Alopecia: A Fresh Look and a New Algorithm for Diagnosis

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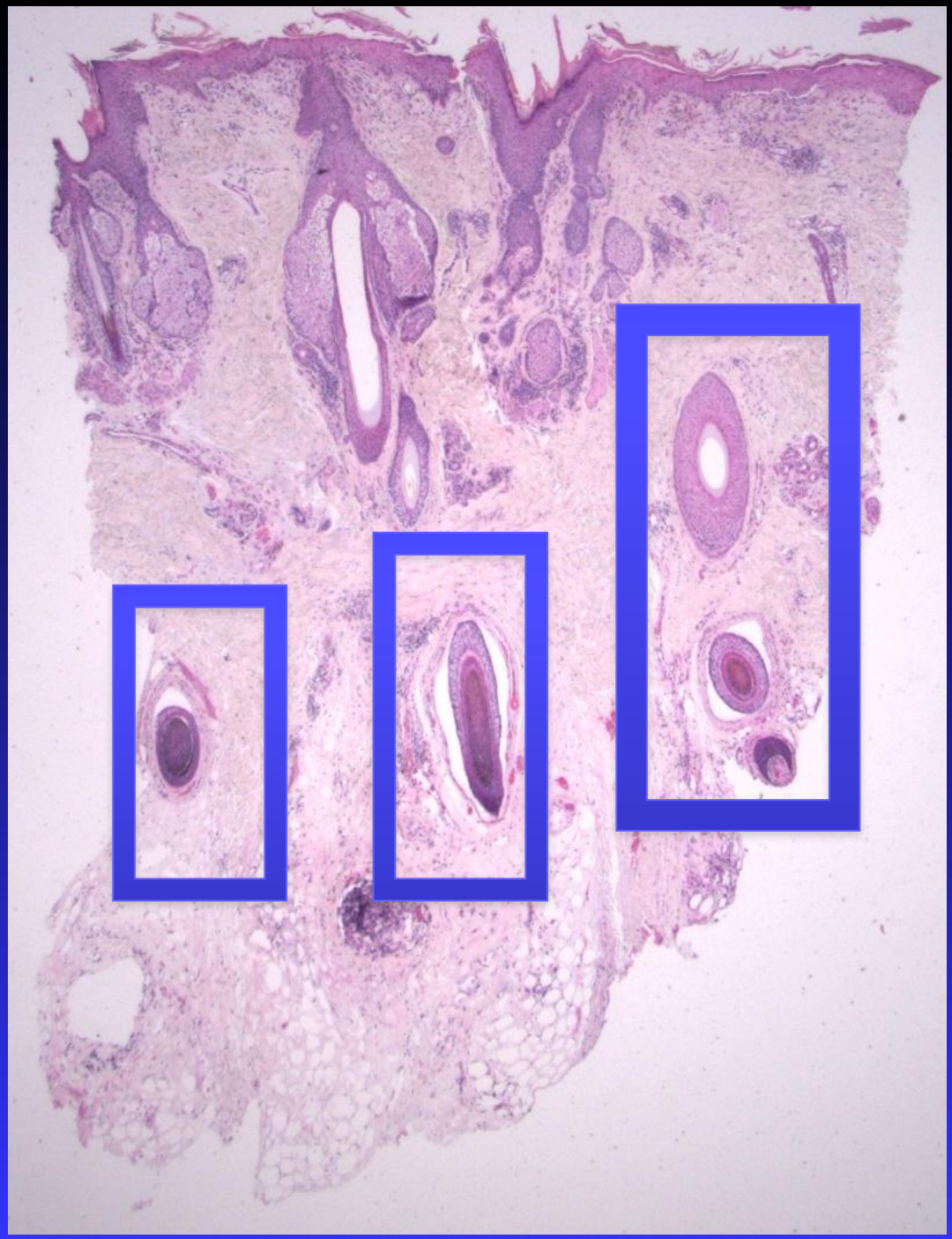
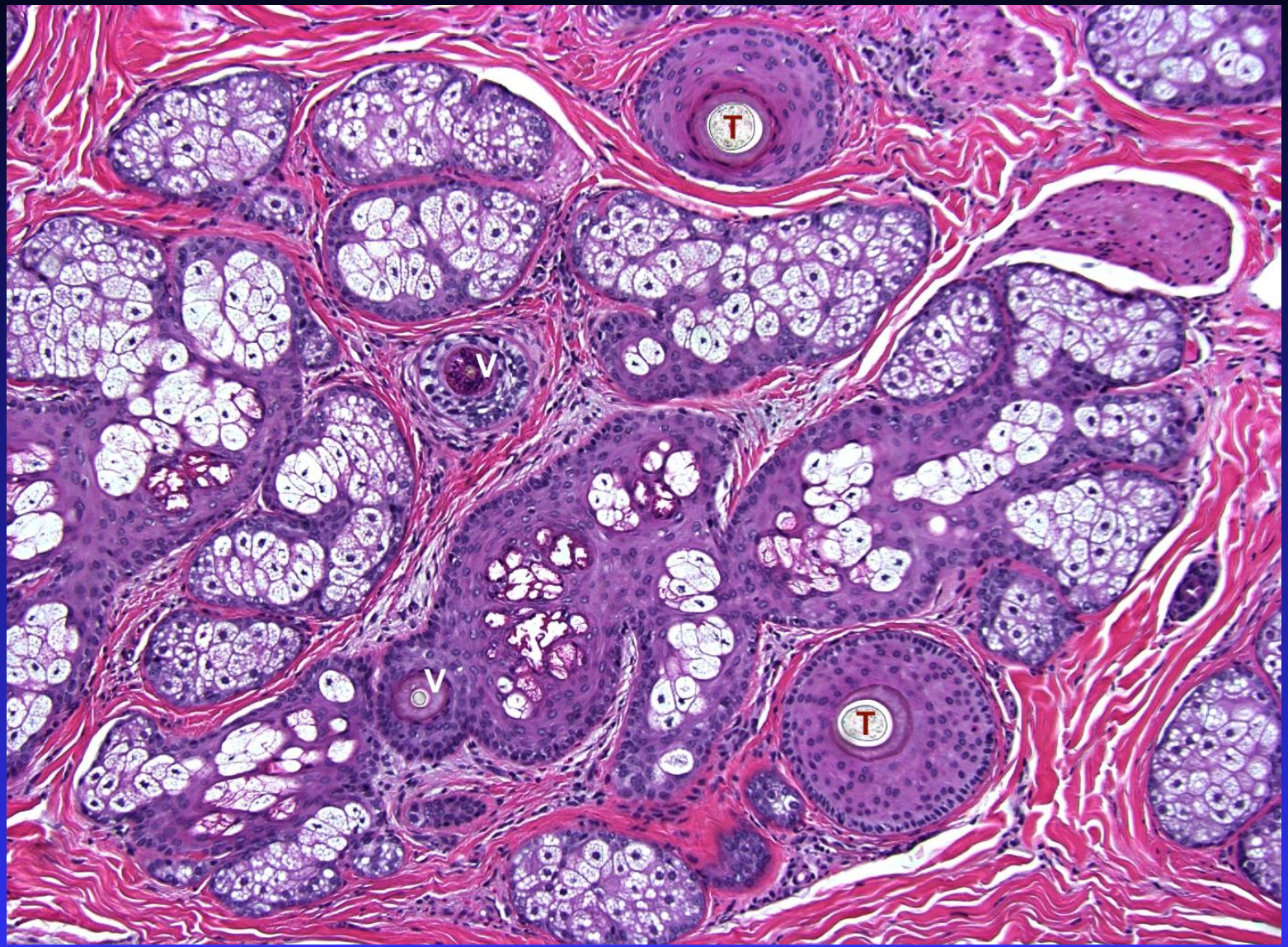
‘Fresh’ Objectives

- Tissue processing providing a more thorough examination
- H&E points of interest
- Immunohistochemistry as an aid in diagnostic impasses
- An algorithm for better diagnostics

Objective #1
Tissue Processing

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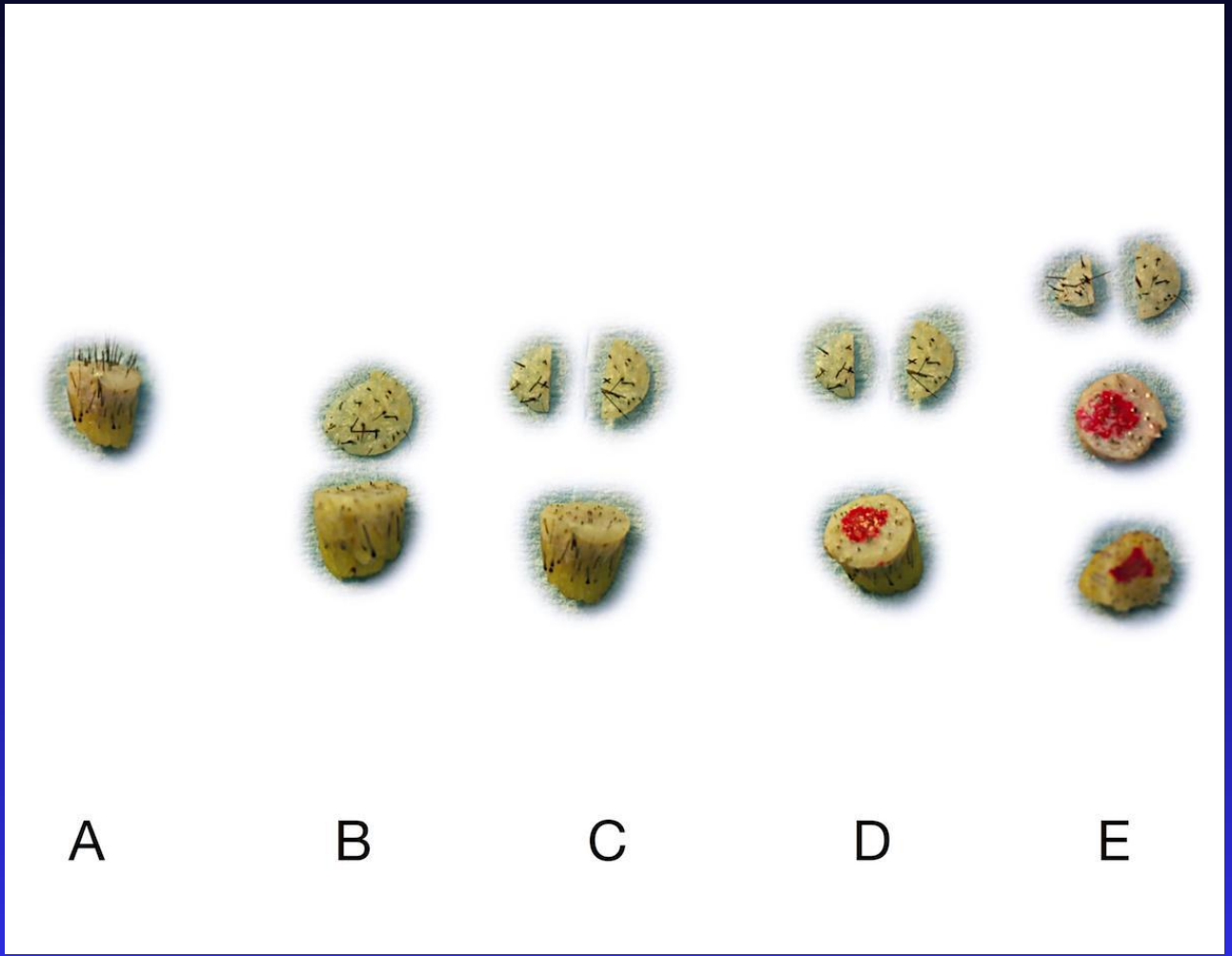
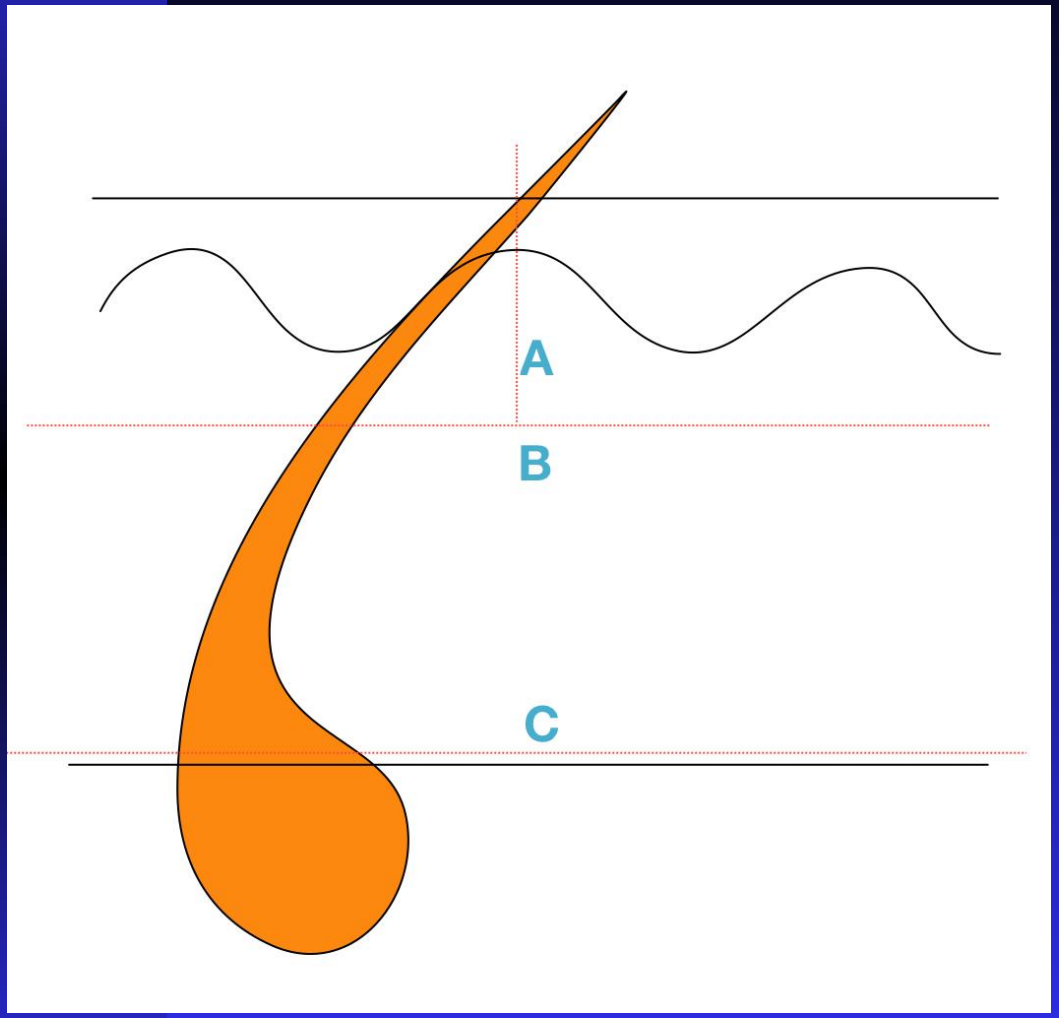
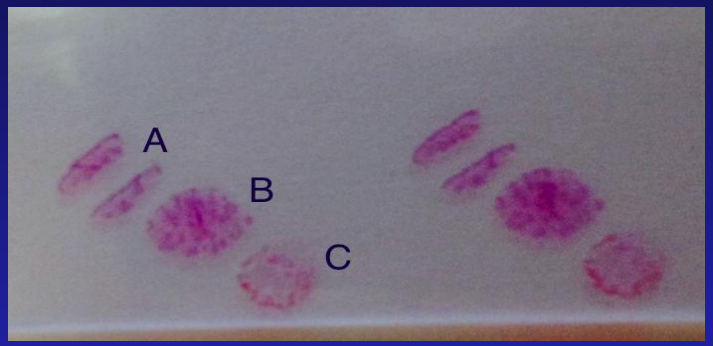
Horizontal to Vertical = HoVert

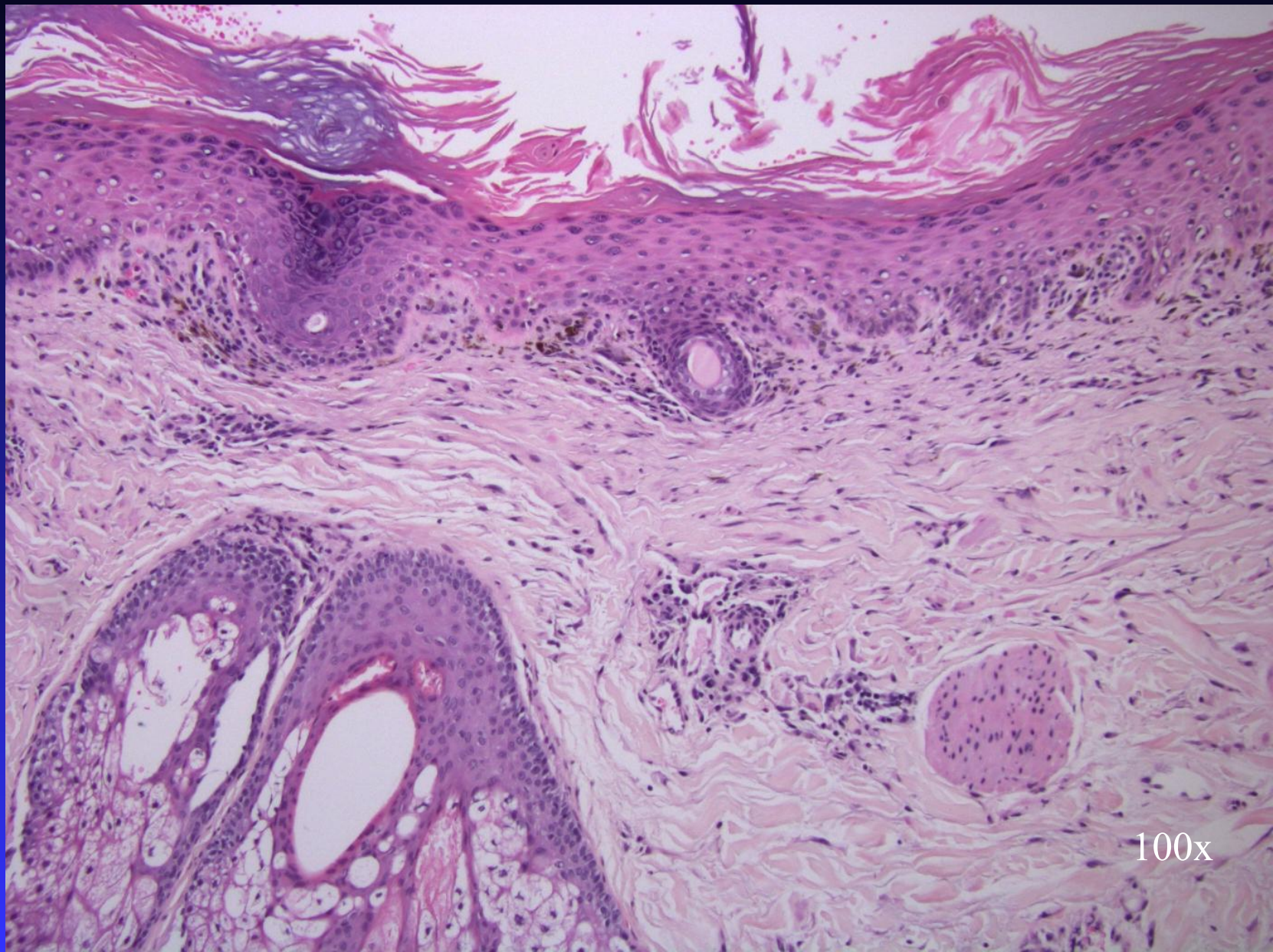


Nguyen JV, Hudacek K, Whitten JA, Rubin AI, Seykora JT. The HoVert technique: a novel method for the sectioning of alopecia biopsies. J Cutan Pathol 2011; 38: 401.

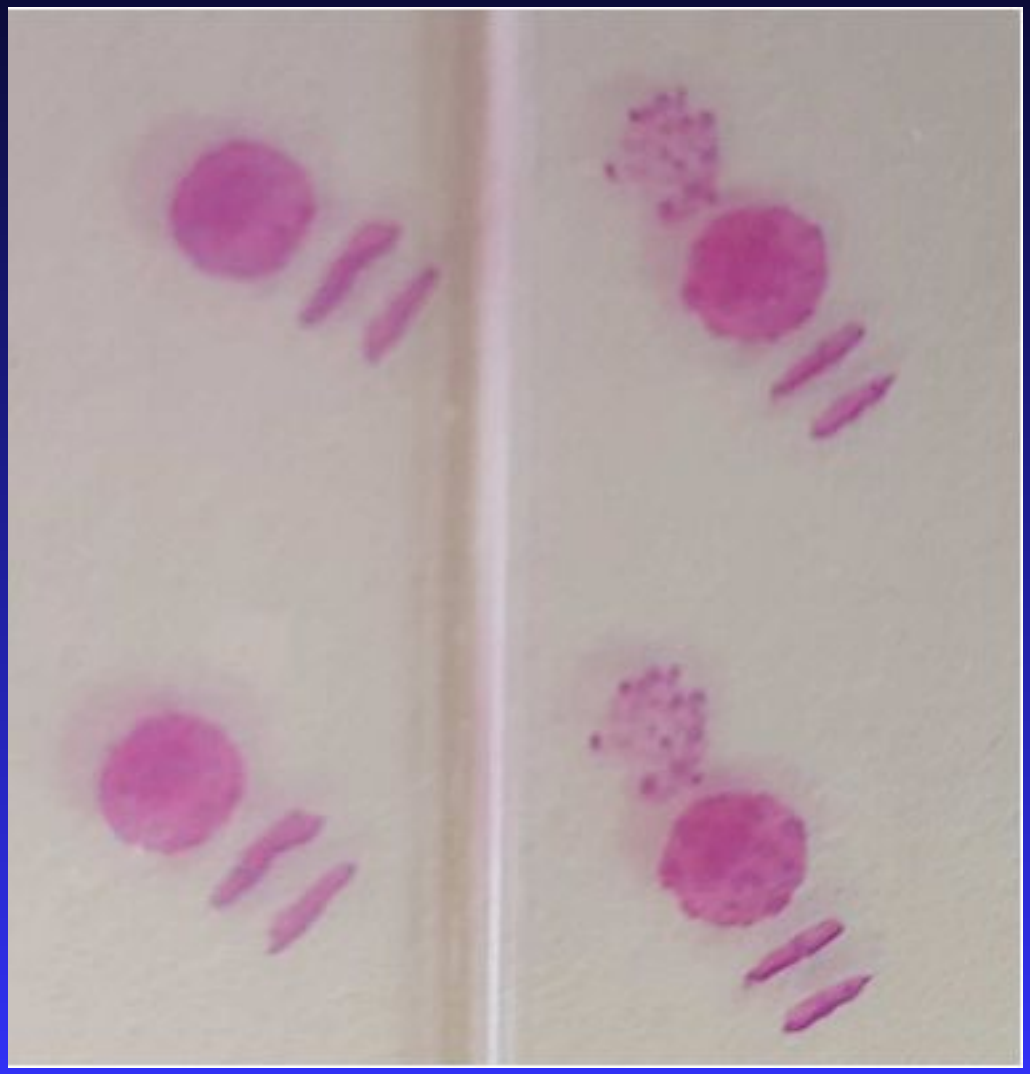
Horizontal Vertical (HoVert) technique



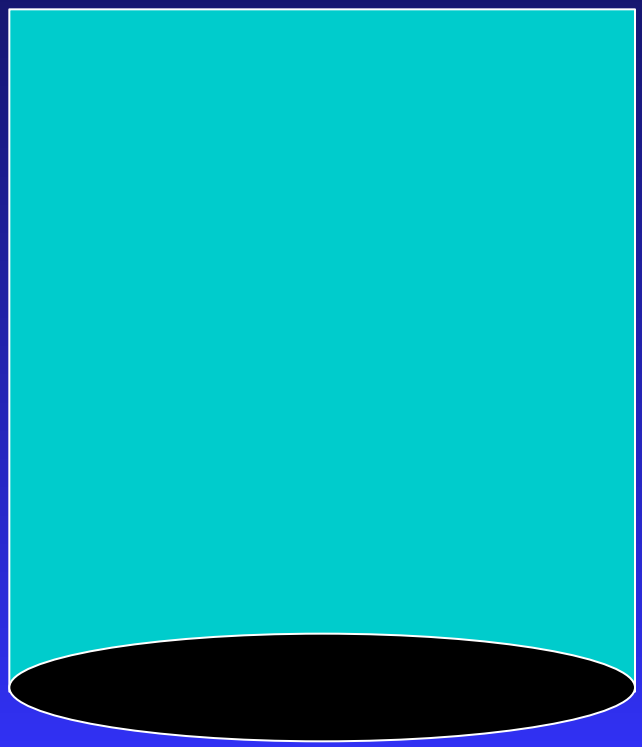


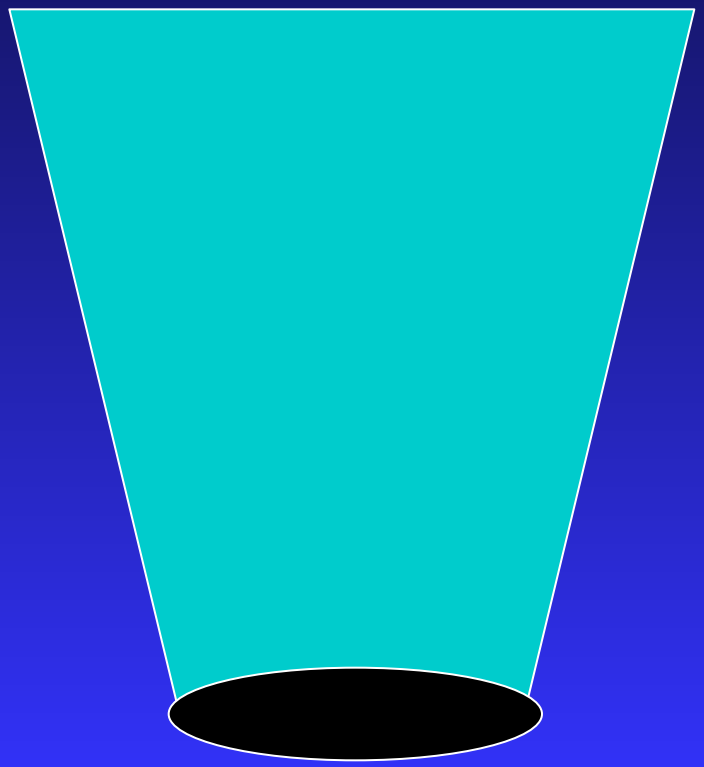

100x

If biopsy is too thin, specimen bisected rather than trisected

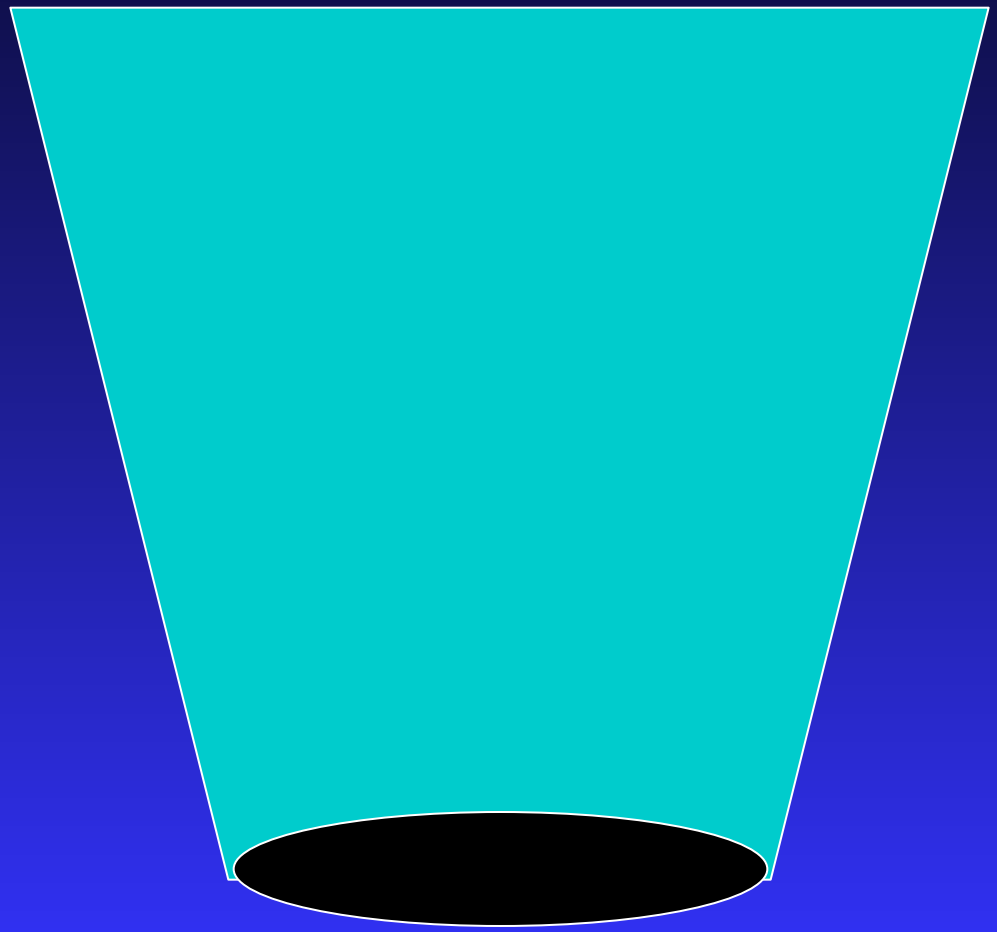


Not all 4mm punches the same





Does not work well with transverse



Objective #2
H&E Examination

Follicular size

Vellus hairs

Shafts ≤ inner root sheath

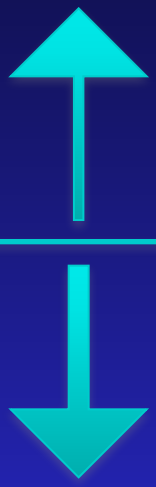
Shafts ≤ 0.03mm

Terminal hairs

Shafts > inner root sheath

Shafts ≥ 0.06mm

Telogen:vellus hair (T:V) ratio



> **3:1** Normal (<50 years old)

> **2:1** Normal (>50 years old): senescence

< **2:1** Miniaturization

Miniaturization
Usually Only 2 diagnoses

- Female/male pattern hair loss (androgenetic)
- Alopecia areata

Female pattern hair loss
vs
Male pattern hair loss

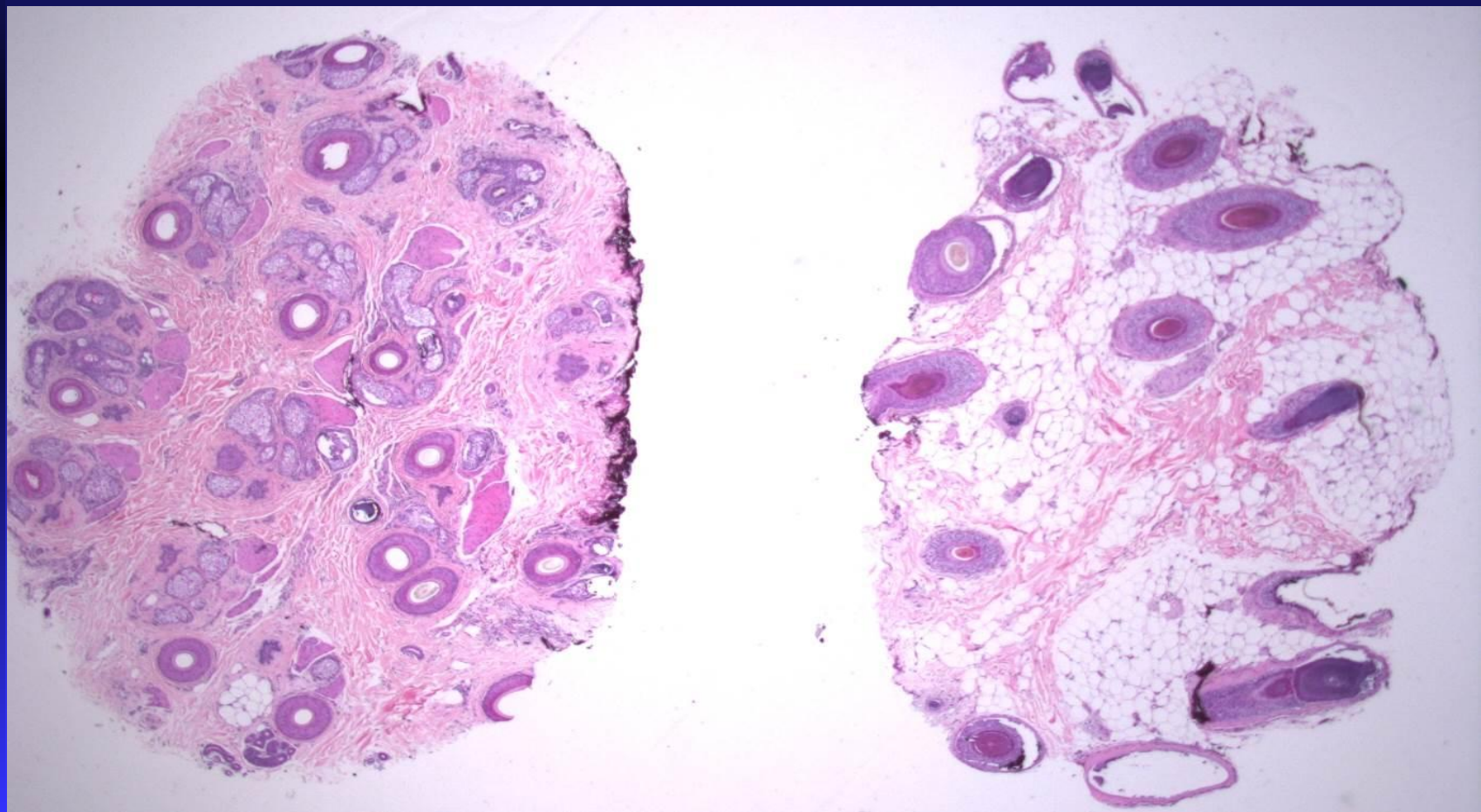
- Female miniaturized to a certain point, then stops
- Male advances to complete loss of follicles

