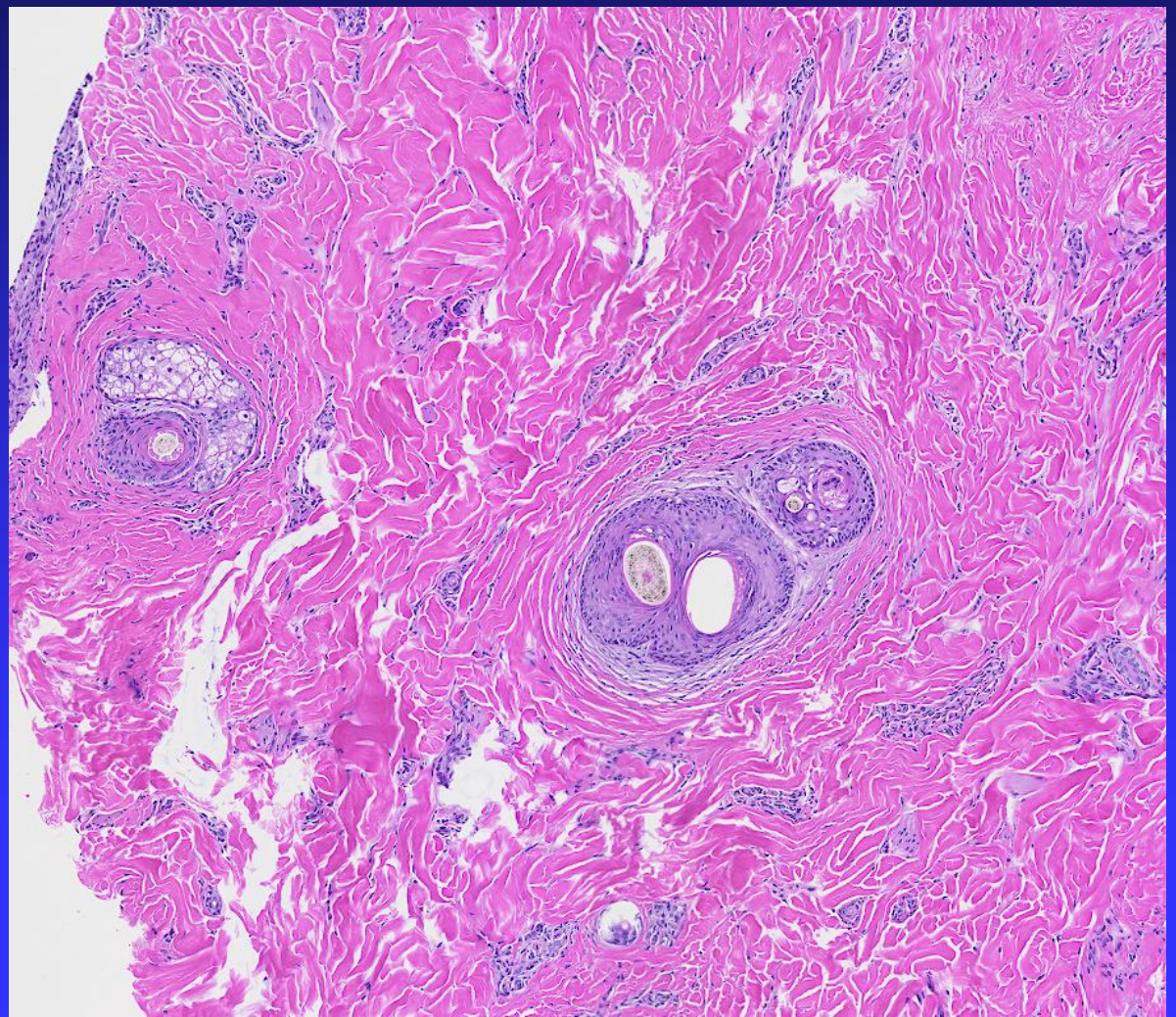
Absence of catagen/telogen with lymphocytes is a clue to LPP/CCCA



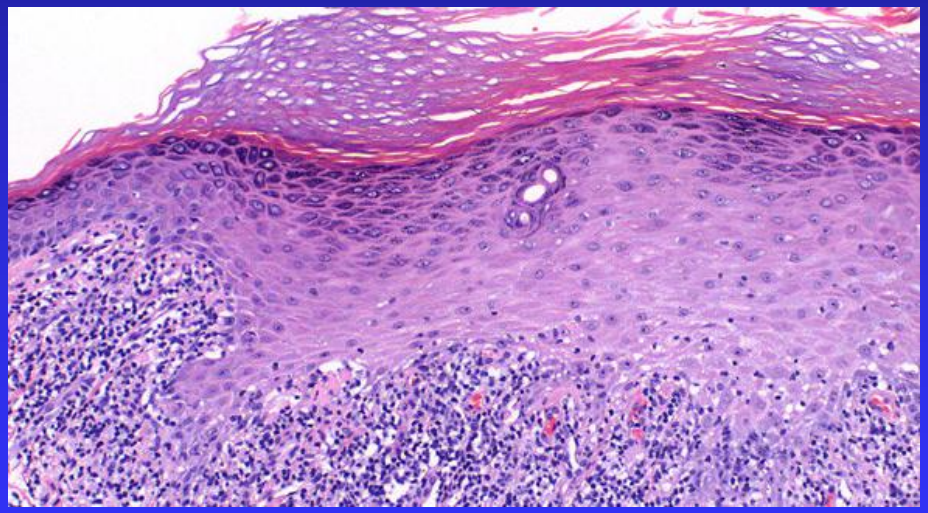
A single focus of LPP can be a resolving acneiform lesion



Central Centrifugal Cicatricial Alopecia
vs
Lichen Planopilaris



Premature desquamation of the inner root sheath



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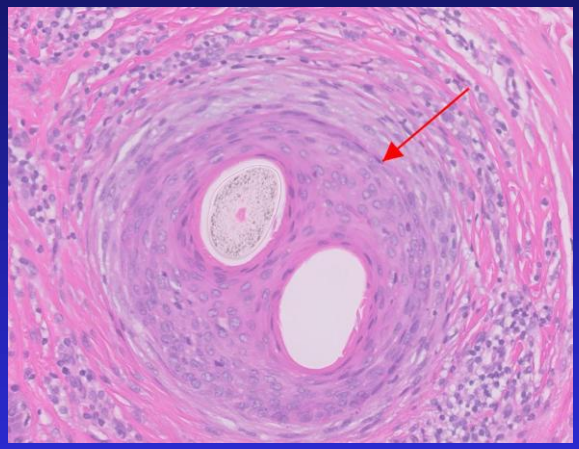


https://dermnetnz.org/topics/lichen-planus-pathology

Premature Desquamation of the Inner Root Sheath in Noninflamed Hair Follicles as a Specific Marker for Central Centrifugal Cicatricial Alopecia

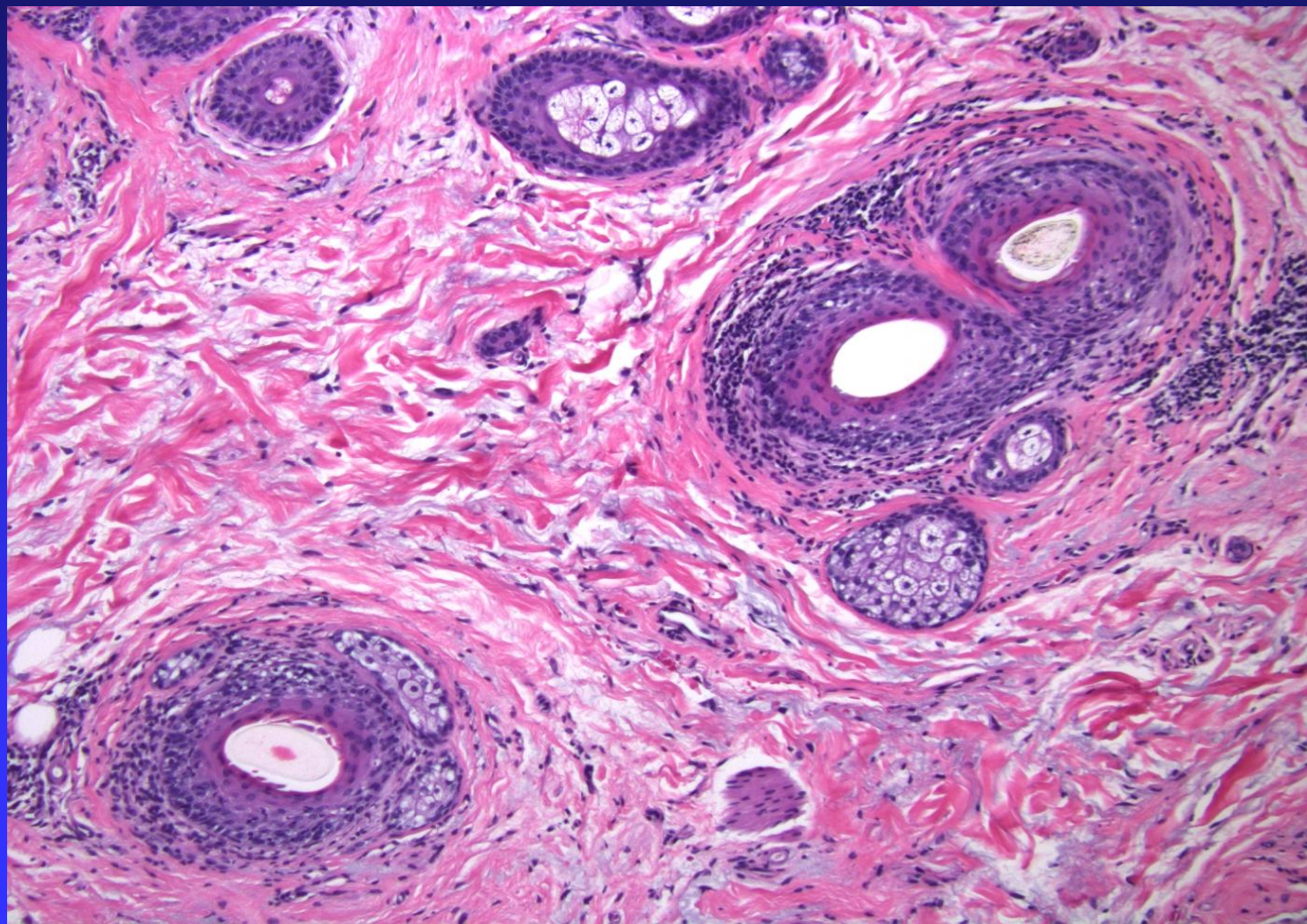
Timothy Tan, DO, Joan Guitart, MD,†‡ Pedram Gerami, MD,†‡ and Pedram Yazdan, MD†*

TABLE 2. Cases of PDIRS in Inflamed and Noninflamed Hair Follicles

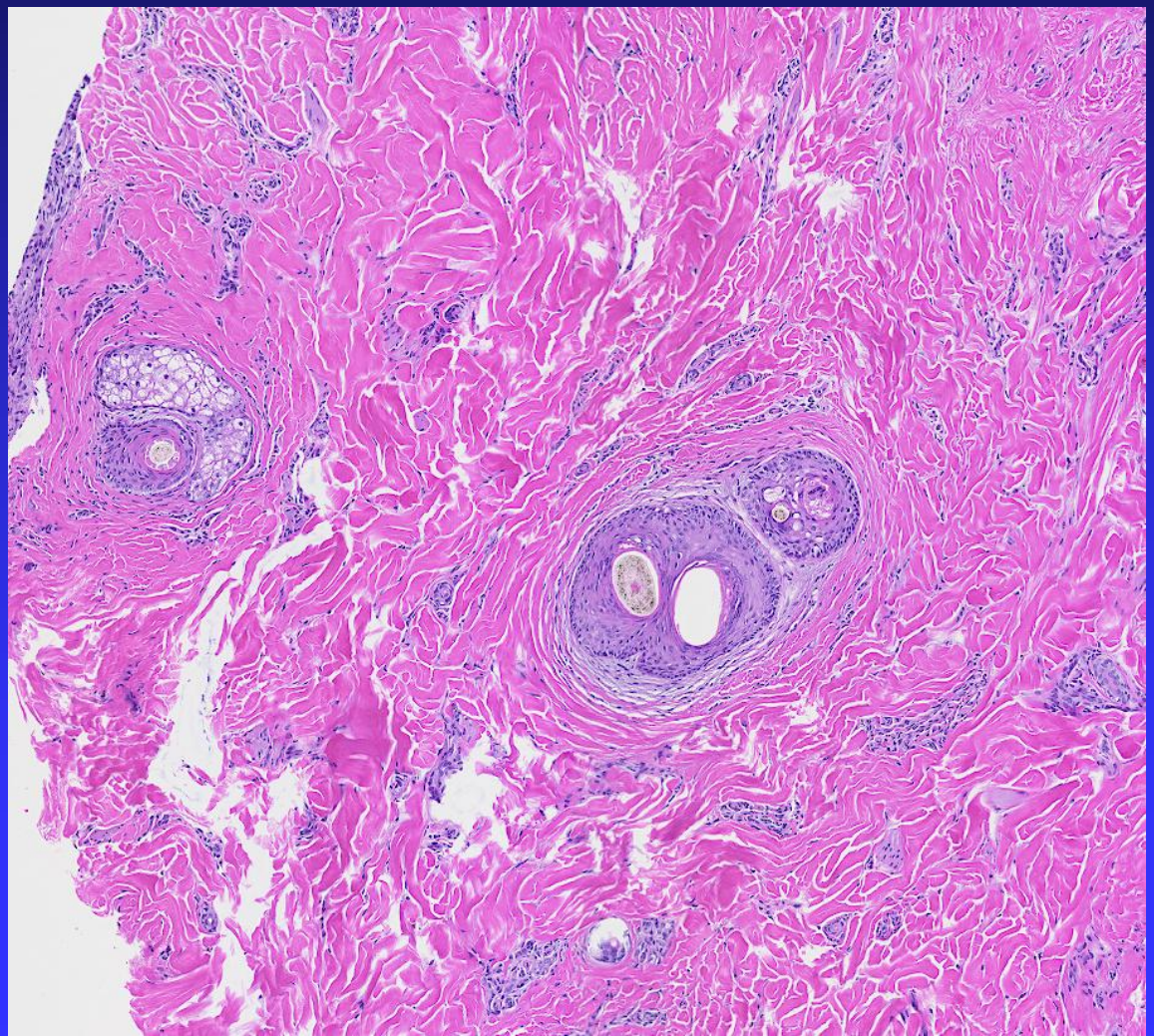
Type of Alopecia	Total Cases With PDIRS, n	Cases With PDIRS in Inflamed Follicles, n (%)	Cases with PDIRS in Noninflamed Follicles, n (%)
Cicatricial alopecia			
CCCA	111	30 (27)	81 (73)
LPP	44	44 (100)	0 (0)
DLE	3	3 (100)	0 (0)
AKN	1	1 (100)	0 (0)
FD	24	21 (87)	3 (13)
Noncicatricial alopecia			
AGA	1	0 (0)	1 (100)
AA	1	1 (100)	0 (0)
PsA	2	0 (0)	2 (100)

Tan T, Guitart J, Gerami P, Yazdan P. Premature Desquamation of the Inner Root Sheath in Noninflamed Hair Follicles as a Specific Marker for Central Centrifugal Cicatricial Alopecia. Am J Dermatopathol. 2019 May;41(5):350-354..