Intermediate Size—For diagnostic purposes group with vellus/miniaturizated

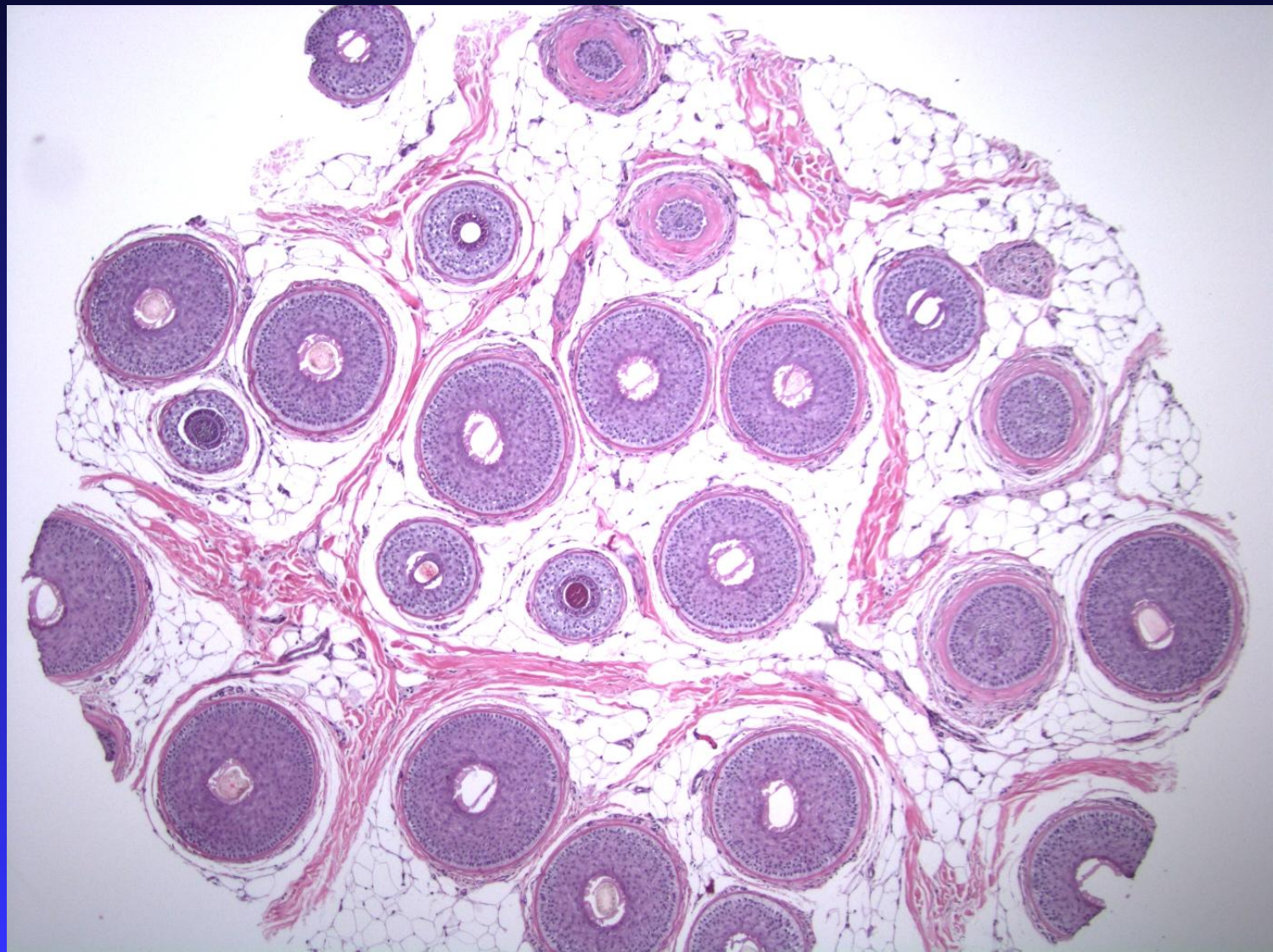
Indeterminate hairs

0.03mm < shafts < 0.06 mm

Miniaturization

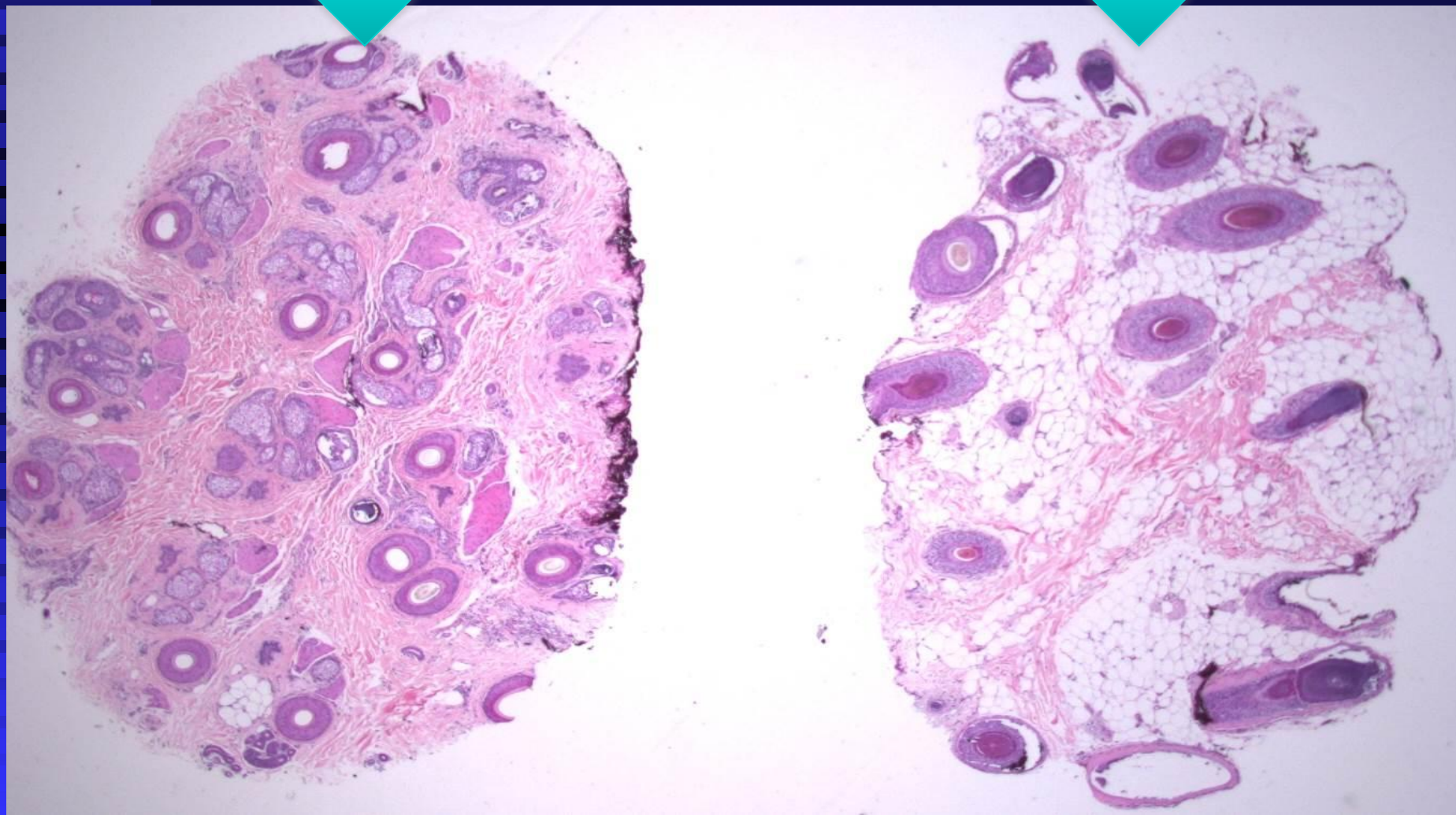


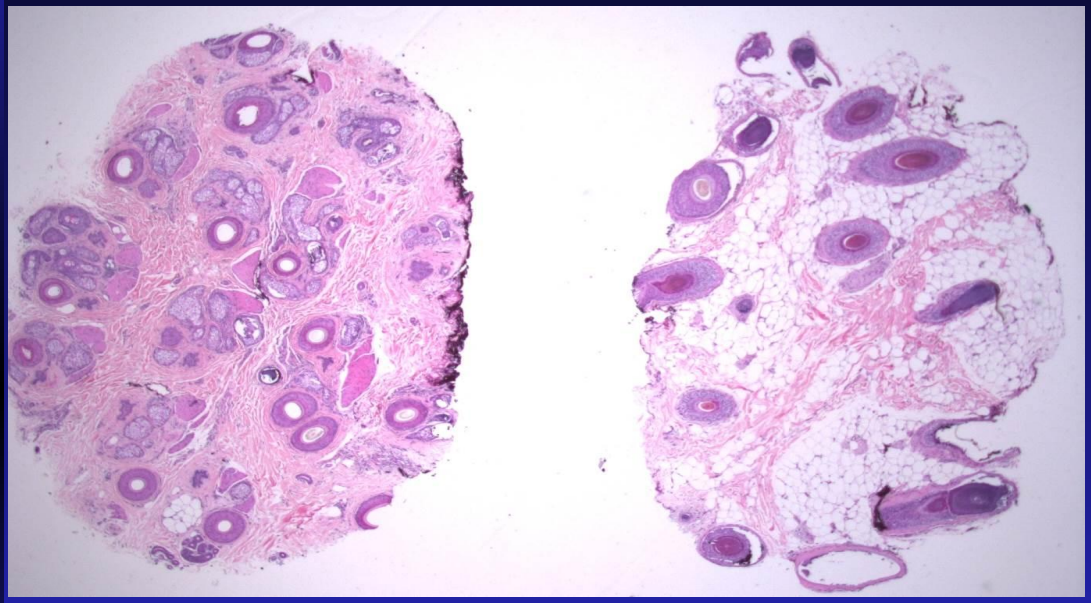
No miniaturization



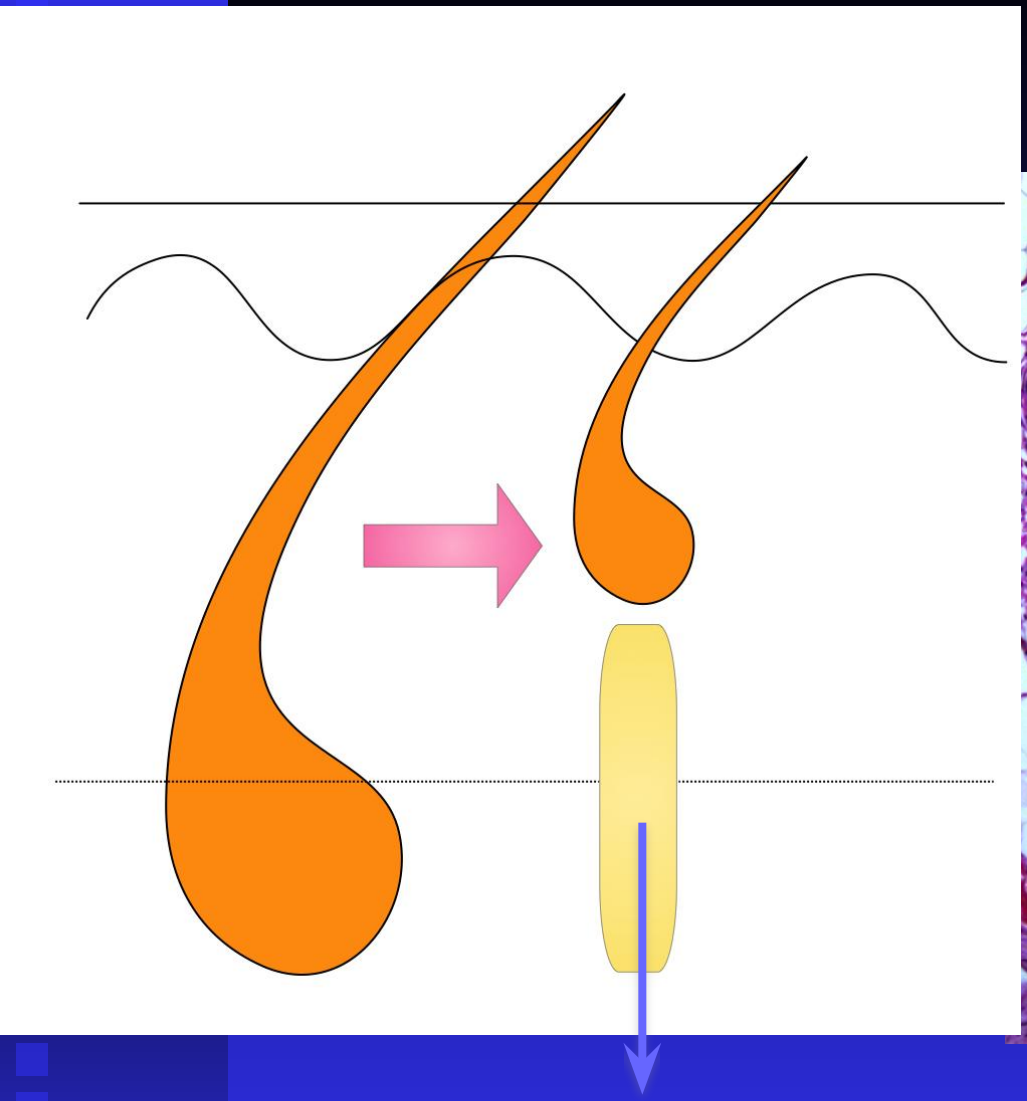
Total = Terminal + Vellus hairs

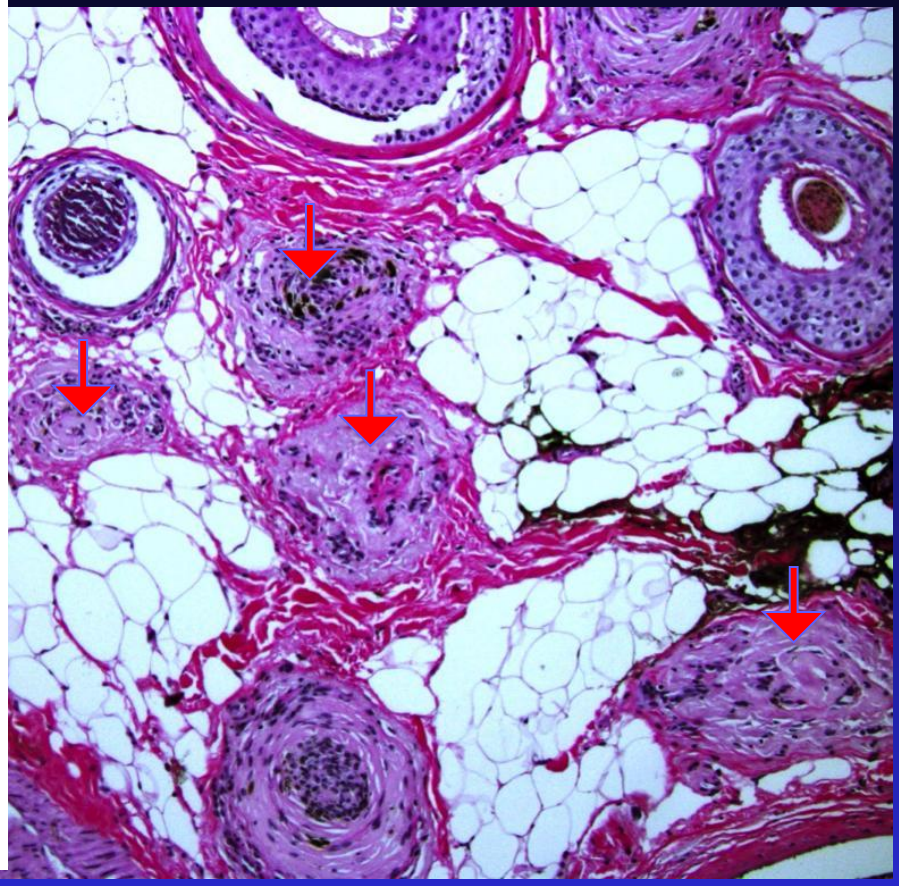
Terminal hairs





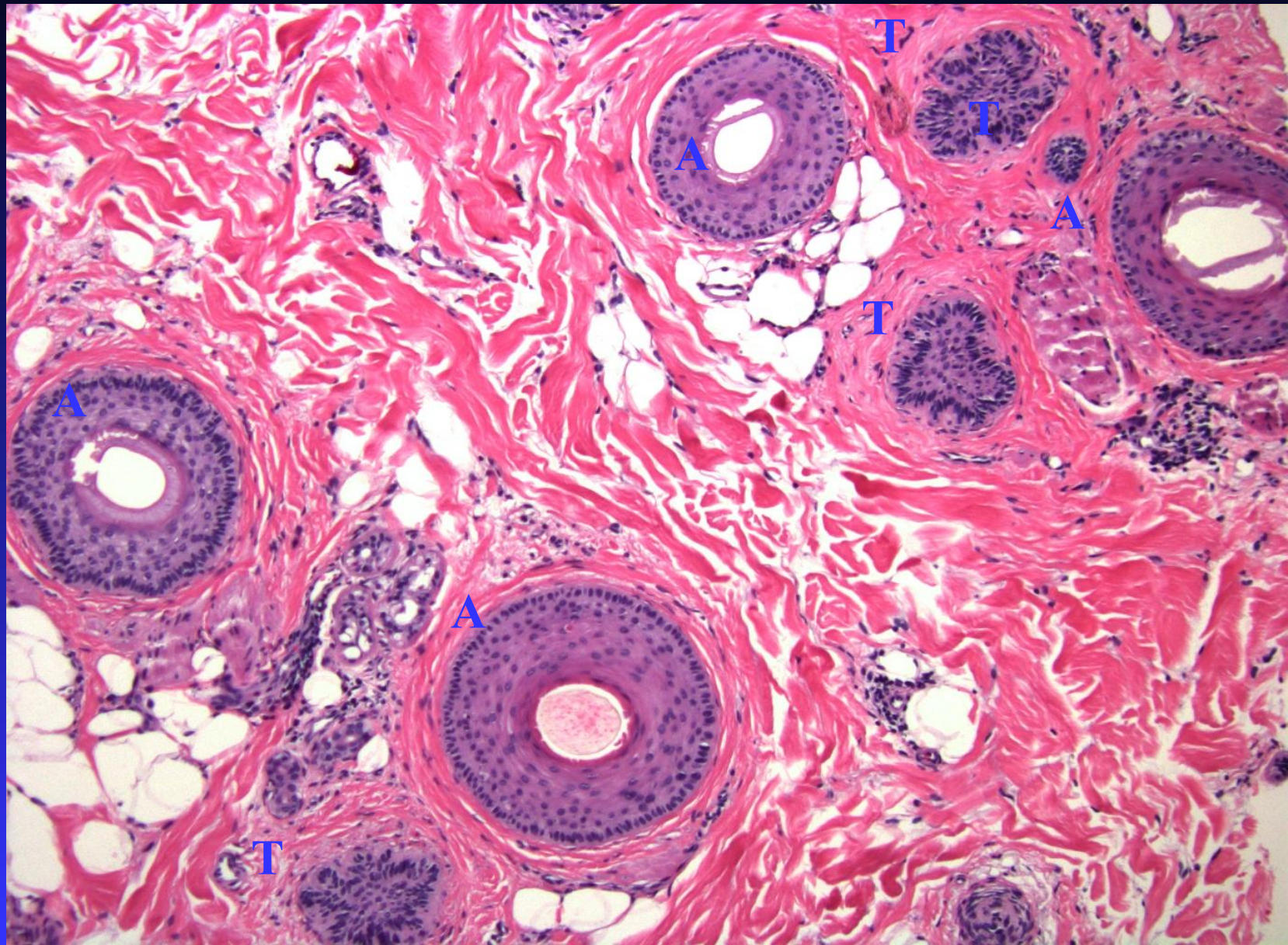
Total – Terminal = Vellus hairs



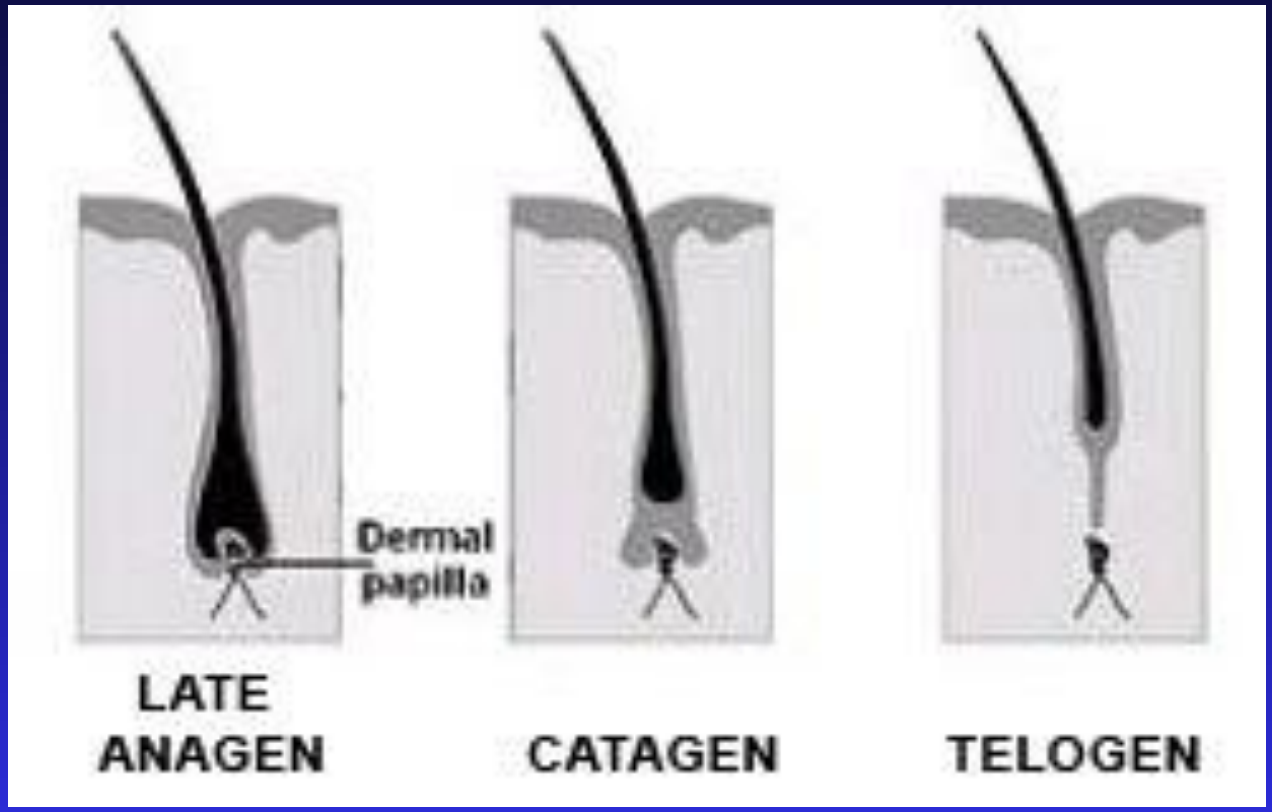


Follicular fibrous tract (stela)

Follicular Phase



Normal Hair Cycle



http://www.hairsurgical.com/hair-loss/

Normal Hair Cycle—Scalp

- Anagen: >85% of all hairs; 5-7 years in length
- Catagen: <2%; 2 weeks
- Telogen: <15%; 5 weeks

Duration of Anagen Phase=Hair Length

- Scalp 2-7 years
- Pubic/Axillary 3 months
- Eyebrows/eyelashes <1 month

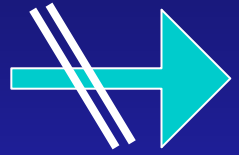
Terminal hair

Miniaturization

Vellus hair

Catagen-Telogen Importance in diagnosis

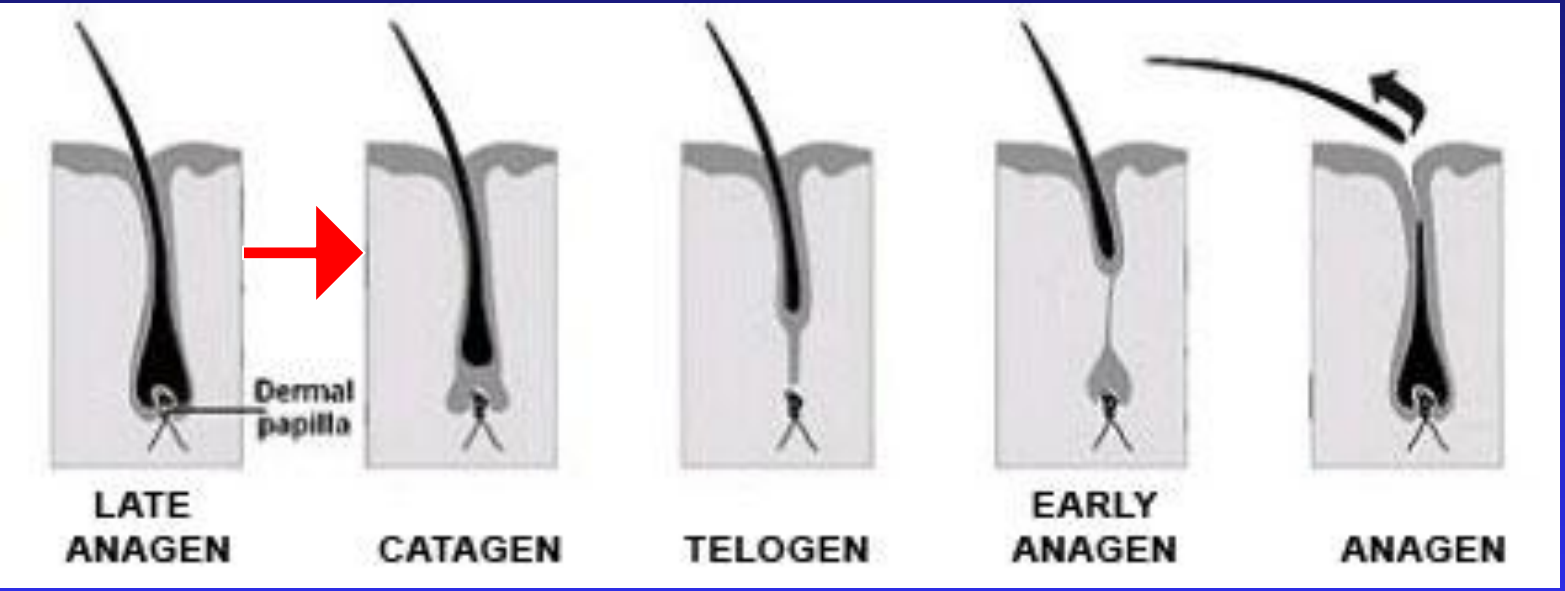
Acute Telogen Effluvium



Chronic Telogen Effluvium

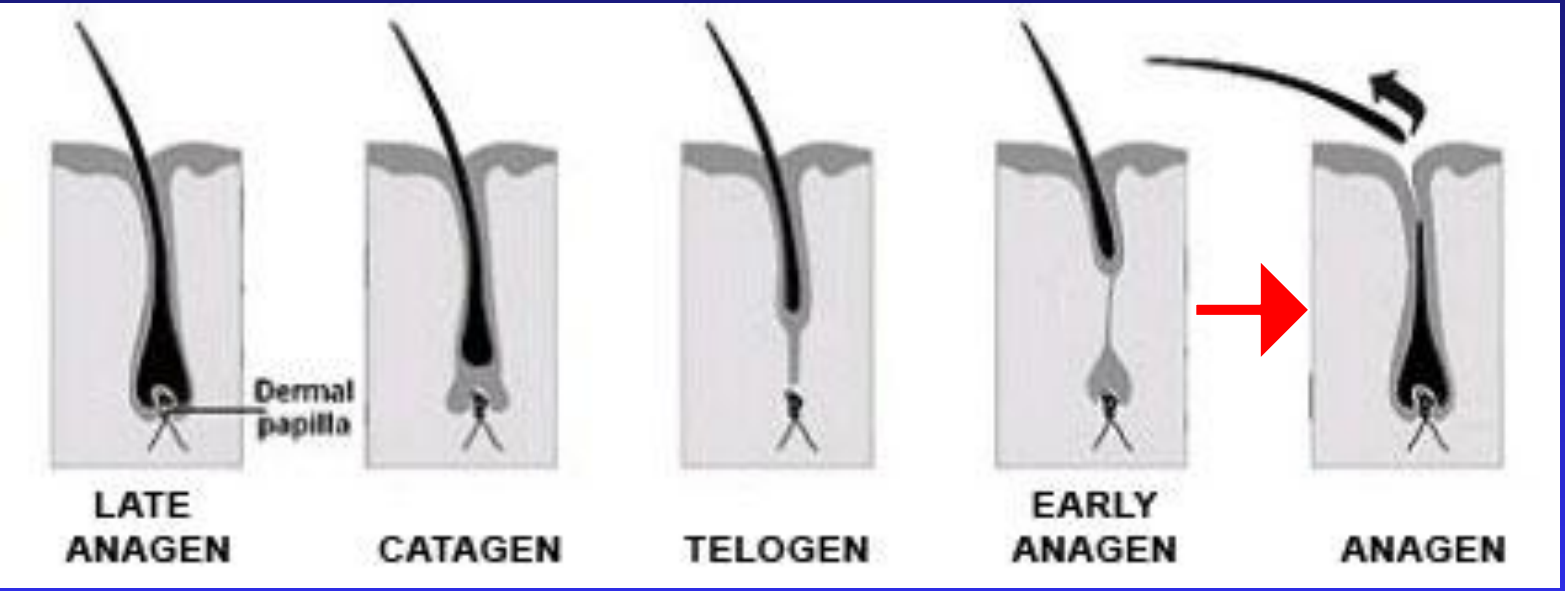
Acute Telogen Effluvium.

- Profound, synchronized cycle into catagen/telogen

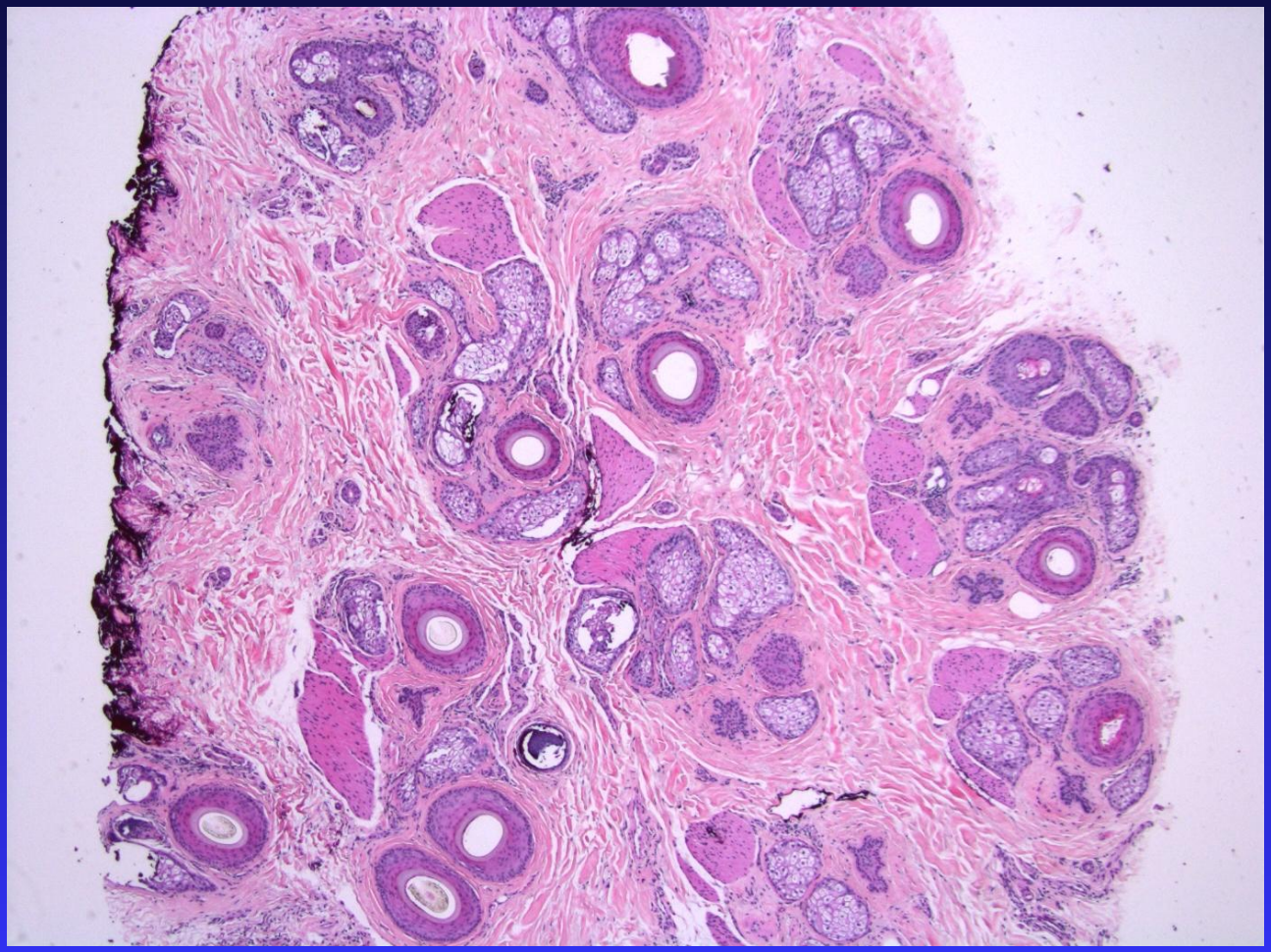


Acute Telogen Effluvium.

- Shedding occurs several months after insult (fever, anesthesia, drug ingestion).



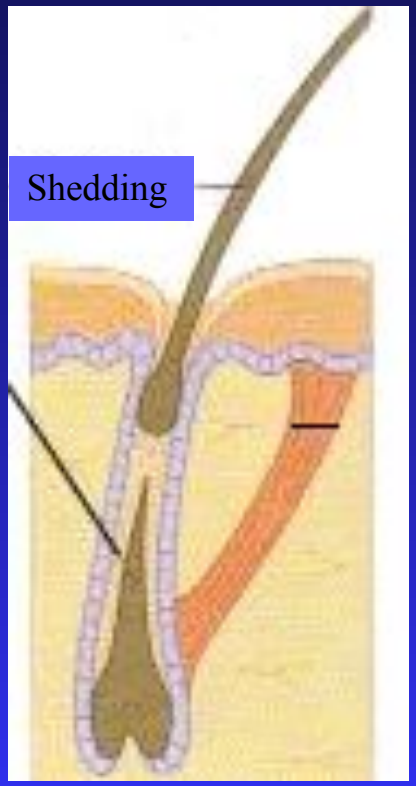
Acute Telogen Effluvium. Right after insult

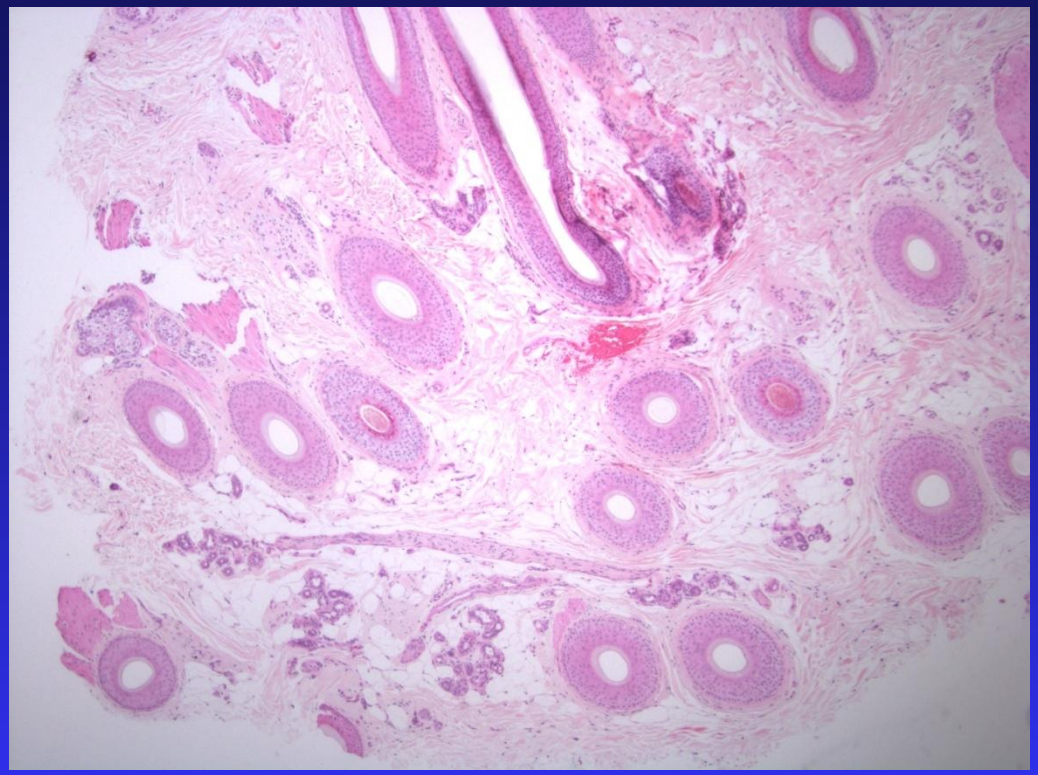


Acute Telogen Effluvium. During shedding

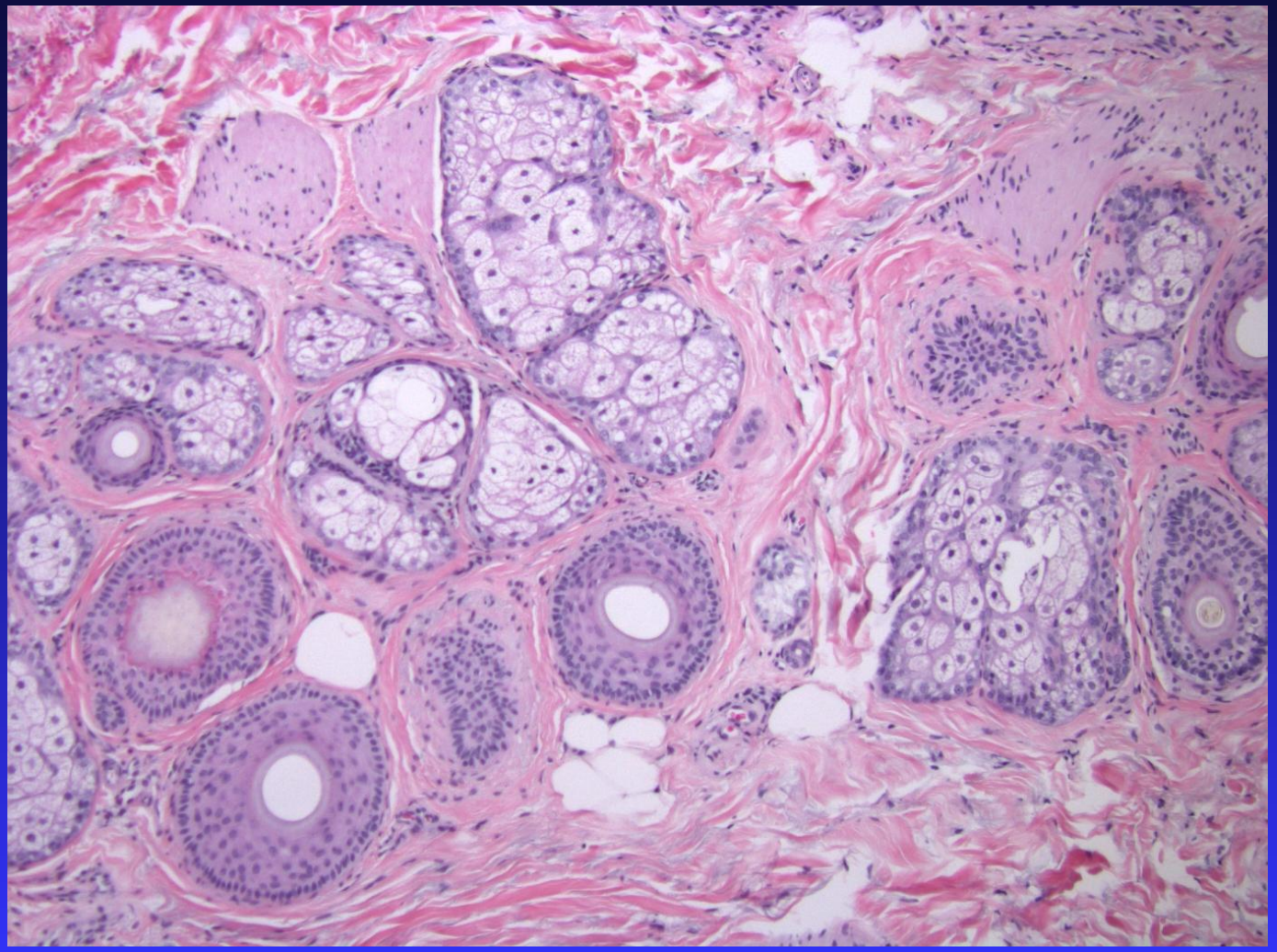
Acute Telogen Effluvium

Histology: 100% Anagen phase follicles





Chronic Telogen Effluvium
Histology: High catagen/telogen (>15-50%)



Summary of Telogen Effluvium

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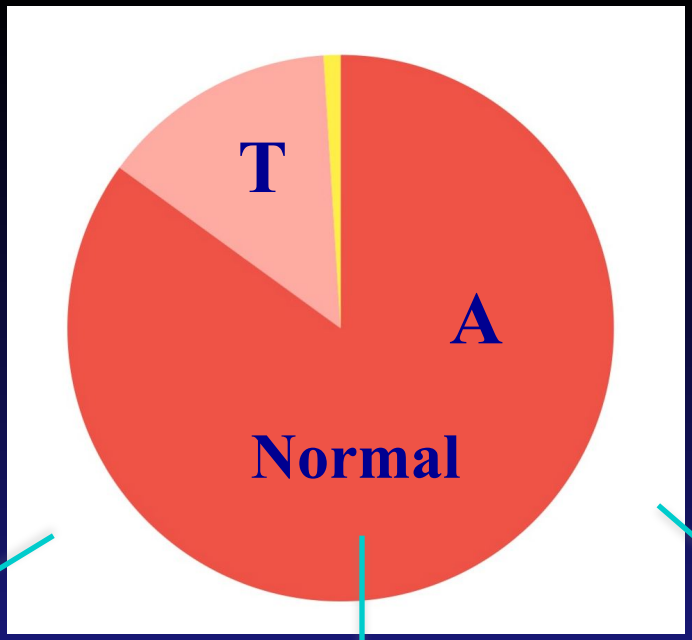
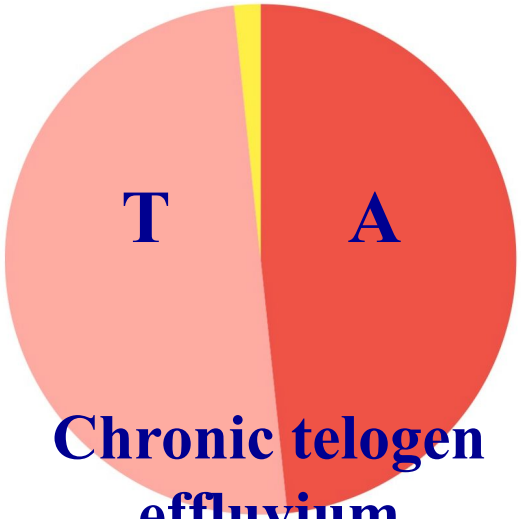
Acute Telogen Effluvium = 100% Anagen

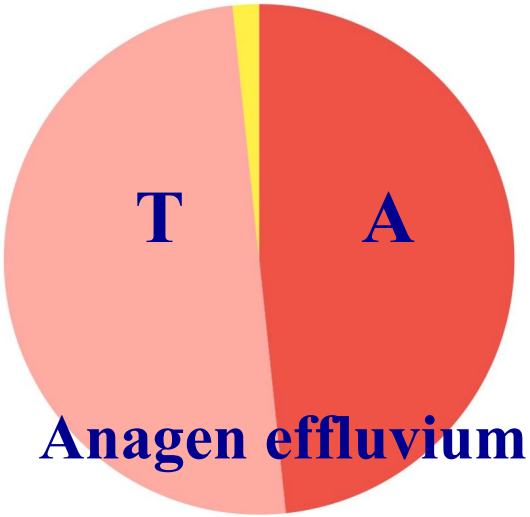
Chronic Telogen Effluvium = >20% Catagen/telogen



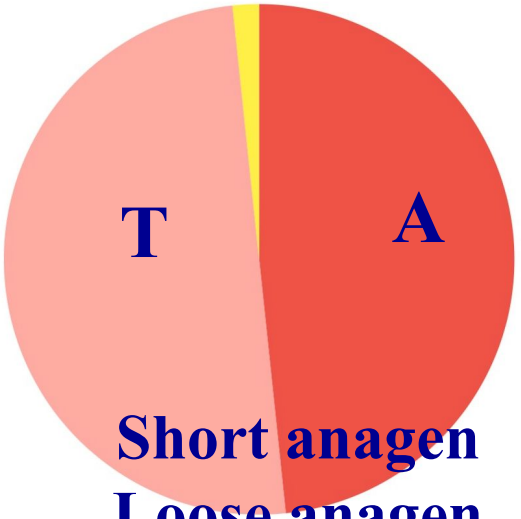
Short anagen duration



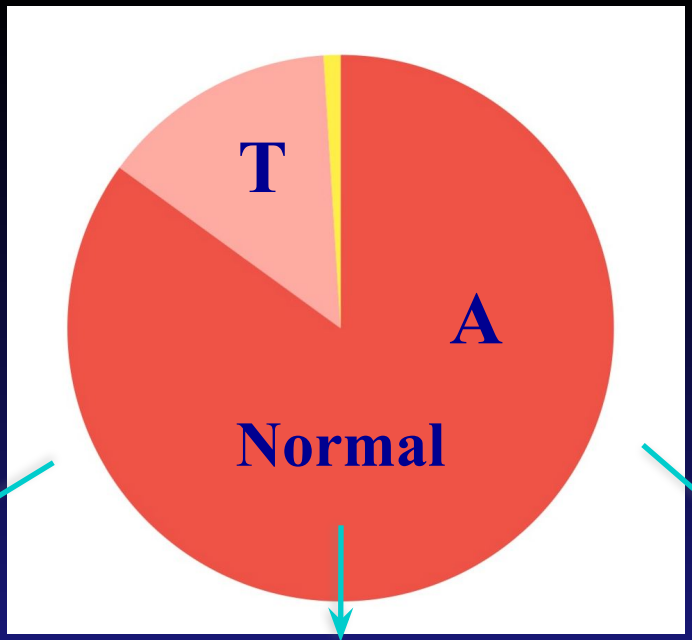
Chronic telogen effluvium



Anagen effluvium



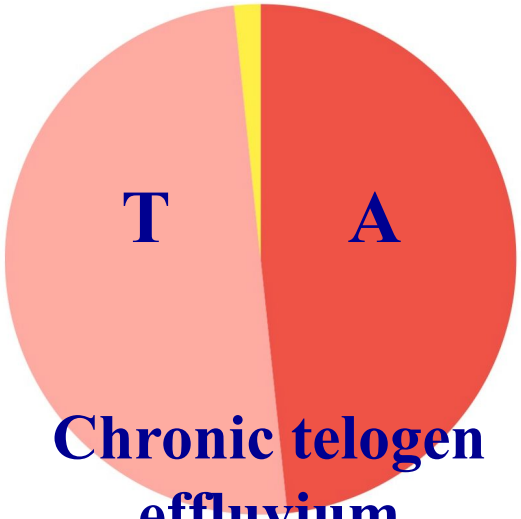
Short anagen
Loose anagen



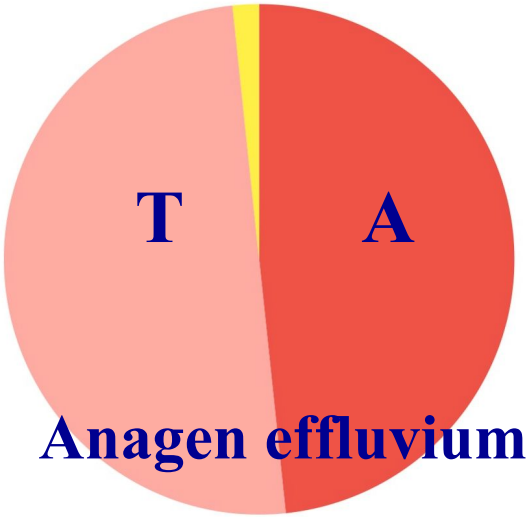
Premature cycling

Abrupt arrest of anagen

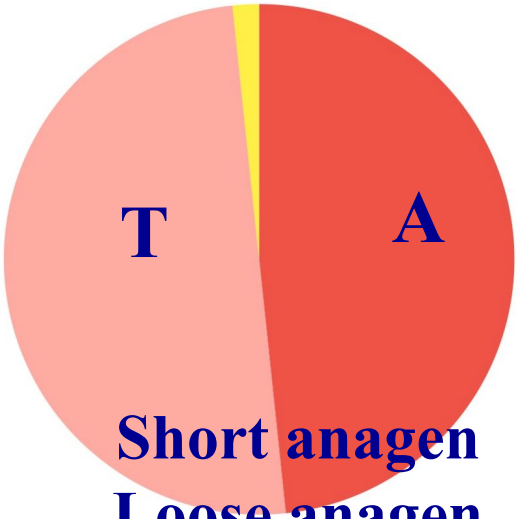
Short cycle genetic



Chronic telogen effluvium



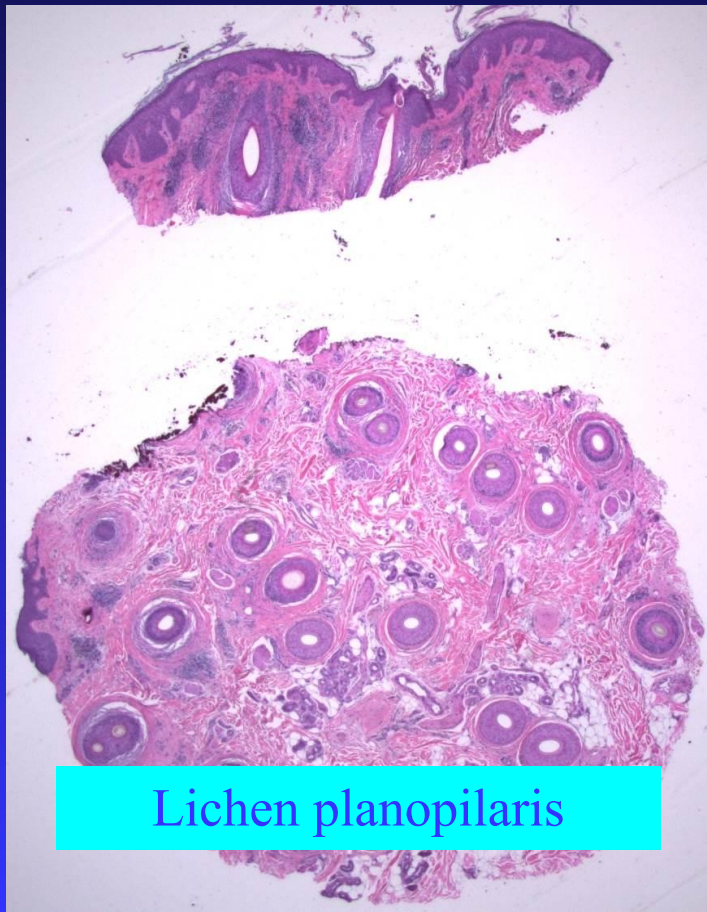
Anagen effluvium



Short anagen
Loose anagen

Diffuse alopecia with normal or absent catagen/telogen hairs:

- Acute telogen effluvium
- Diffuse lichen planopilaris



Trichotillosis

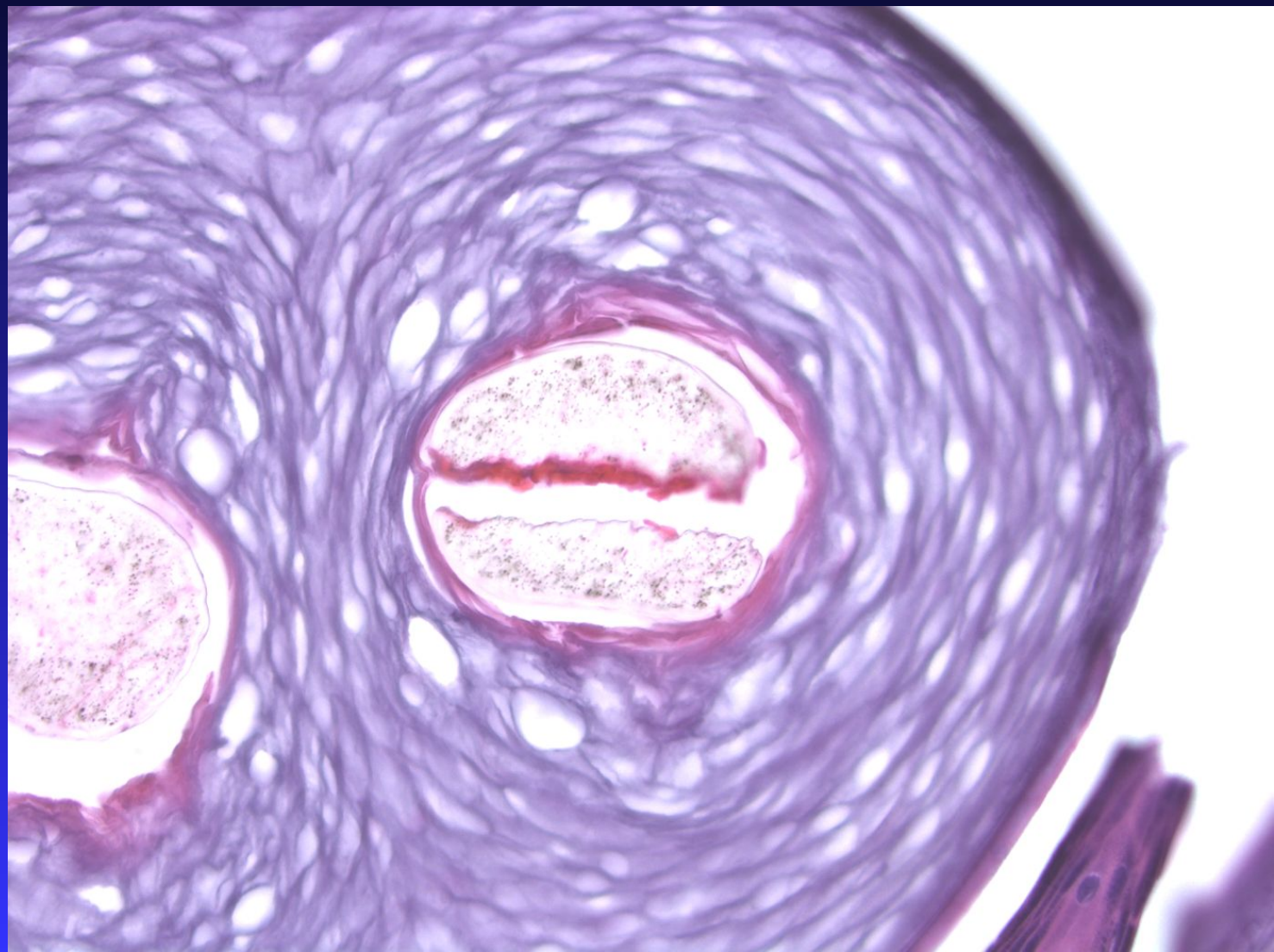
- Trichotillomania
- Traction alopecia

Trichotillosis
Probably not good to group

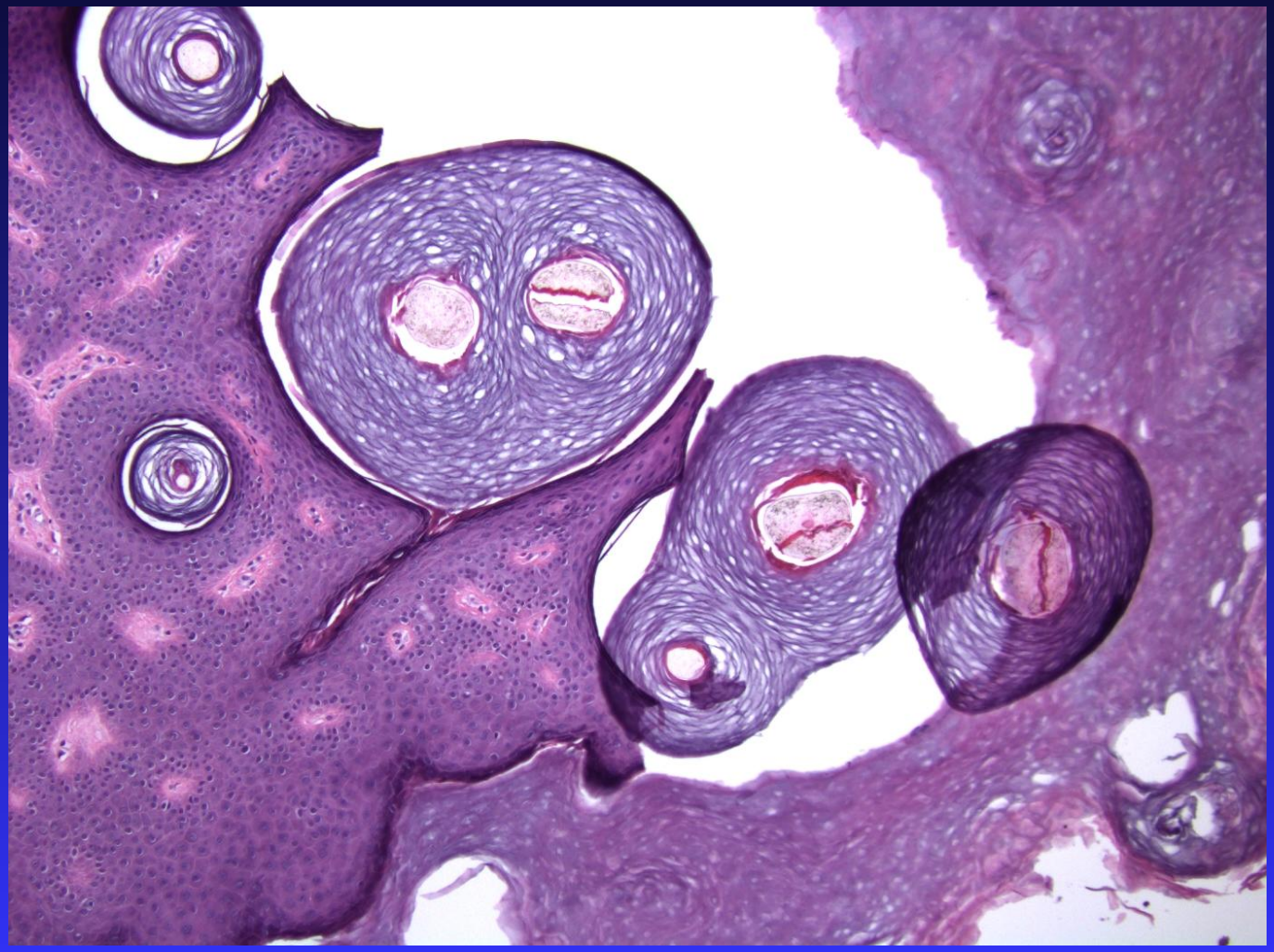
- Trichotillomania
  - Catagen/telogen shift
  - Hair shaft breakage
  - Melanin casts
  - Lichen simplex chronicus
- Traction alopecia
  - Low count (follicular loss)
  - Catagen/telogen shift

Trichotillomania: Hamburger Sign

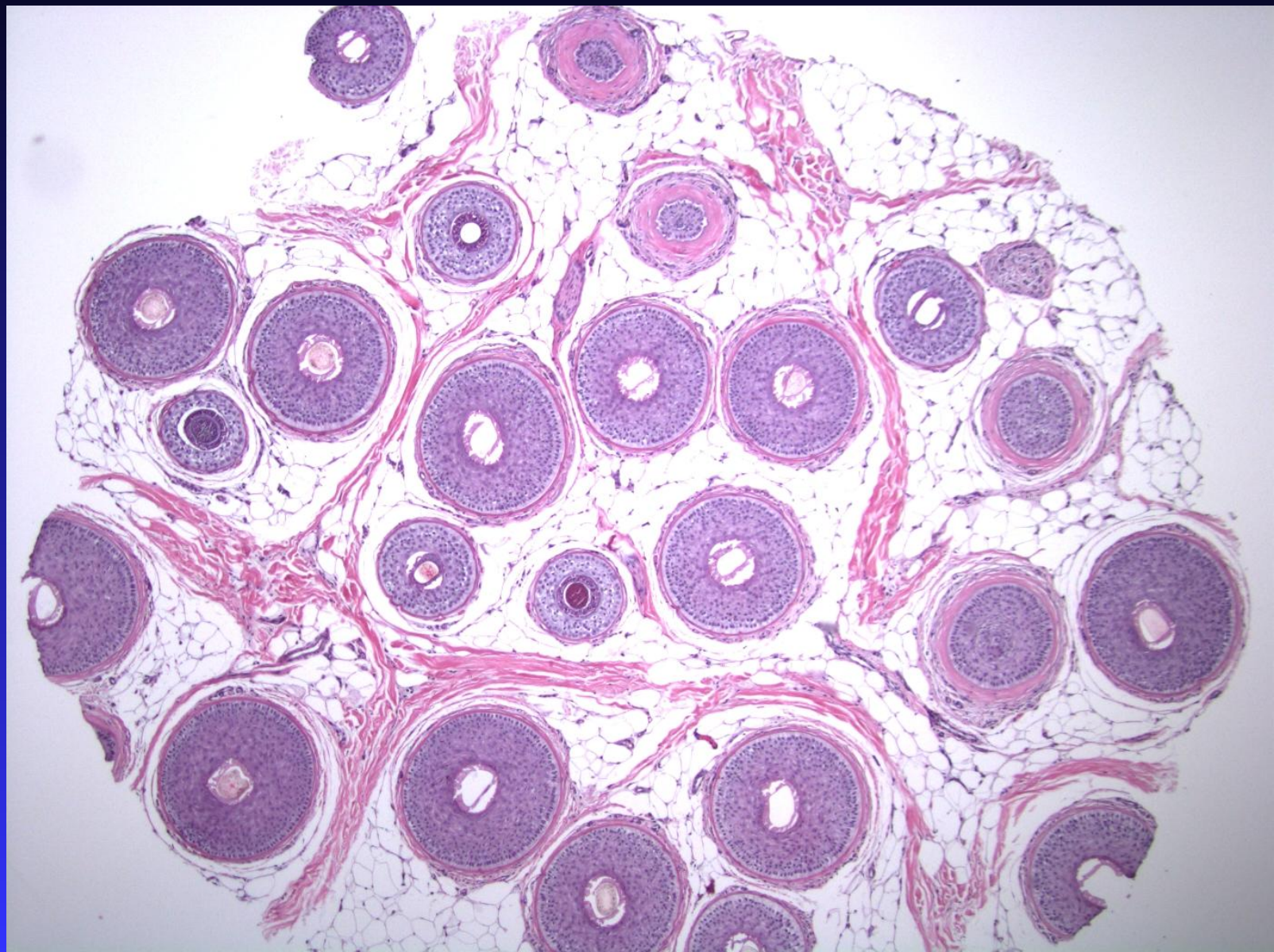
Royer MCRoyer MC and Sperling LCRoyer MC and Sperling LC. Splitting hairs: the 'hamburger sign' in TRoyer MC and Sperling LC. Splitting hairs: the 'hamburger sign' in Trichotillomania. J Cutan Pathol. 33Suppl 2:63-4, 2006.