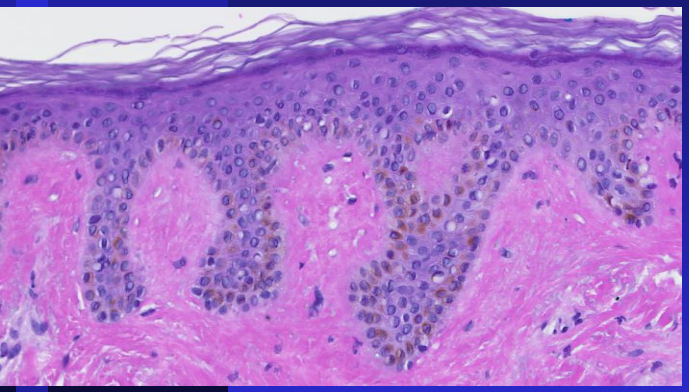
LPP
Intraepithelial lymphocytes.

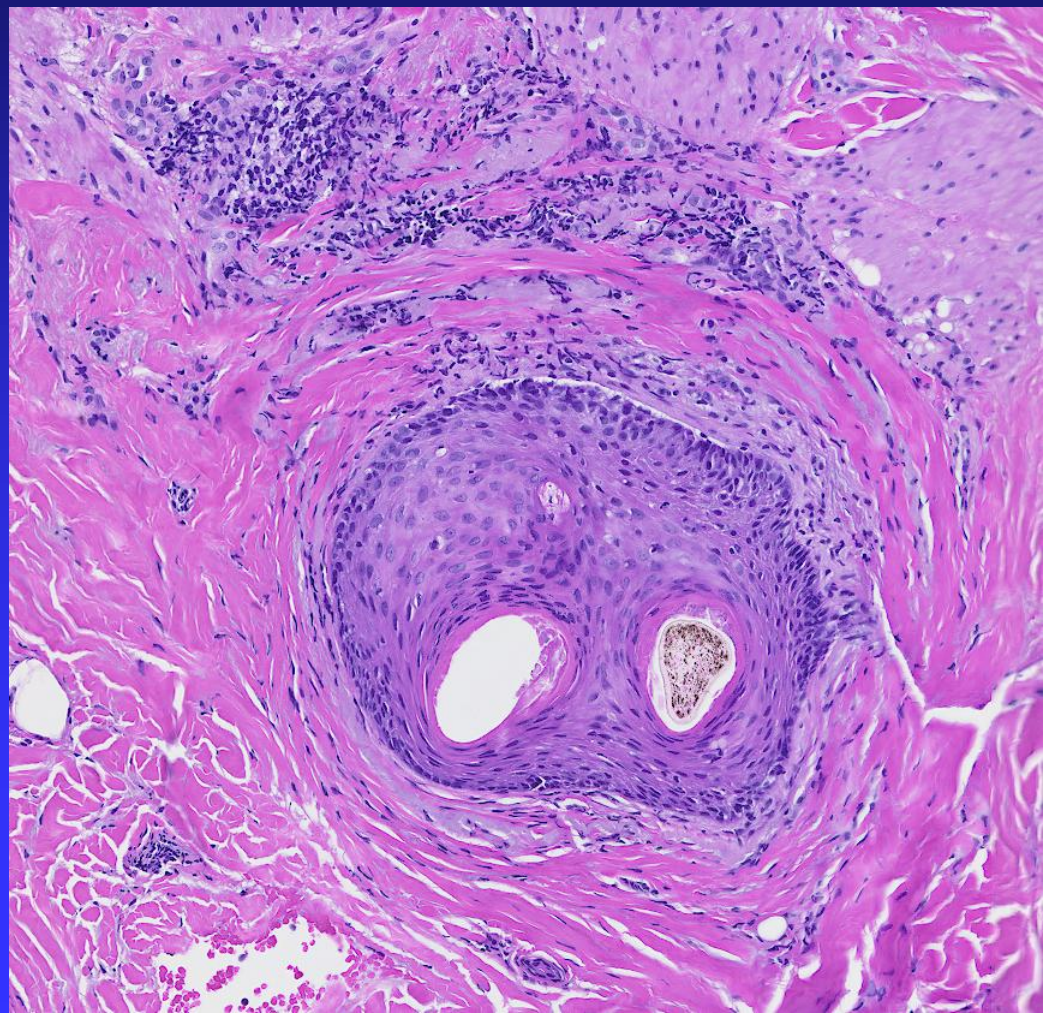


CCCA
(Burned out/advanced LPP-like)



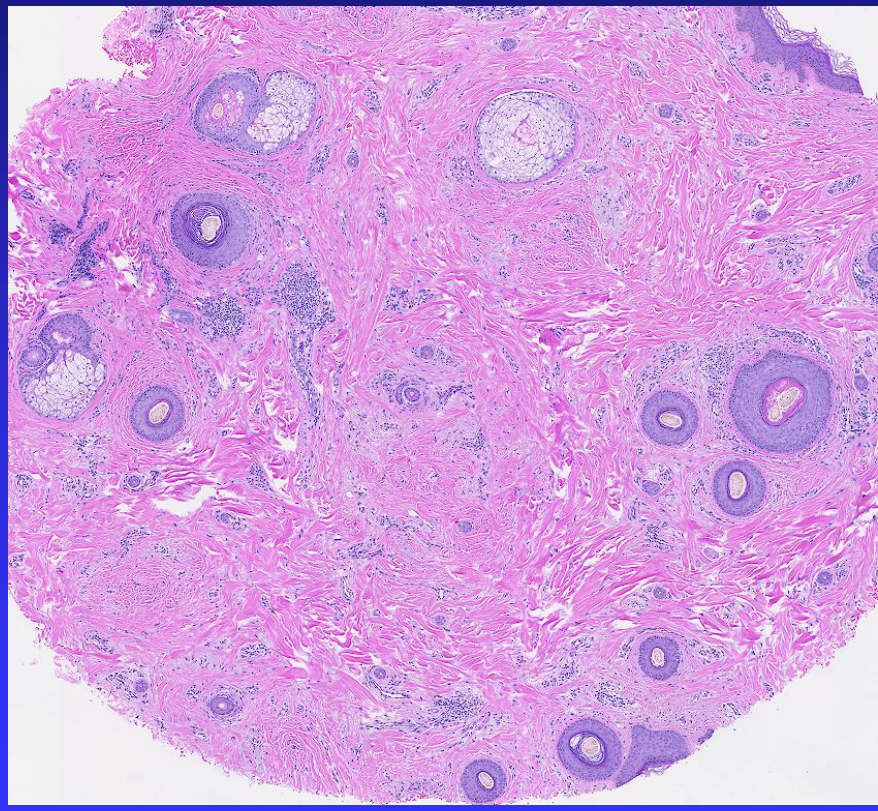
CCCA
Excentric follicular atrophy



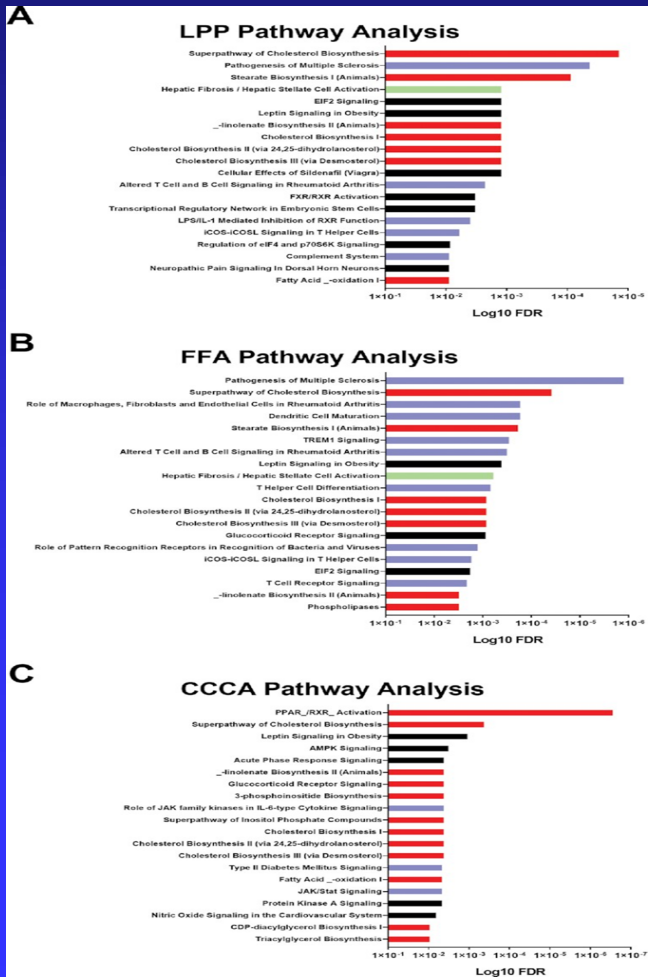


CCCA

- Less inflammation
- More end-stage than LPP
- Patient of African descent



Shared dysregulated pathways in cholesterol biosynthesis and ...



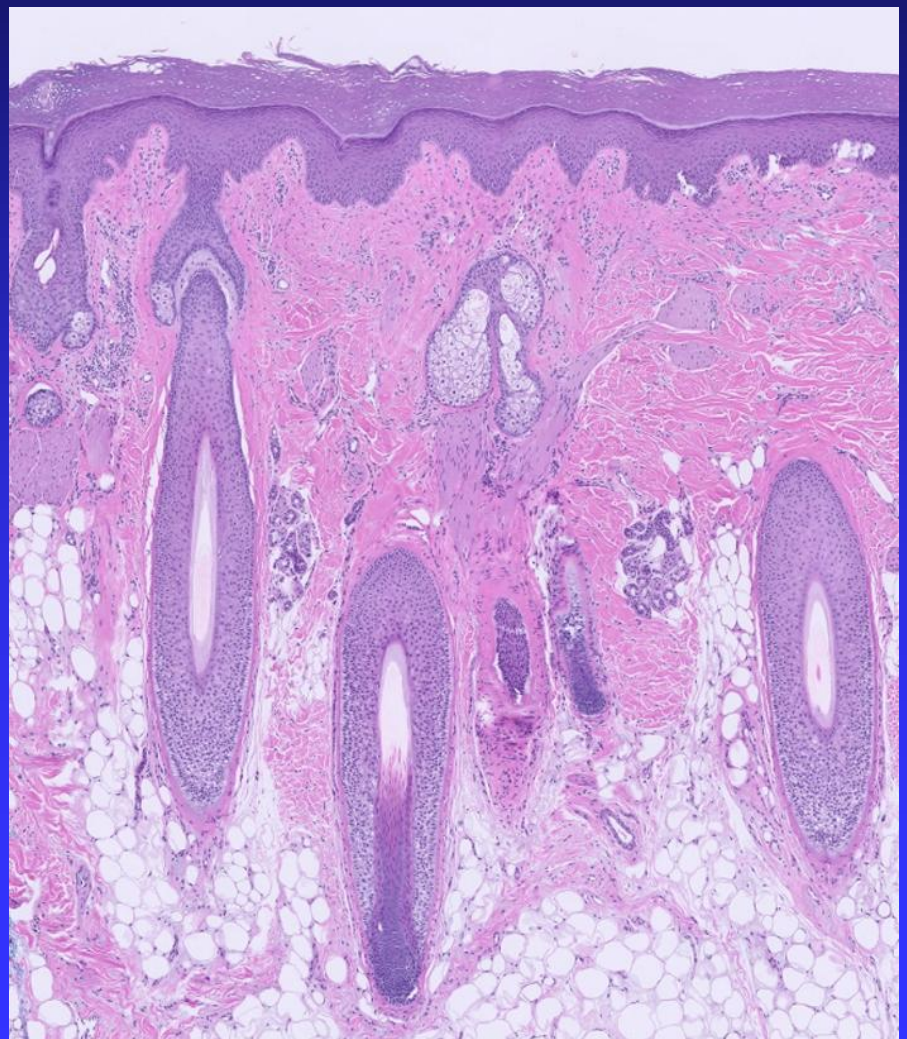
Eddy H C Wang, Isha Monga, Brigitte N Sallee, James C Chen, Alexa R Abdelaziz, Rolando Perez-Lorenzo, Lindsey A Bordone, Angela M Christiano, Primary cicatricial alopecias are characterized by dysregulation of shared gene expression pathways, *PNAS Nexus*, Volume 1, Issue 3, July 2022, pgac111.