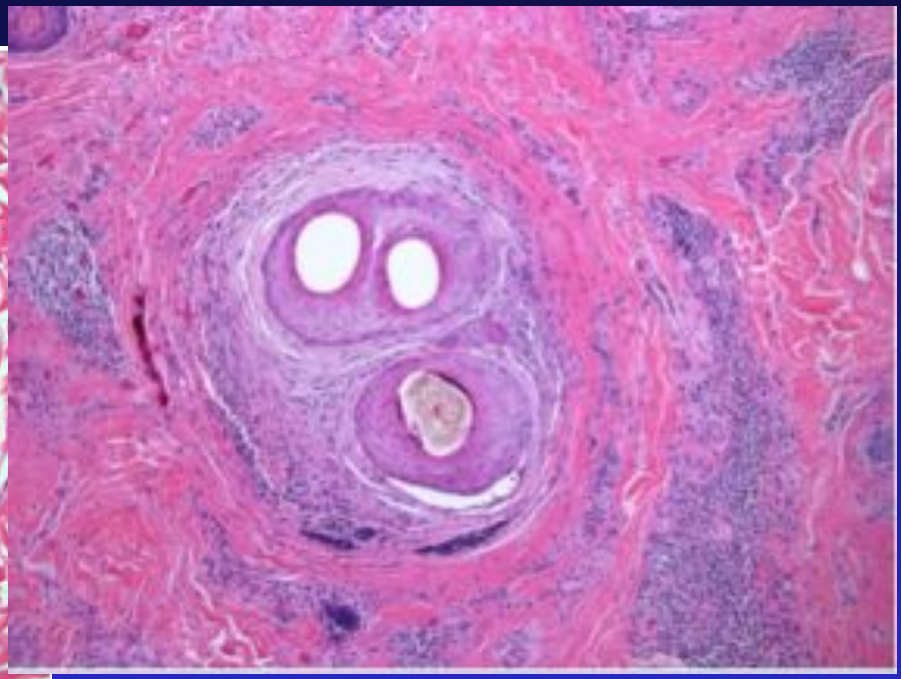
Lichen simplex chronicus



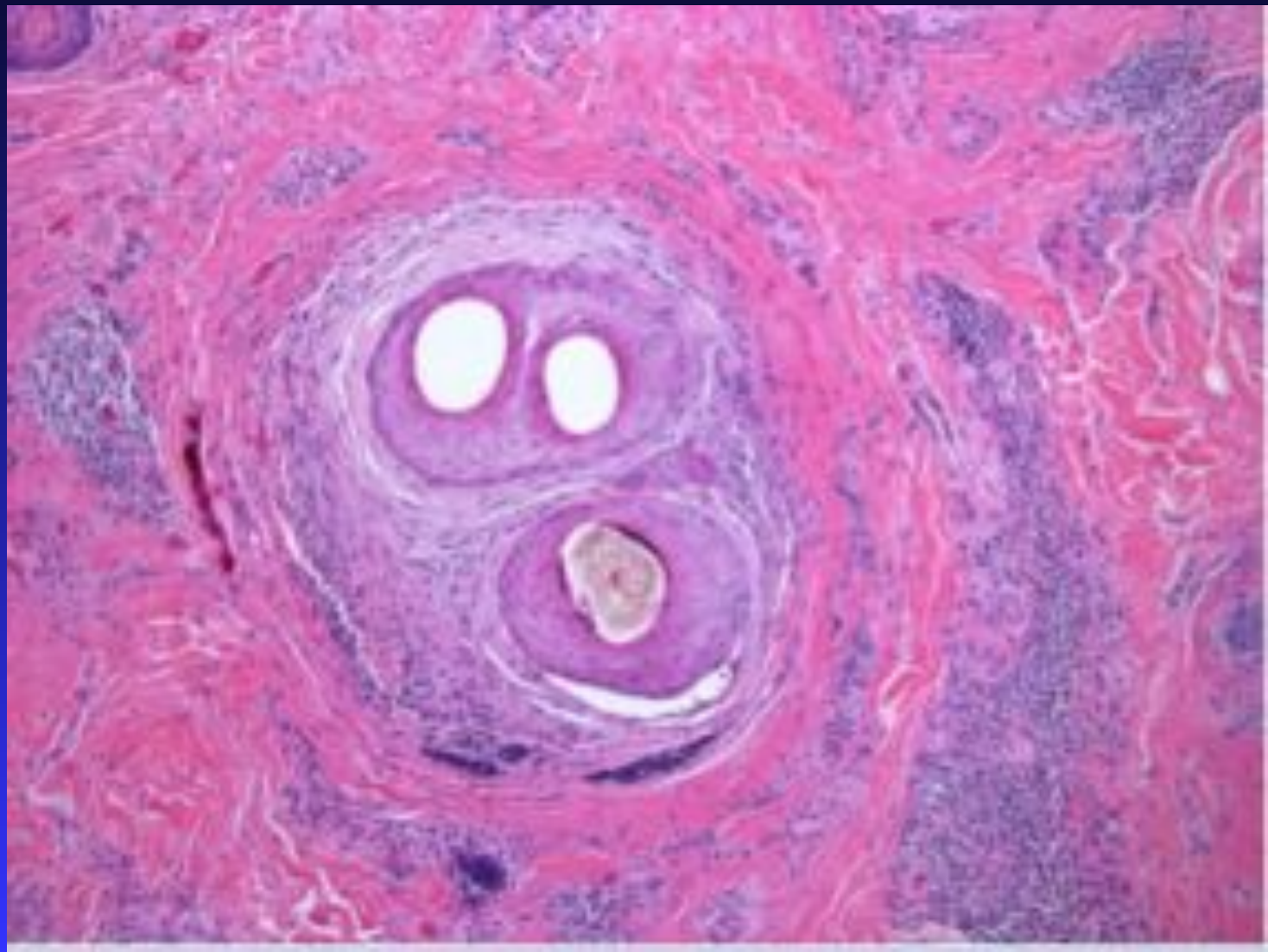
Trichotillosis-Catagen/Telogen shift



Normal Ostium—Not scar



May be a resolving acneiform lesion (Zit)



Lichen Planopilaris (LPP)

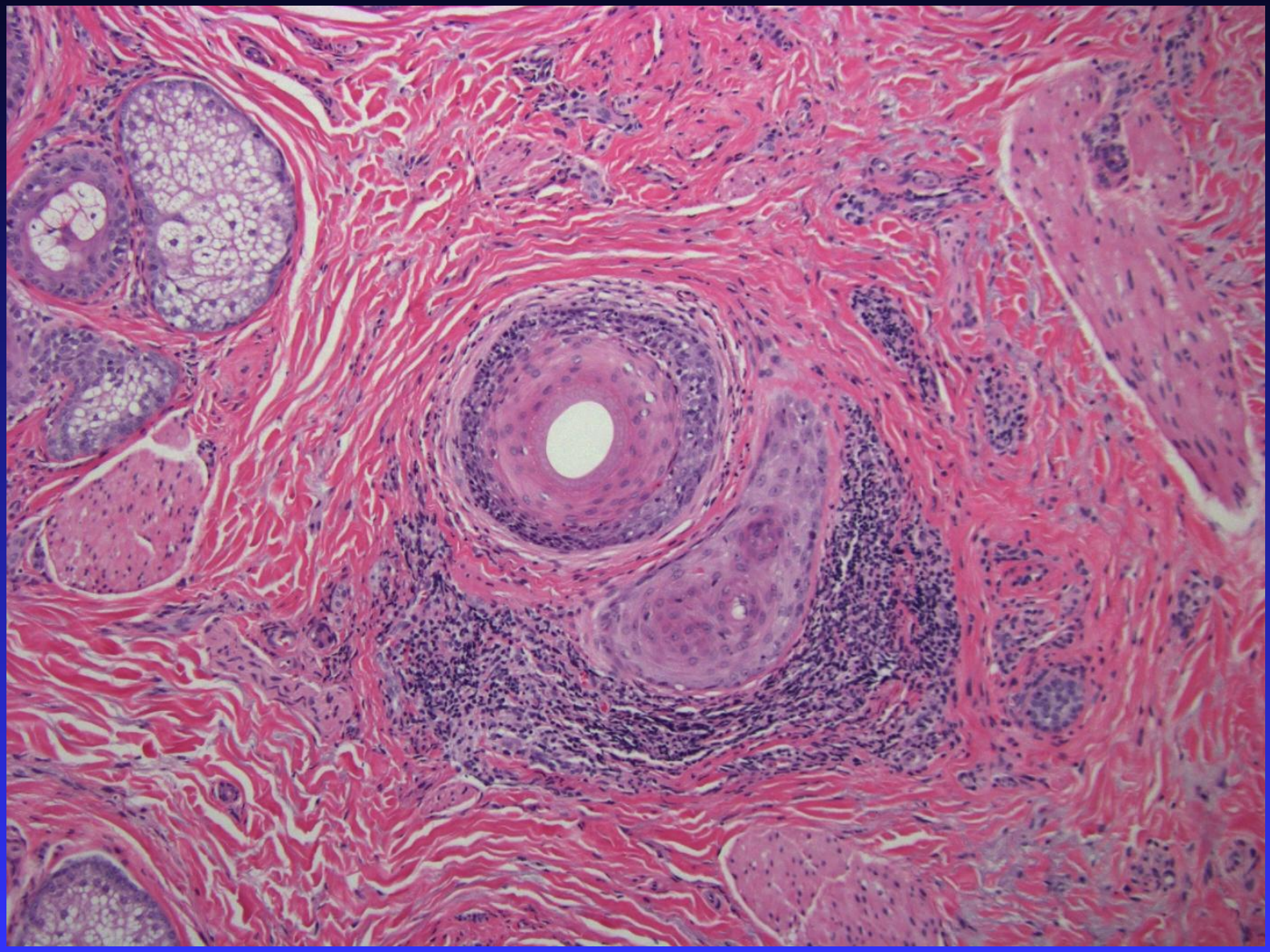
- Miniepidemic?
  - Hair loss clinicians observing increased incidence.
  - Traditionally USWest Coast > East Coast
  - Observed during exams when patient being seen for other problem

Lichen Planopilaris Increasing Incidence

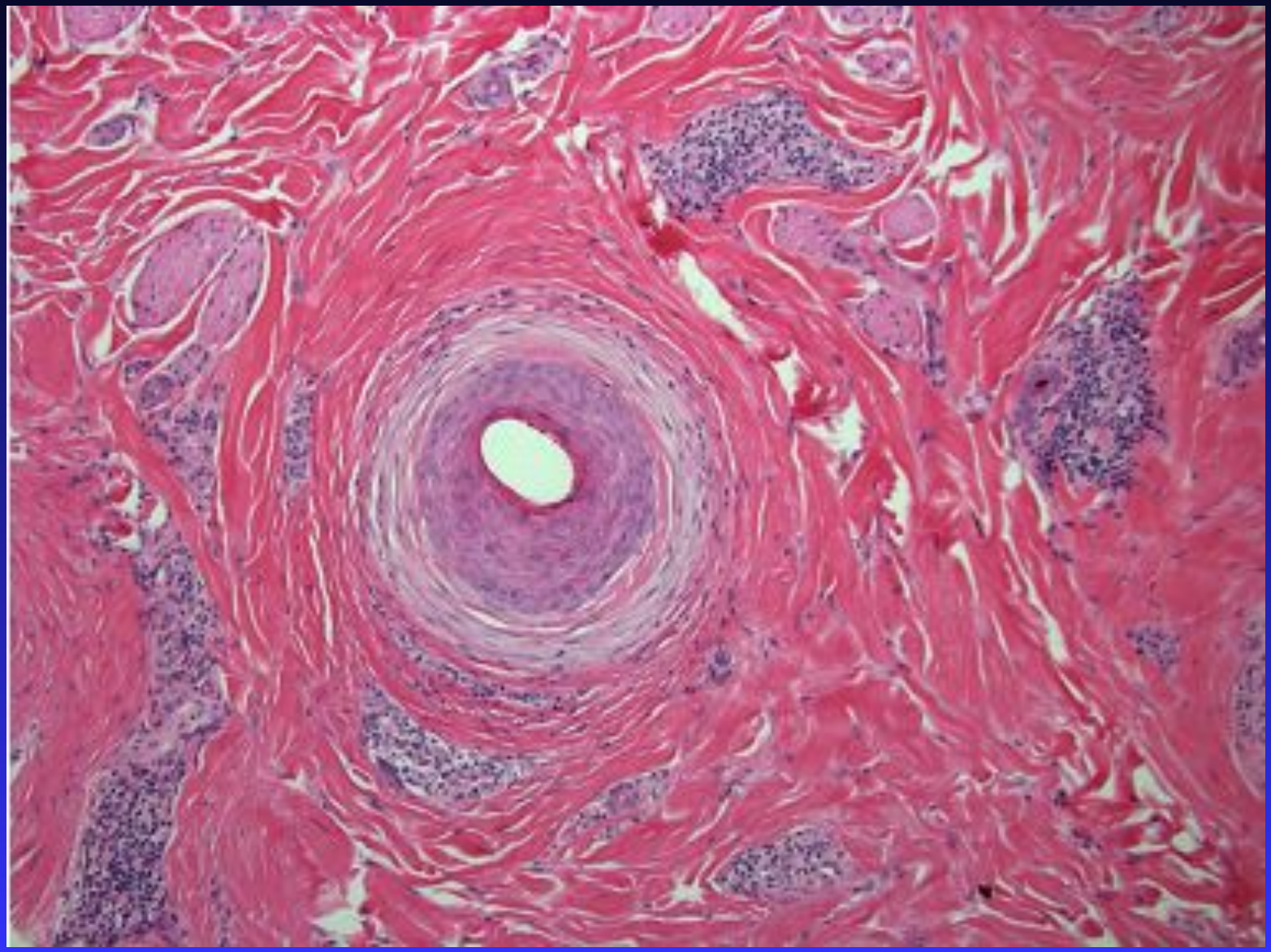
- Nanoparticle
  - Lichen planus—Metals, especially dental implicated
    - Gold, mercury—dental*
    - Nail LP associated with +metal patch test**

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

Lichen Planopilaris



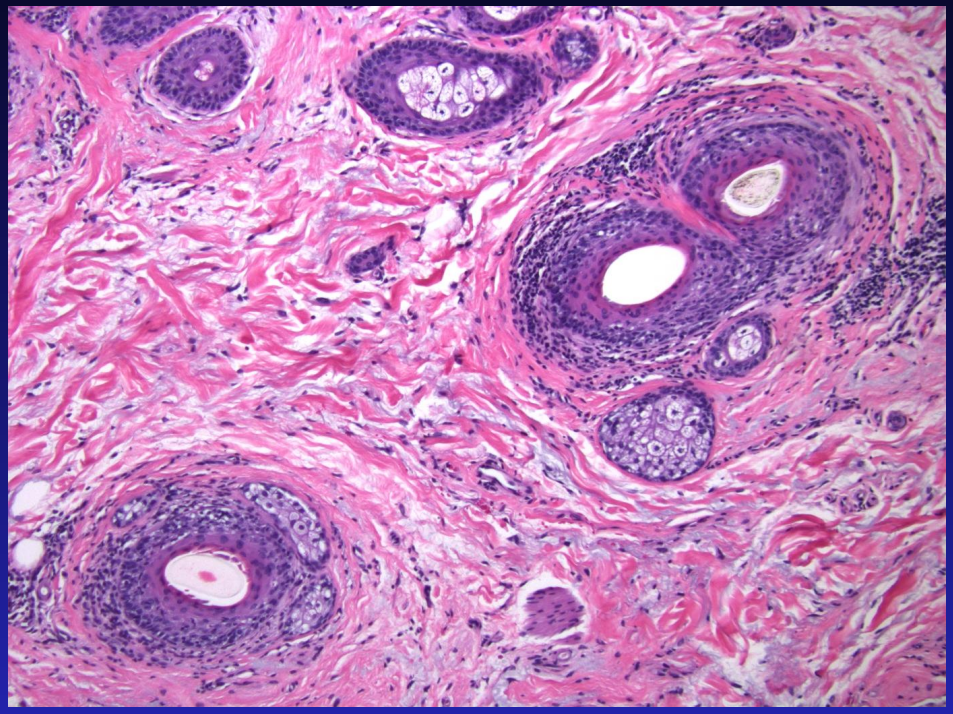
Lichen Planopilaris

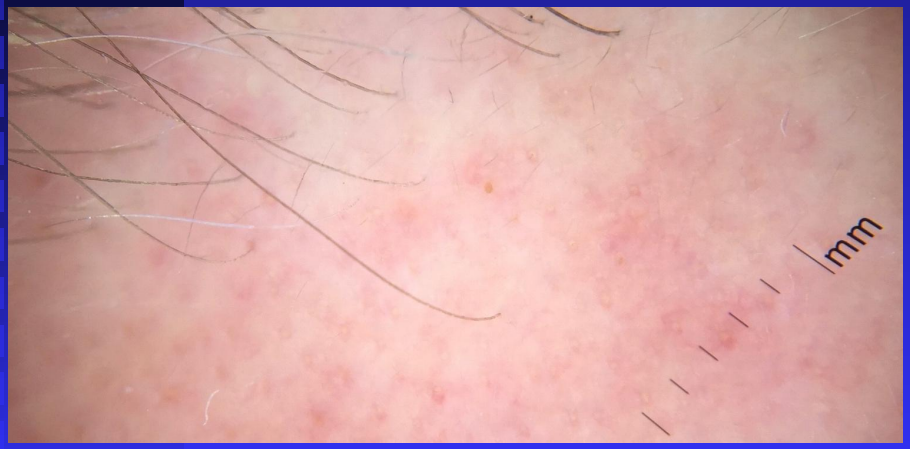


LPP—Frontal Fibrosing Variant

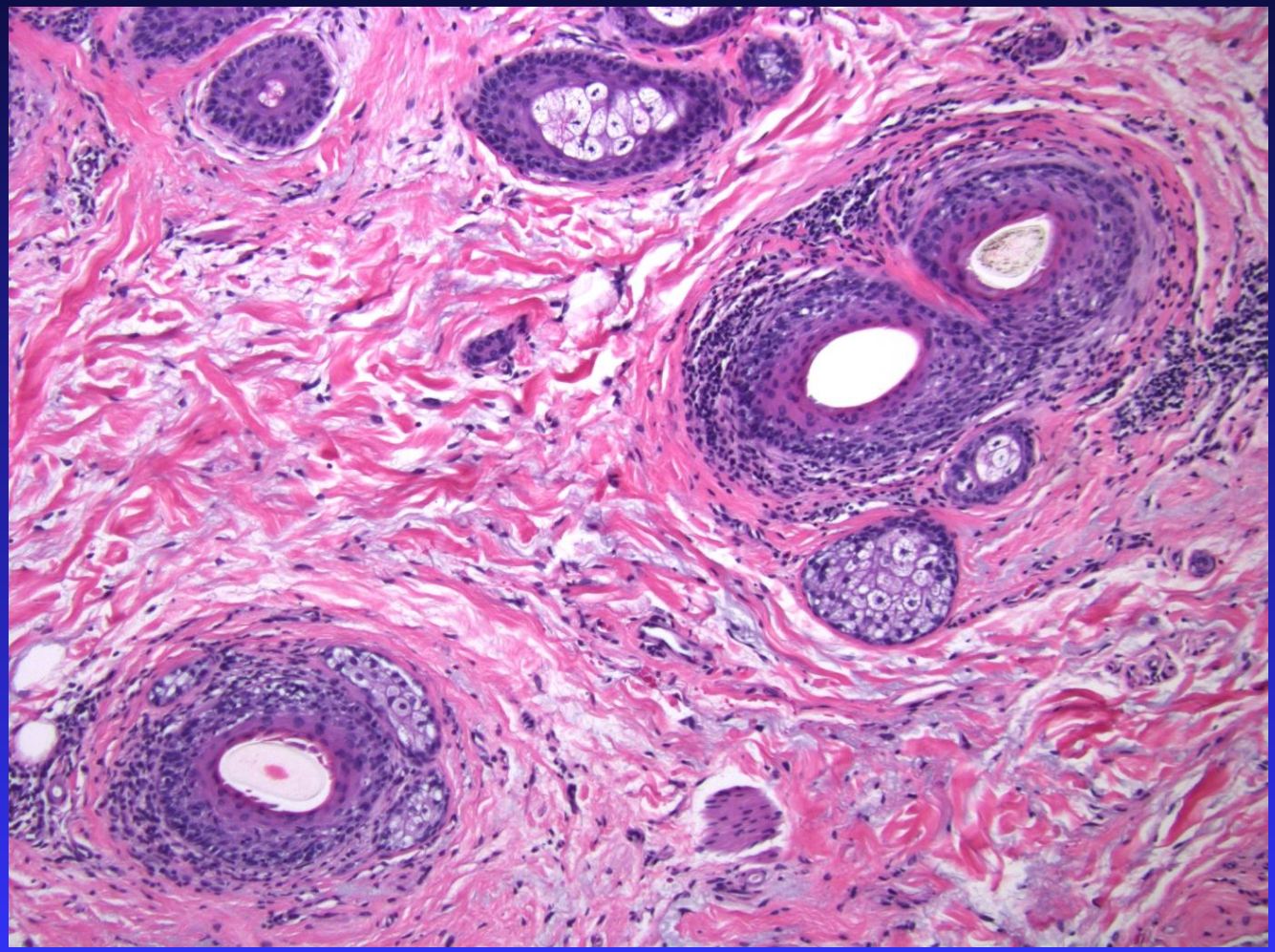
- Appears to target smaller follicles (eyebrows, vellus/body)
- Increasing incidence

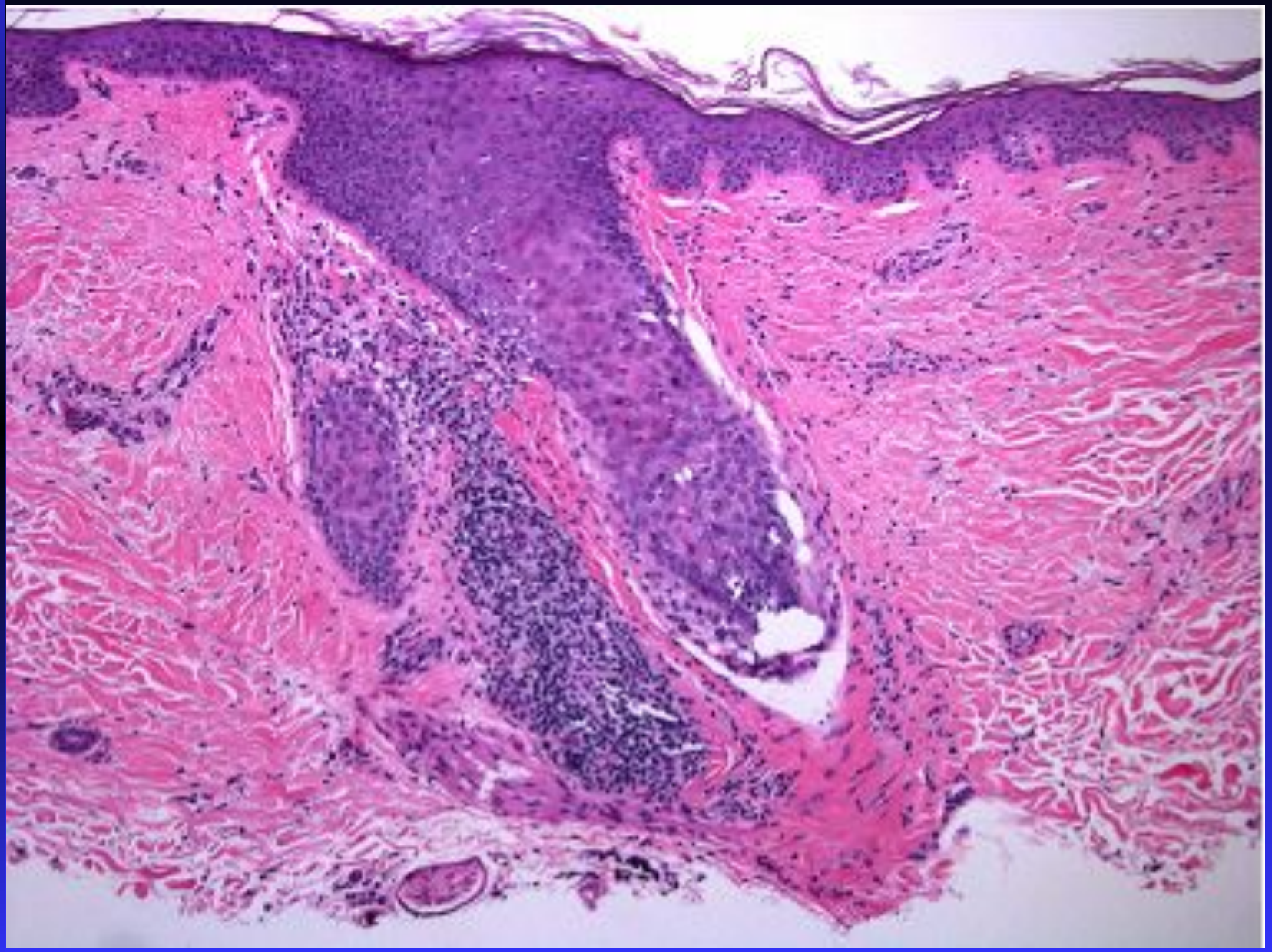
Frontal fibrosing alopecia





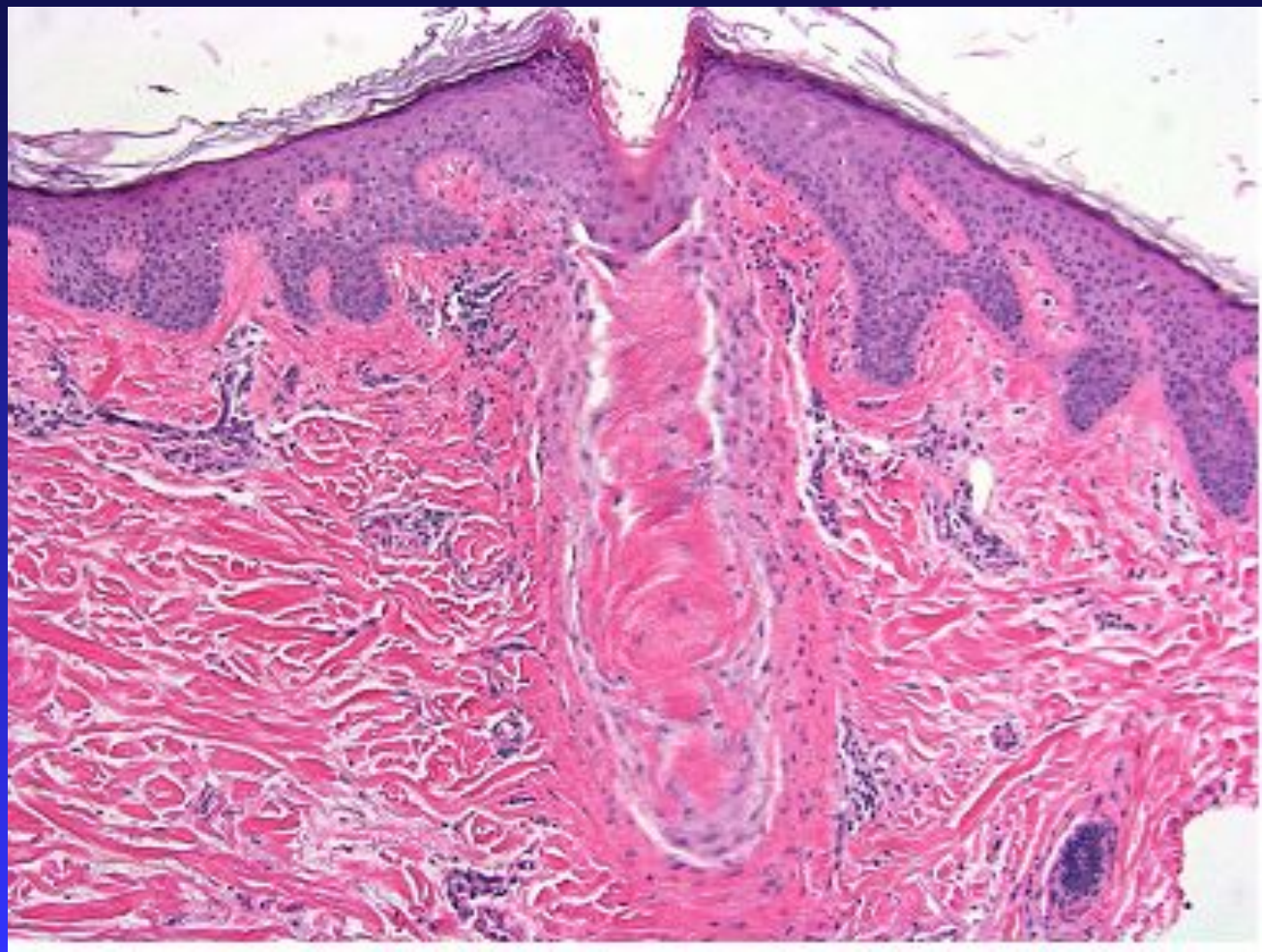
LPP—Frontal Fibrosing Variant Histology: Minimal or no scarring





LPP Frontal Fibrosing--Eyebrow

Often complete follicular loss with lymphocytes and no scarring



Concept

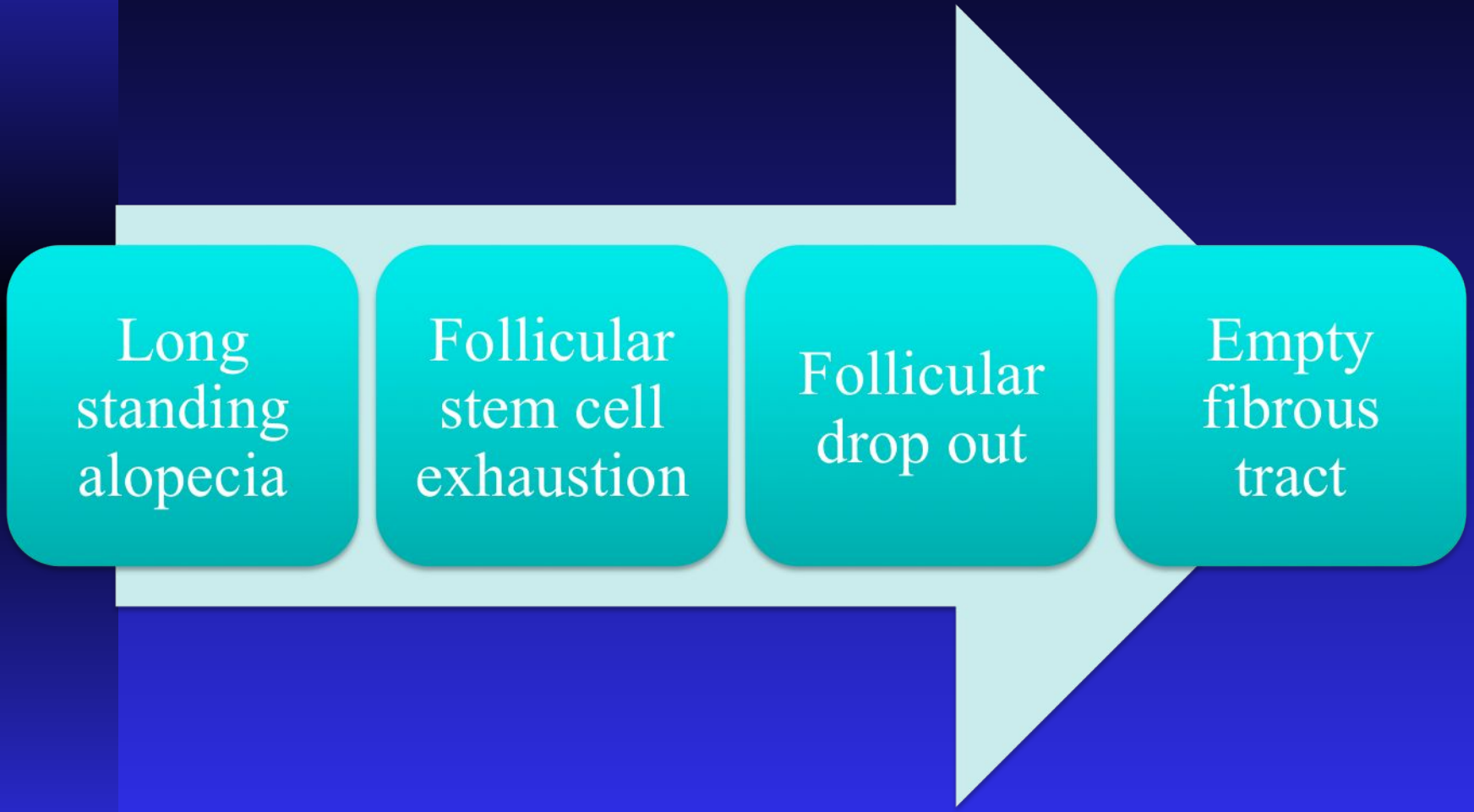
All alopecias, whether classified as cicatricial or non-cicatricial, may, in the end, be scarring

	Cicatricial alopecia	Non-cicatricial alopecia
Follicular and sebaceous epithelium	Destroyed	Preserved
Final outcome	Replacement by follicular scarring	Regrowth
Hair loss	Irreversible	Reversible

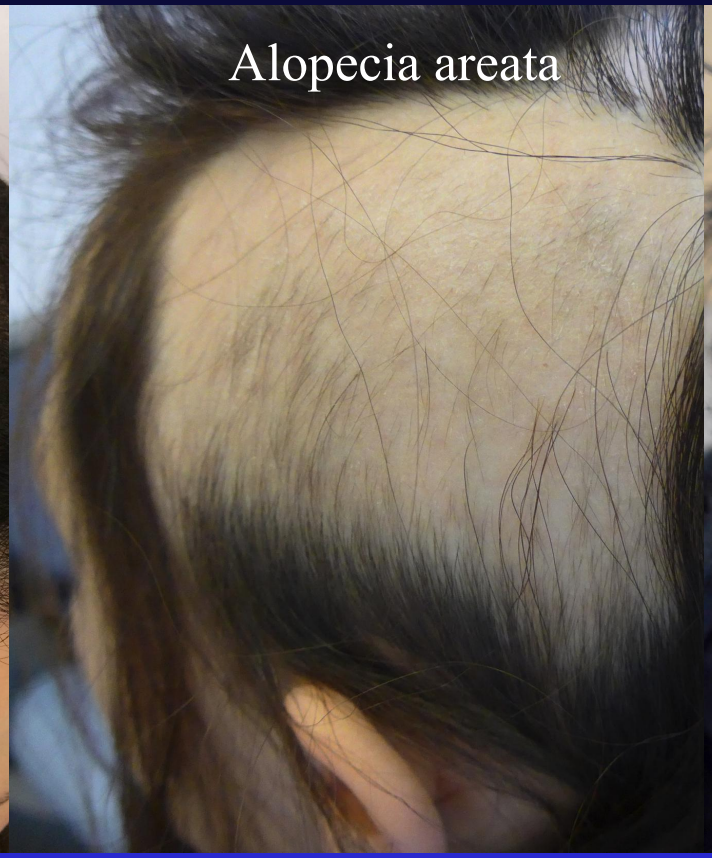
Not Necessarily True

	Cicatricial alopecia	Non-cicatricial alopecia
Follicular and sebaceous epithelium	Destroyed	Preserved
Final outcome	Replacement by follicular scarring	Regrowth
Hair loss	Irreversible	Reversible

Biphasic alopecia



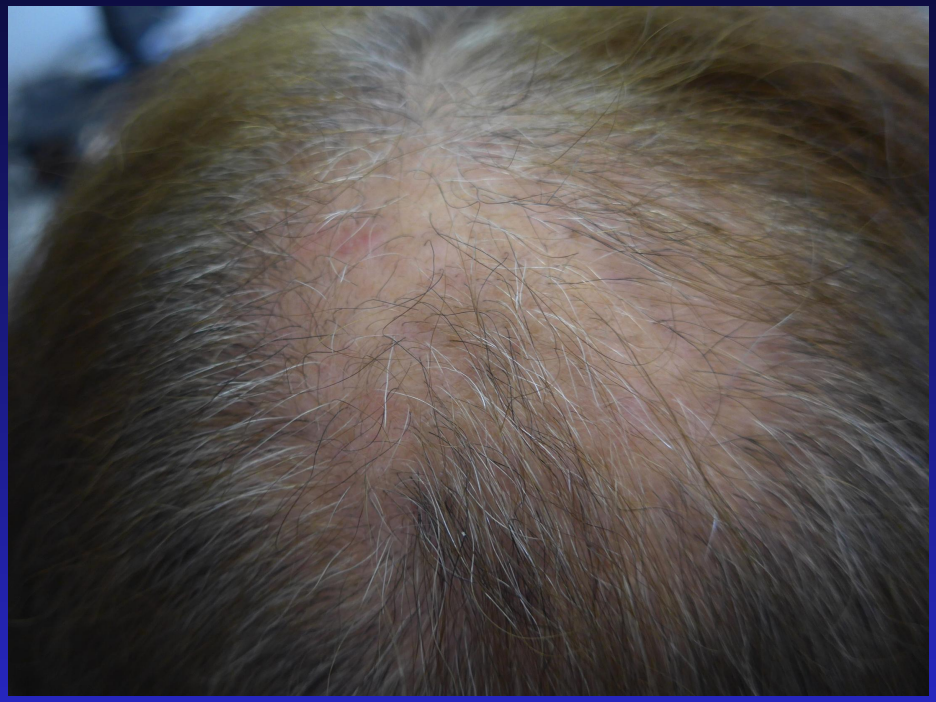
Biphasic alopecia

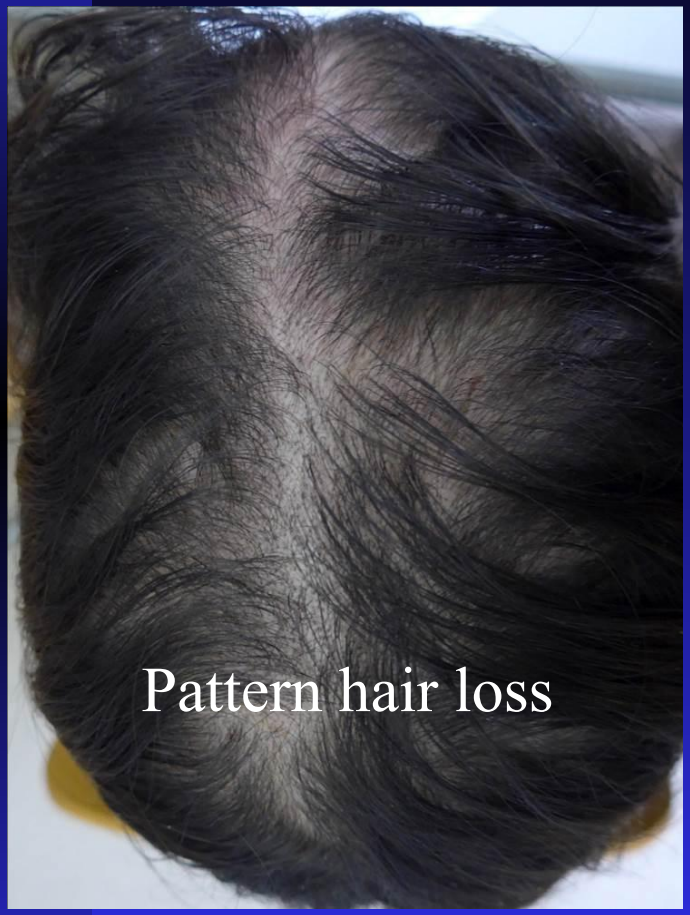


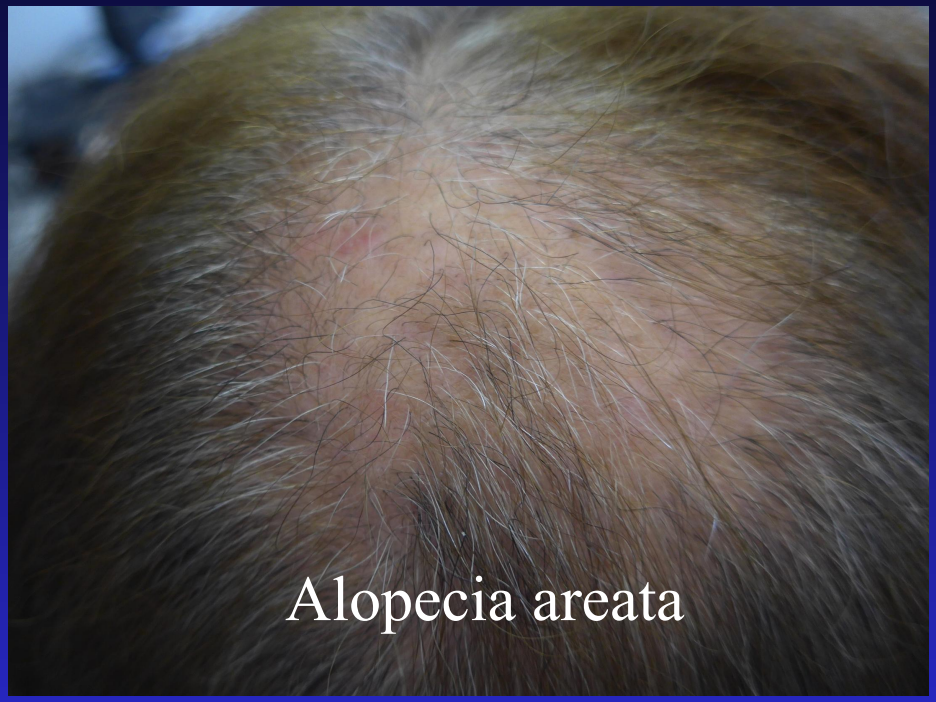
Sperling LC, Lupton GP. Histopathology of non-scarring alopecia. J Cutan Pathol 1995; 22: 97-114.

Objective #3

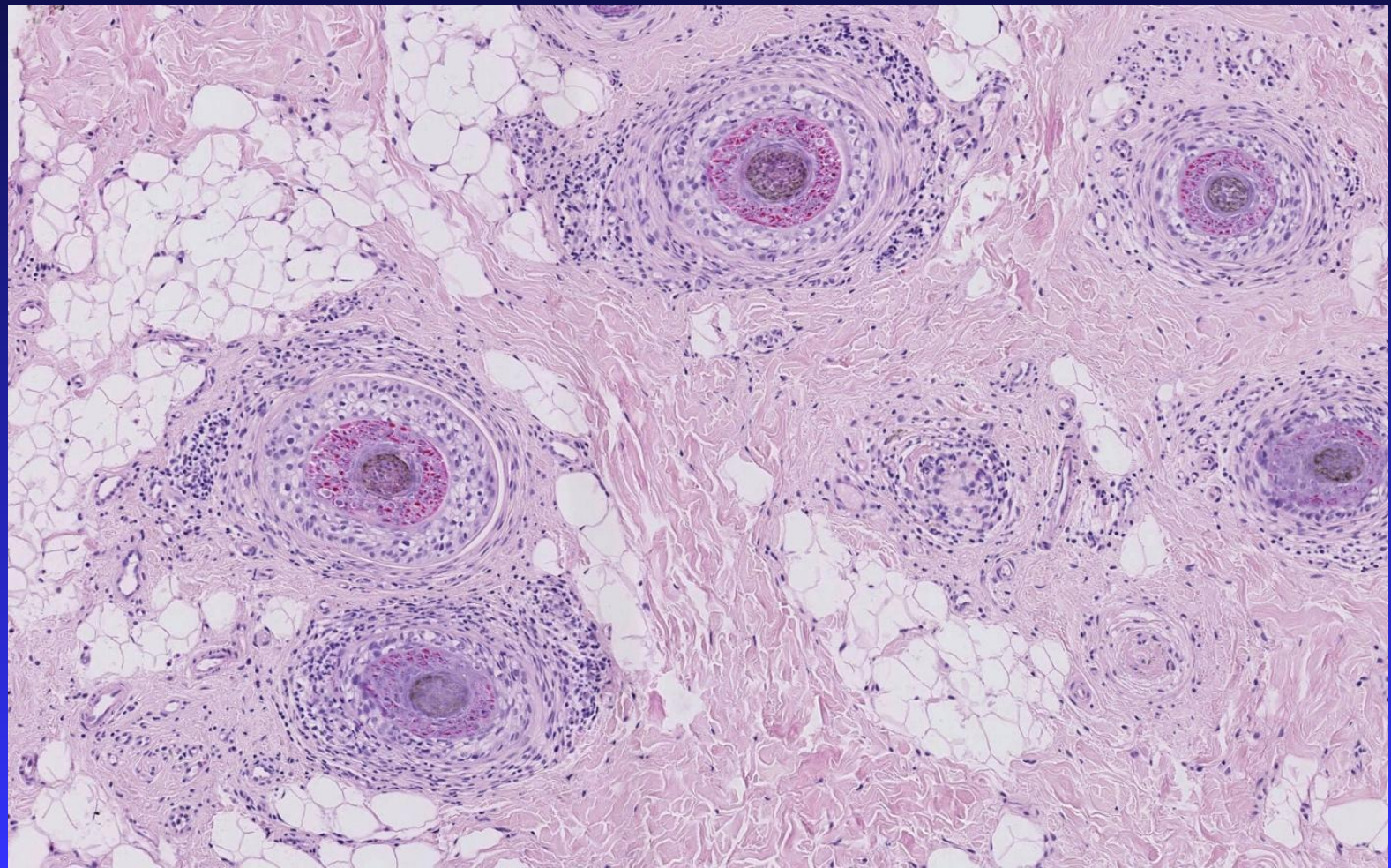
- Immunohistochemistry for diagnostic impasses




Pattern hair loss


Alopecia areata

Acute alopecia areata
« Hive of Bees »



Alopecia areata incognita

Courtesy BM Piraccini, Bologna

	Pattern hair loss	Alopecia areata
Terminal/Vellus hair ratio	Decrease	Decreased
% catagen and telogen hair	Increased	Increased

1. Elston DM, Ferringer T, Dalton S, Fillman E, Tyler W. A comparison of vertical versus transverse sections in the evaluation of alopecia biopsy specimens. J Am Acad Dermatol 2005; 53: 267.
2. Wohltmann WE, Sperling LC. Histopathologic diagnosis of multifactorial alopecia. J Cutan Pathol 2016; 43: 483.