CCCA is not related to folliculitis devalvans

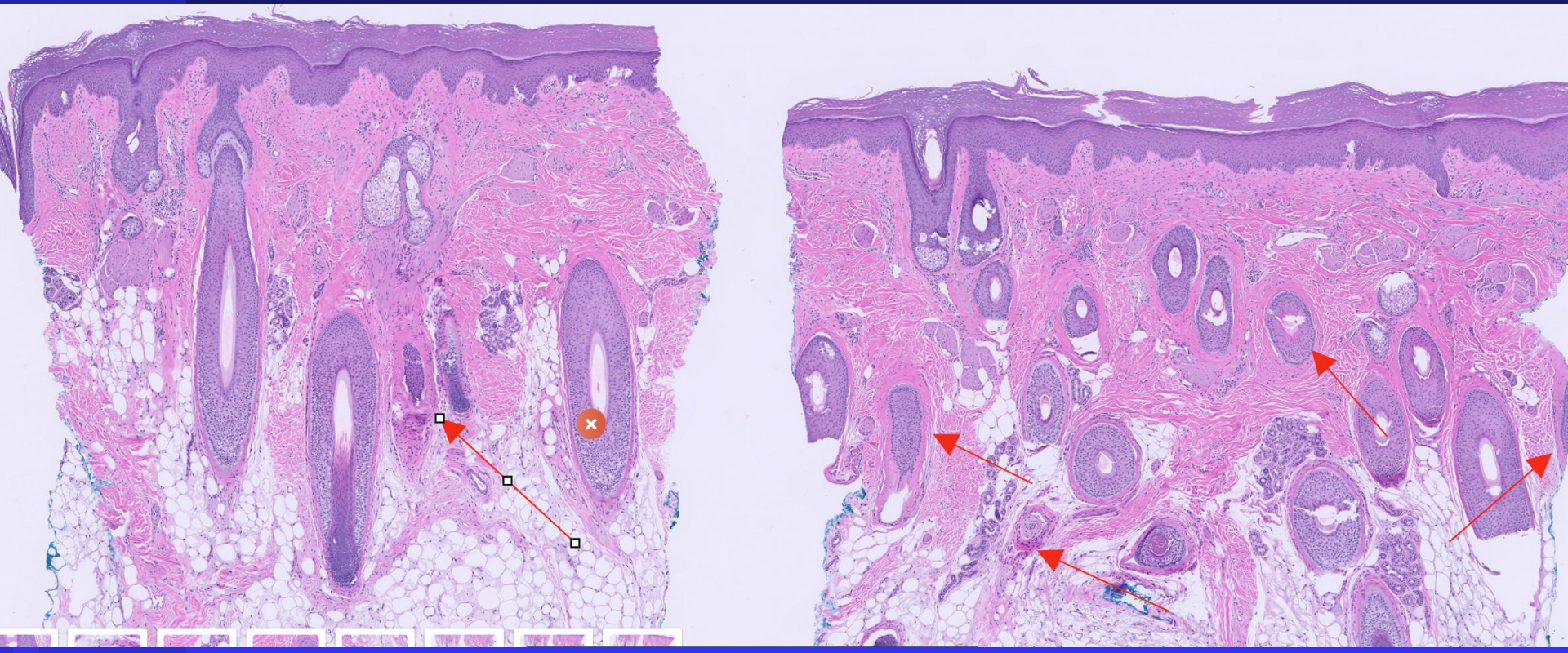
- CCCA--women of African descent over age 40
- Folliculitis decalvans--men under age 40

Clue

LSC is a part of trichotillomania

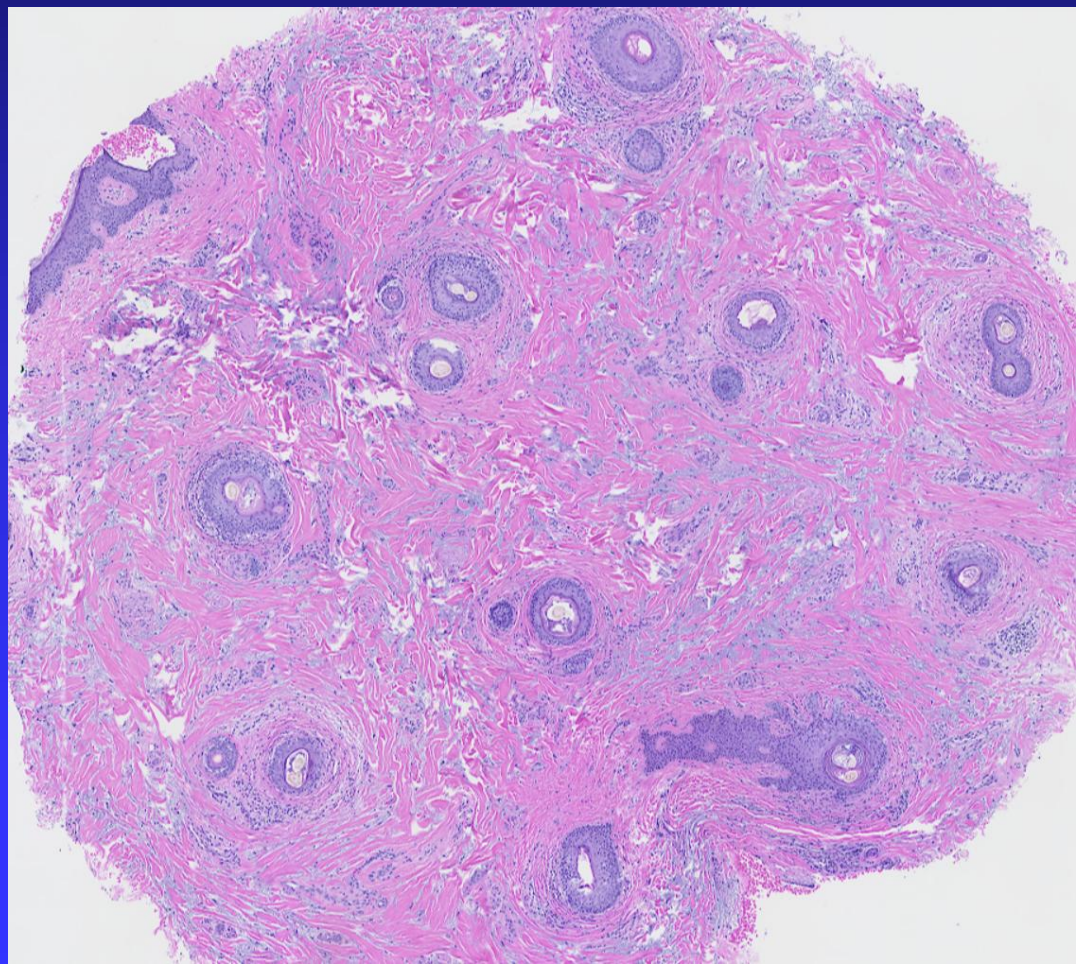


LSC clue to trichotillomania



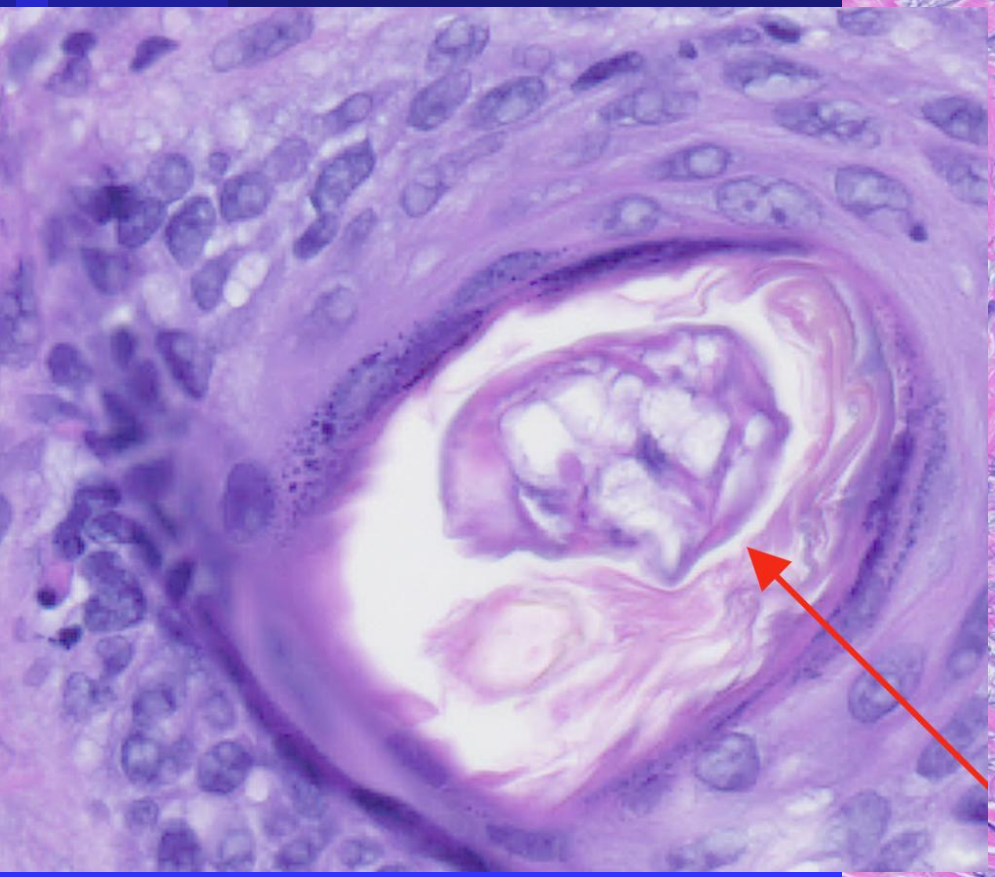
Clue

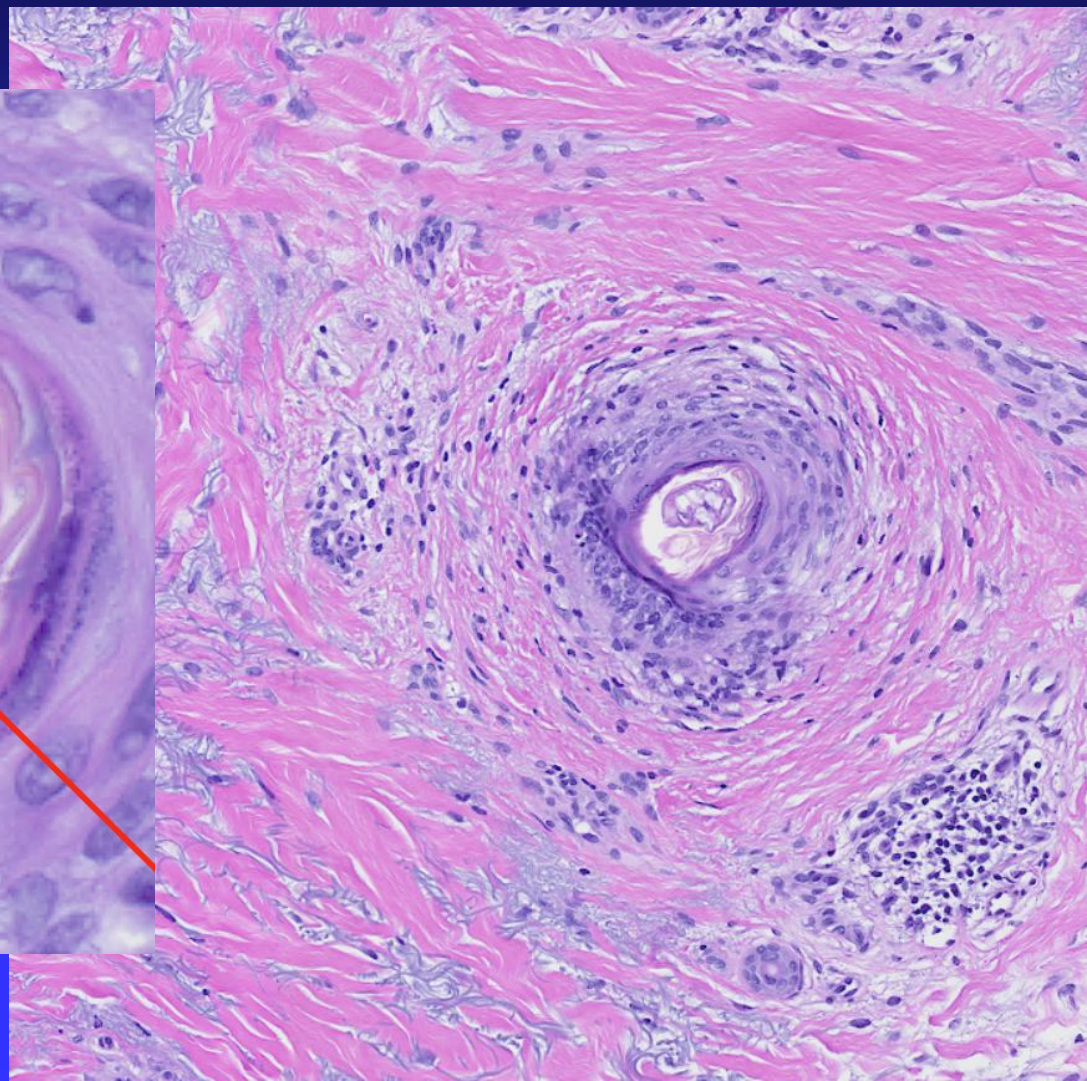
Solar elastosis—clue to female pattern hair loss (androgenetic alopecia)