How to make the distinction between alopecia areata and pattern hair loss in absence of peribulbar lymphocytic infiltrate?

DERMATOPATHOLOGY

Distinguishing diffuse alopecia areata (AA) from pattern hair loss (PHL) using CD3$^+$ T cells

Athanassios Kolivras, MD,[a] and Curtis Thompson, MD[b]
Brussels, Belgium, and Portland, Oregon

Background: Distinguishing between diffuse subacute alopecia areata (AA), in which the peribulbar infiltrate is absent, and pattern hair loss is challenging, particularly in cases that lack marked follicular miniaturization and a marked catagen/telogen shift.

Objective: We sought to distinguish diffuse AA from pattern hair loss using CD3$^+$ T lymphocytes.

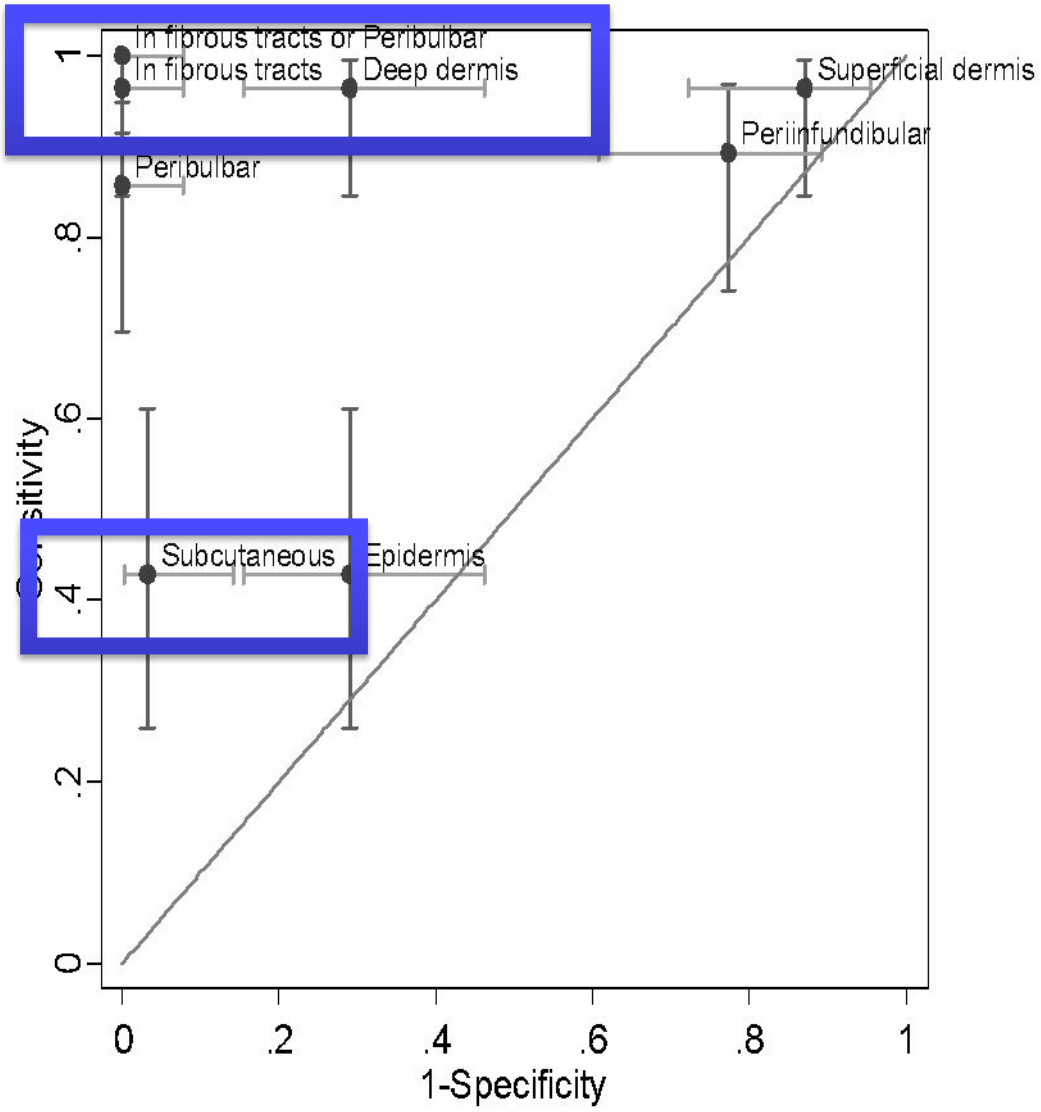
Methods: A total of 28 cases of subacute AA and 31 cases of pattern hair loss were selected and a 4-mm punch biopsy was performed. All the specimens were processed using the "HoVert" (horizontal and vertical) technique. In all cases, hematoxylin-eosin and immunohistochemical stains for CD3, CD4, CD8, and CD20 were performed.

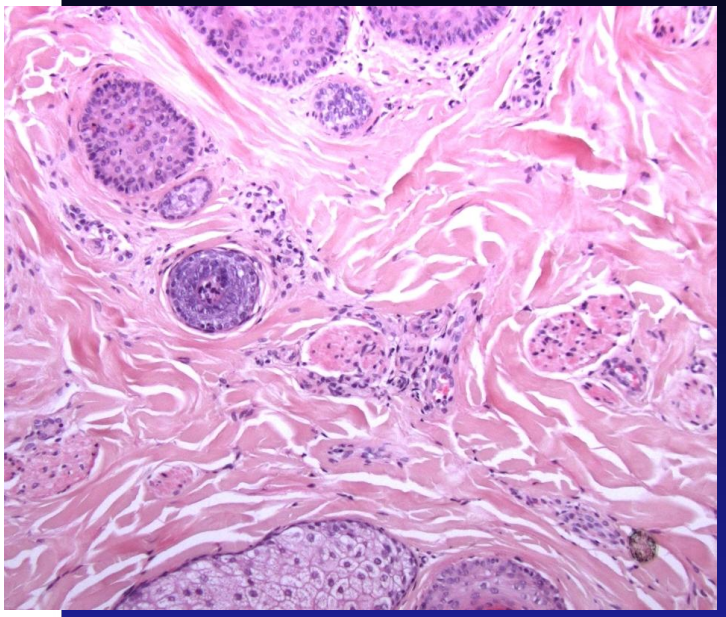
Results: The presence of CD3$^+$ lymphocytes within empty follicular fibrous tracts (stela), even without a concomitant peribulbar infiltrate, is a reliable histopathological clue in supporting a diagnosis of AA (sensitivity 0.964, specificity 1, $P \leq .001$).

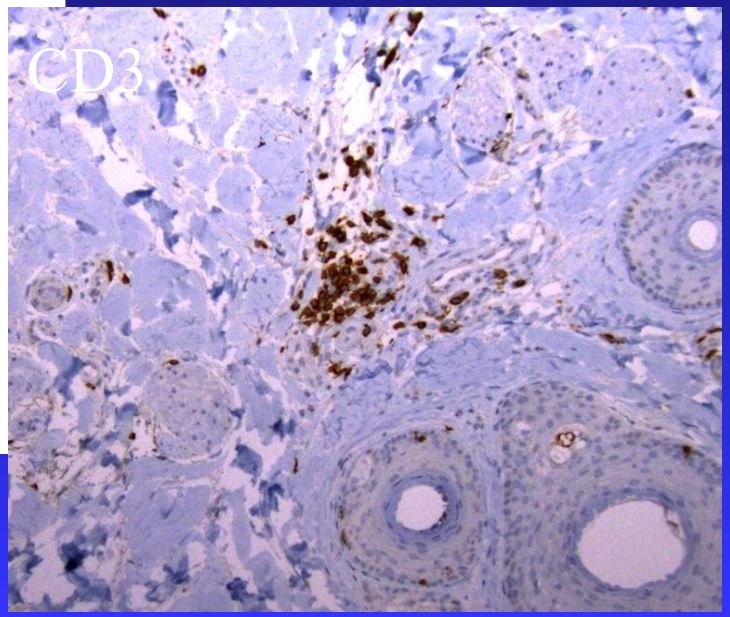
Limitations: Limited tissue for analysis remained in the clinical sample tissue blocks.

Conclusion: The presence of CD3$^+$ T-cells within empty follicular fibrous tracts (stela) supports a diagnosis of AA. (J Am Acad Dermatol http://dx.doi.org/10.1016/j.jaad.2015.12.011.)

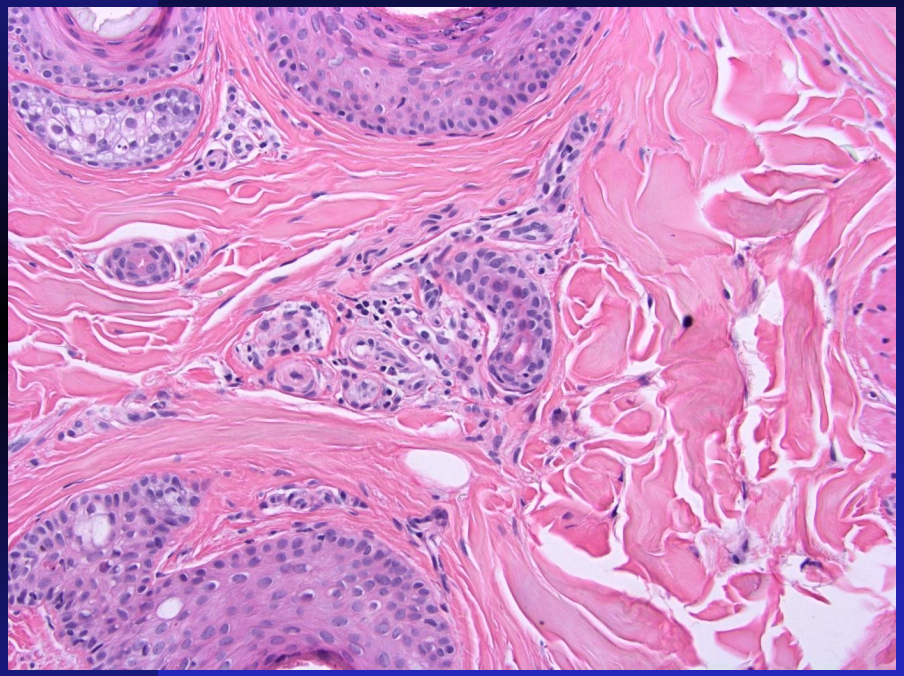
Alopecia areata

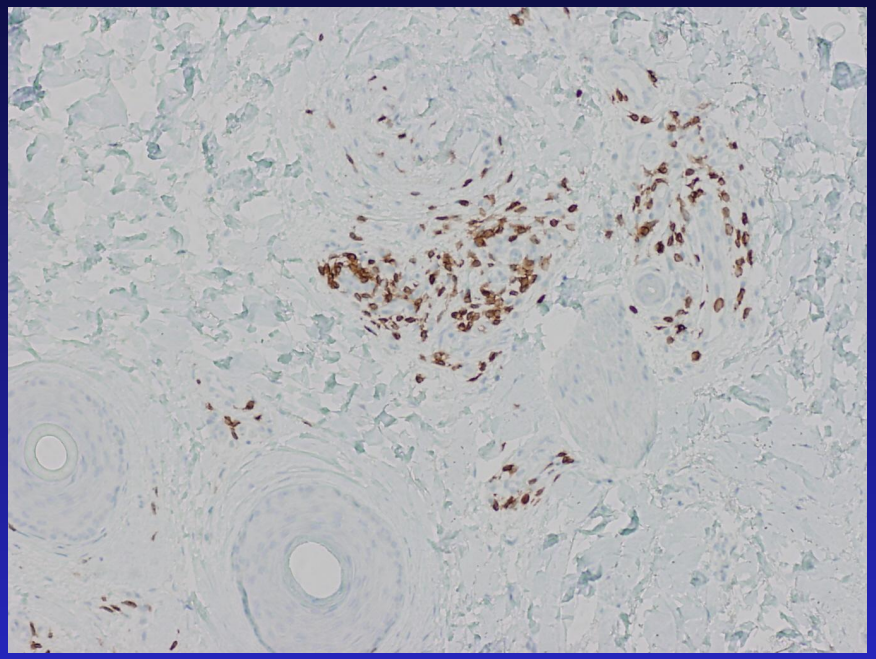






AA = CD3 in empty tracts





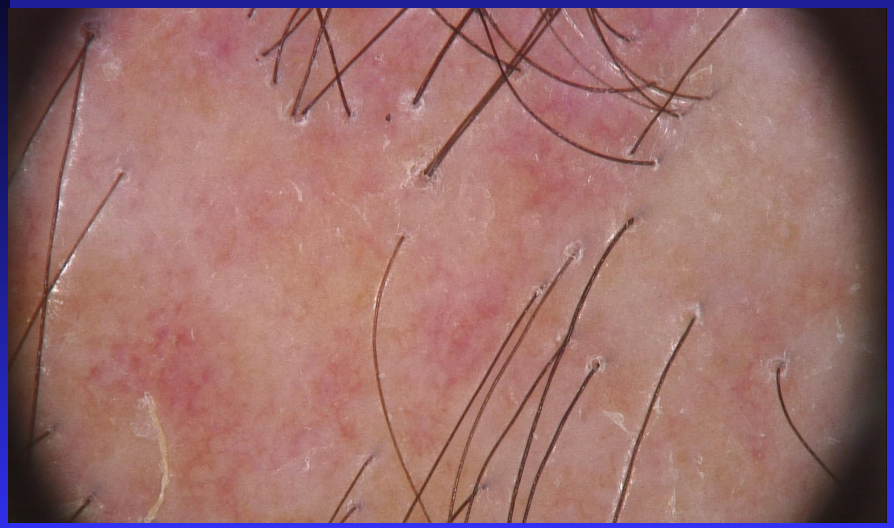
CONCLUSION

Presence of CD3+ T-lymphocytes within the empty fibrous follicular tracts favors a diagnosis of alopecia areata

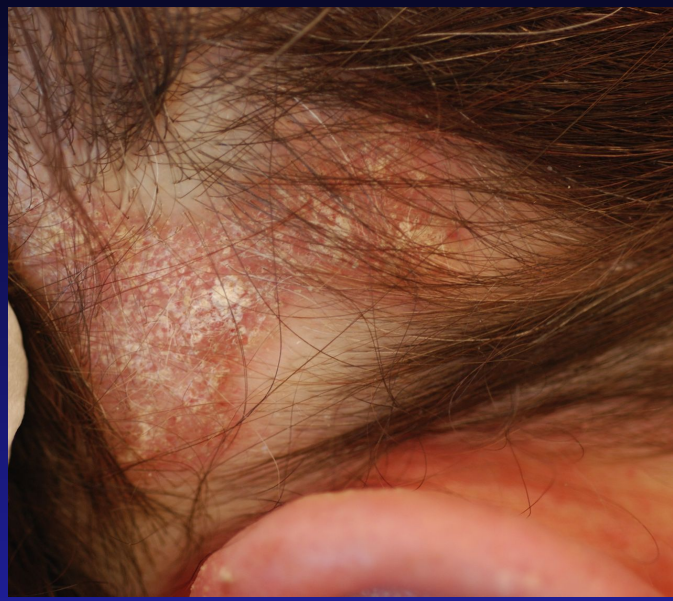
Courtesy BM Piraccini, Bologna

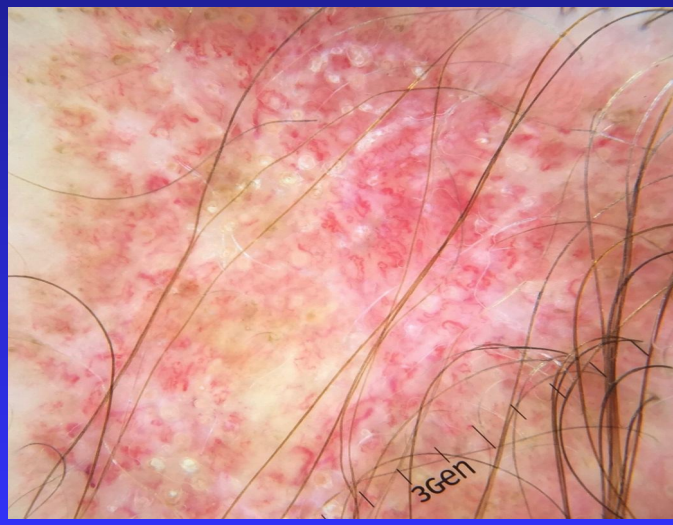

Lichen planopilaris or
Discoid lupus erythematosus ?

LPP



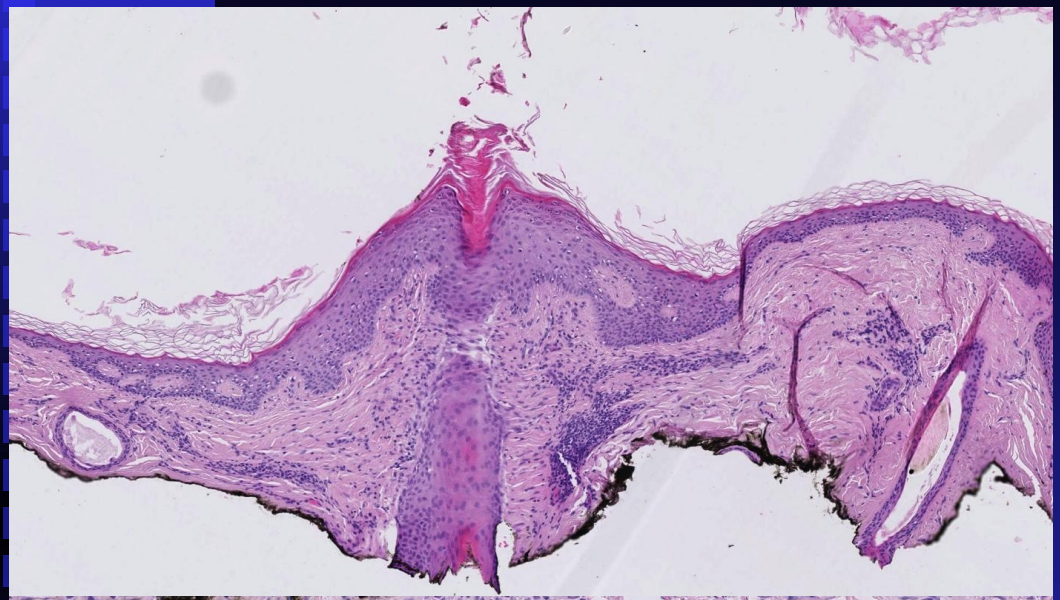
Discoid LE

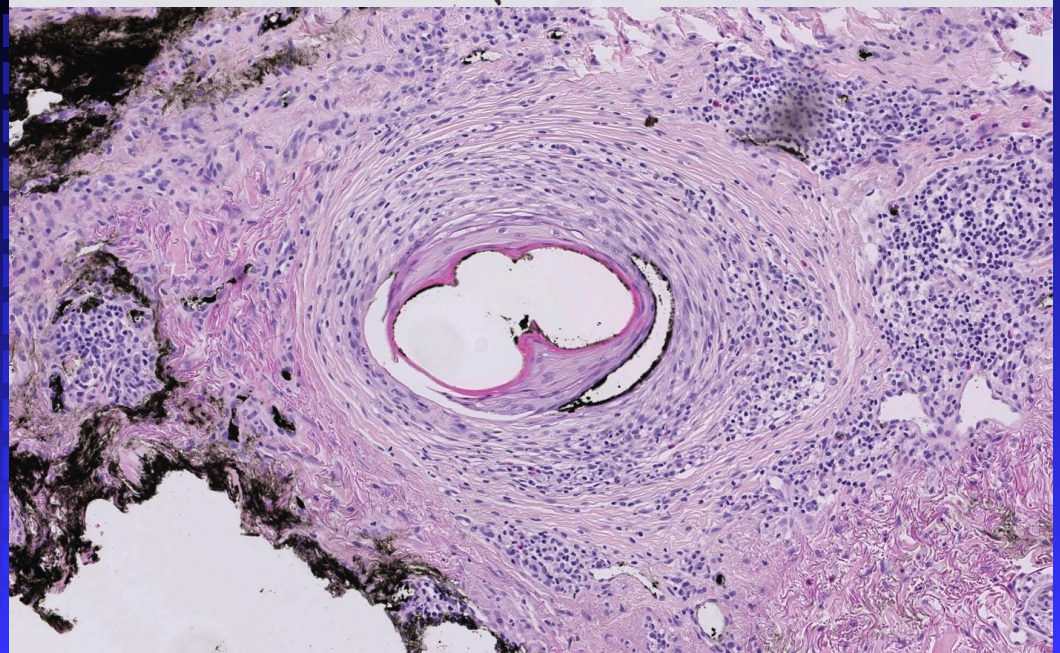




Courtesy BM Piraccini, Bologna

LPP



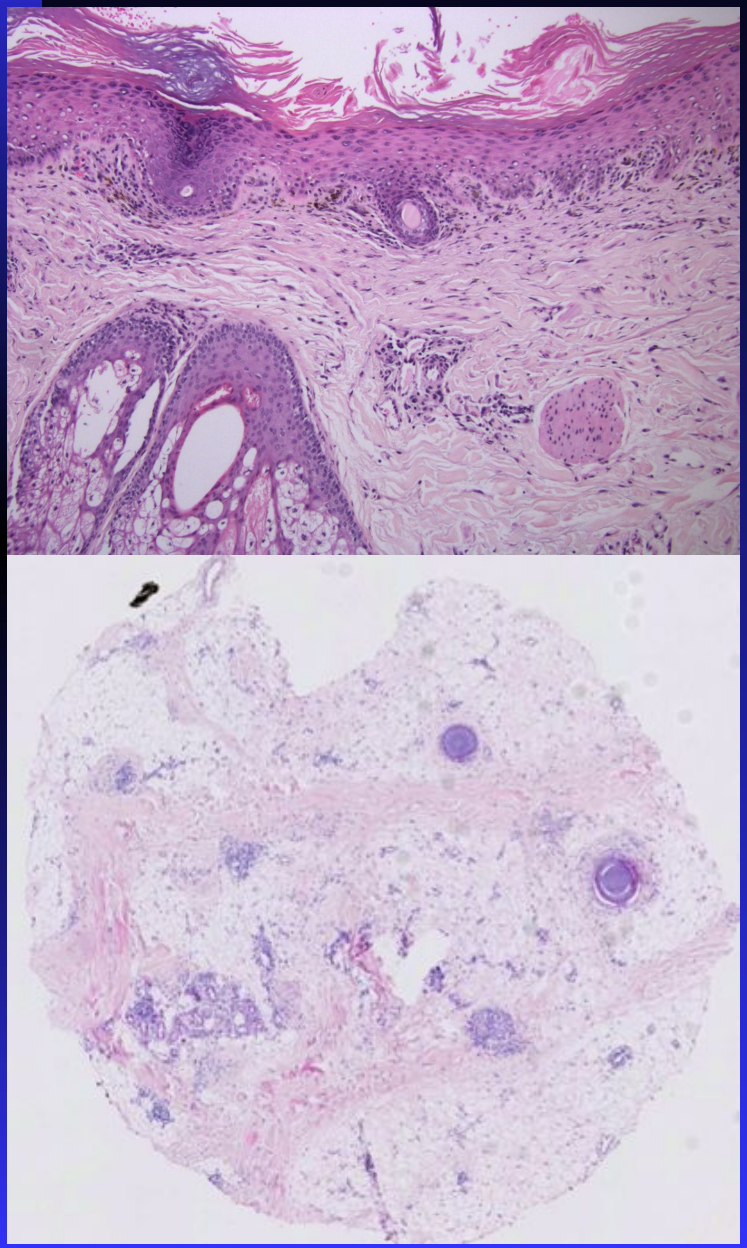


1. Perifollicular scarring and lymphocytic infiltrate at the level of the infundibulum or superficial isthmus

2. No inter-follicular epidermal interface dermatitis

3. No deep infiltrate

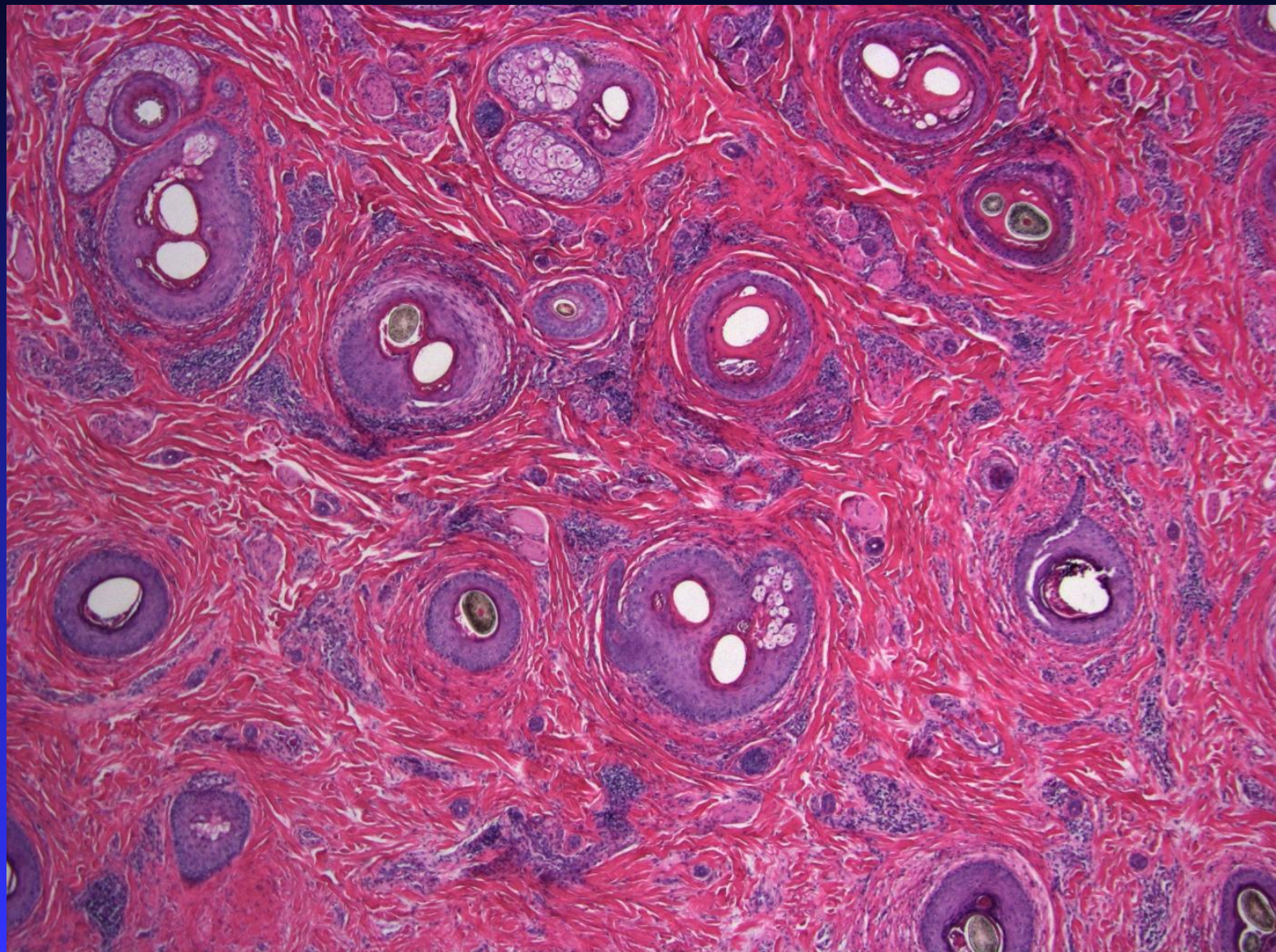
LE

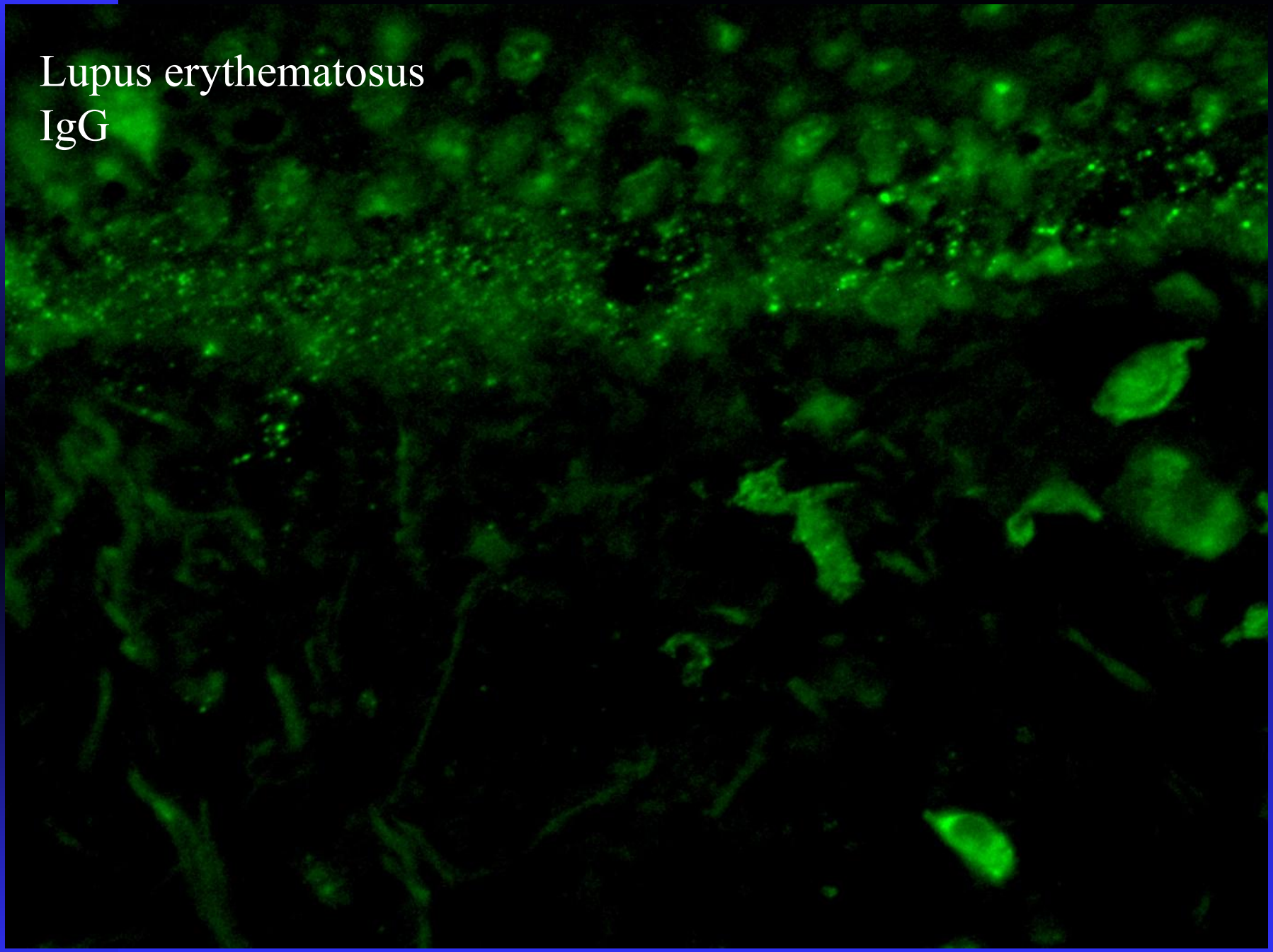


Interface change in the interfollicular epidermis

Deep dermal or subcutaneous lymphocytes

LPP or LE?




Lupus erythematosus
IgG

Plasmacytoid dendritic cells: CD123

J Cutan Pathol 2010: 37: 1132–1139
doi: 10.1111/j.1600-0560.2010.01587.x
John Wiley & Sons. Printed in Singapore

Journal of
Cutaneous Pathology

Continuing Medical Education Article
Visit www.asdp.org/cme to learn more.

Plasmacytoid dendritic cells: an overview of their presence and distribution in different inflammatory skin diseases, with special emphasis on Jessner's lymphocytic infiltrate of the skin and cutaneous lupus erythematosus

Dario Tomasini[1], Thomas Mentzel[2], Markus Hantschke[2], Amilcare Cerri[3], Bruno Paredes[2], Arno Rütten[2], Leo Schärer[2] and Heinz Kutzner[2]

[1]Department of Dermatology, Hospital of Busto Arsizio, Busto Arsizio, Italy,
[2]Dermatopathologie Friedrichshafen, Friedrichshafen, Germany, and
[3]Department of Medicine, Surgery and Dentistry, University of Milan, Milan, Italy

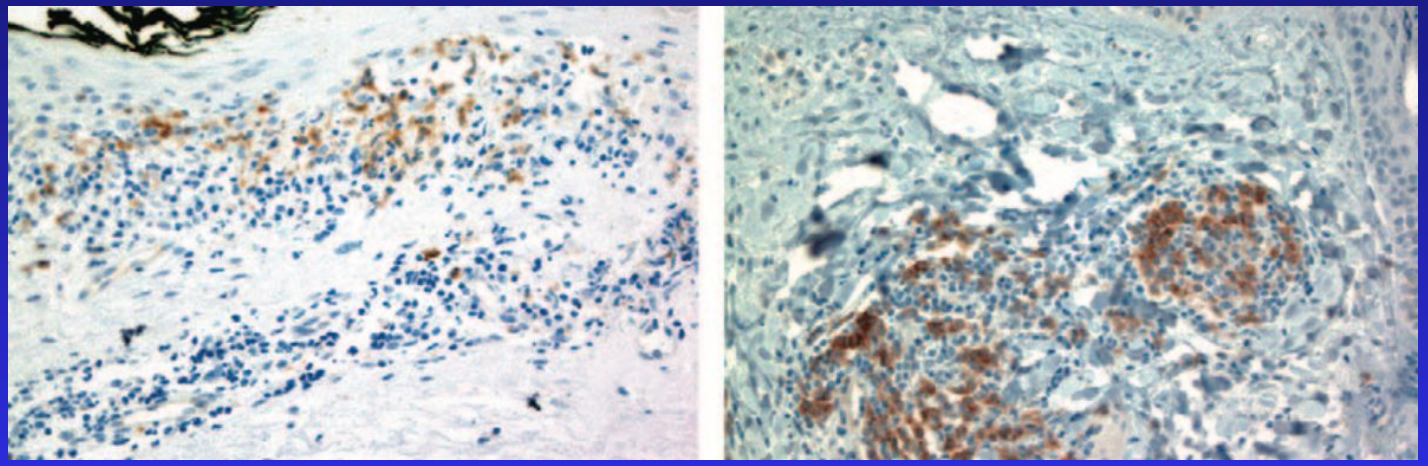
J Cutan Pathol 2008: 35: 452–456
doi: 10.1111/j.1600-0560.2007.00848.x
Blackwell Munksgaard. Printed in Singapore

Journal of
Cutaneous Pathology

Plasmacytoid dendritic cells are present in cutaneous dermatomyositis lesions in a pattern distinct from lupus erythematosus

Jennifer M. McNiff[1,2] and Daniel H. Kaplan[3]

[1]Department of Dermatology and
[2]Department of Pathology, Yale University School of Medicine, New Haven, CT, USA
[3]Department of Dermatology, University of Minnesota, Minneapolis, MN, USA

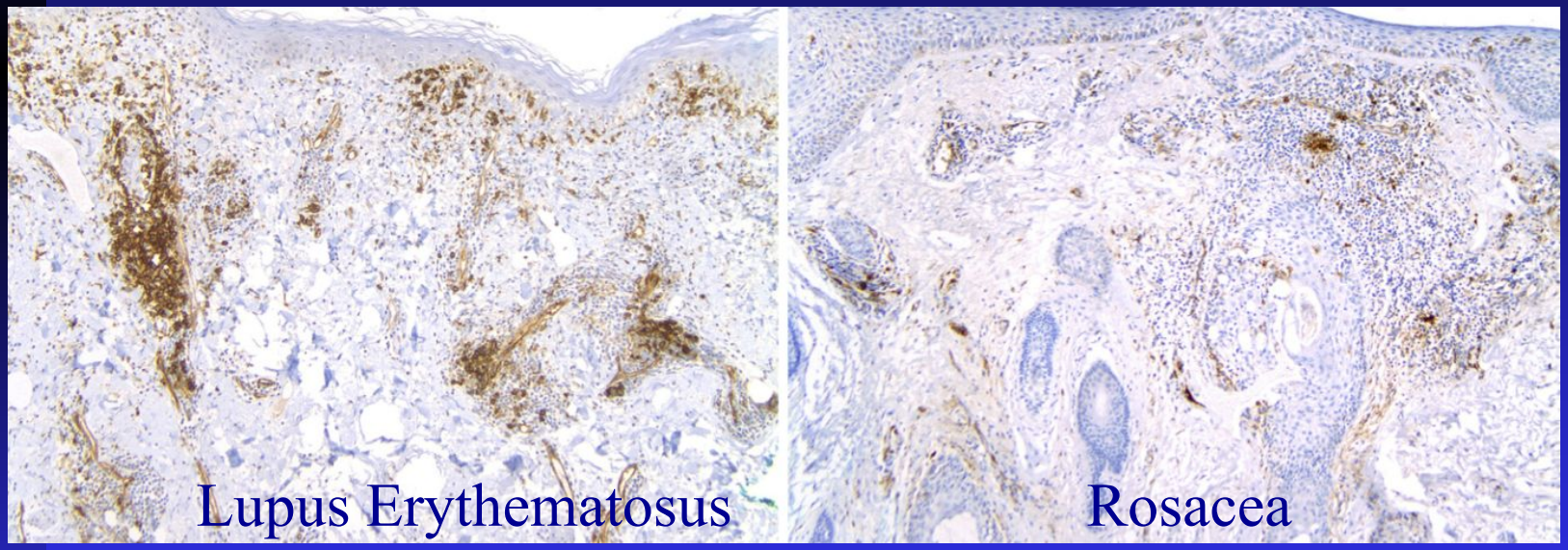


Dermatomyositis Lupus Erythematosus

DERMATOPATHOLOGY

Comparative analysis of rosacea and cutaneous lupus erythematosus: Histopathologic features, T-cell subsets, and plasmacytoid dendritic cells

Theodore T. Brown, MD,[a] Eun-Young K. Choi, MD,[a] Dafydd G. Thomas, MD, PhD,[a] Alexandra C. Hristov, MD,[a,b] and May P. Chan, MD[a,b]
Ann Arbor, Michigan



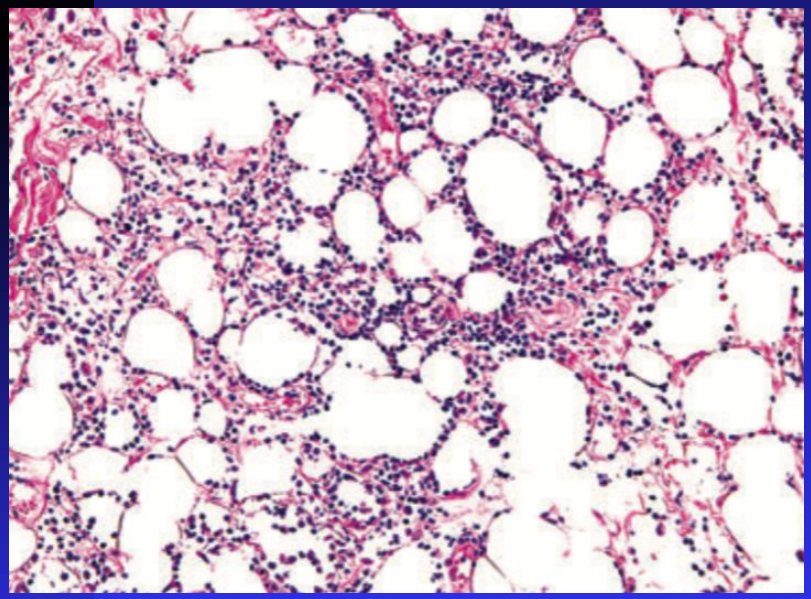
Conclusion: The infiltrates in rosacea and LE differ immunophenotypically, and may aid in their distinction in addition to conventional histologic examination. (J Am Acad Dermatol 2014;71:100-7.)

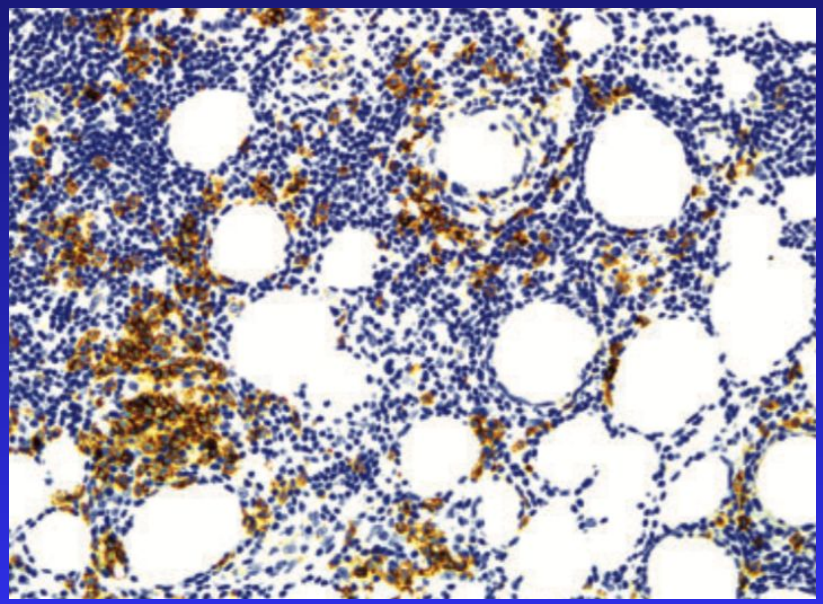
Histopathology

Histopathology 2013, **62**, 1057–1066. DOI: 10.1111/his.12105

The presence of clusters of plasmacytoid dendritic cells is a helpful feature for differentiating lupus panniculitis from subcutaneous panniculitis-like T-cell lymphoma

Jau-Yu Liau,[1] Shih-Sung Chuang,[2] Chia-Yu Chu,[3] Wen-Hui Ku,[4] Jia-Huei Tsai[1] & Teng-Fu Shih[5]

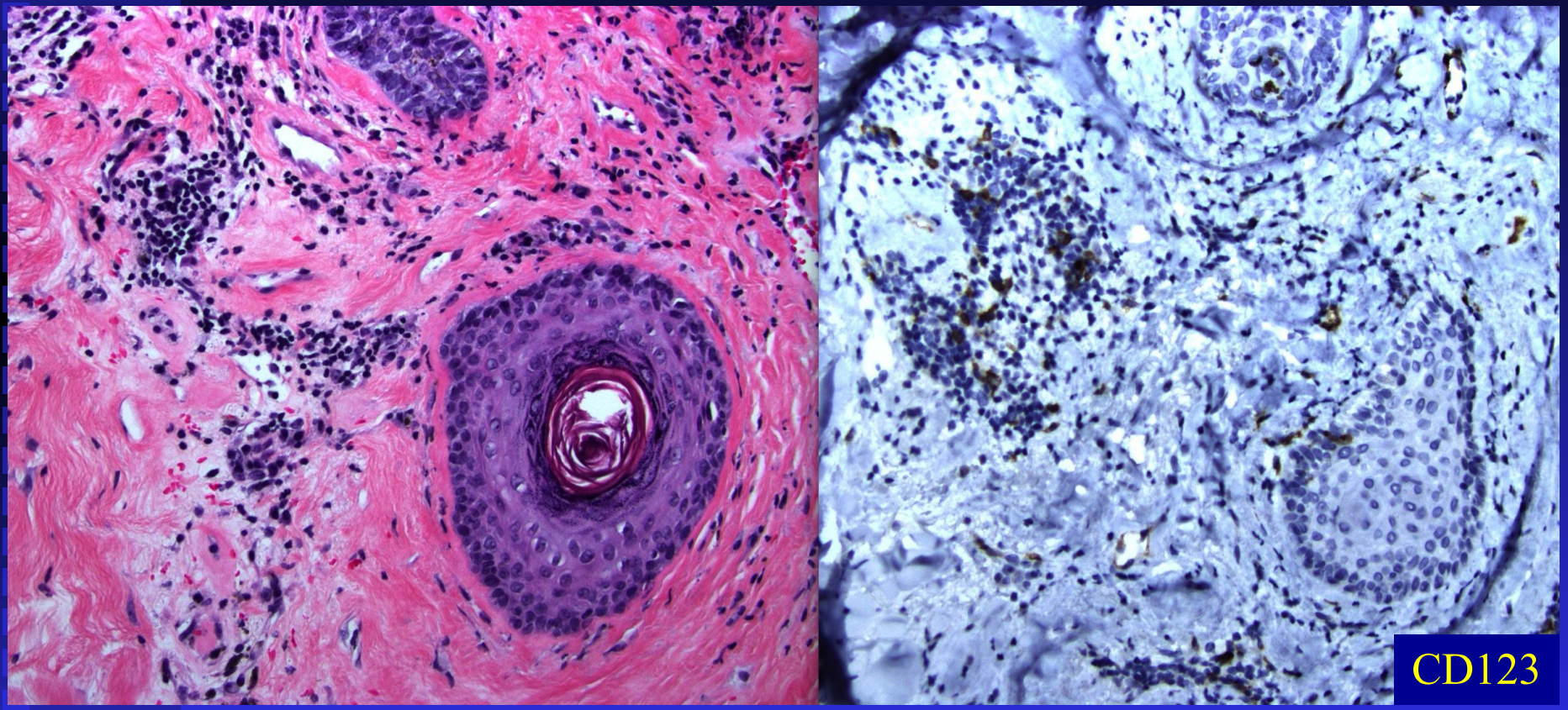




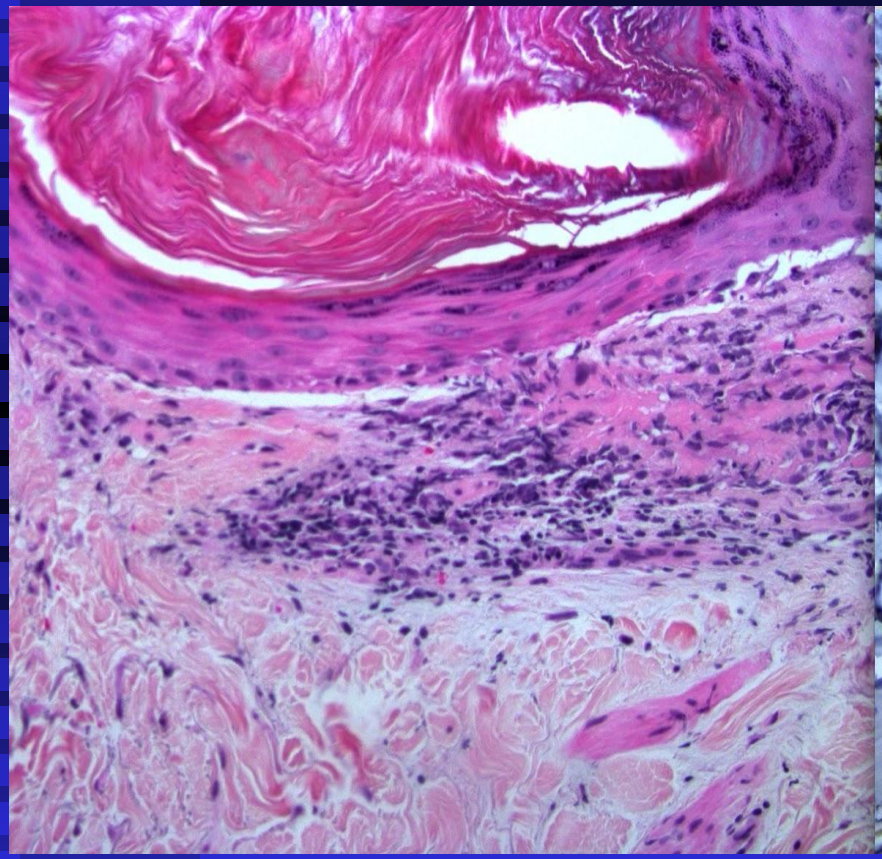
Subcutaneous panniculitis-like T-cell lymphoma

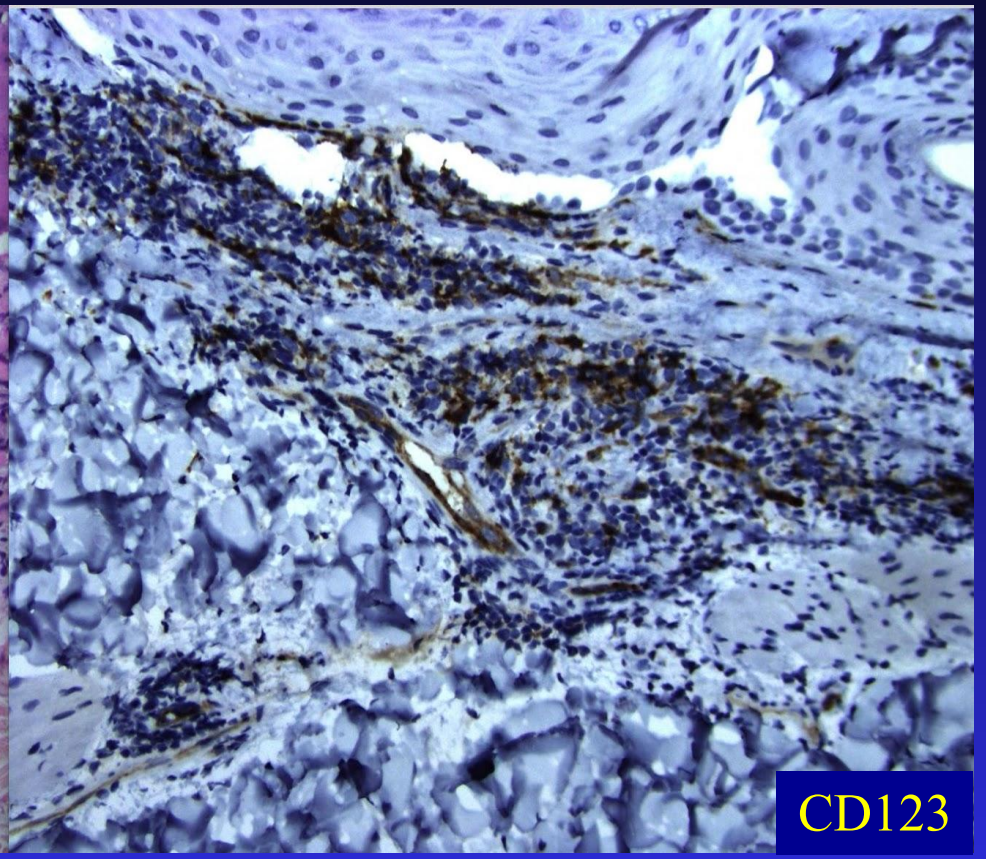
Kolivras A, Thompson C.
Clusters of CD123+ plasmacytoid dendritic cells help distinguish lupus alopecia from lichen planopilaris.
J Am Acad Dermatol 2016; 74: 1267–69.

Diffuse dermal expression

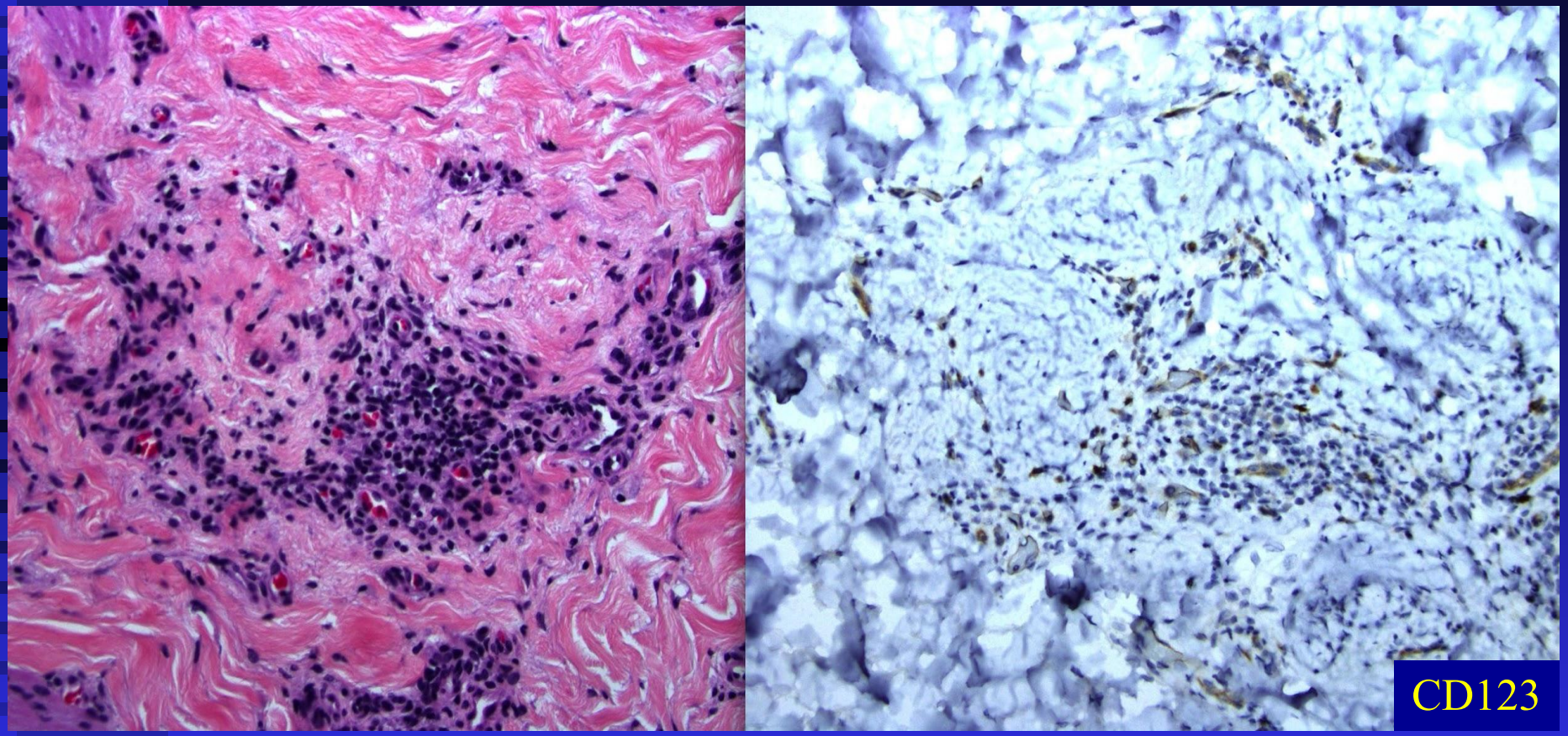


Underneath perifollicular epidermis

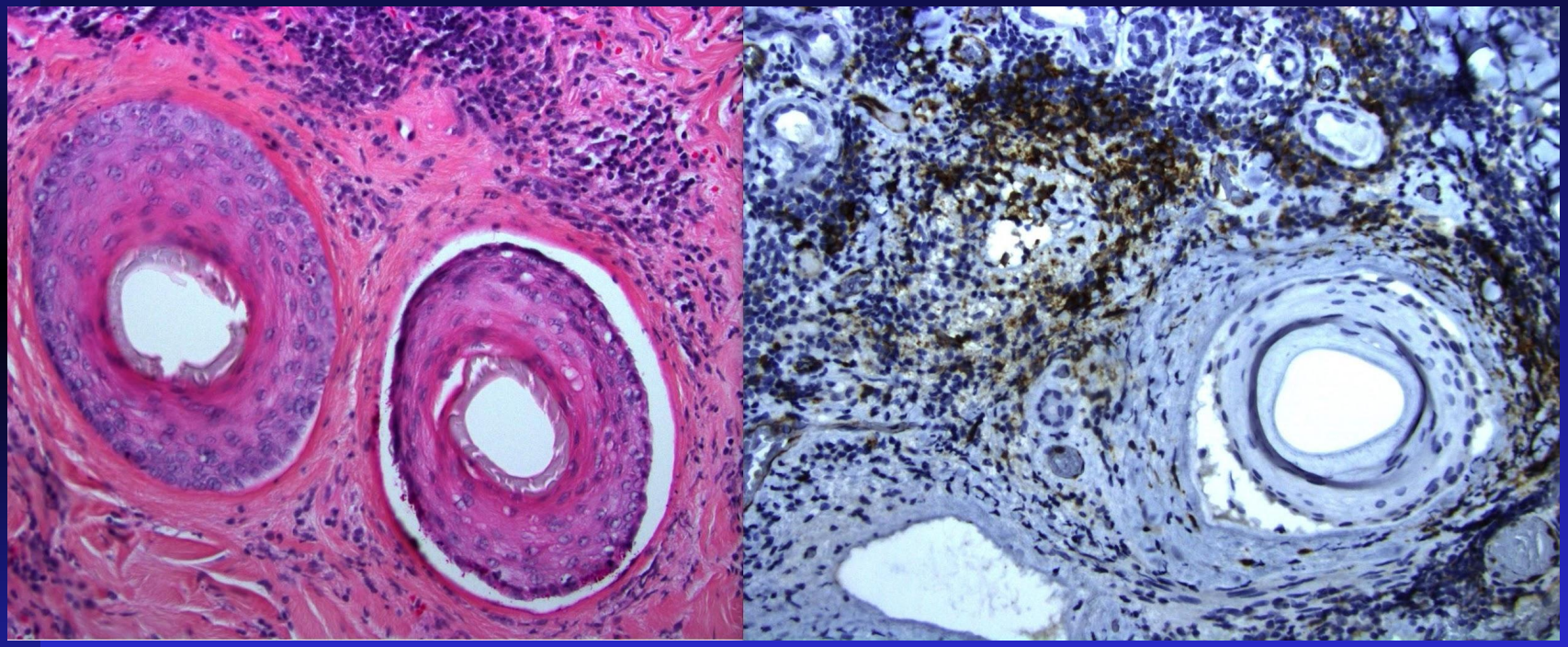


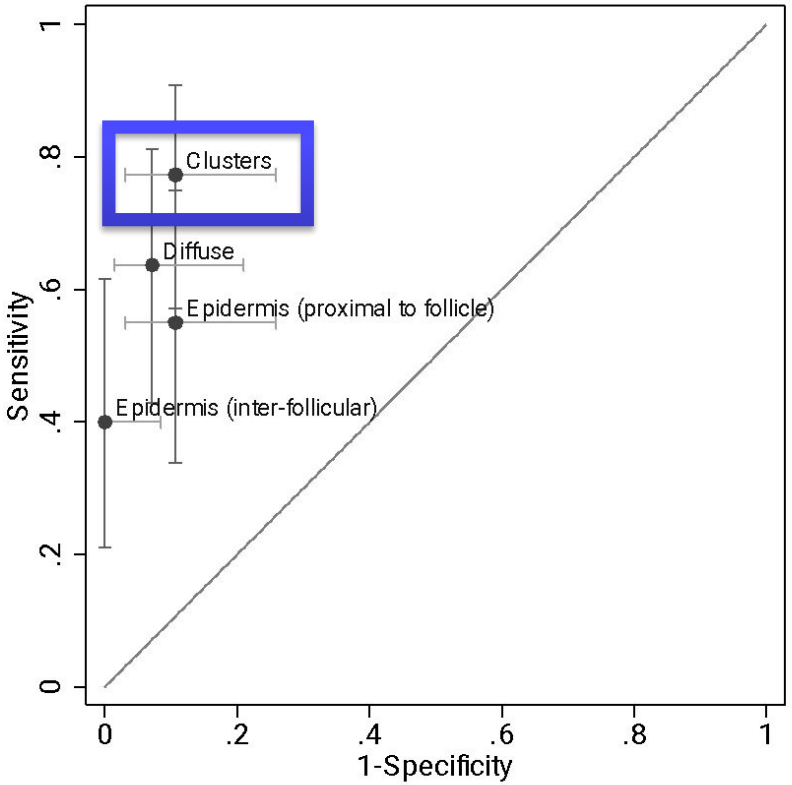


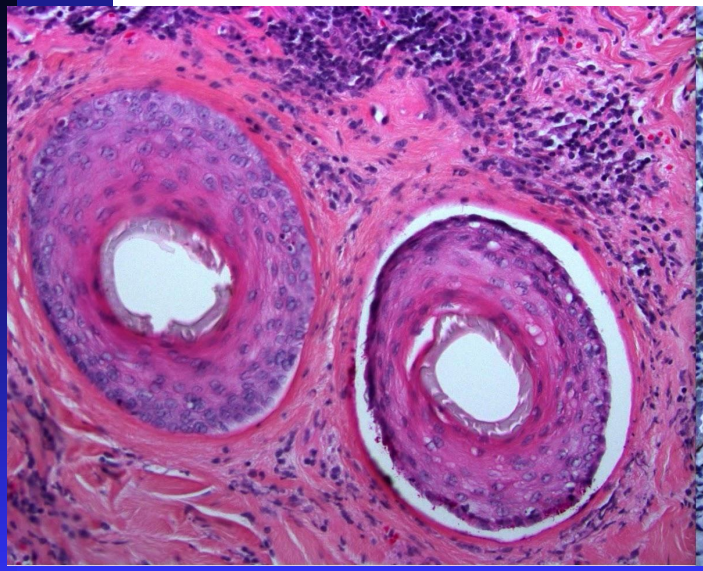
Underneath interfollicular epidermis

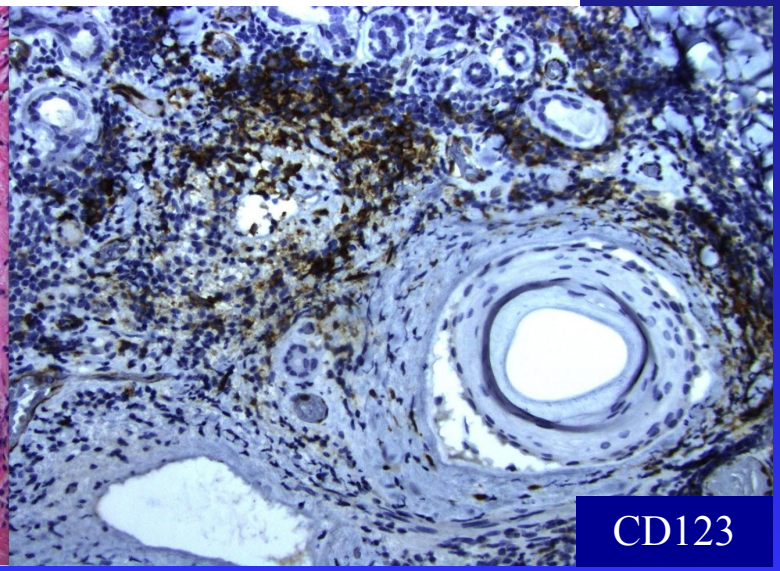


Clusters of CD123 = Lupus



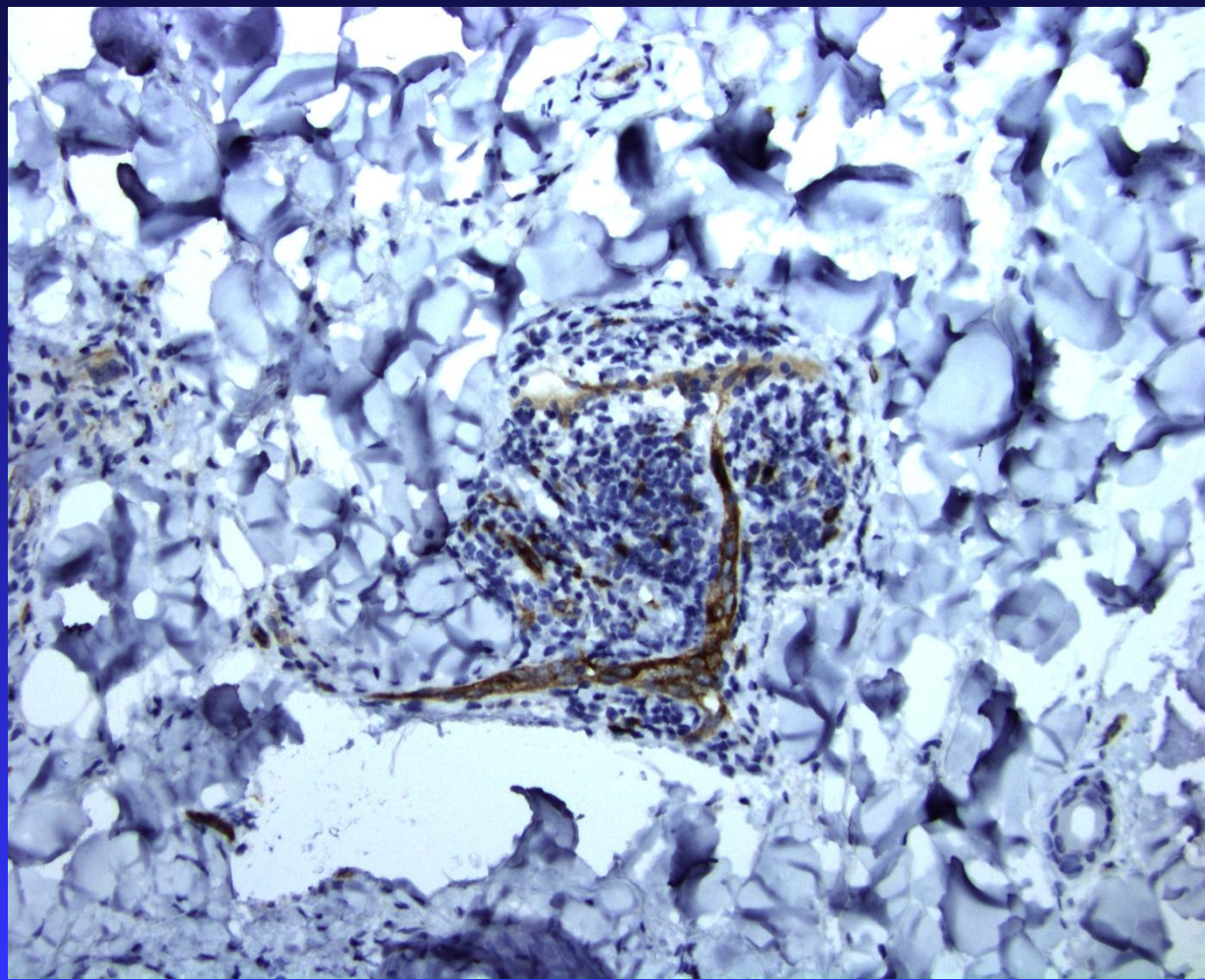

Clusters
Diffuse
Epidermis (proximal to follicle)
Epidermis (inter-follicular)
Sensitivity
1-Specificity
0
.2
.4
.6
.8
1





CD123

Warning:
CD123 positive in endothelium



CONCLUSION

Clusters of CD123+ plasmacytoid dendritic cells favor a diagnosis of lupus erythematosus

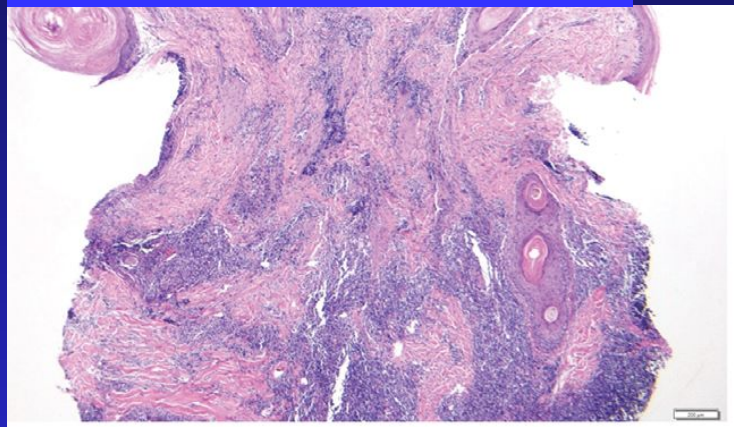
CD123 immunohistochemistry for plasmacytoid dendritic cells is useful in the diagnosis of scarring alopecia

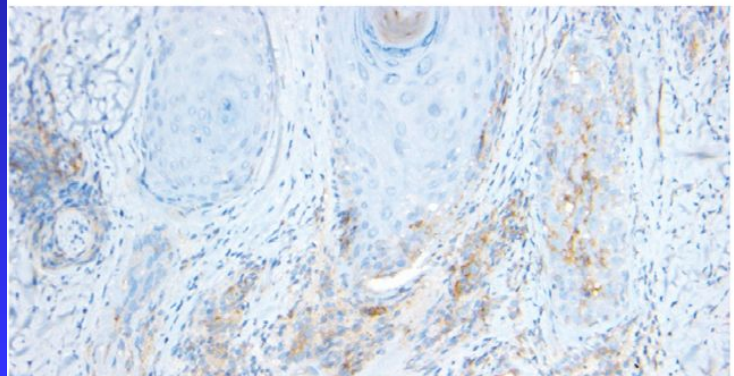
Katherine Fening[1], Viswas Parekh[2] and Kristopher McKay[1]

[1]Division of Dermatopathology, University of Alabama at Birmingham, Birmingham, AL, USA and
[2]Department of Pathology, University of Alabama at Birmingham, Birmingham, AL, USA

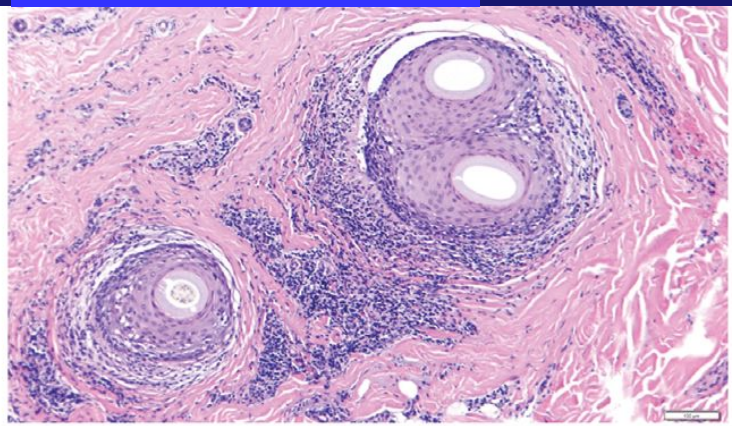
J Cutan Pathol 2016; 43: 643-8

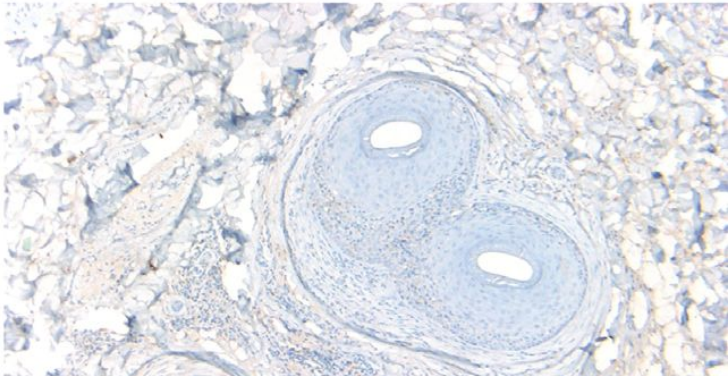
Lupus erythematosus





Lichen planopilaris



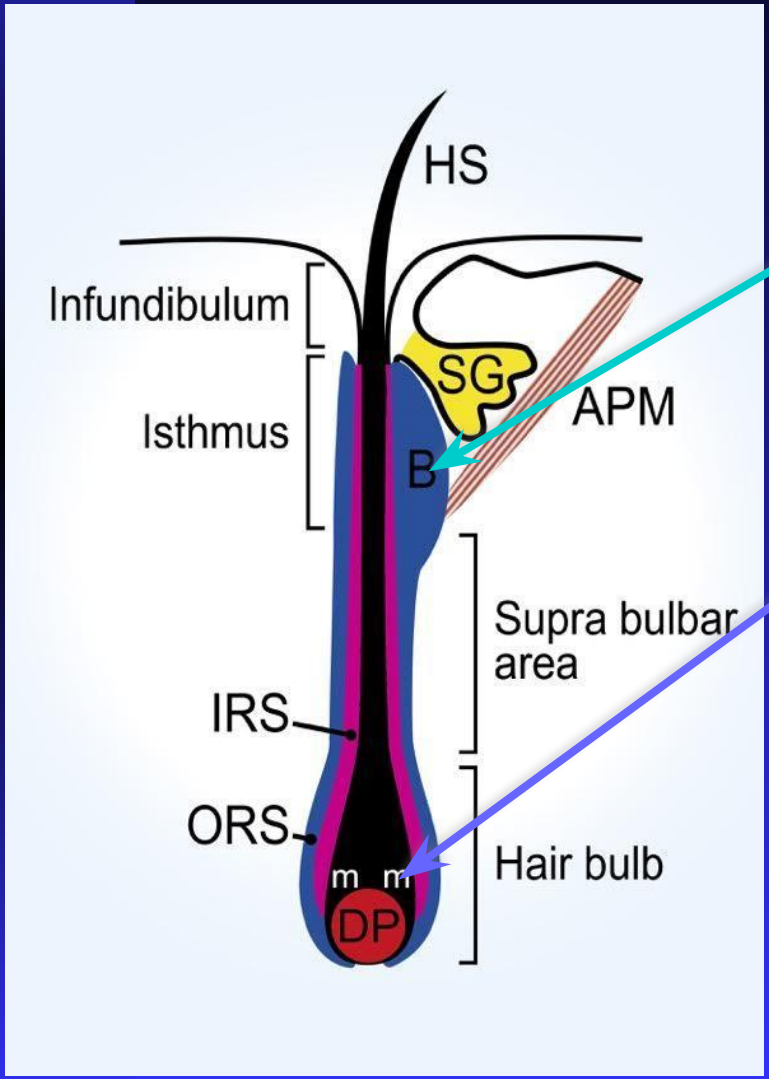


Lichen Planopilaris (LPP)

"Both the patient and the doctor ask the vexing question: "When will it end?" . . . LPP sometimes has no apparent ending."

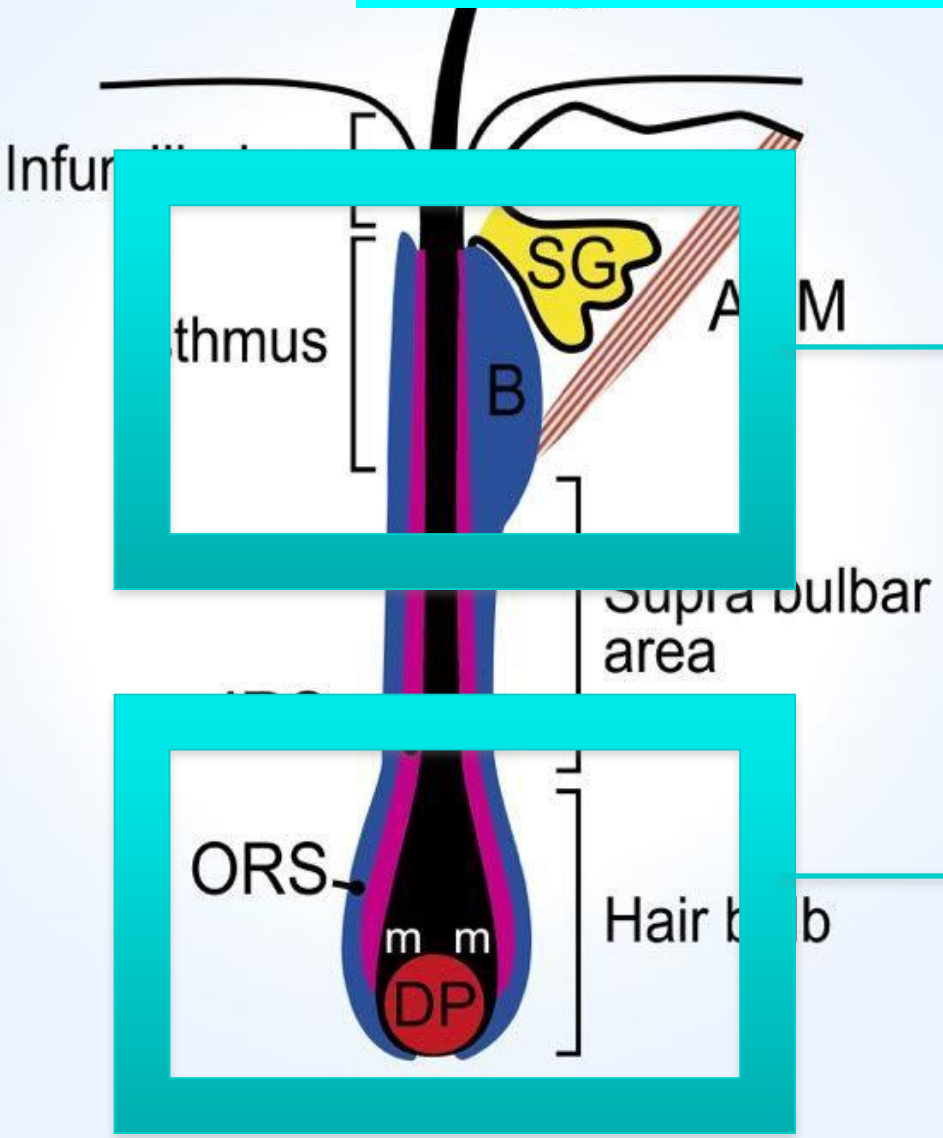
Philippe Assouly and Pascal Reygagne. Lichen Planopilaris: Update on Diagnosis and Treatment. Semin Cutan Med Surg 28:3-10, 2009.

Two Stem Cells



1. **Bulge stem cells**: quiescent and maintain long-term stem cell pool
2. **Hair germ cells**: activated during anaphase engaging in a new growth

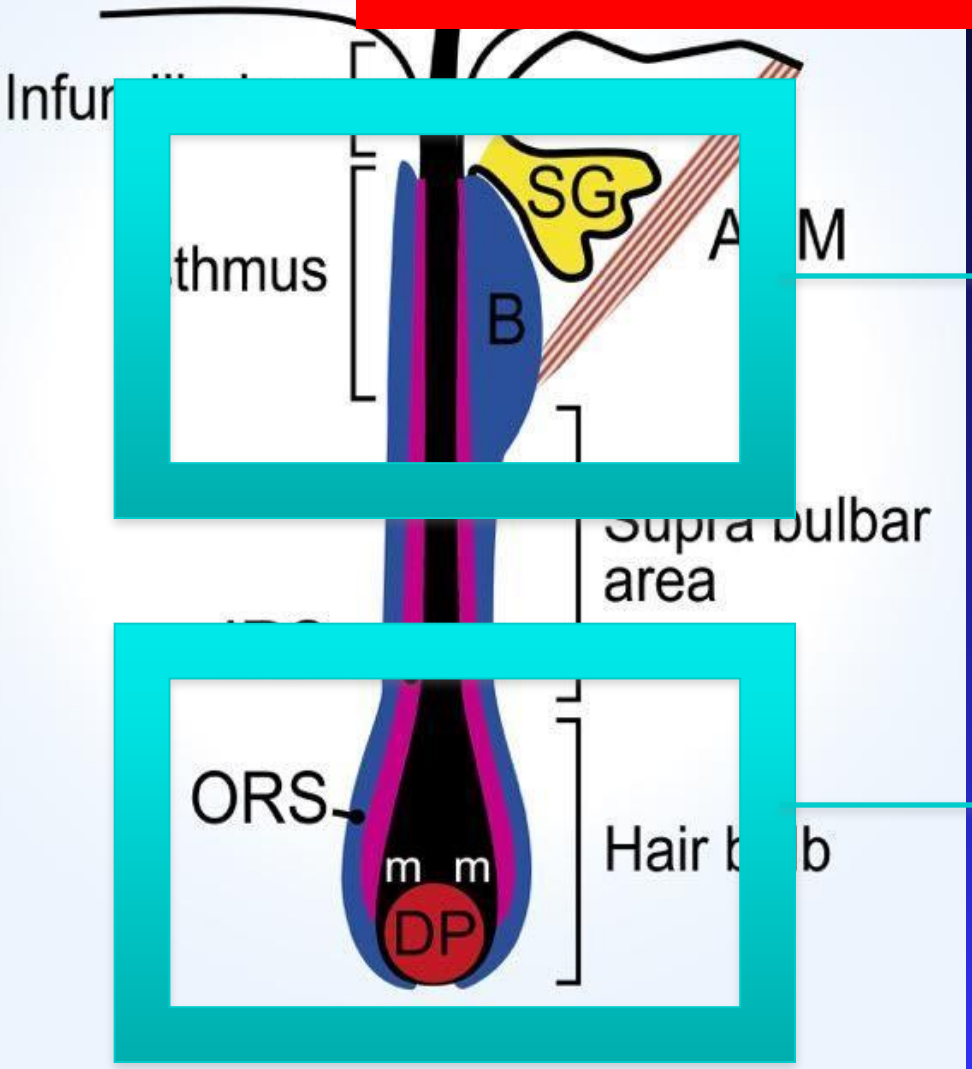
Immune privilege



Permanent immune privilege

Temporary immune privilege during anagen phase

Immune privilege collapse



Lichen planopilaris

Alopecia areata

J Cutan Pathol 2005: 32: 675–679
Blackwell Munksgaard. Printed in Singapore

Journal of
Cutaneous Pathology

Possible role of the bulge region in the pathogenesis of inflammatory scarring alopecia: lichen planopilaris as the prototype

Narciss Mobini, Sam Tam and Hideko Kamino

Department of Dermatology, Section of Dermatopathology, New York University Medical Center, New York, NY, USA

Conclusion: Our study supports the finding that in LPP, the inflammatory infiltrate mainly involves the bulge region, where the stem cells reside. Once this area is damaged, the hair loses its potential of regrowth with resulting scarring alopecia. This is in contrast with inflammatory non-scarring alopecias such as alopecia areata, where the bulb region is targeted, sparing the stem cells.

Journal of Pathology
J Pathol 2013; **231**: 236–247
Published online in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/path.4233

ORIGINAL PAPER

Lichen planopilaris is characterized by immune privilege collapse of the hair follicle's epithelial stem cell niche

Matthew J Harries,[1] Katja Meyer,[2] Iskander Chaudhry,[3] Jennifer E Kloepper,[2] Enrique Poblet,[4] Christopher EM Griffiths[1] and Ralf Paus[1,2]*

[1] *Dermatology Centre, Salford Royal NHS Foundation Trust, University of Manchester, Manchester Academic Health Science Centre, UK*
[2] *Department of Dermatology, University of Lübeck, Germany*
[3] *Department of Pathology, Central Manchester NHS Foundation Trust, UK*
[4] *Department of Pathology, University General Hospital of Murcia, Spain*

**Correspondence to: R Paus, Department of Dermatology, University of Lübeck, Lübeck, Germany. E-mail: ralf.paus@uksh.de or ralf.paus@manchester.ac.uk*

"These novel findings raise the possibility that LPP represents an autoimmune disease in whose pathogenesis ***IFNγ-induced bulge immune privilege collapse*** *plays an important role."*

REVIEW ARTICLE

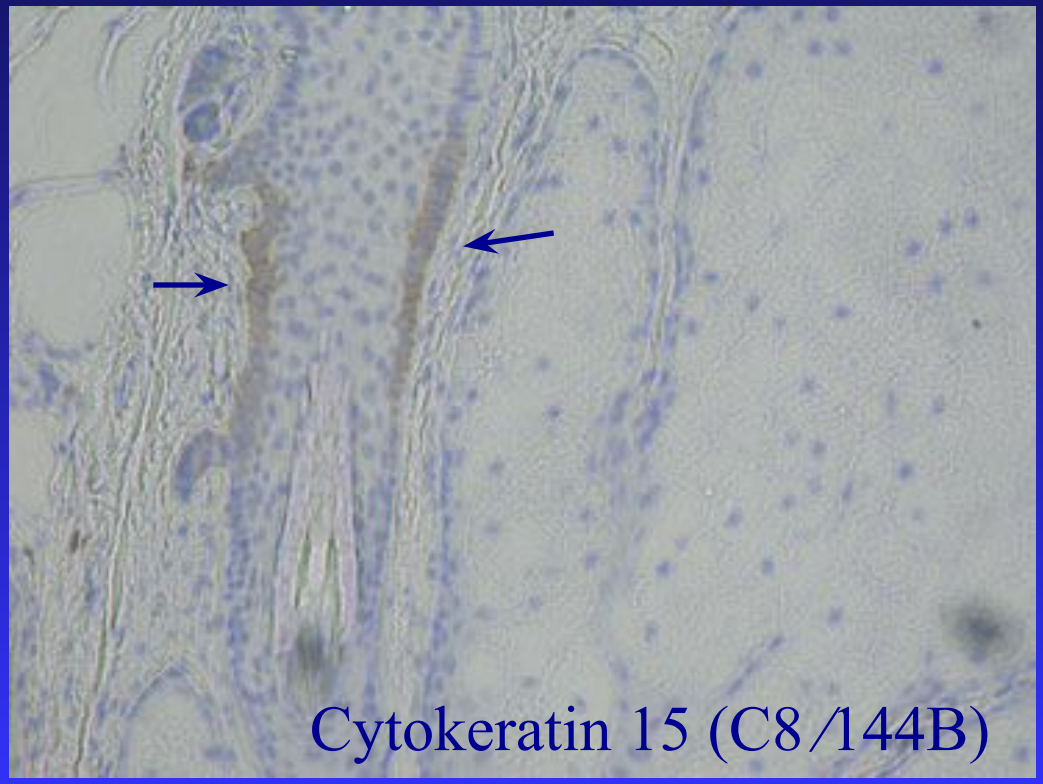
BJD
British Journal of Dermatology

Stem cells and alopecia: a review of pathogenesis

K. Al-Refu

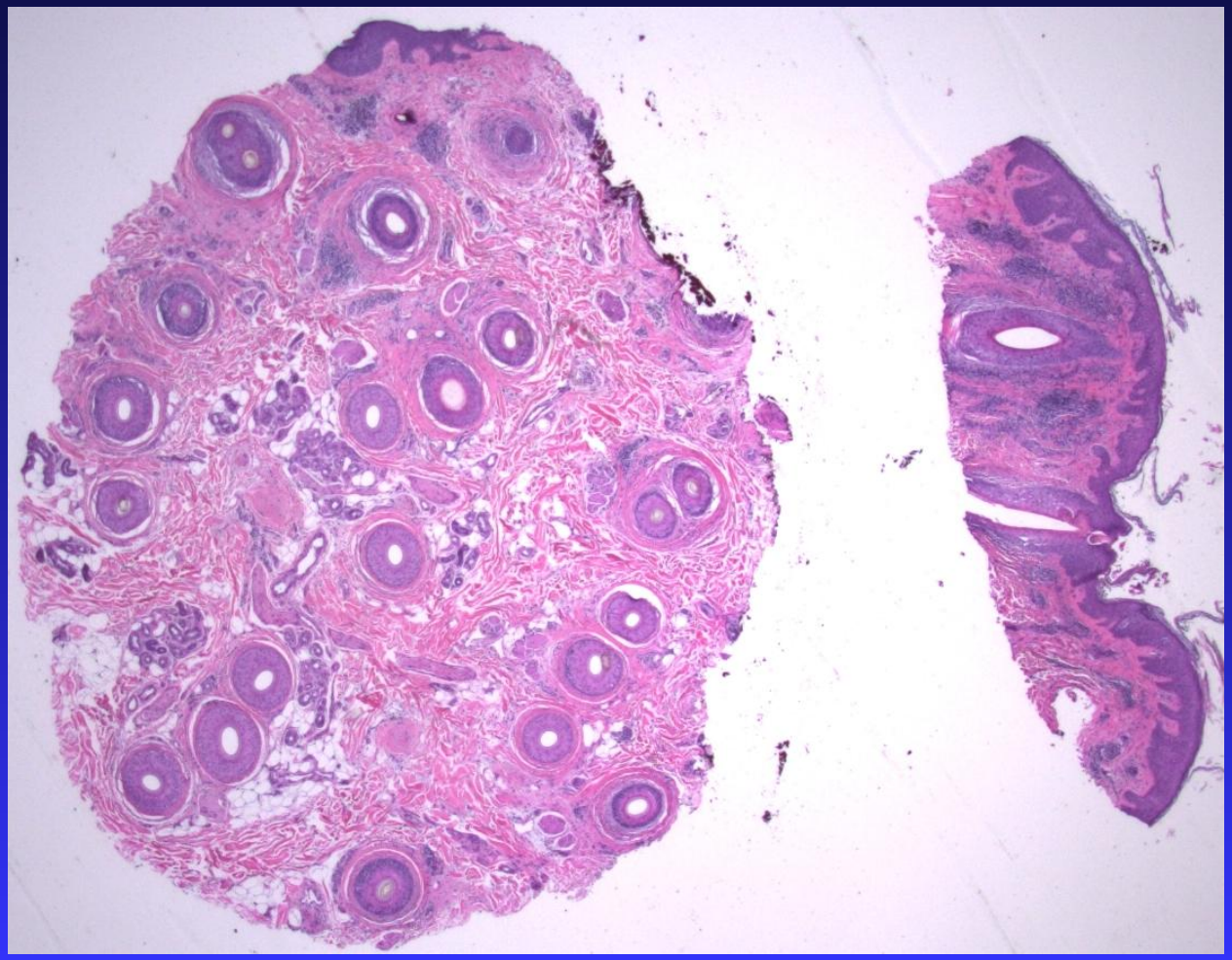
Faculty of Medicine, Internal Medicine Department, Mu'tah University, PO Box 5, Karak, Mu'tah 61710, Jordan

Br J Dermatol 2012; 167: 479-484.