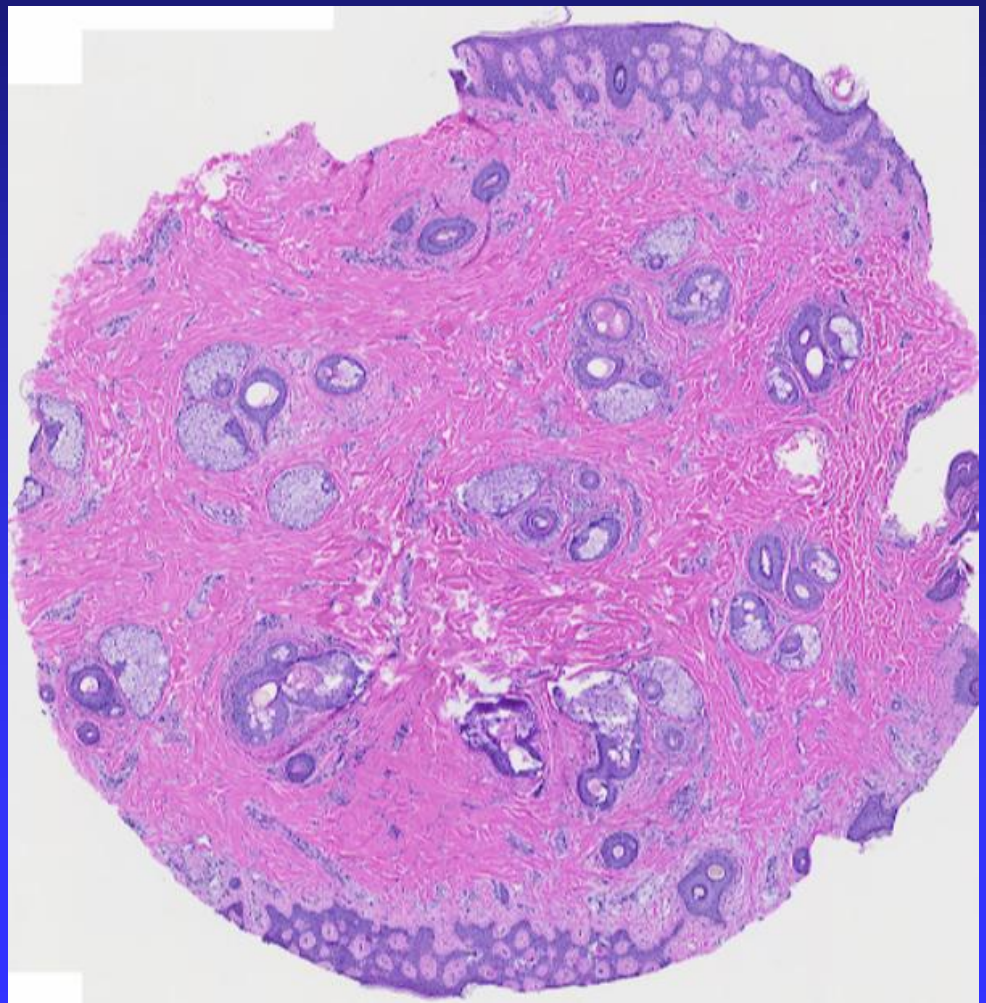
Clue

Demodex Cause of inflammation and pruritus



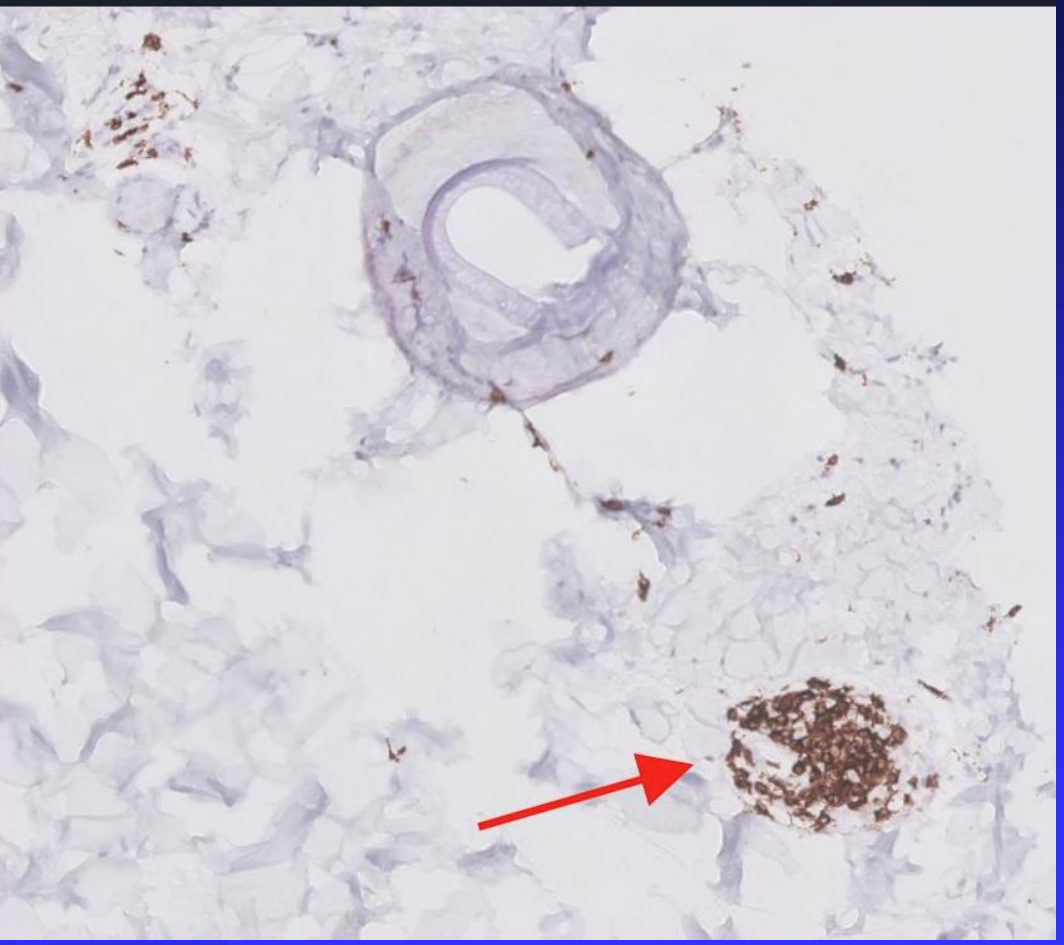


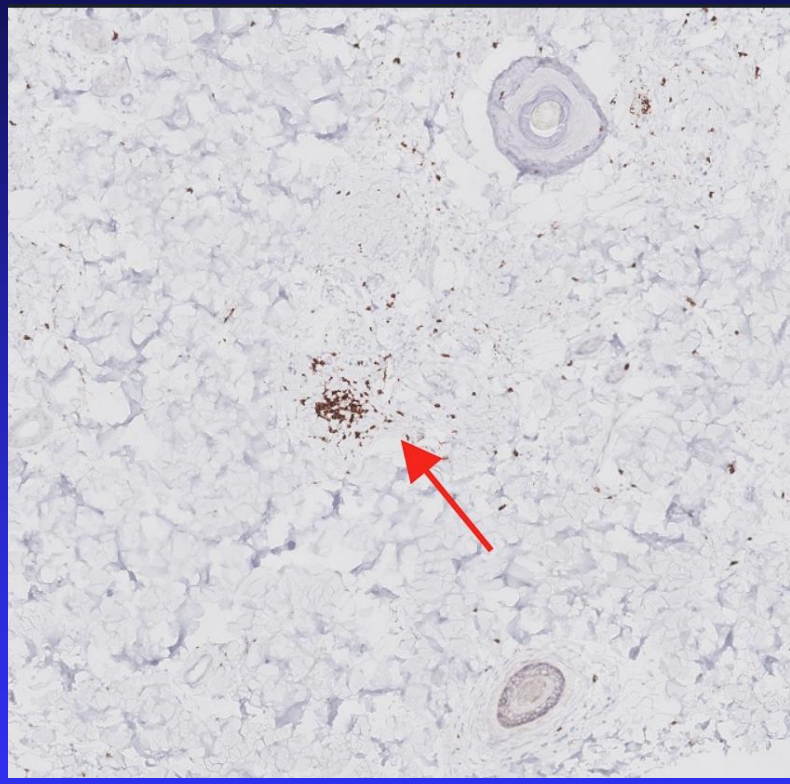
FPHL with Seb Derm versus Alopecia areata



CD3 on all unstained slides

CD3 subacute alopecia areata





Kolivras A and Thompson CT. Distinguishing diffuse alopecia areata from pattern hair loss using CD3+ T-cells. JAAD. 74:937-44, 2016.