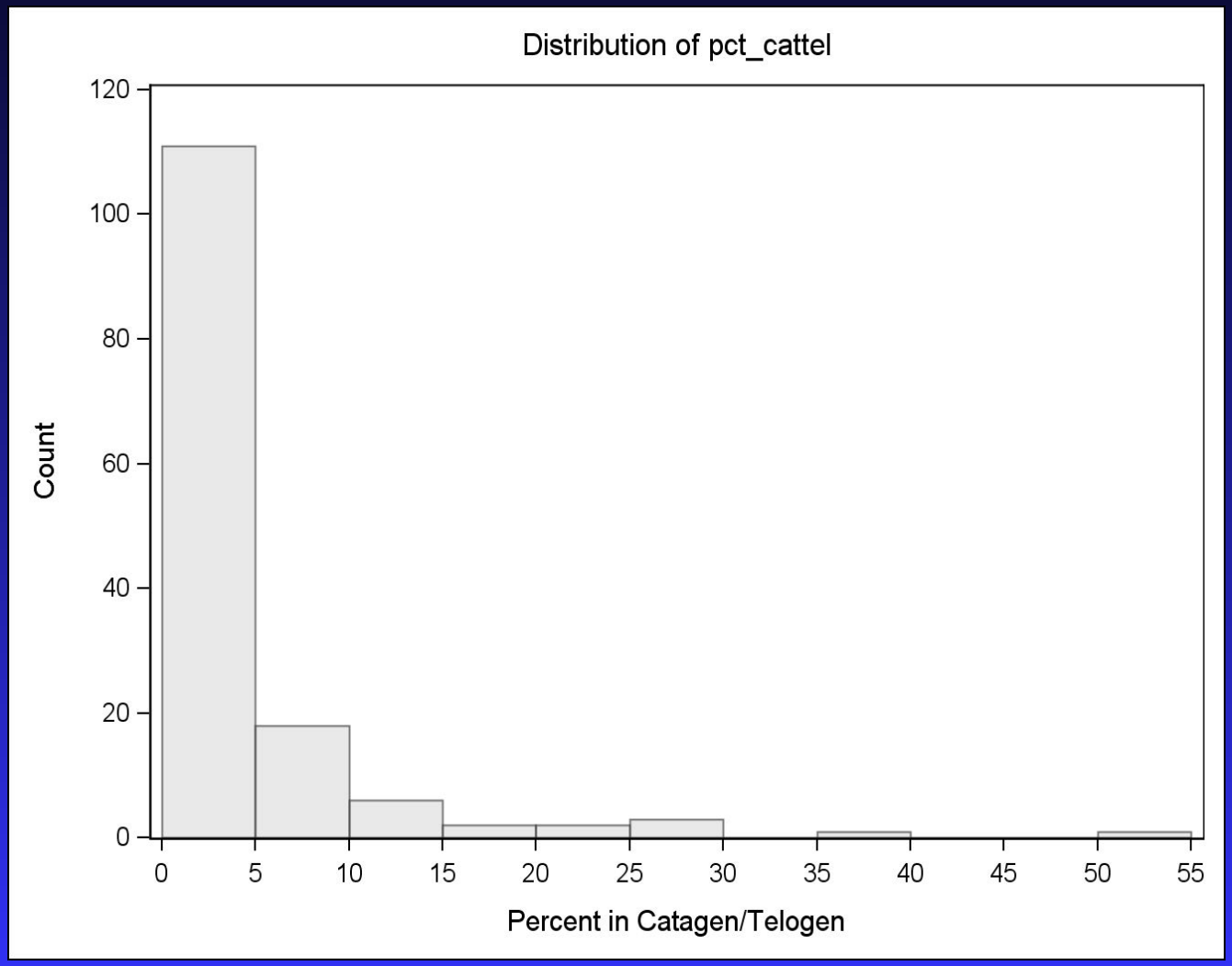


Cytokeratin 15 (C8/144B)

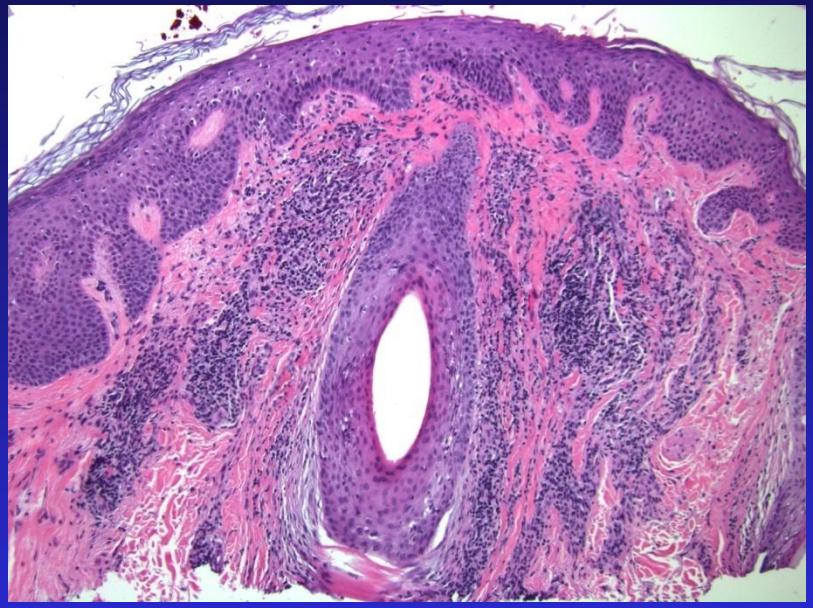
Near absence of catagen/telogen in lichen planopilaris

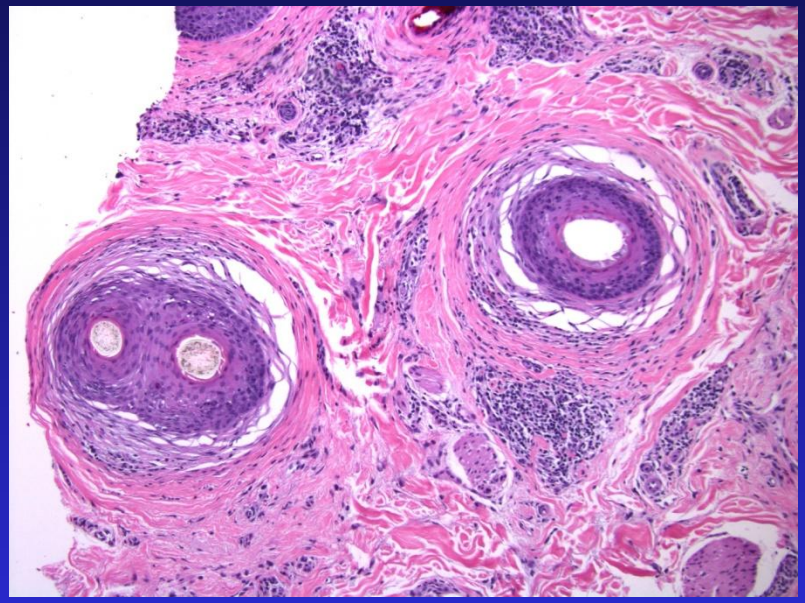


Near absence of catagen/telogen in LPP



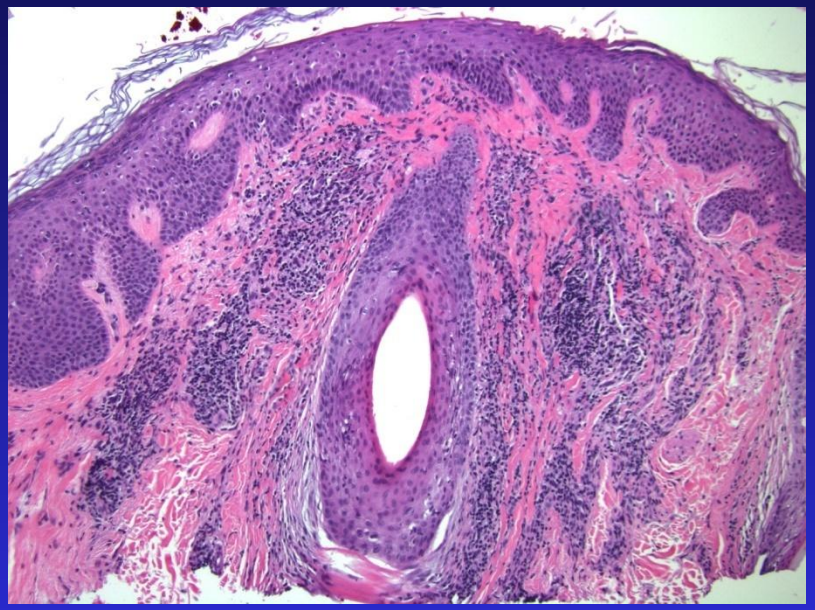
Lichen Planopilaris (LPP)

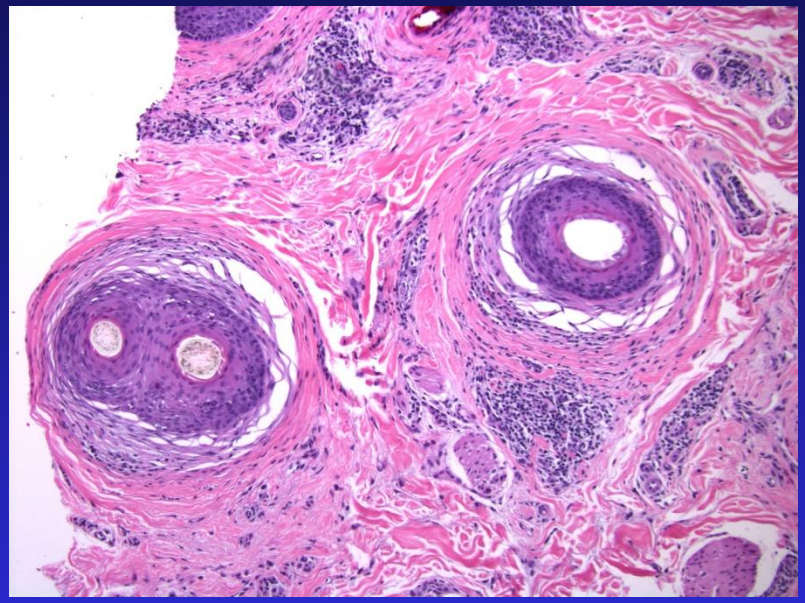




Inflammation at level of the follicular bulge.

Lichen Planopilaris (LPP)



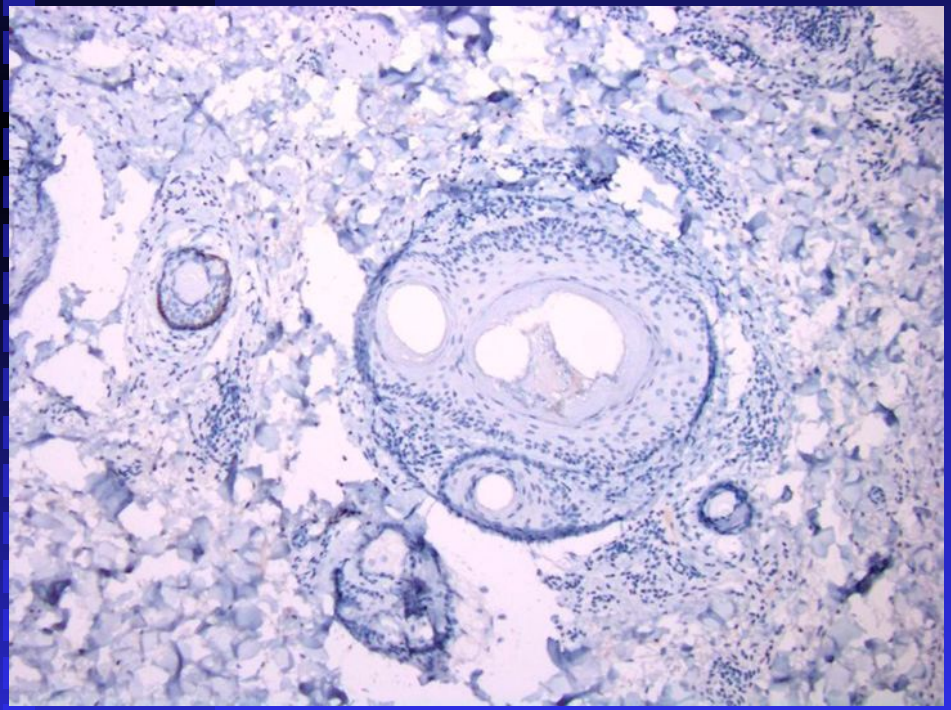


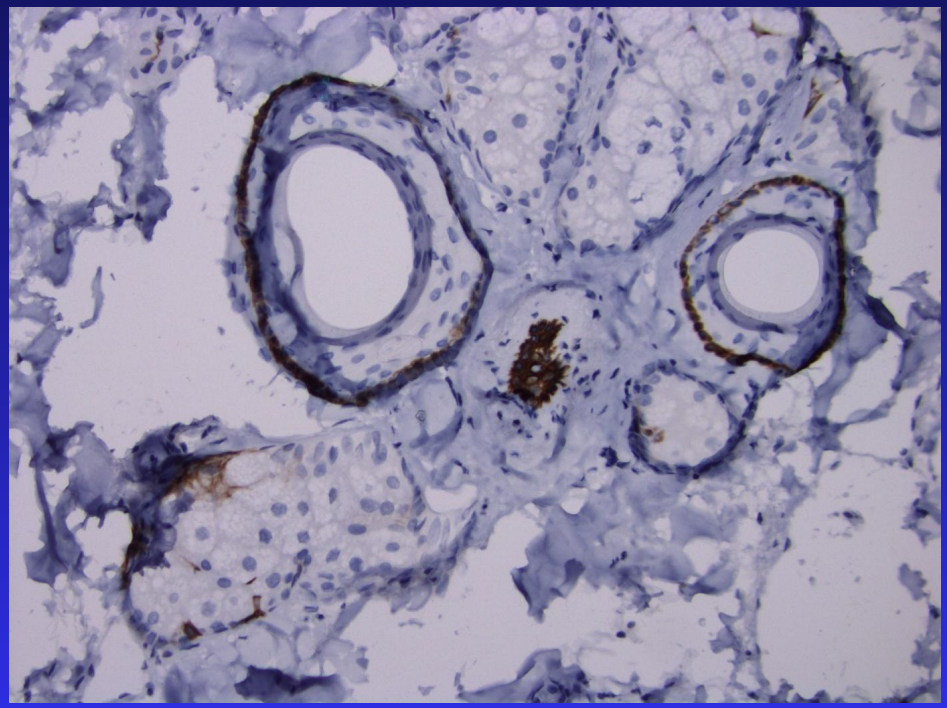
Loss of catagen/telogen phase follicles

Absence of catagen/telogen phase and loss of cytokeratin 15 expression in hair follicles in lichen planopilaris

Arlette Habashi-Daniel, MD,[a] Janet L. Roberts, MD,[b] Nisha Desai, MD,[d] and Curtis T. Thompson, MD[a,b,c]
Portland, Oregon

J Am Acad Dermatol 2014;71:969-72.



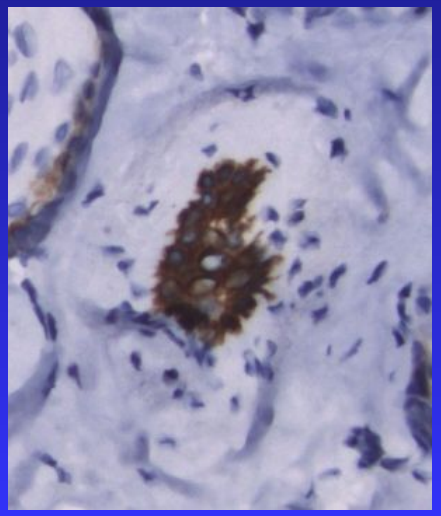


Lichen Planopilaris Progression

Loss of CK15+ stem cells

↓

Disappearance of follicle when cycle into catagen



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Clinical progression despite immunosuppressive treatment

Lichen Planopilaris (LPP)

Absence of catagen/telogen

Loss of CK15+ stem cells

EARLY INTERVENTION IS LIKELY THE MOST IMPORTANT FACTOR IN PROGNOSIS.

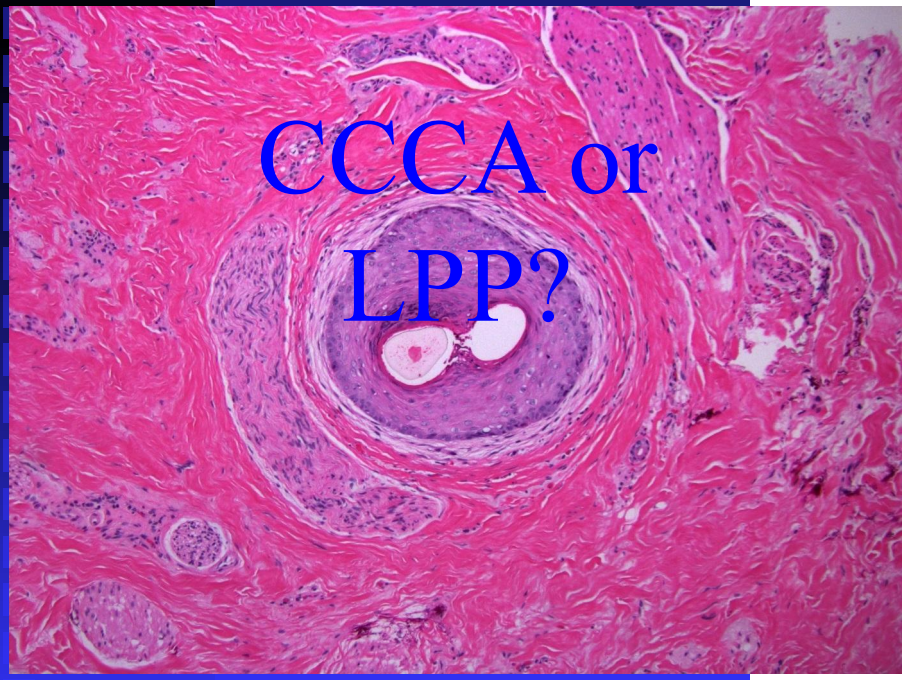
CK15+ Stem Cell Loss in Other Cicatricial Diseases

- Alopetic lupus erythematosus—(7 cases)
- Central centrifugal cicatricial alopecia (CCCA)—(7)
- Frontal fibrosing alopecia (LPP)—(9)
- Lichen planopilaris (19)

Kolivras A, Thompson N, Thompson C. Loss of cytokeratin-15 (CK15) expression is not specific for lichen planopilaris (LPP). J Am Acad Dermatol 2016; 75: 428-9.

CONCLUSION

Loss of CK15+ follicular bulge cells has no diagnostic value in distinguishing cicatricial alopecias



PRIMARY CICATRICIAL ALOPECIA	
Lymphocytic	Chronic cutaneous lupus erythematosus
	Lichen planopilaris (LPP)
	- Classic LPP
	- 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
Mixed	Folliculitis (acne) keloidalis
	Folliculitis (acne) necrotica
	Erosive pustular dermatosis
Non specific	

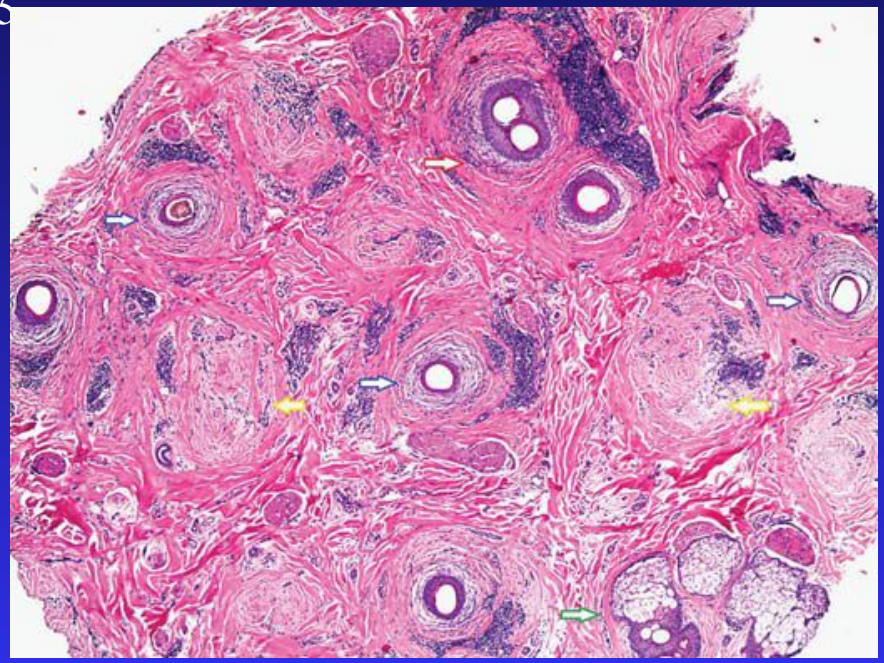
Central Centrifugal Cicatricial Alopecia Presenting with Irregular Patchy Alopecia on the Lateral and Posterior Scalp

Mariya Miteva Antonella Tosti

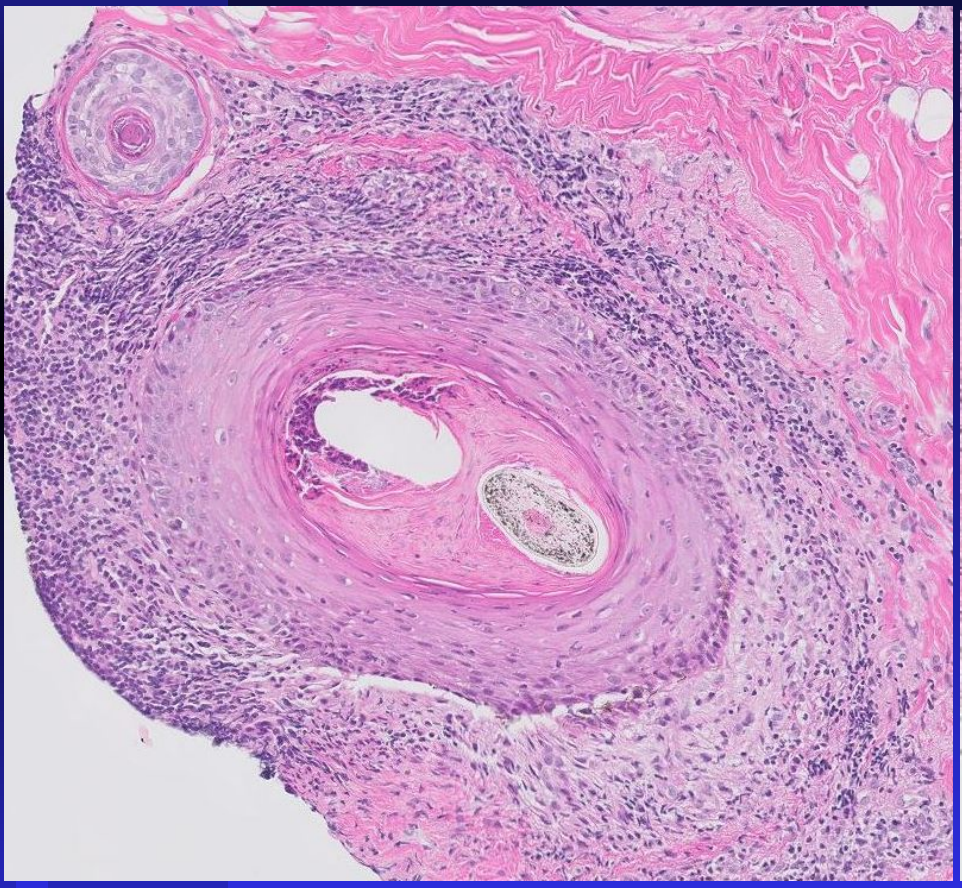
Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, Miami, Fla., USA

Skin Appendage Disord

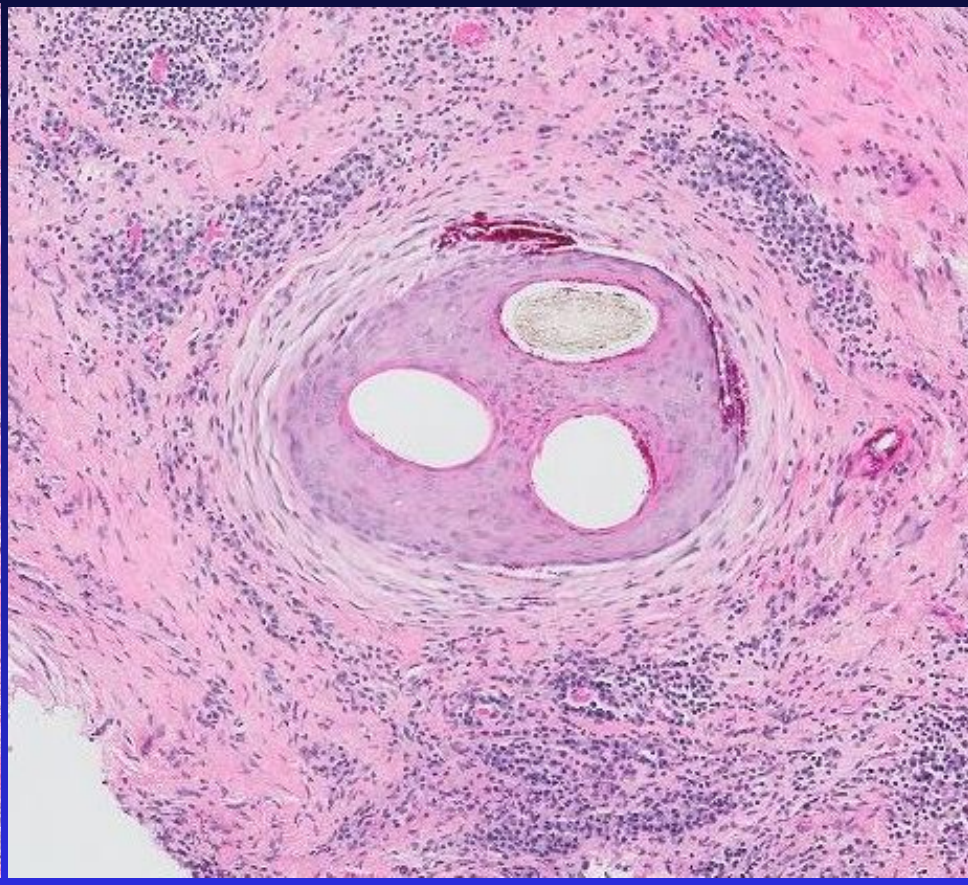
2015;1:1–5



CCCA vs LPP—Current Study



CCCA

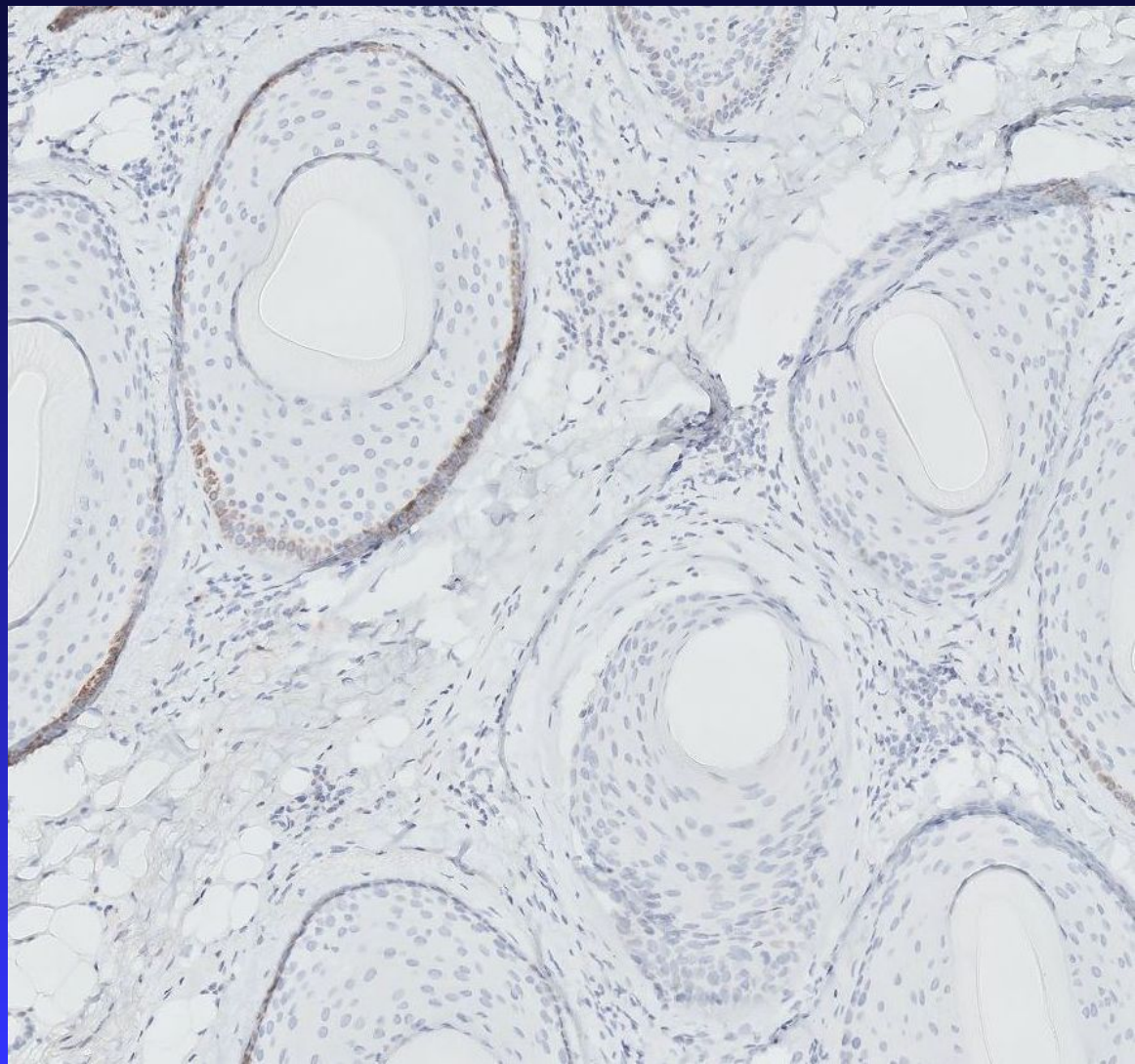


LPP

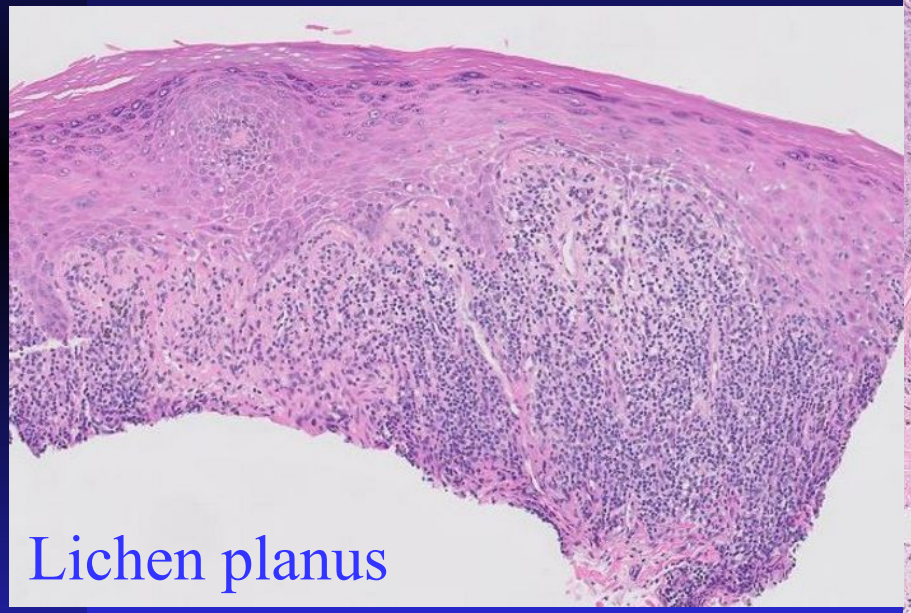
Data collection and Analysis

- CD4, CD8, CD20, CD68,
- CD123
- Myeloperoxidase
- CK15

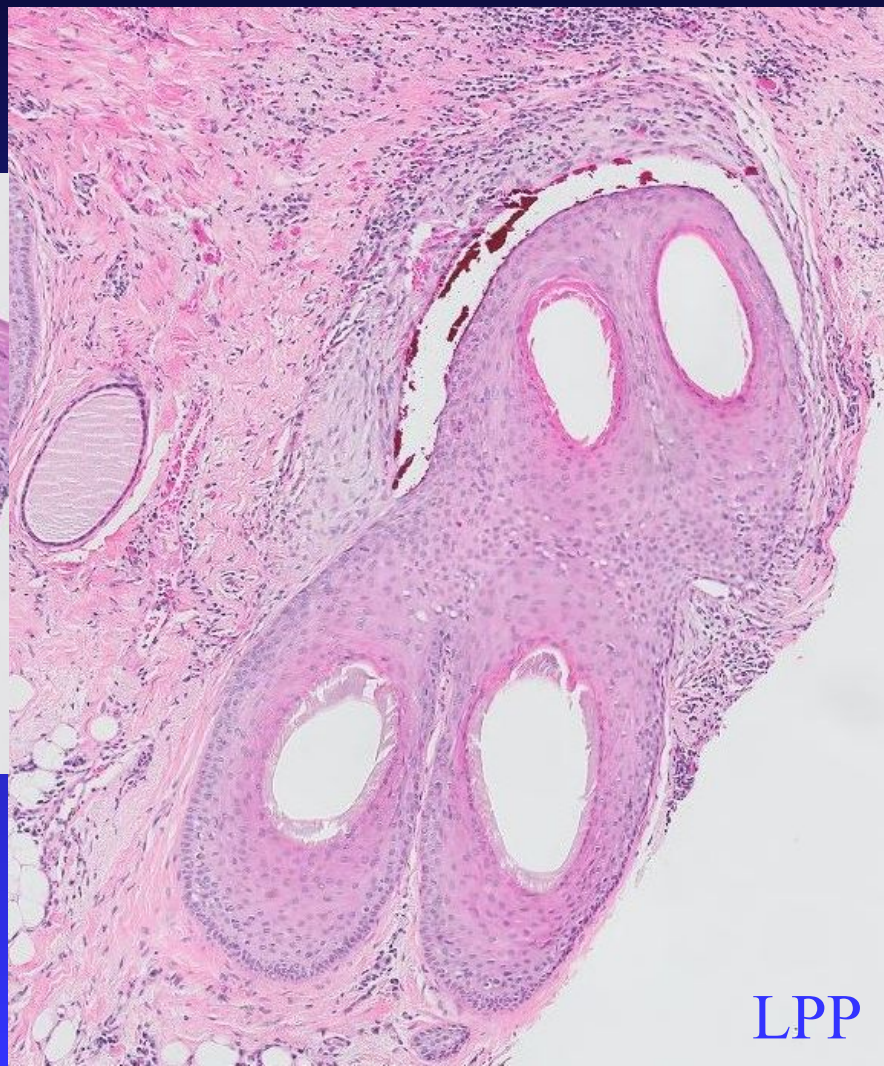
Conclusion #1
CK15 helps detects subtle disease



Conclusion #2
Squamotization of Follicular Epithelium: Same as lichen planus

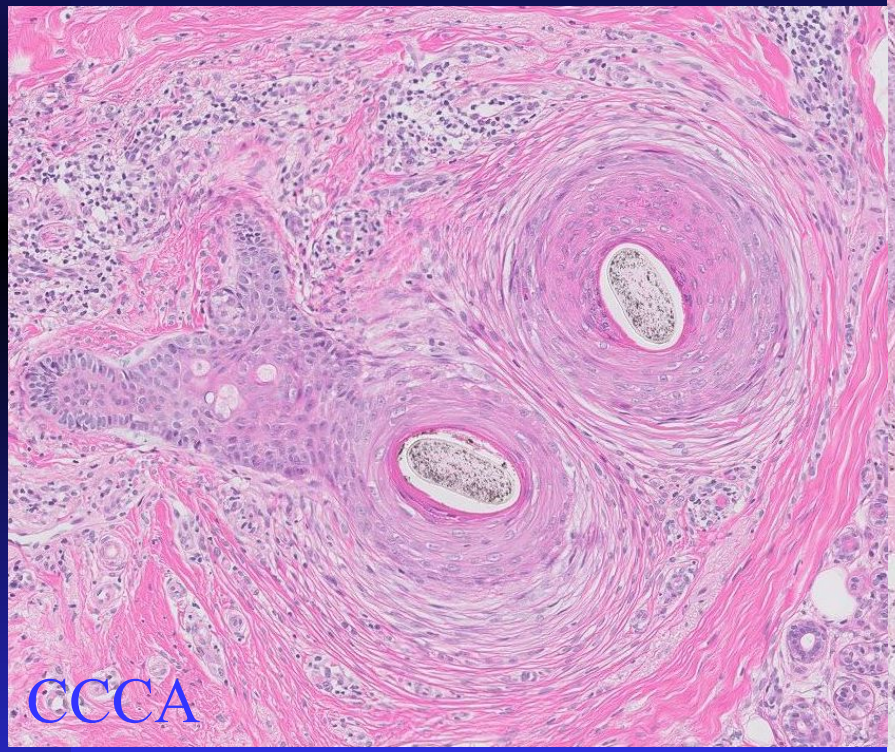


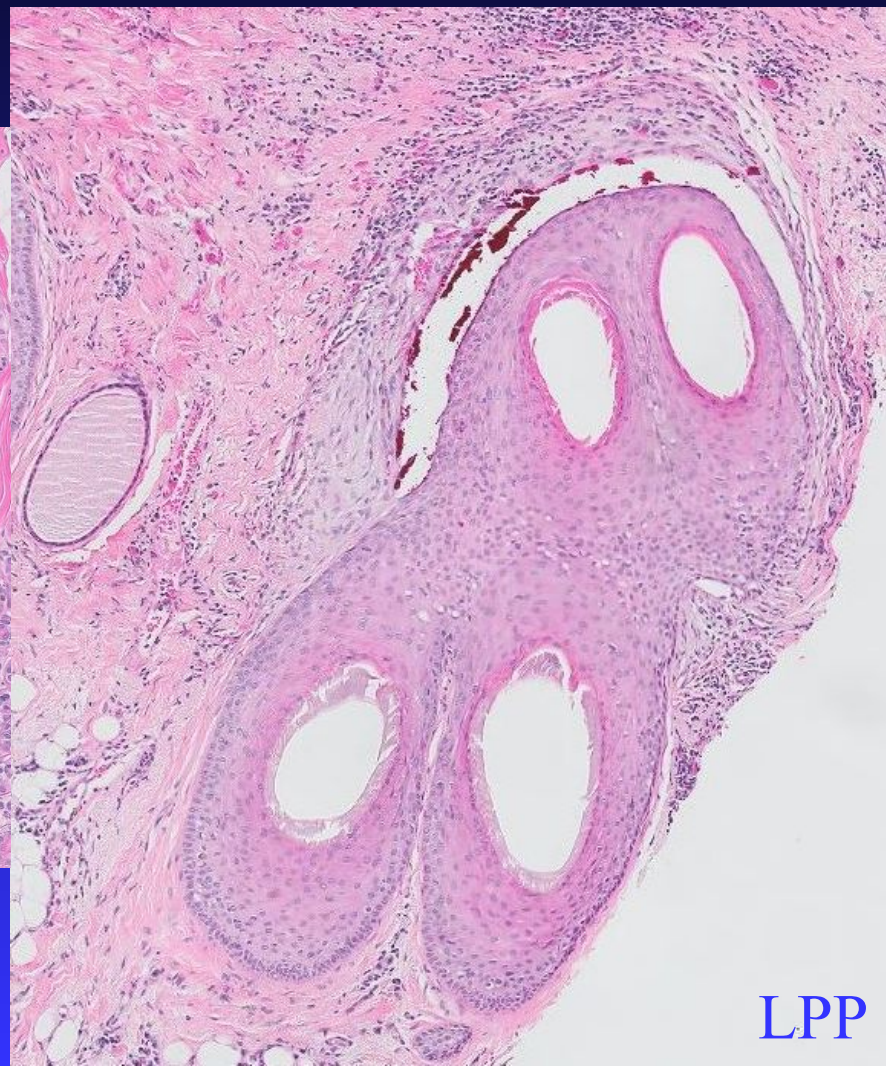
Lichen planus



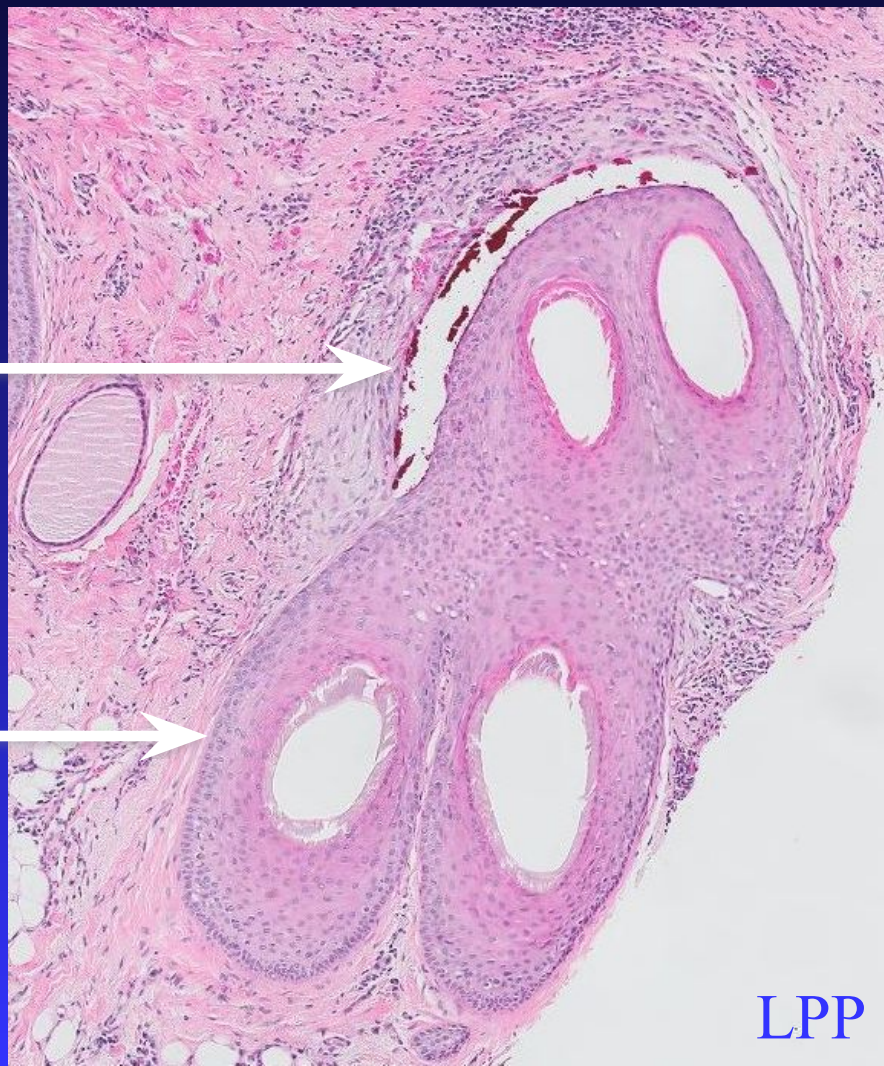
LPP

Conclusion #2
Squamotization of Follicular Epithelium Identical in CCCA and LPP





Conclusion #2
Squamotization of Follicular Epithelium is "Premature Desquamation of the Inner Root Sheath"

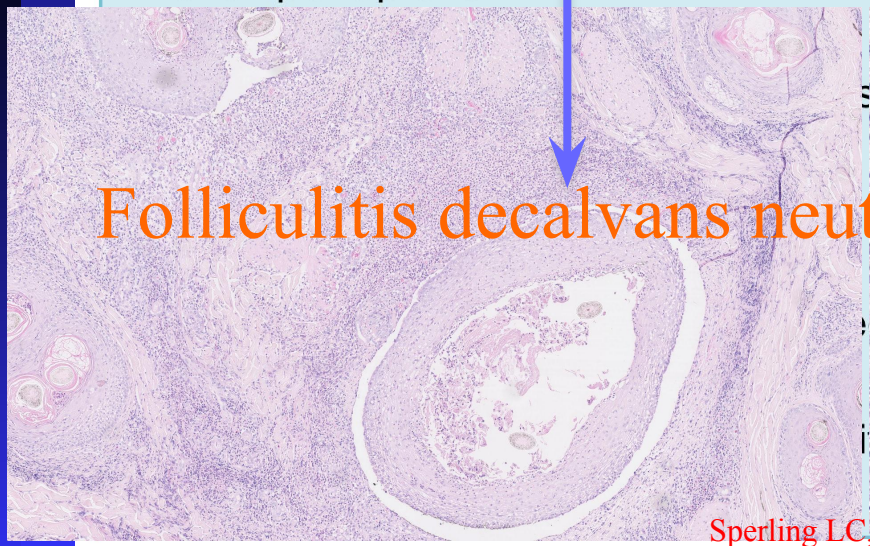


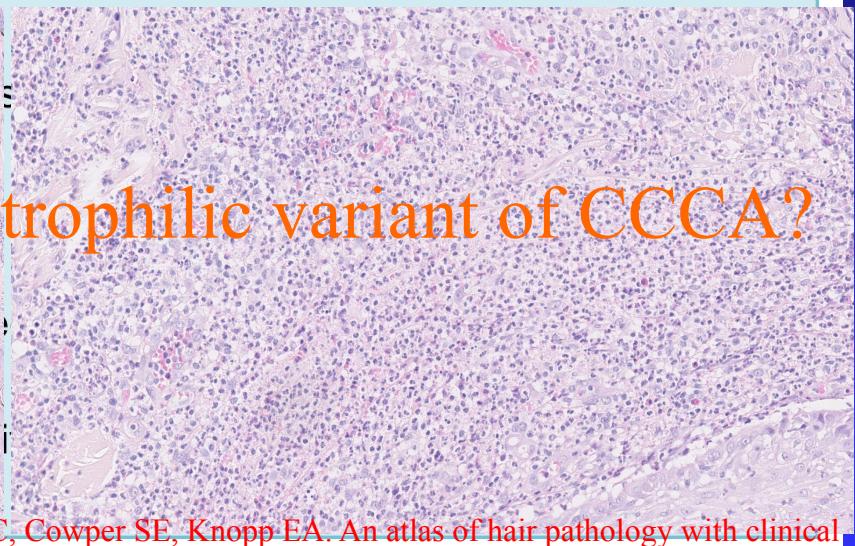
Conclusion #3
Lack of neutrophils (MPO) suggests no relationship between Folliculitis Decalvans and CCCA

SIMPLIFIED CLASSIFICATION OF PRIMARY CICATRICIAL ALOPECIA

Central Centrifugal cicatricial alopecia

Lichen planopilaris





Folliculitis decalvans neutrophilic variant of CCCA?

Sperling LC, Cowper SE, Knopp EA. An atlas of hair pathology with clinical correlations. 2nd ed. Boca Raton (FL): Taylor and Francis Group; 2012.

Overall Conclusion:
For diagnostic purposes,
CCCA is identical to LPP

SIMPLIFIED CLASSIFICATION OF PRIMARY CICATRICIAL ALOPECIA

Central Centrifugal cicatricial alopecia

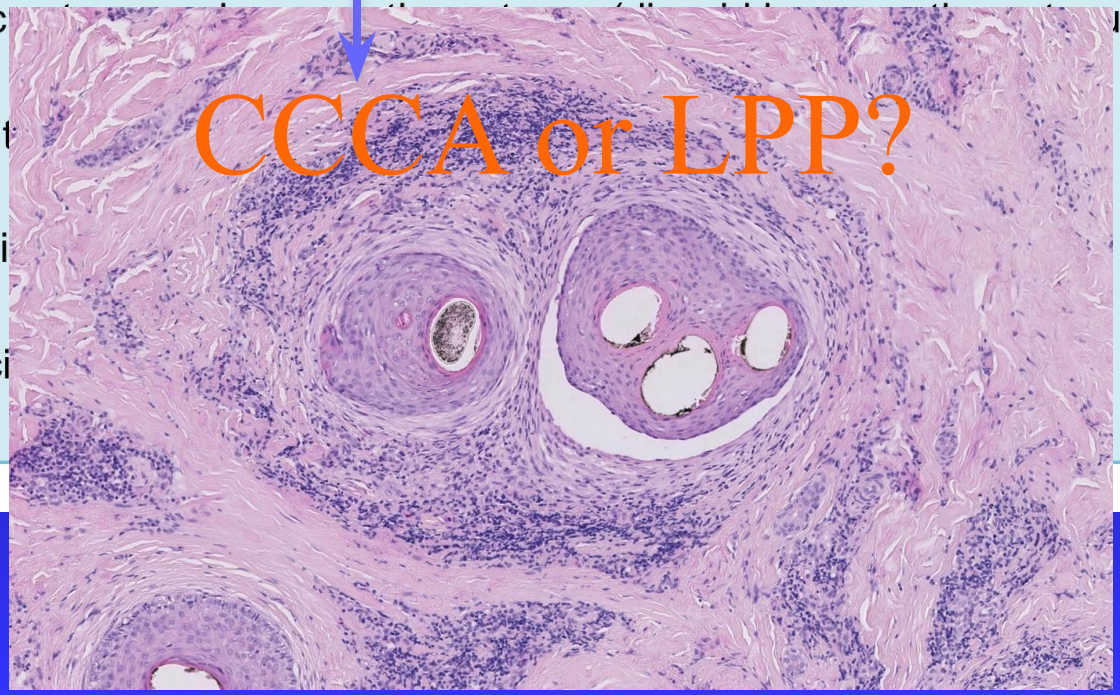
Lichen planopilaris

Chronic

Folliculit

Dissecti

Cicatrici

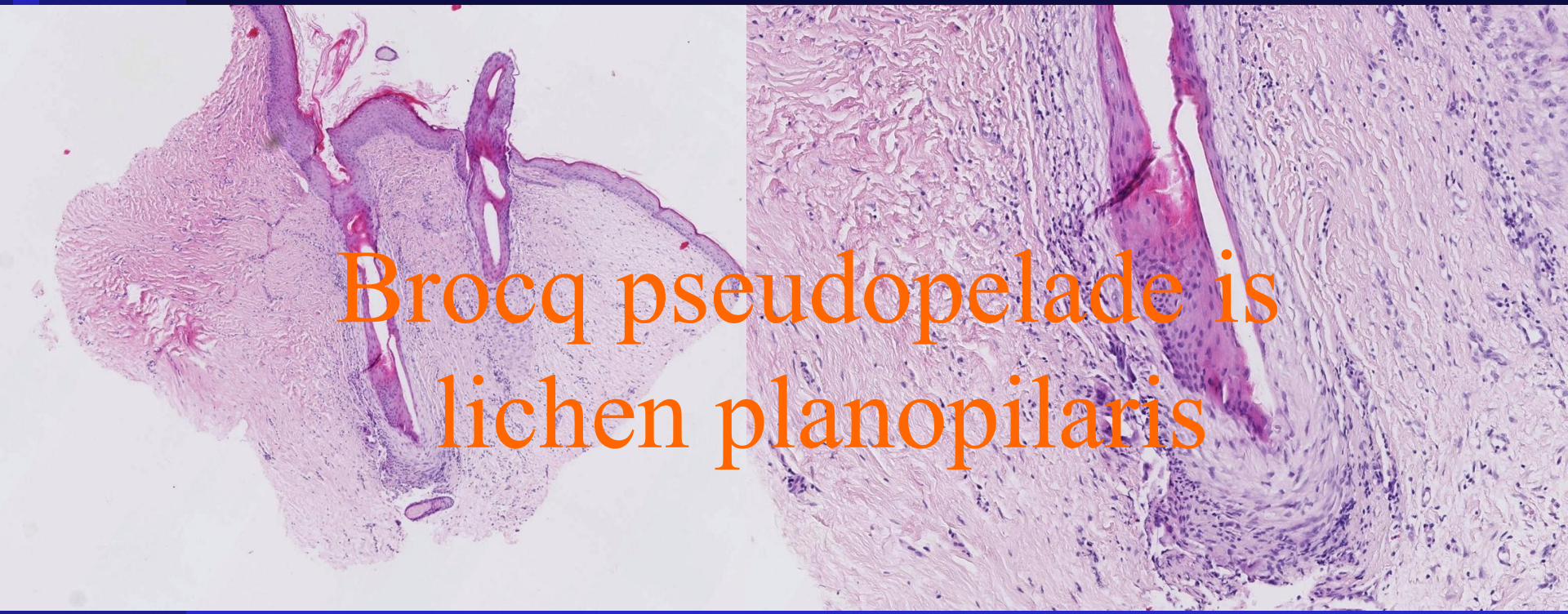


Pseudopelade of Brocq

Pseudopelade of Brocq

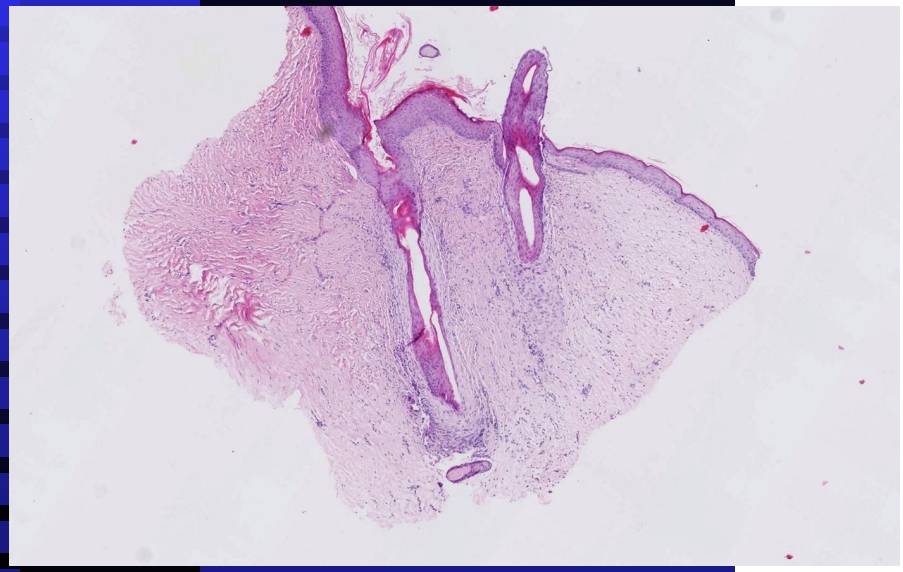
- With transverse sections foci of inflammation and scarring are identified
- Now diagnosed as lichen planopilaris
- Recommend abandoning this term.

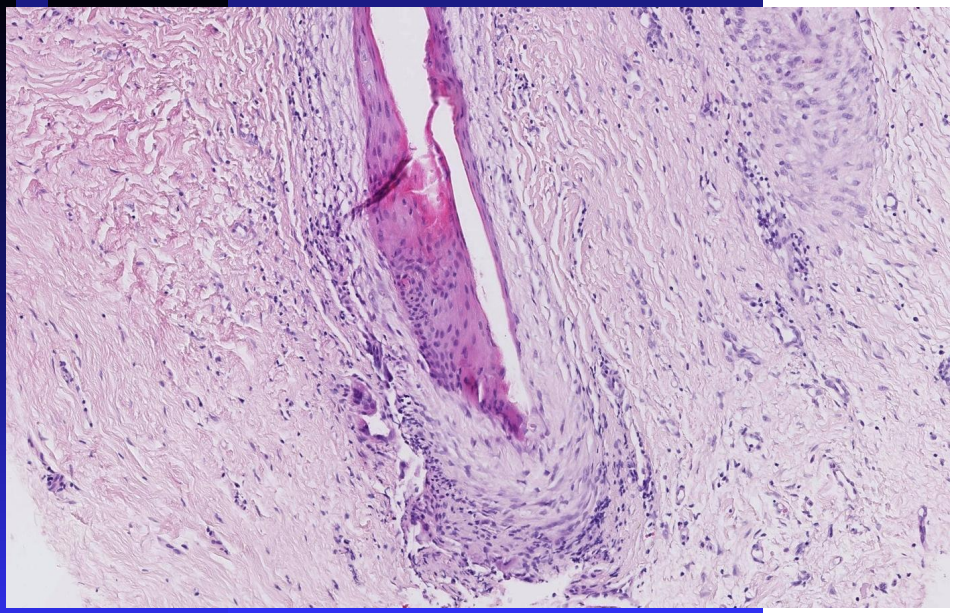
Brocq pseudopelade



Brocq pseudopelade is lichen planopilaris

Silvers DN, Katz BE, Young AW. Pseudopelade of Brocq is lichen planopilaris: report of four cases that support this nosology. Cutis 1993; 51: 99.





PRIMARY CICATRICIAL ALOPECIA

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	Keratosis follicularis spinulosa decalvans
Neutrophilic	Folliculitis decalvans
	Dissecting cellulitis/folliculitis
Mixed	Folliculitis (acne) keloidalis
	Folliculitis (acne) necrotica
	Erosive pustular dermatosis
Non specific	

Objective #4

- New Algorithm

North American Hair Research Society (NAHRS) Classification

PRIMARY CICATRICIAL ALOPECIA	
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	Erosive pustular dermatosis
Non specific	

1. Olsen EA, Bergfeld WF, Cotsarelis G, et al. Summary of North American Hair Research Society (NAHRS)-sponsored Workshop on Cicatricial Alopecia, Duke University Medical Center, February 10 and 11, 2001. J Am Acad Dermatol 2003; 48: 103.
2. Olsen EA, Stenn K, Bergfeld W, et al. Update on Cicatricial Alopecia. J Invest Dermatol Symp Proc 2003; 8: 18.

American Hair Research Society (AHRS) Classification

PRIMARY CICATRICIAL ALOPECIA	
Lymphocytic	Chronic cutaneous lupus erythematosus Lichen planopilaris (LPP) - Classic LPP - 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
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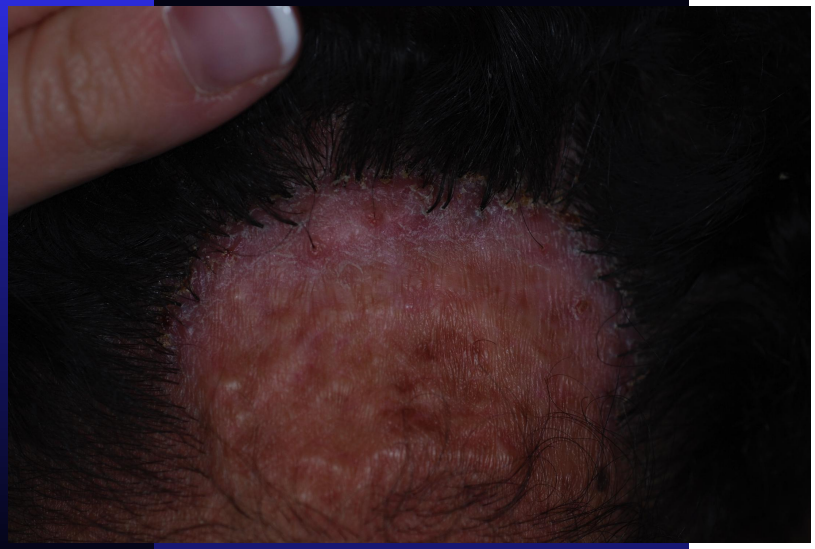

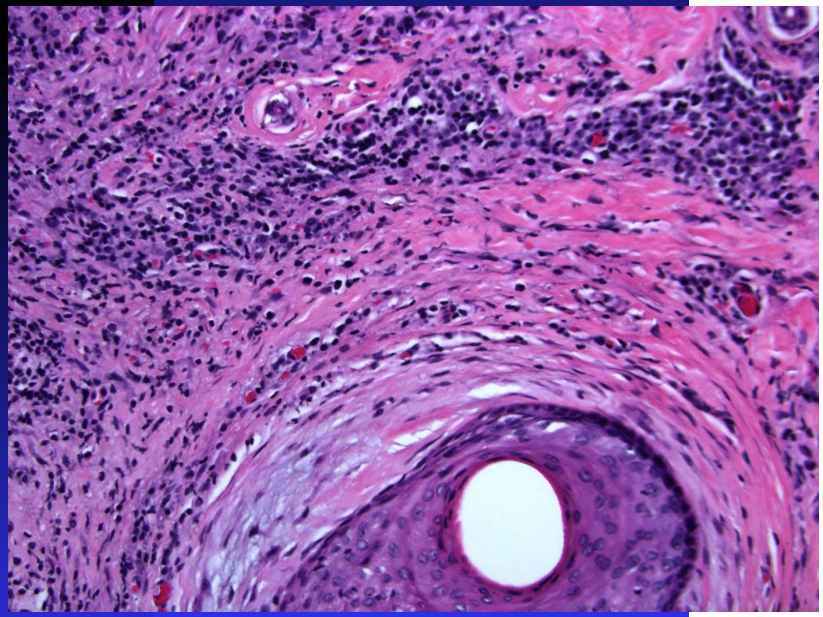

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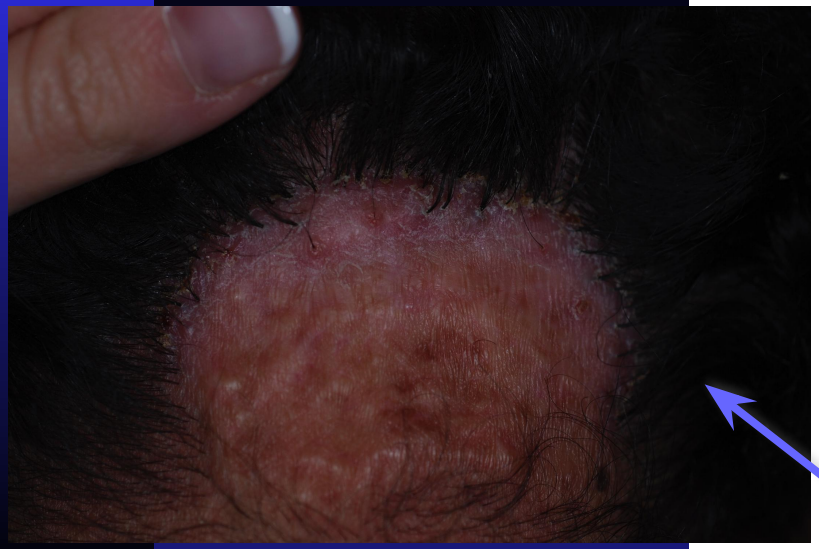

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	Folliculitis (acne) necrotica
	Erosive pustular dermatosis
Non specific	

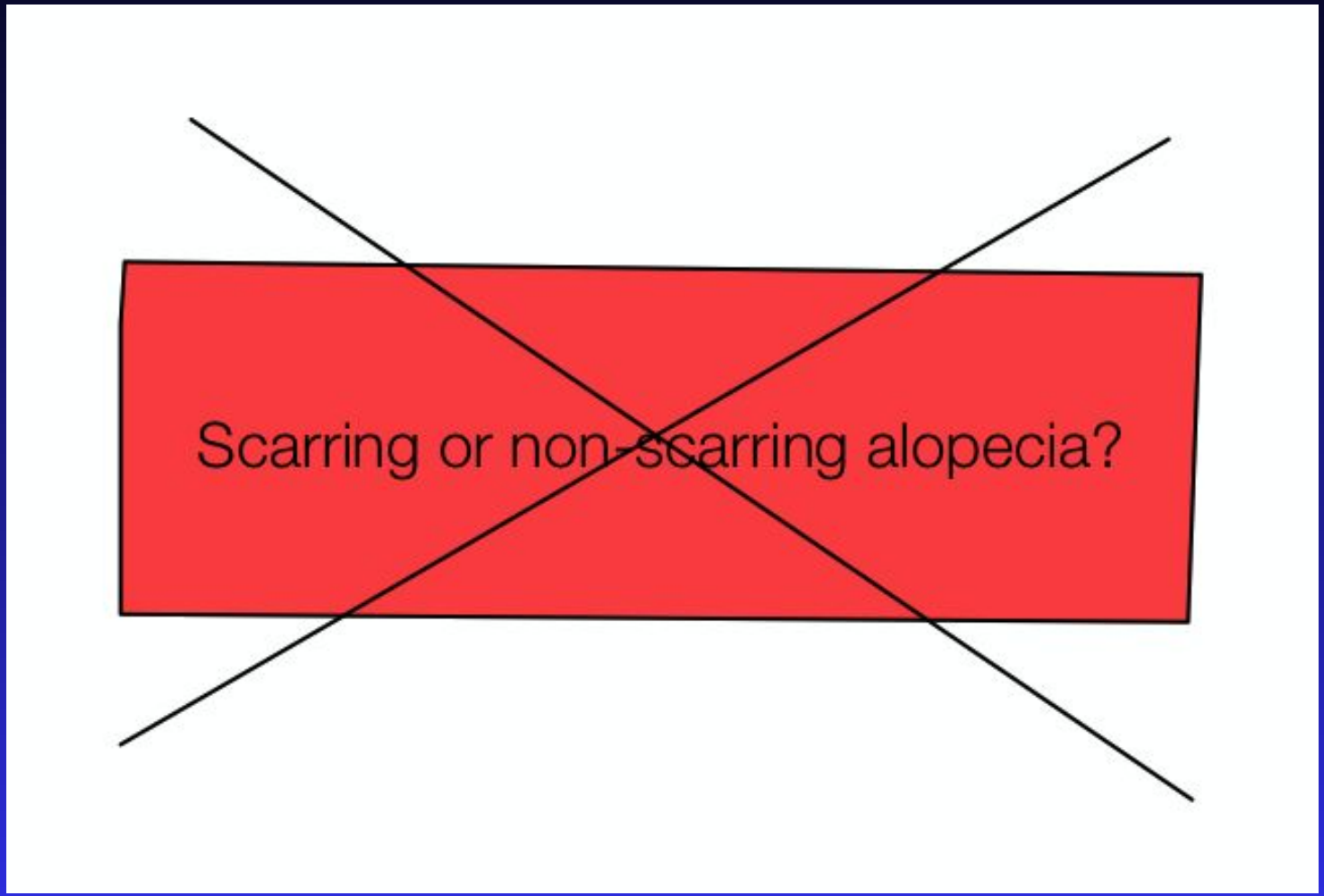
Simplified classification lumps clinically disparate disorders

SIMPLIFIED CLASSIFICATION OF PRIMARY CICATRICIAL ALOPECIA
Central Centrifugal cicatricial alopecia ≠Folliculitis Decalvans
Lichen planopilaris
Chronic cutaneous lupus erythematosus (discoid lupus erythematosus)
Folliculitis Keloidalis (folliculitis nuchae, acne keloidalis nuchae)
Dissecting cellulitis (perifolliculitis abscedens et suffodiens)
Cicatricial alopecia, not otherwise classified

Sperling LC, Cowper SE, Knopp EA. An atlas of hair pathology with clinical correlations. 2nd ed. Boca Raton (FL): Taylor and Francis Group; 2012.

LIMITATIONS

1. All alopecias may, in the end, be scarring
2. Cases in marked follicular miniaturization or increase of the catagen/telogen count may be misinterpreted as cicatricial alopecia (empty tracts).
3. Using the cell type of the infiltrate for classification may be misleading.


Scarring or non-scarring alopecia?

How?

How to bridge the historical classification of alopecia with all the current concepts and how to provide clinicians and dermatopathologists a practical guide to diagnosis?

J Cutan Pathol 2016
doi: 10.1111/cup.12822
John Wiley & Sons. Printed in Singapore

Journal of
Cutaneous Pathology

Review

Primary scalp alopecia: new histopathological tools, new concepts and a practical guide to diagnosis

The diagnosis of primary scalp alopecia remains one of the most challenging fields in dermatopathology. In this review, we would like to connect the established classification of primary alopecia into scarring (cicatricial) and non-scarring (non-cicatricial) with current concepts. We introduce a simplified pathway for the diagnosis of the most common causes of alopecia, including a discussion of tissue processing techniques and use of immunohistochemistry.

Keywords: non-scarring (non-cicatricial) alopecia, primary scalp alopecia, scarring (cicatricial) alopecia

Kolivras A, Thompson C. Primary scalp alopecia: new histopathological tools, new concepts and a practical guide to diagnosis.
J Cutan Pathol 2016. © 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd

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[3]Department of Biomedical Engineering, Oregon Health Sciences University, Portland, OR, USA,
[4]Department of Pathology, Oregon Health Sciences University, Portland, OR, USA, and
[5]Department of Dermatology, Oregon Health Sciences University, Portland, OR, USA

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Accepted for publication September 20, 2016

A practical guide to diagnosis

Getting the clinical clues

- Diffuse or patchy?
- Usual or special clinical context?

Examine the biopsy specimen

- Density
- Follicular size
- Catagen and telogen percentage
- Perifollicular scarring
- Inflammatory infiltrate
- Follicular fibrous tracts

Apply the 2-step algorithm

- Presence or absence of follicular miniaturization?
- Increased or normal CT count?

Diffuse or patchy?
Usual or special clinical context?

Table 1

CLINICAL CONTEXT	DIFFUSE ALOPECIA	PATCHY ALOPECIA
COMMON ENTITIES	ALOPECIA AREATA	ACNE KELOIDALIS
	FIBROSING ALOPECIA IN A PATTERN DISTRIBUTION	ALOPECIA AREATA
	LICHEN PLANOPILARIS	CENTRAL CENTRIFUGAL SCARRING ALOPECIA
	PATTERN HAIR LOSS (FEMALE AND MALE)	DISSECTING CELLULITIS
	TELOGEN EFFLUVIUM (ACUTE AND CHRONIC)	FOLLICULITIS DECALVANS
		LICHEN PLANOPILARIS
		LUPUS ERYTHEMATOSUS (DISCOID AND NON-SCARRING)
		SYPHILIS
		TRACTION ALOPECIA (EARLY AND CHRONIC)
		TRICHOTILLOMANIA
SPECIAL ENTITIES	CHEMOTHERAPY-RELATED ALOPECIA	FRONTAL FIBROSING ALOPECIA
	I. ANAGEN EFFLUVIUM	LOOSE ANAGEN SYNDROME
	II. PERMANENT ALOPECIA AFTER CHEMOTHERAPY	POST-OPERATIVE (PRESSURE-INDUCED) ALOPECIA
	LOOSE ANAGEN SYNDROME	PSORIATIC ALOPECIA AND DRUG-INDUCED PSORIASIFORM ALOPECIA
	SHORT ANAGEN SYNDROME	TRIANGULAR ALOPECIA

Diffuse or patchy?
Usual or special clinical context?

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Usual or special clinical context?

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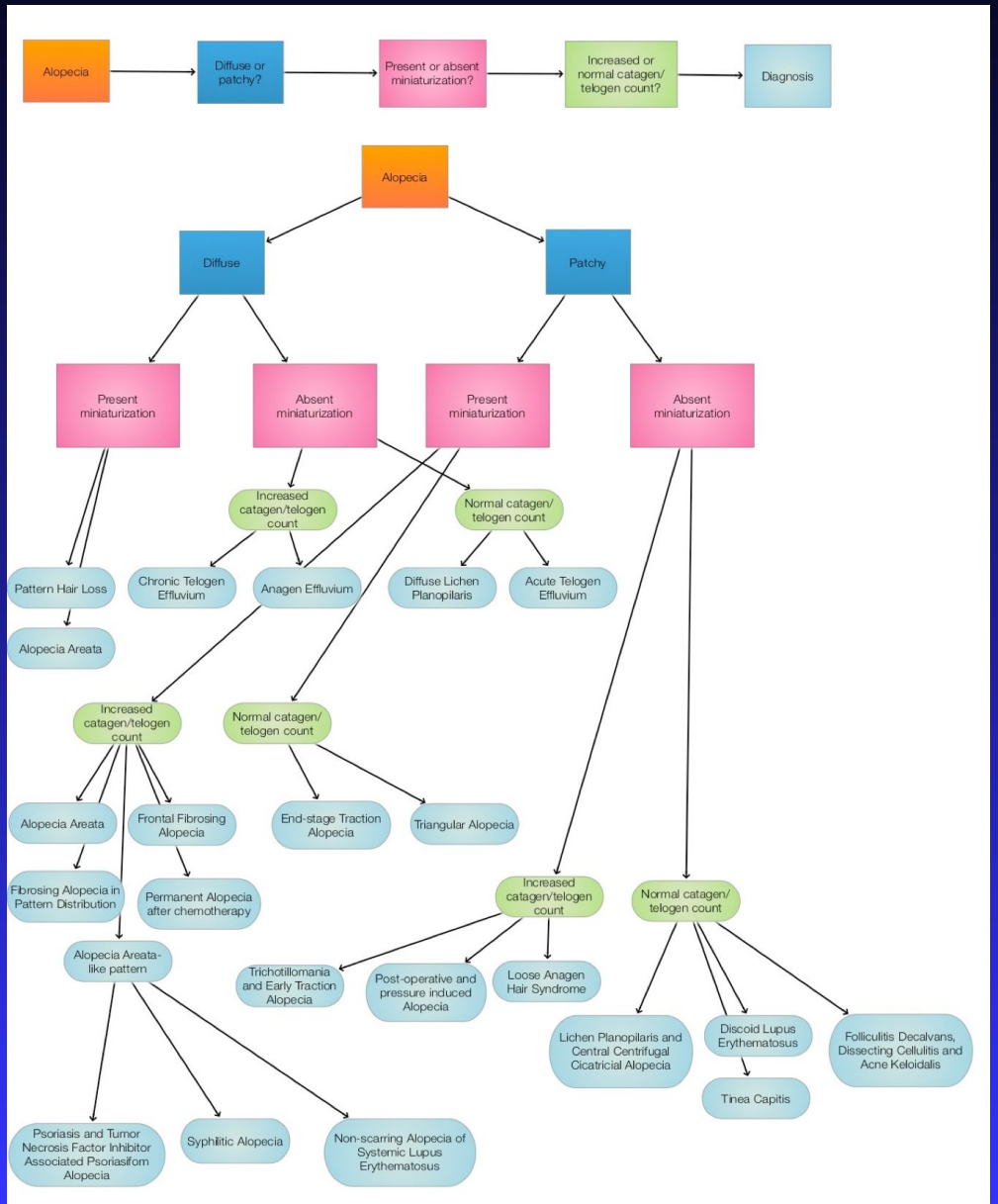
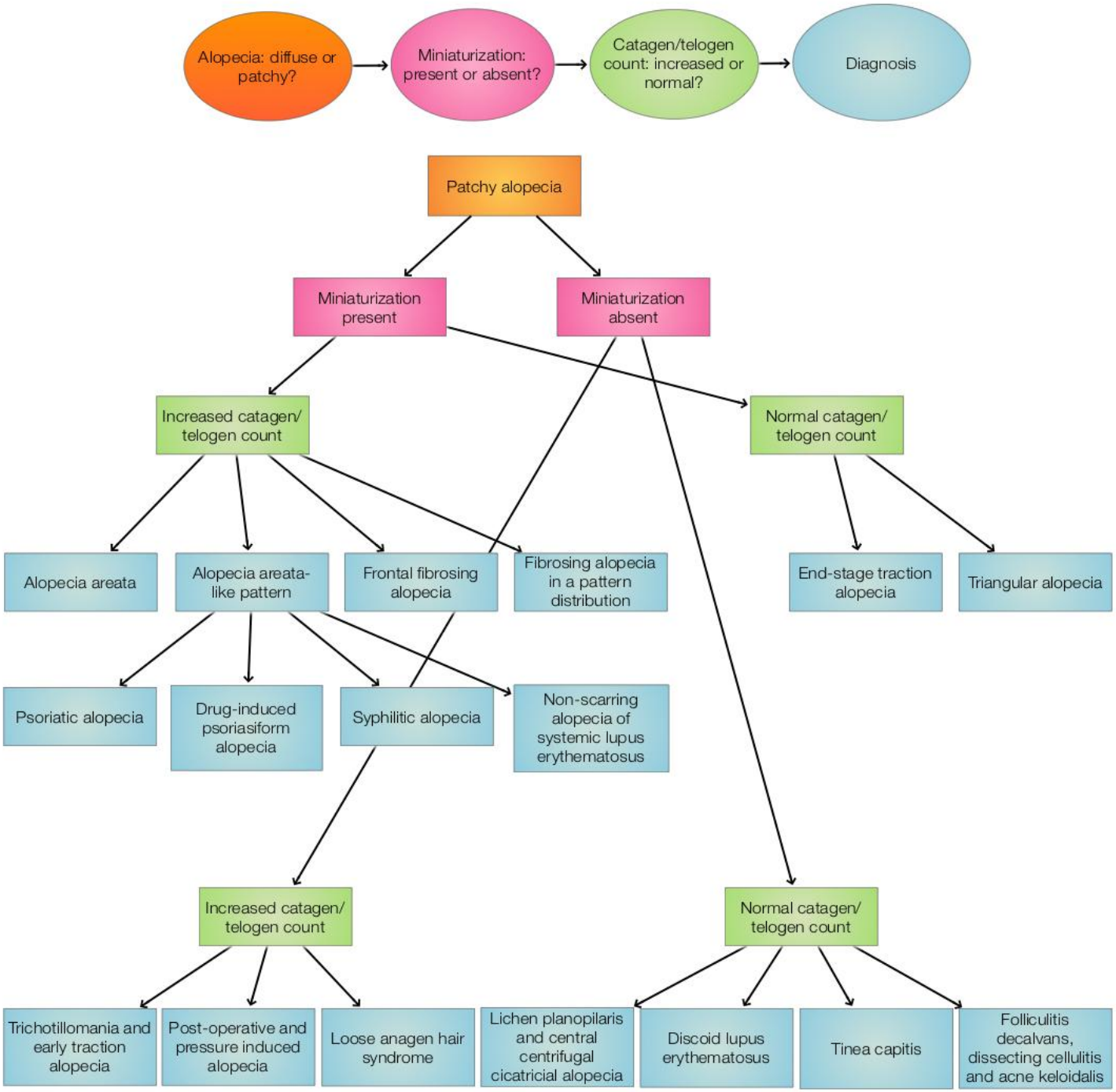
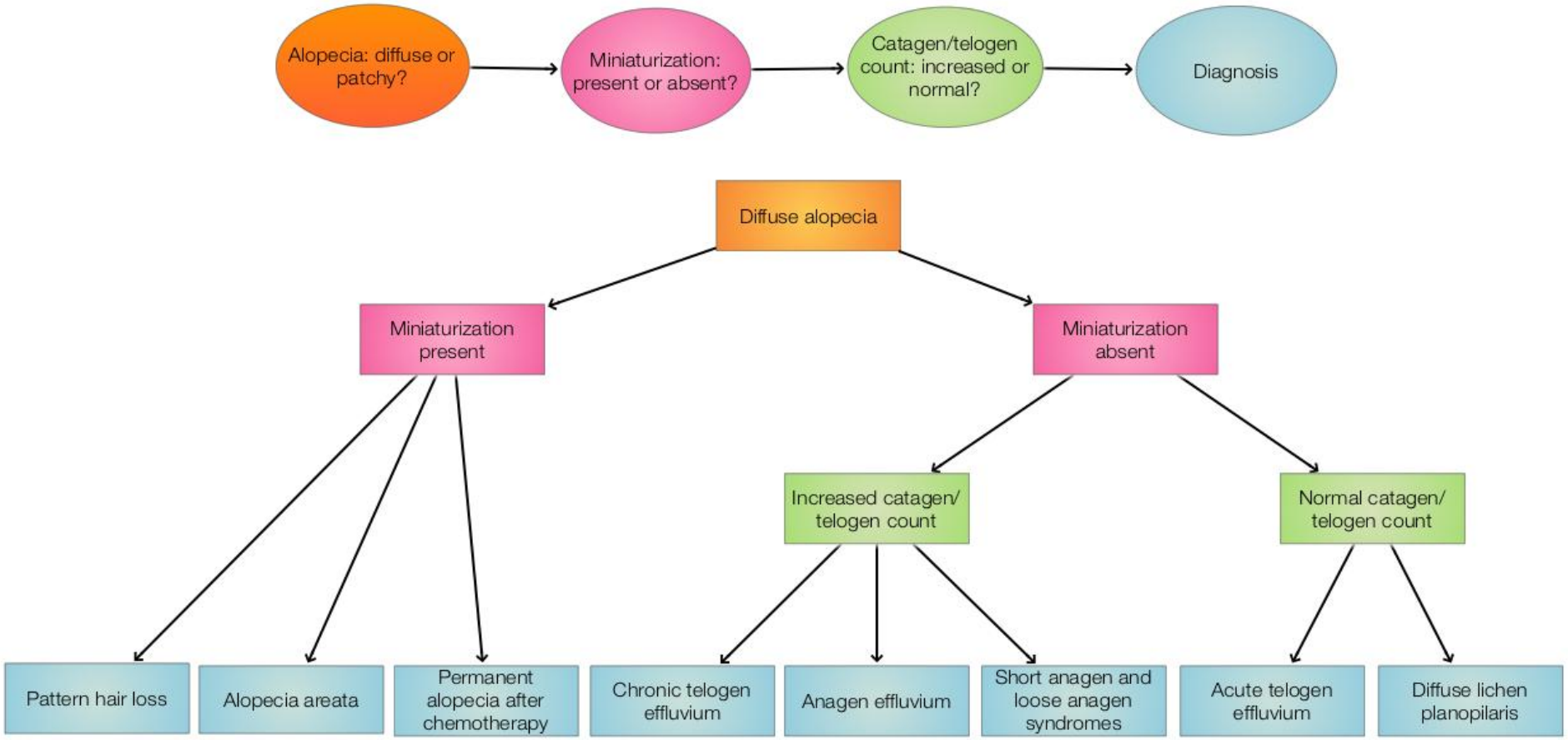
	LOOSE ANAGEN SYNDROME	PSORIATIC ALOPECIA AND DRUG-INDUCED PSORIASIFORM ALOPECIA
	SHORT ANAGEN SYNDROME	TRIANGULAR ALOPECIA

Diagnostic Algorithm




Alopecia: diffuse or patchy?
Miniaturization: present or absent?
Catagen/telogen count: increased or normal?
Diagnosis
Patchy alopecia
Miniaturization present
Miniaturization absent
Increased catagen/ telogen count
Normal catagen/ telogen count
Alopecia areata
Alopecia areata-like pattern
Frontal fibrosing alopecia
Fibrosing alopecia in a pattern distribution
End-stage traction alopecia
Triangular alopecia
Psoriatic alopecia
Drug-induced psoriasiform alopecia
Syphilitic alopecia
Non-scarring alopecia of systemic lupus erythematosus
Increased catagen/ telogen count
Normal catagen/ telogen count
Trichotillomania and early traction alopecia
Post-operative and pressure induced alopecia
Loose anagen hair syndrome
Lichen planopilaris and central centrifugal cicatricial alopecia
Discoid lupus erythematosus
Tinea capitis
Folliculitis decalvans, dissecting cellulitis and acne keloidalis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Catagen/telogen count: increased or normal?
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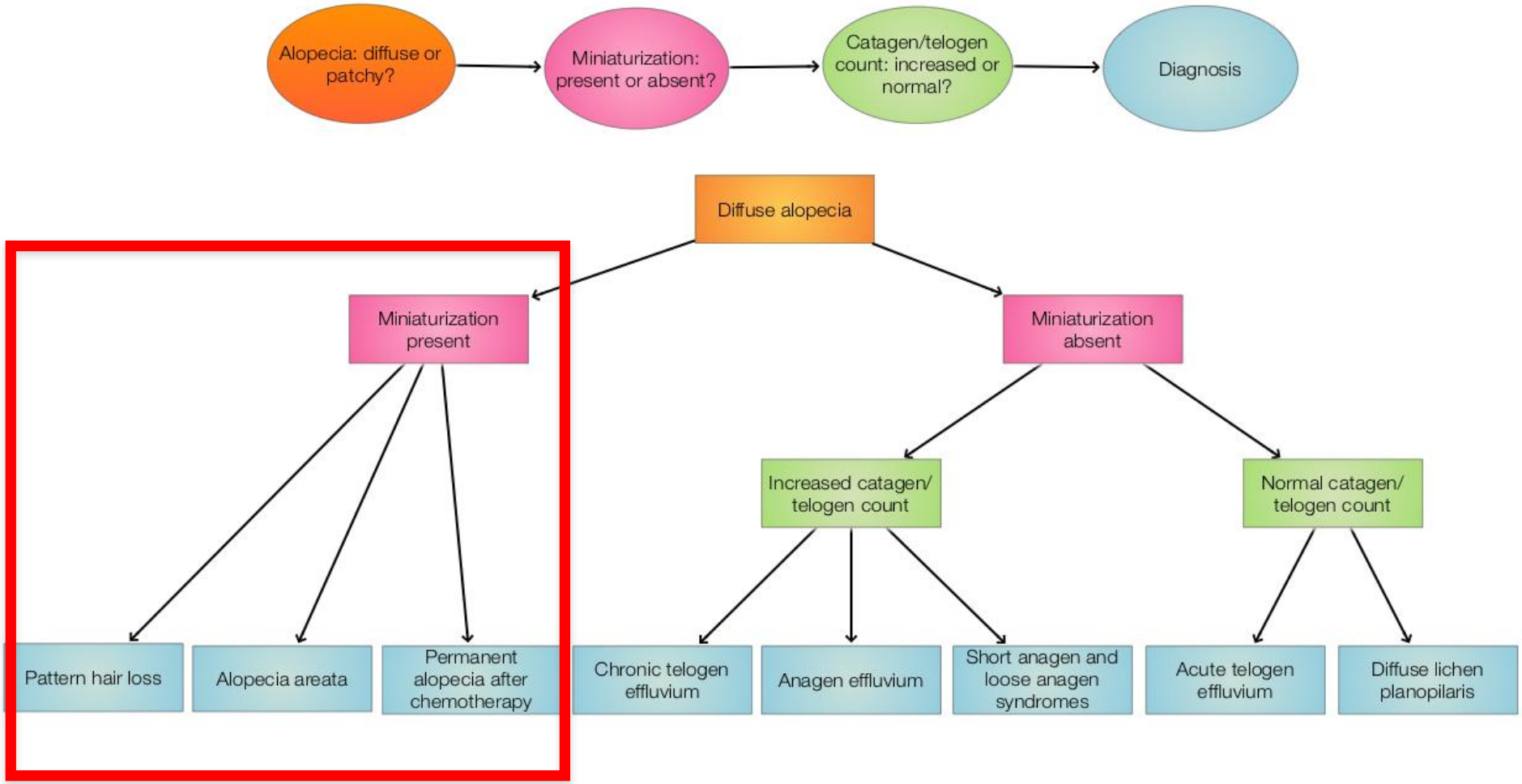
Diffuse alopecia
Miniaturization present
Miniaturization absent
Increased catagen/ telogen count
Normal catagen/ telogen count
Pattern hair loss
Alopecia areata
Permanent alopecia after chemotherapy
Chronic telogen effluvium
Anagen effluvium
Short anagen and loose anagen syndromes
Acute telogen effluvium
Diffuse lichen planopilaris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Diffuse lichen planopilaris

Alopecia areata incognita

Courtesy BM Piraccini, Bologna

Catagen/telogen count: increased or normal?

Diagnosis

Diffuse alopecia

Miniaturization present

Miniaturization absent

Increased catagen/ telogen count

Normal catagen/ telogen count

CD3

Pattern hair loss

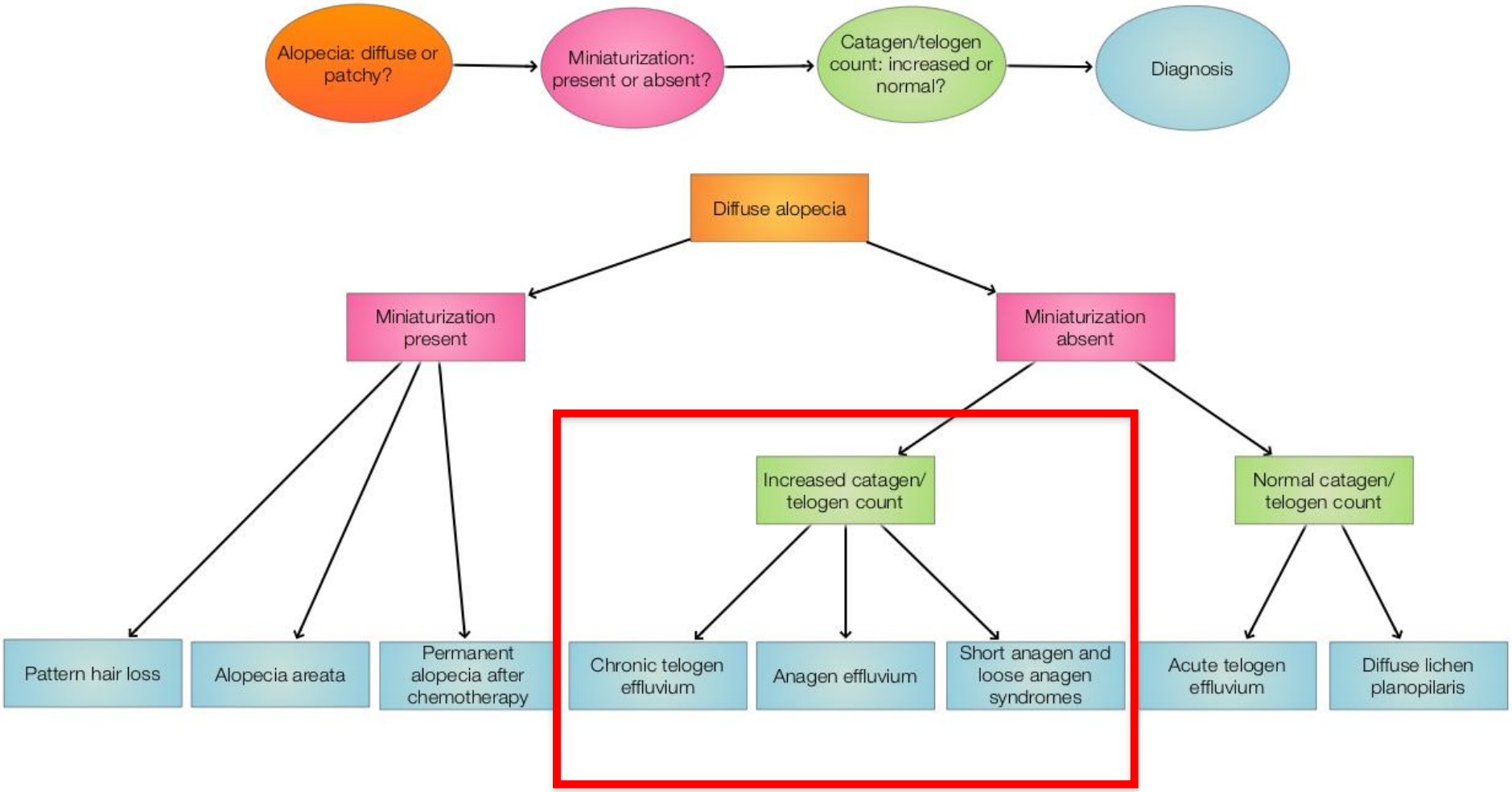
Alopecia areata

Short anagen and loose anagen syndromes

Acute telogen effluvium

Diffuse lichen planopilaris

Female pattern hair loss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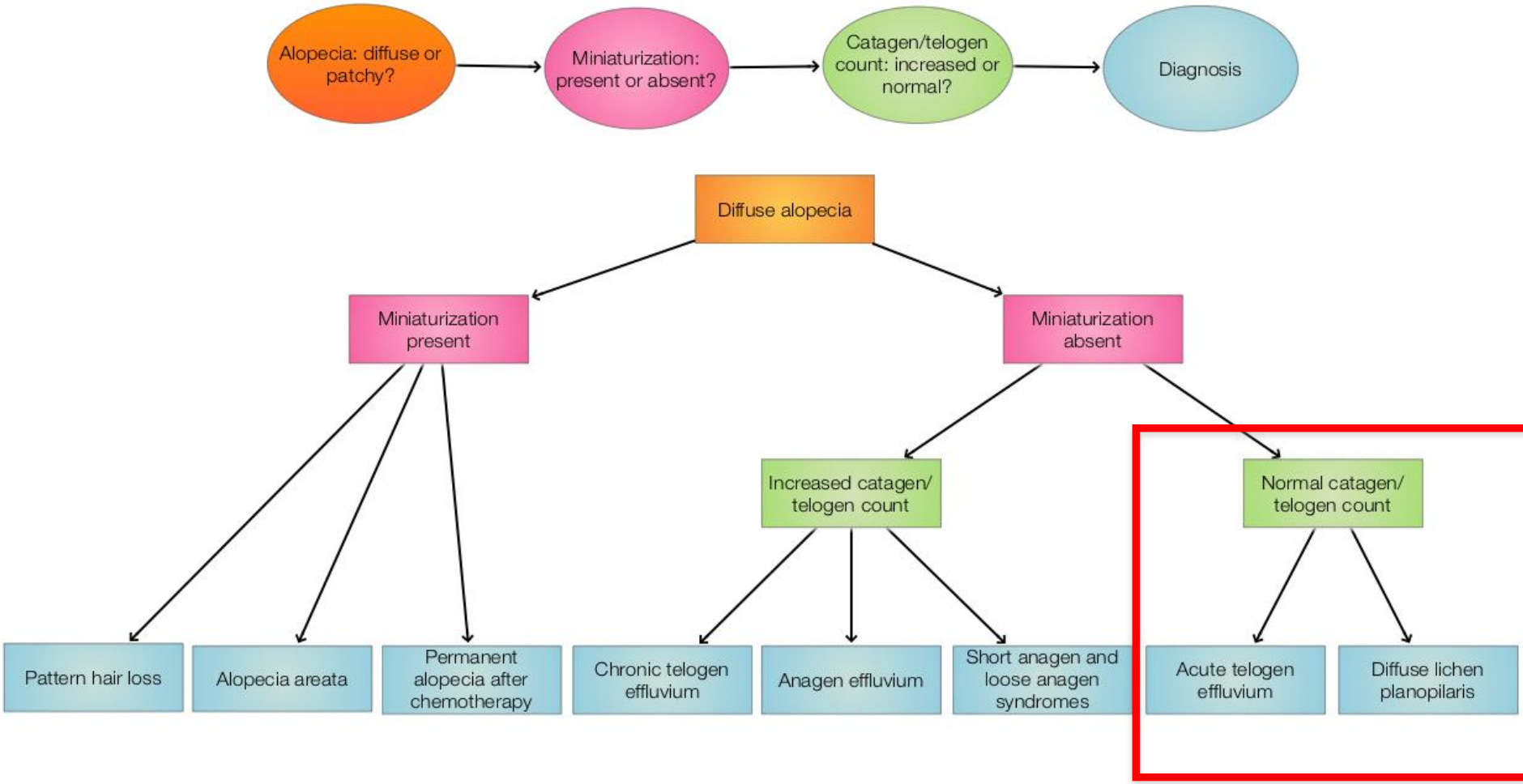
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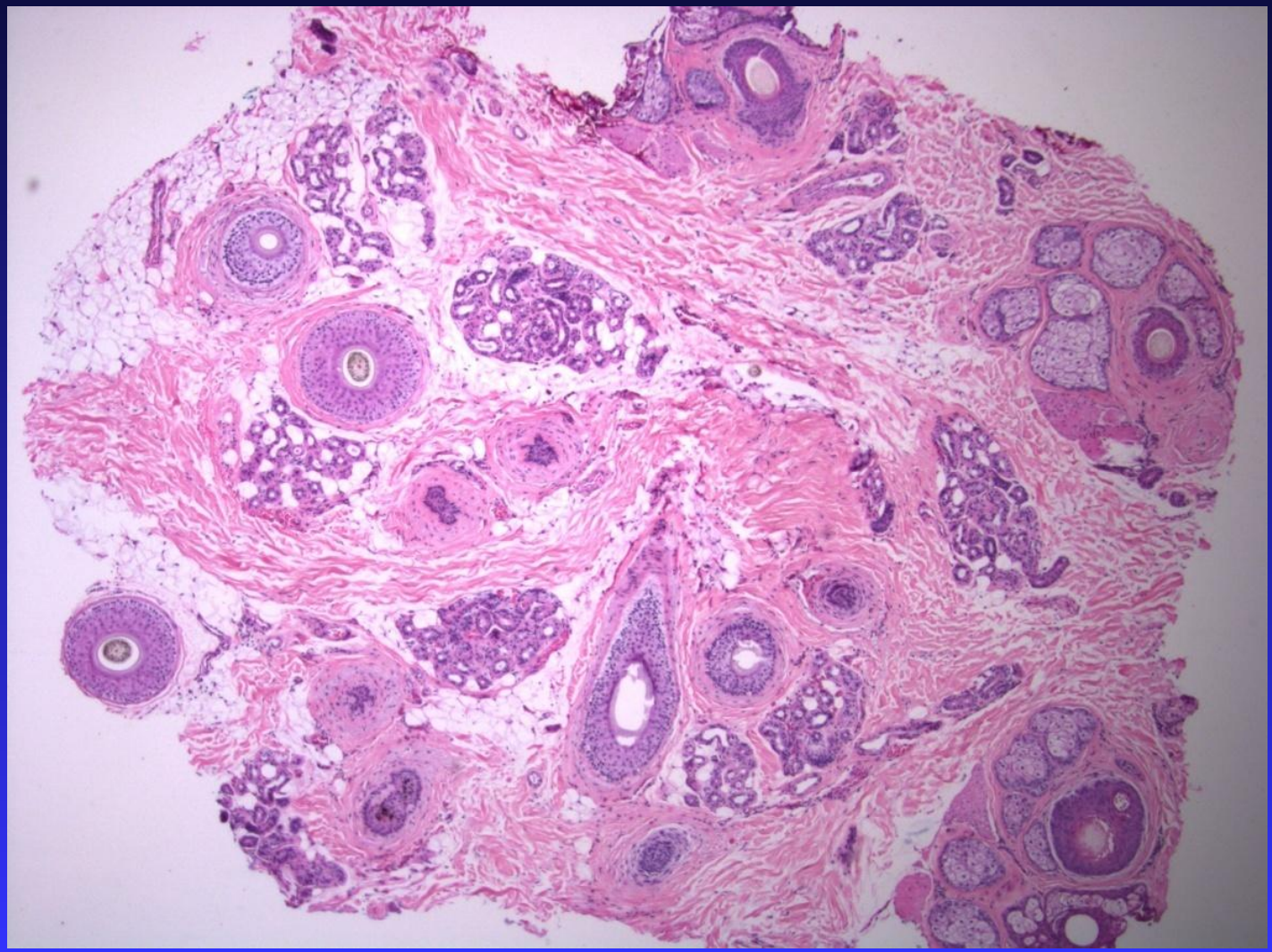
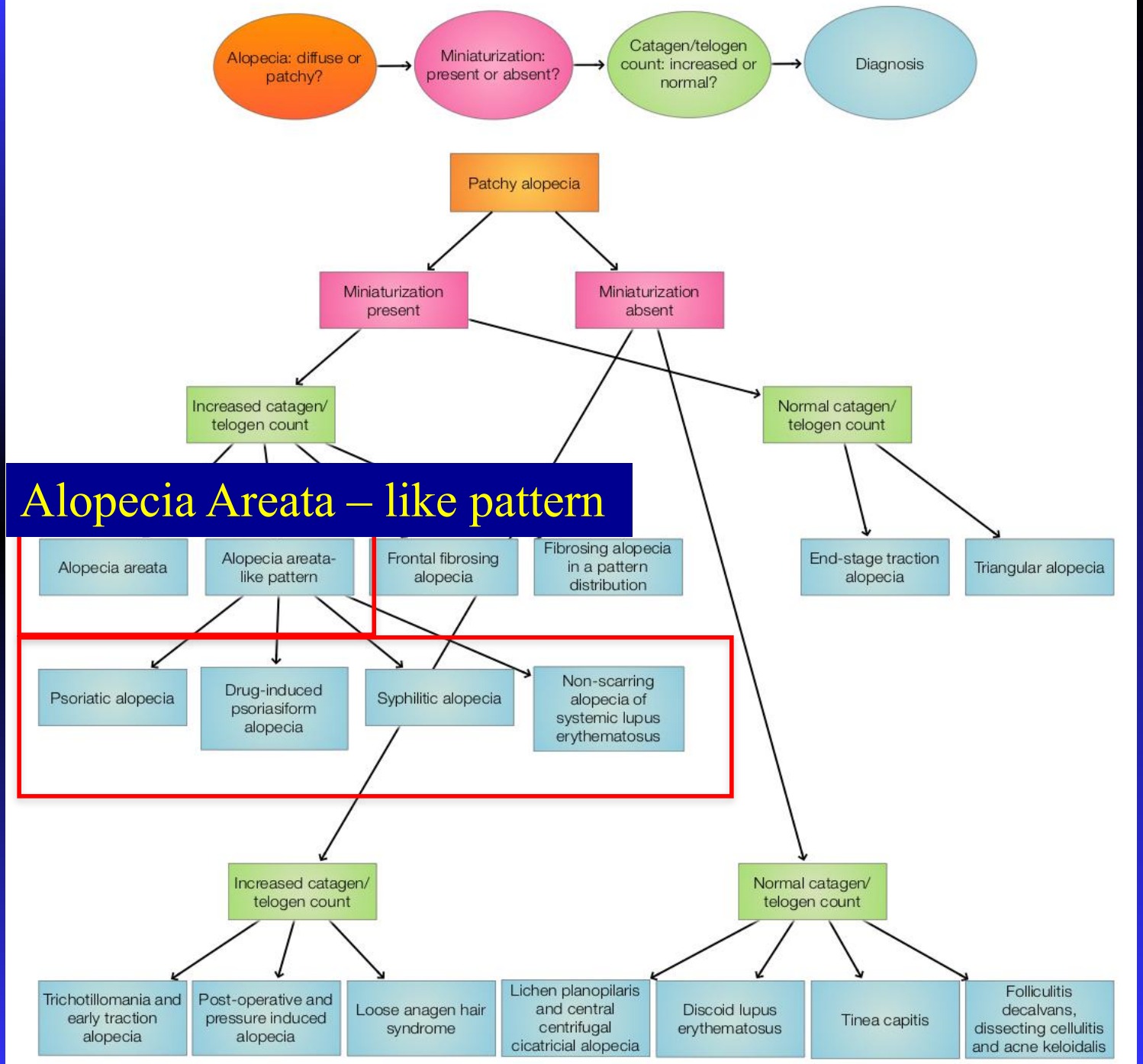
Diffuse lichen planopilaris