A few more clues for alopecia:

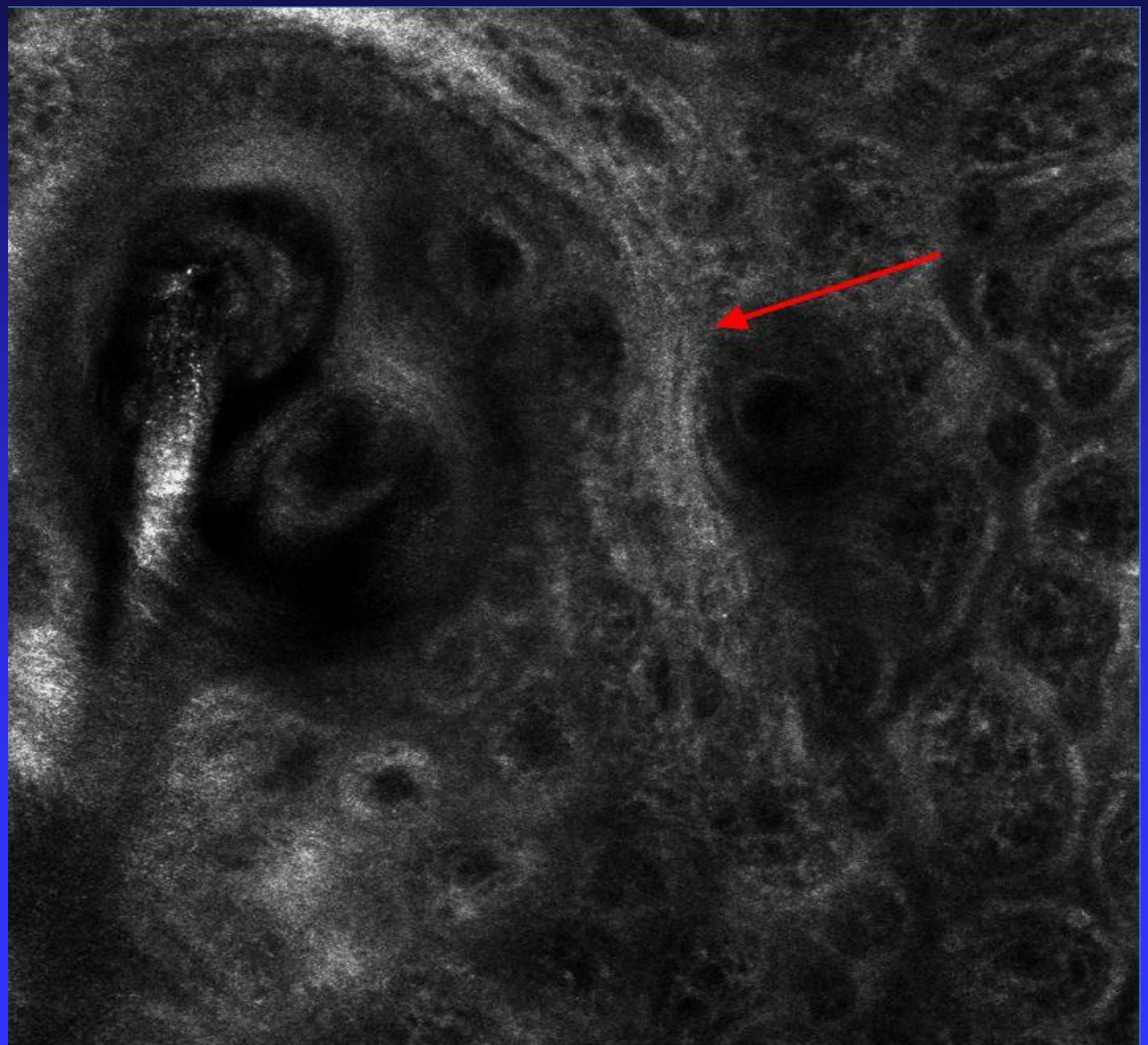
- Most important clinical informationto ask for: Patch vs diffuse
- Be careful with biopsies from the hairline (where large meets small)
- Telogen effluvium is ~15% catagen/telogen and generally a +hair pull test or complaint of significant shedding

Case Reports > JAAD Case Rep. 2022 Mar 11;23:46-48. doi: 10.1016/j.jdcr.2022.02.036. eCollection 2022 May.

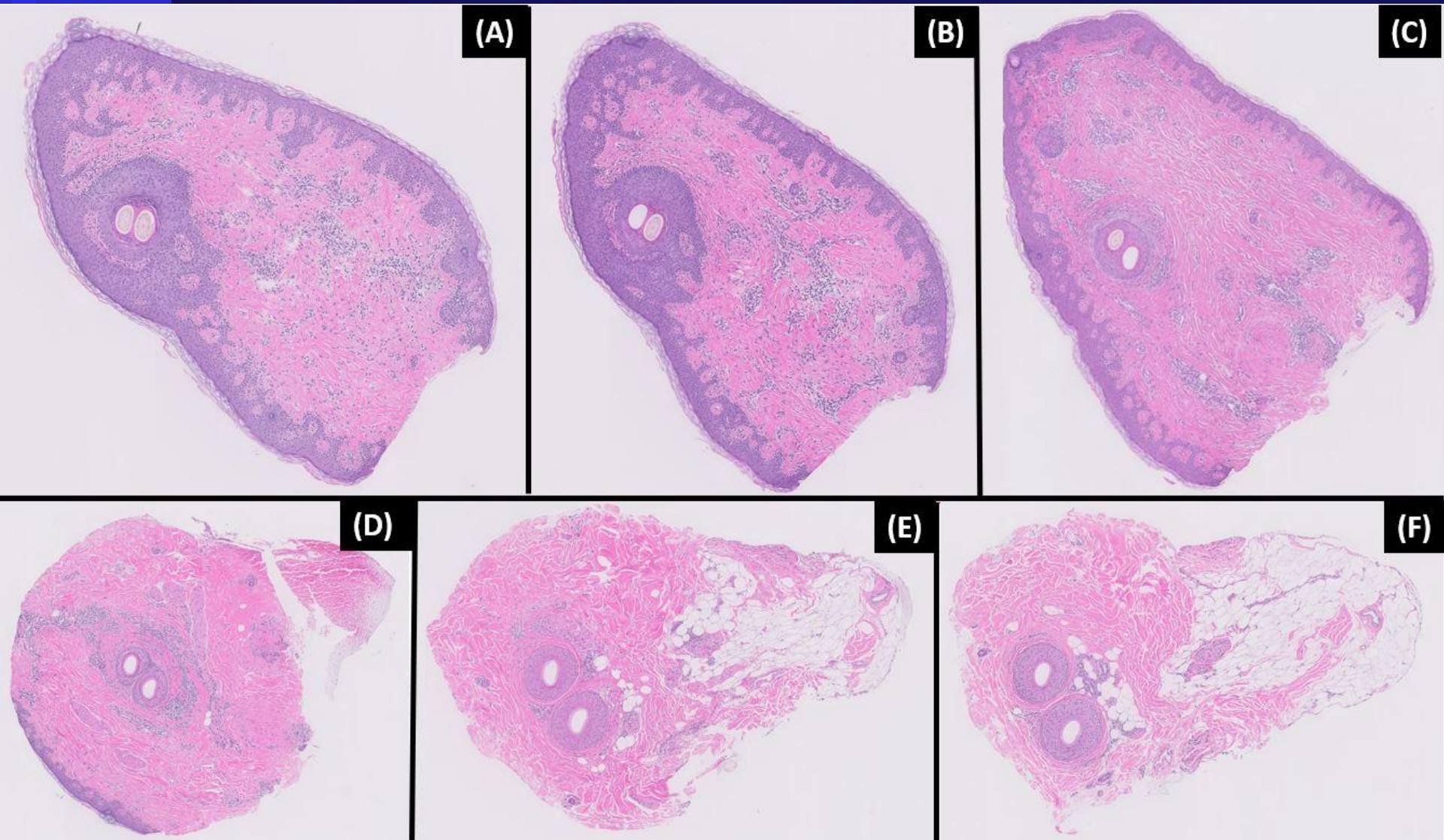
Three-dimensional imaging of a peripilar cast and compound follicle in frontal fibrosing alopecia

Curtis T Thompson [1] [2], Maria Abril Martinez Velasco [3], Antonella Tosti [4]

In vivo confocal microscopy



2mm transverse H&E sections



Thanks!

Mahalo!

¡ Gracias!