Alopecia Areata-like Pattern can be a few of entities

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Alopecia Areata – like pattern
Alopecia areata
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Frontal fibrosing alopecia
Fibrosing alopecia in a pattern distribution
End-stage traction alopecia
Triangular alopecia
Psoriatic alopecia
Drug-induced psoriasiform alopecia
Syphilitic alopecia
Non-scarring alopecia of systemic lupus erythematosus
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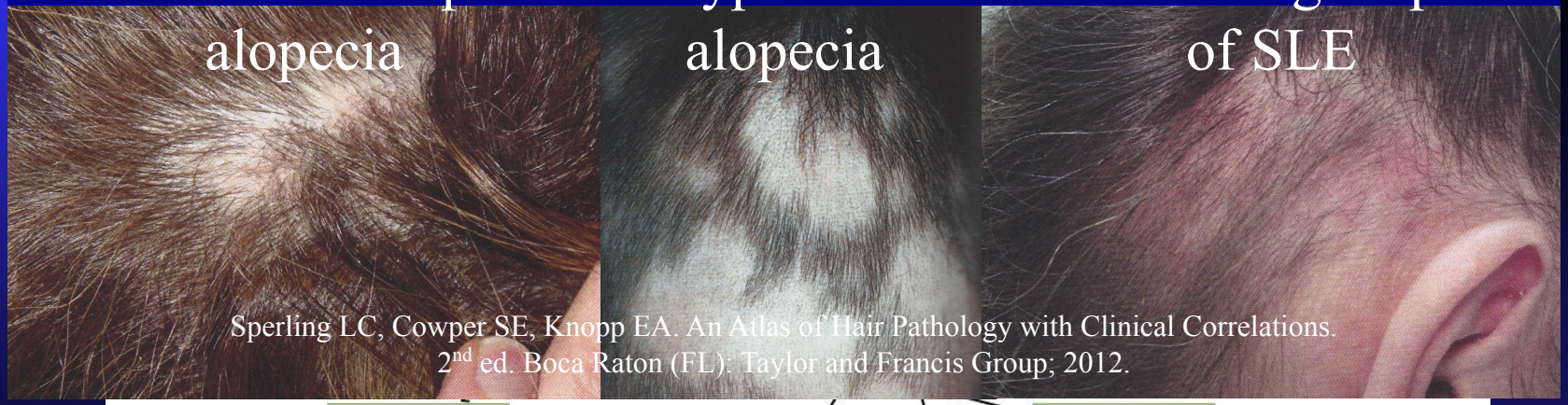
Tinea capitis
Folliculitis decalvans, dissecting cellulitis and acne keloidalis

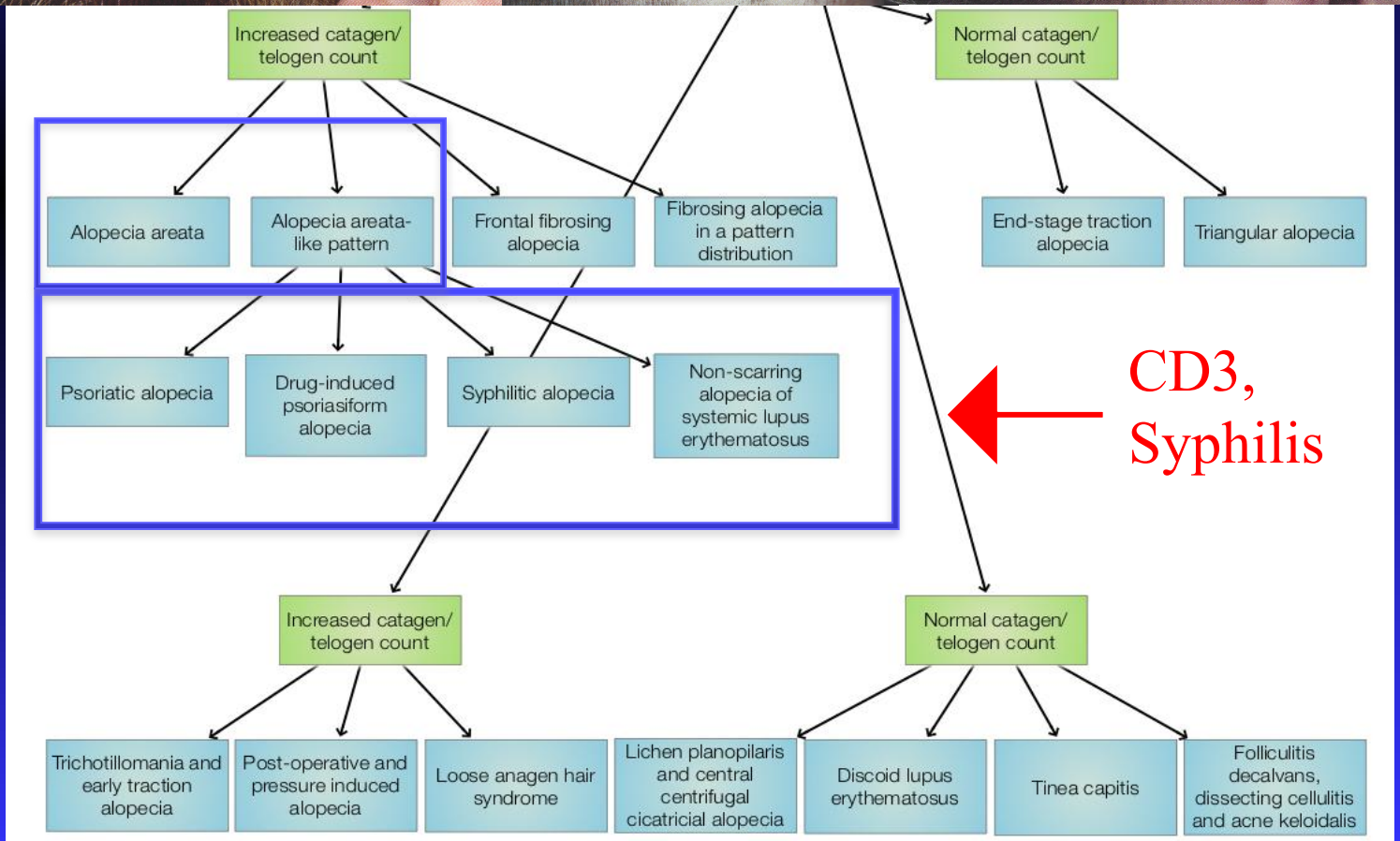
Post-etanercept alopecia

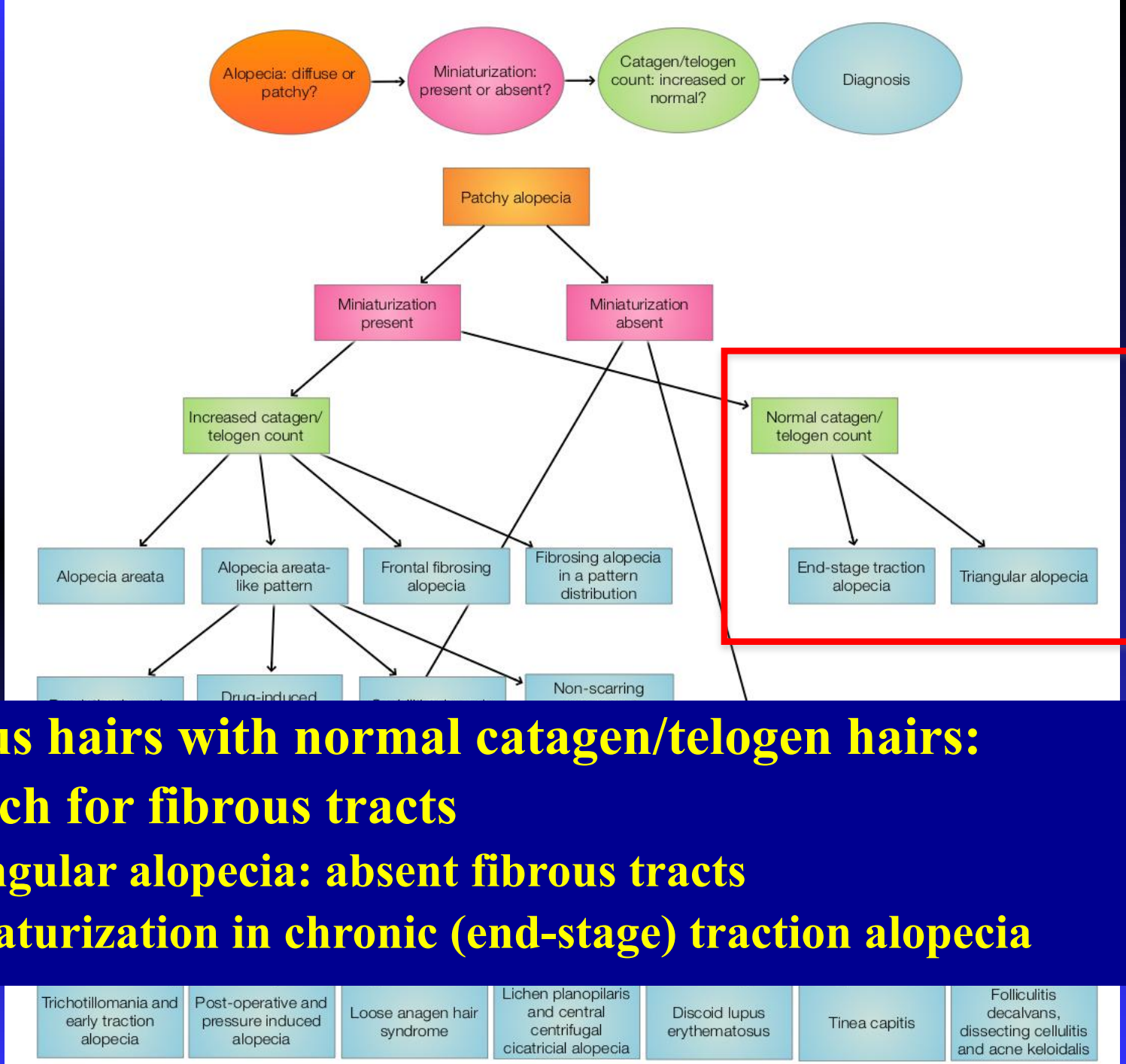
Syphilitic alopecia

Non-scarring alopecia of SLE



Sperling LC, Cowper SE, Knopp EA. An Atlas of Hair Pathology with Clinical Correlations. 2nd ed. Boca Raton (FL): Taylor and Francis Group; 2012.

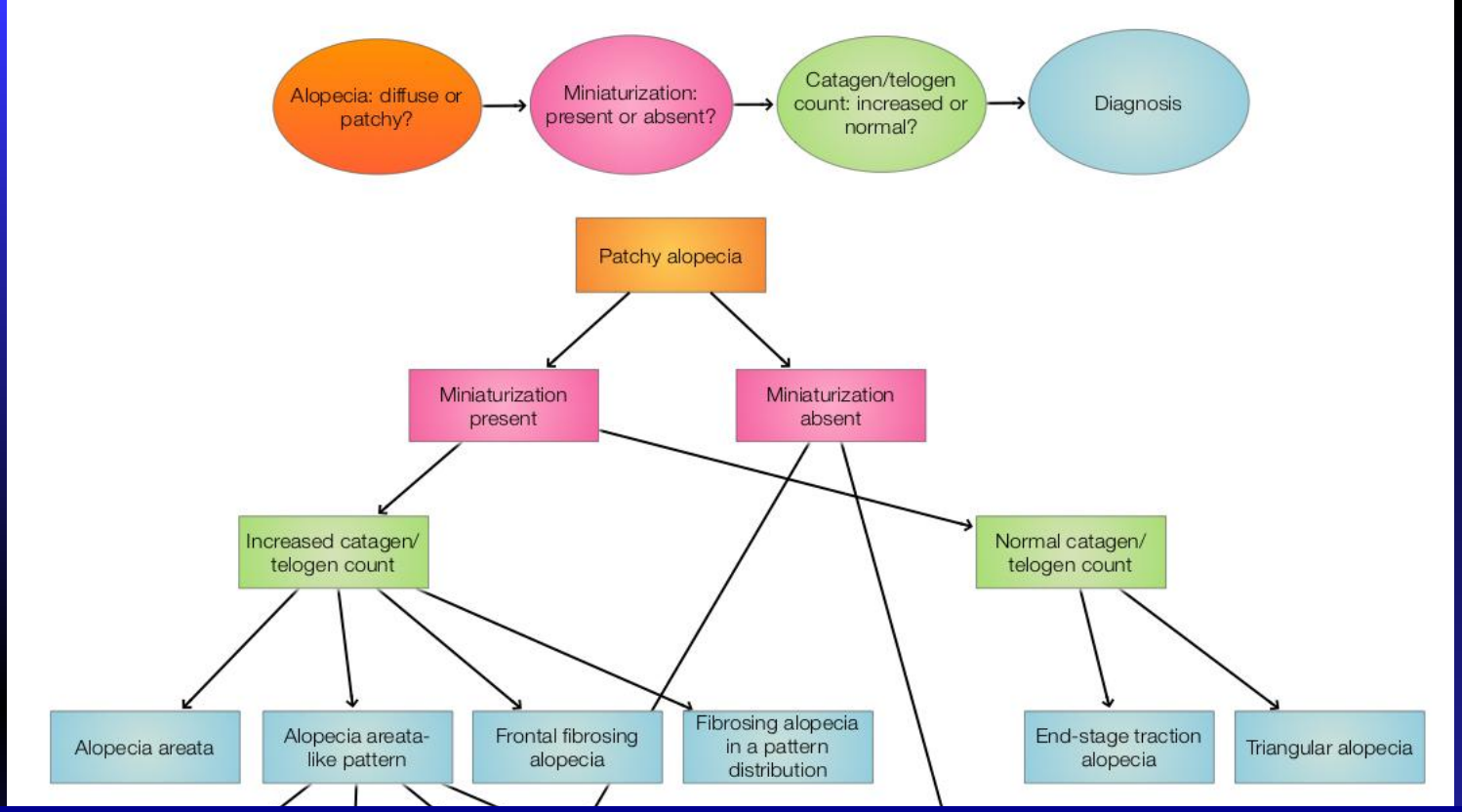




Vellus hairs with normal catagen/telogen hairs:

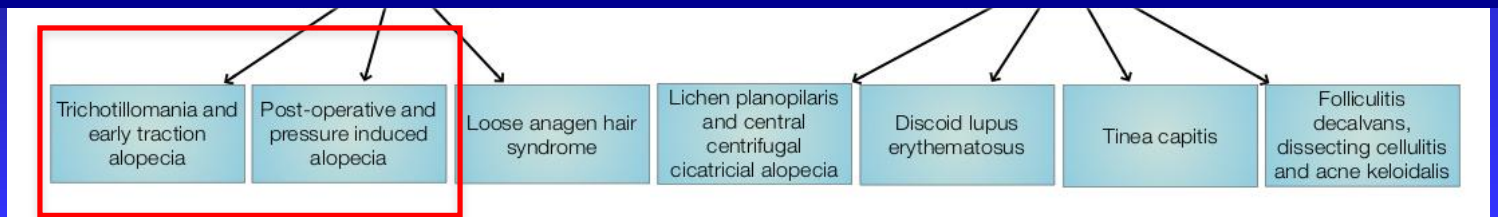
Search for fibrous tracts

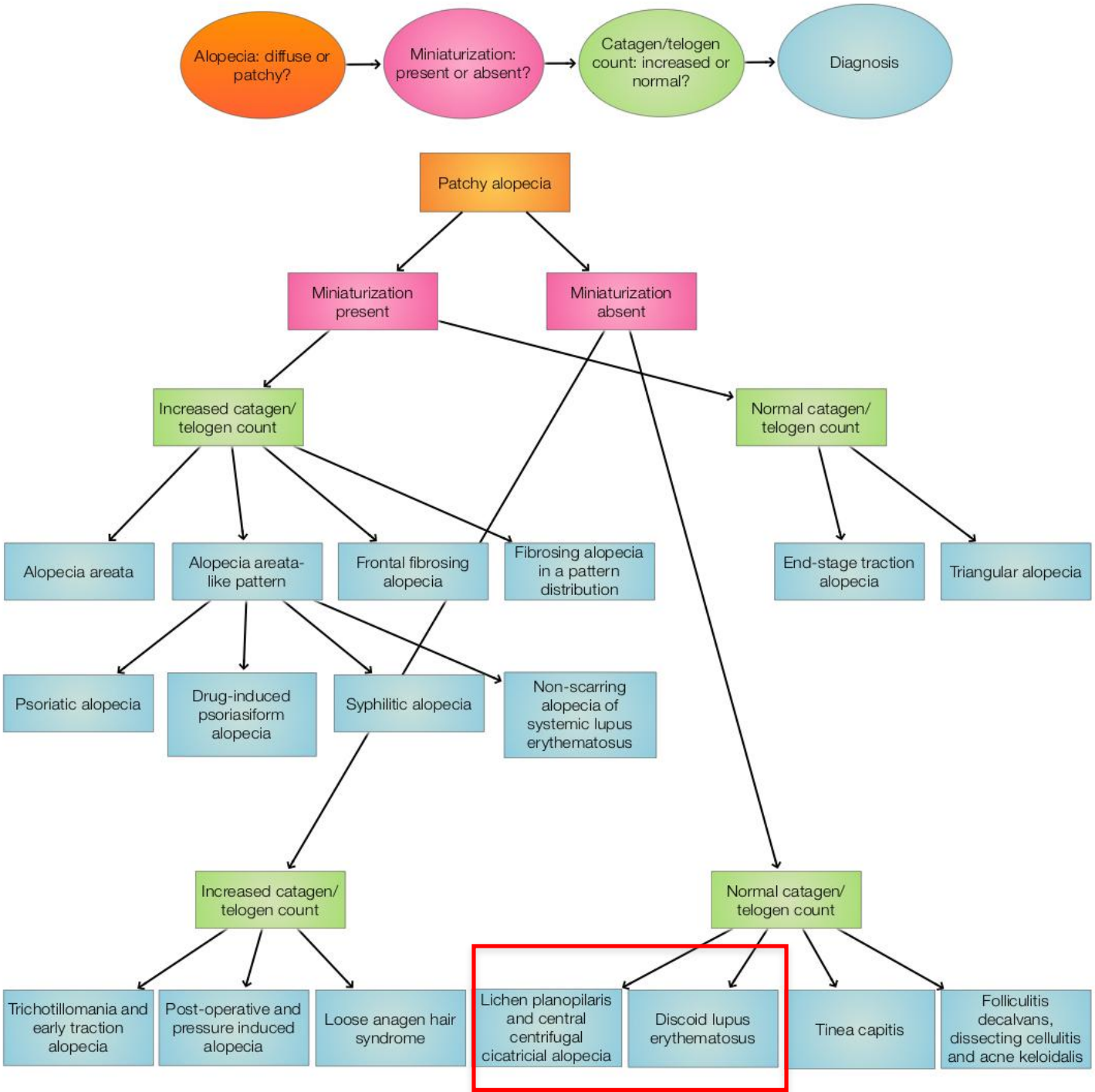
1. **Triangular alopecia: absent fibrous tracts**
2. **Miniaturization in chronic (end-stage) traction alopecia**



Catagen/telogen shift without follicular miniaturization

1. Trichotillosis (trichotillomania and early traction alopecia)
2. Post-operative and pressure induced alopecia: vascular thrombosis and fat necrosis

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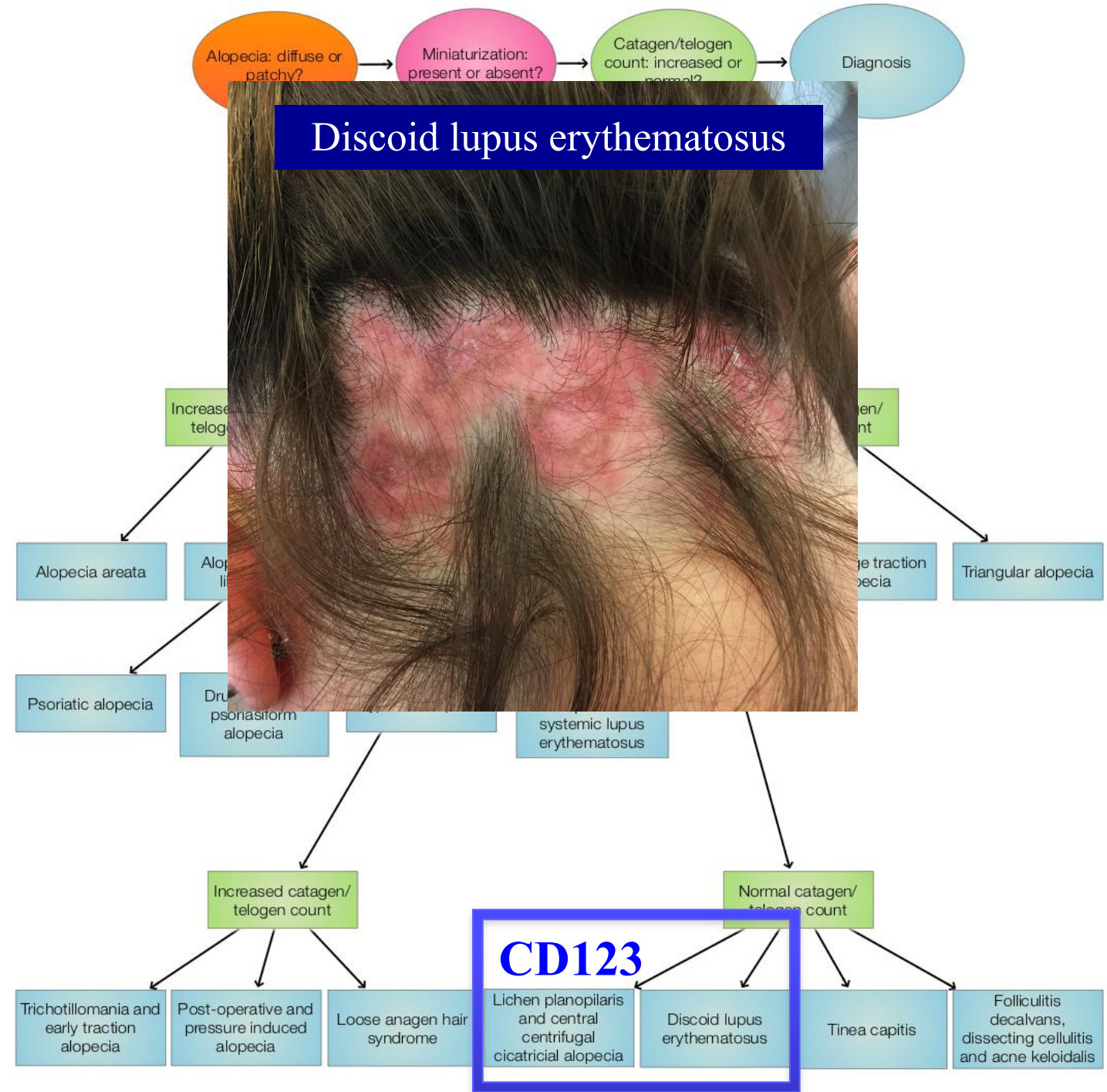
Folliculitis decalvans, dissecting cellulitis and acne keloidalis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CD123
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Post-operative and pressure induced alopecia
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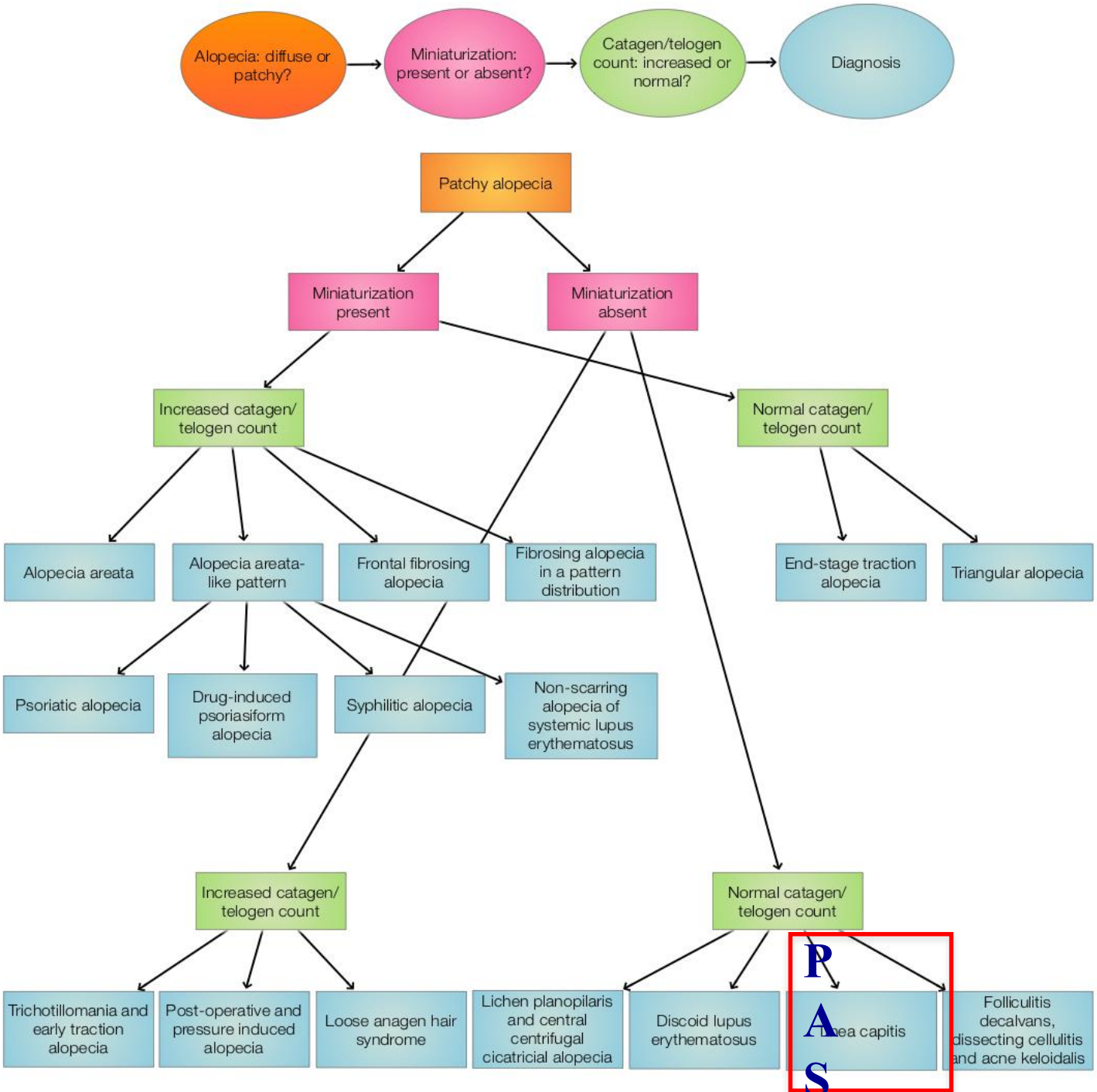
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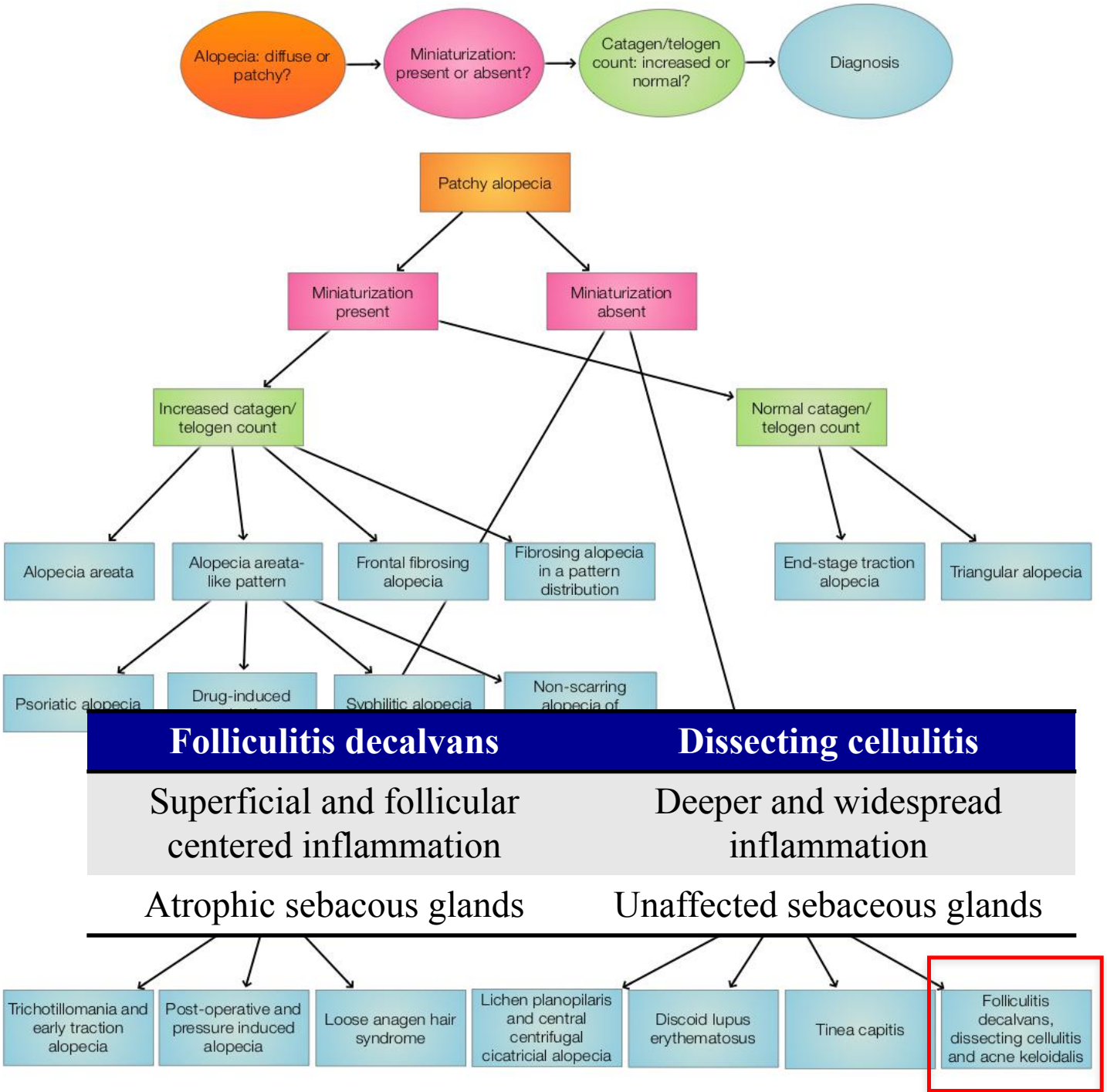
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Dissecting cellulitis
Superficial and follicular centered inflammation
Deeper and widespread inflammation
Atrophic sebacous glands
Unaffected sebaceous glands
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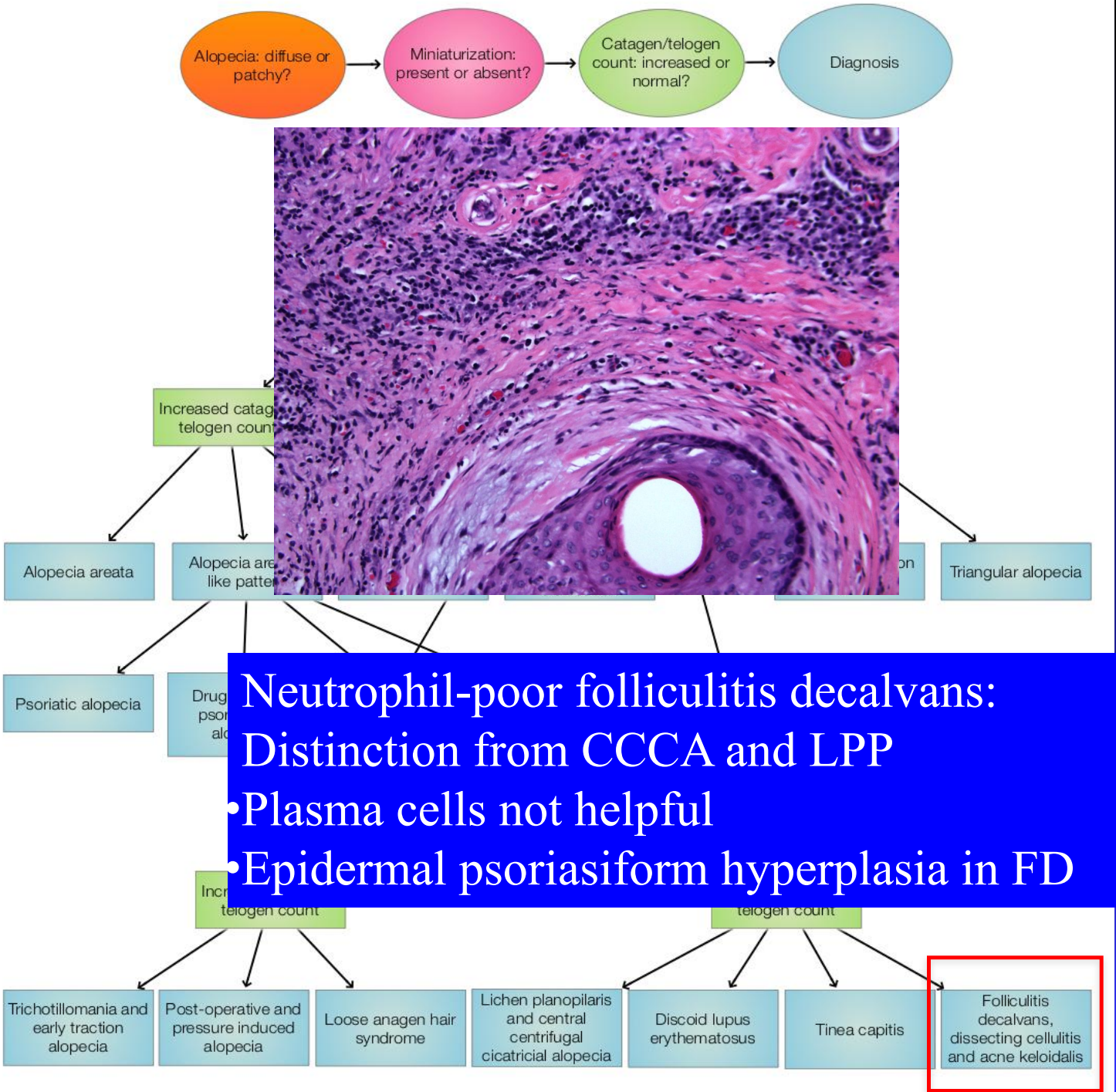
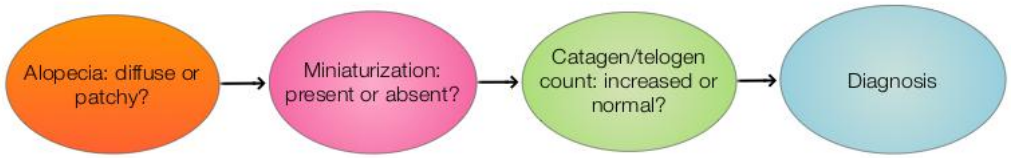
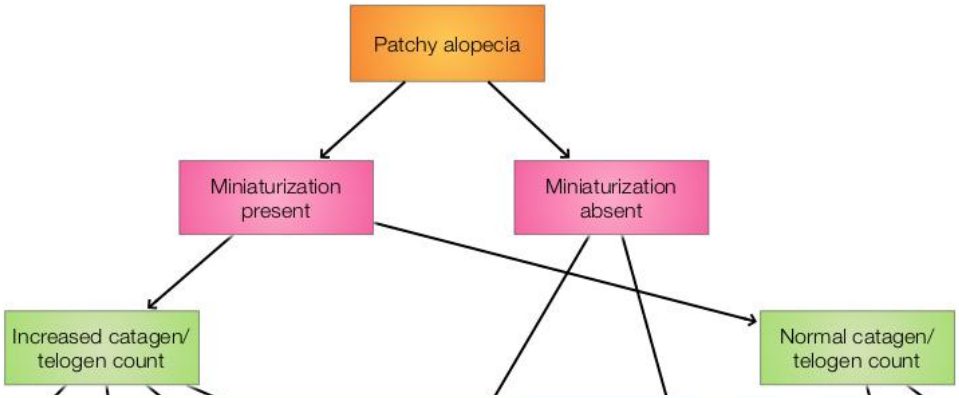


Neutrophil-poor folliculitis decalvans: Distinction from CCCA and LPP

- Plasma cells not helpful
- Epidermal psoriasiform hyperplasia in FD





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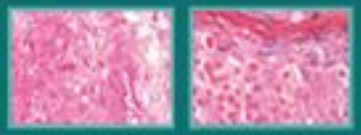


ORIGINAL ARTICLE

Epidermal psoriasiform hyperplasia, an unrecognized sign of folliculitis decalvans: a histological study of 26 patients

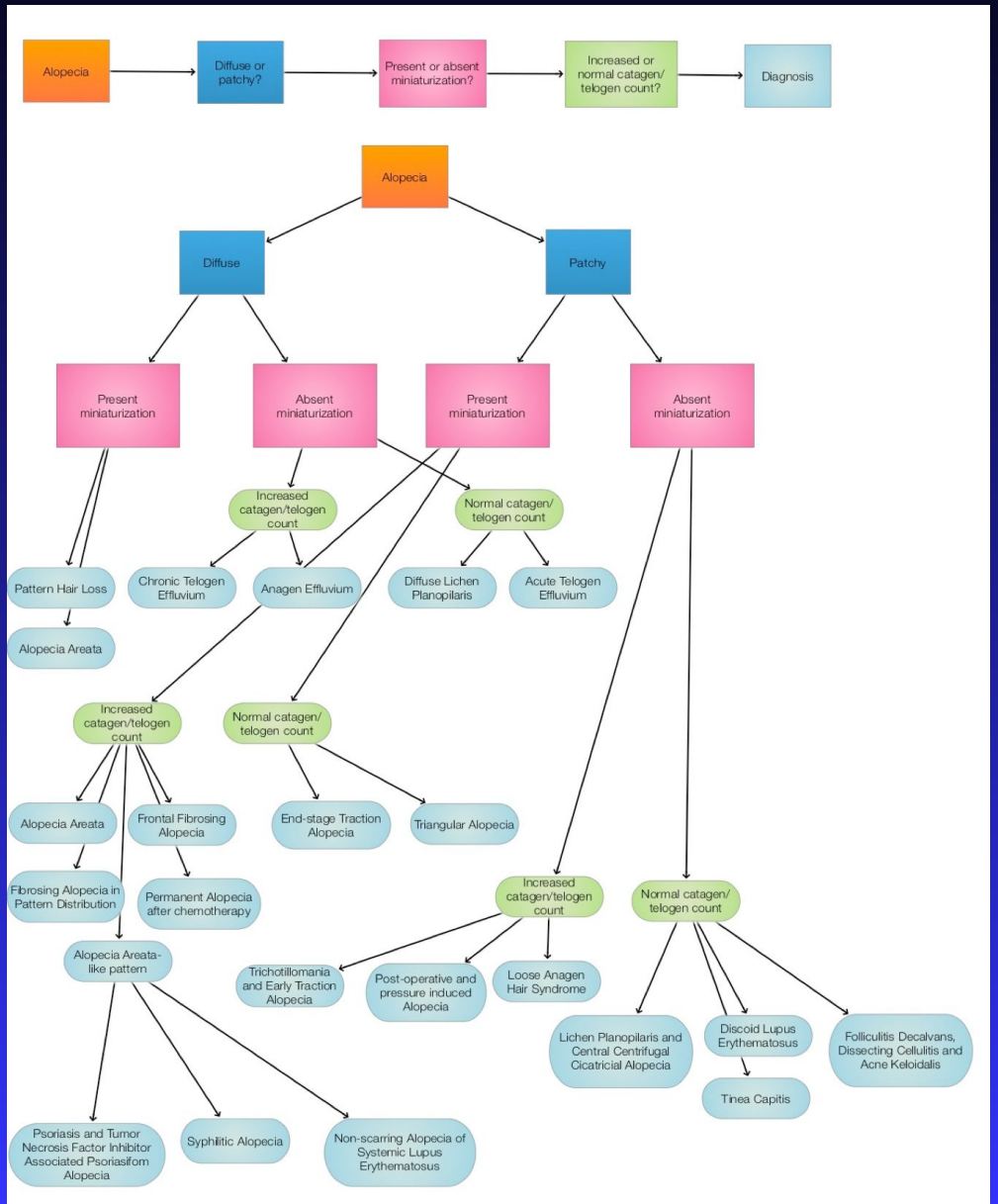
B. Matard ✉, B. Cavelier-balloy, P. Reygagne

Diffuse or patchy?
Usual or special clinical context?

Table 1

CLINICAL CONTEXT	DIFFUSE ALOPECIA	PATCHY ALOPECIA
COMMON ENTITIES	ALOPECIA AREATA	ACNE KELOIDALIS
	FIBROSING ALOPECIA IN A PATTERN DISTRIBUTION	ALOPECIA AREATA
	LICHEN PLANOPILARIS	CENTRAL CENTRIFUGAL SCARRING ALOPECIA
	PATTERN HAIR LOSS (FEMALE AND MALE)	DISSECTING CELLULITIS
	TELOGEN EFFLUVIUM (ACUTE AND CHRONIC)	FOLLICULITIS DECALVANS
		LICHEN PLANOPILARIS
		LUPUS ERYTHEMATOSUS (DISCOID AND NON-SCARRING)
		SYPHILIS
		TRACTION ALOPECIA (EARLY AND CHRONIC)
		TRICHOTILLOMANIA
SPECIAL ENTITIES	CHEMOTHERAPY-RELATED ALOPECIA	FRONTAL FIBROSING ALOPECIA
	I. ANAGEN EFFLUVIUM	LOOSE ANAGEN SYNDROME
	II. PERMANENT ALOPECIA AFTER CHEMOTHERAPY	POST-OPERATIVE (PRESSURE-INDUCED) ALOPECIA
	LOOSE ANAGEN SYNDROME	PSORIATIC ALOPECIA AND DRUG-INDUCED PSORIASIFORM ALOPECIA
	SHORT ANAGEN SYNDROME	TRIANGULAR ALOPECIA

Diagnostic Algorithm



Acknowledgements

- Athanassios Kolivras, MD, Saint-Pierre, Brugmann and HUDERF Hospitals, Université Libre de Bruxelles, Brussels, Belgium.
- Janet Roberts, MD and Nisha Desai, MD
- Residents and Medical Students
  - Cindi Chapman, MD
  - Arlette Habashi-Daniel, MD
  - Elizabeth Dawson, MD (Caroline Xavier, MD and Omar Lupi, MD—Rio de Janeiro)
- Vera Price, MD

Thank you!

MAY 17TH, 2017

UPDATED 7:00 AM

28°

Snowing

TODAY AT TIMBERLINE:

We are scheduled to operate Today

NEW SNOW	INCHES
SINCE 5AM:	1"
LAST 24 HRS (5am to 5am):	6"
LAST 72 HRS:	12"
BASE DEPTH AT LODGE:	175"

Click for Palmer Snow Depth

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