Penn Veterinary Medicine

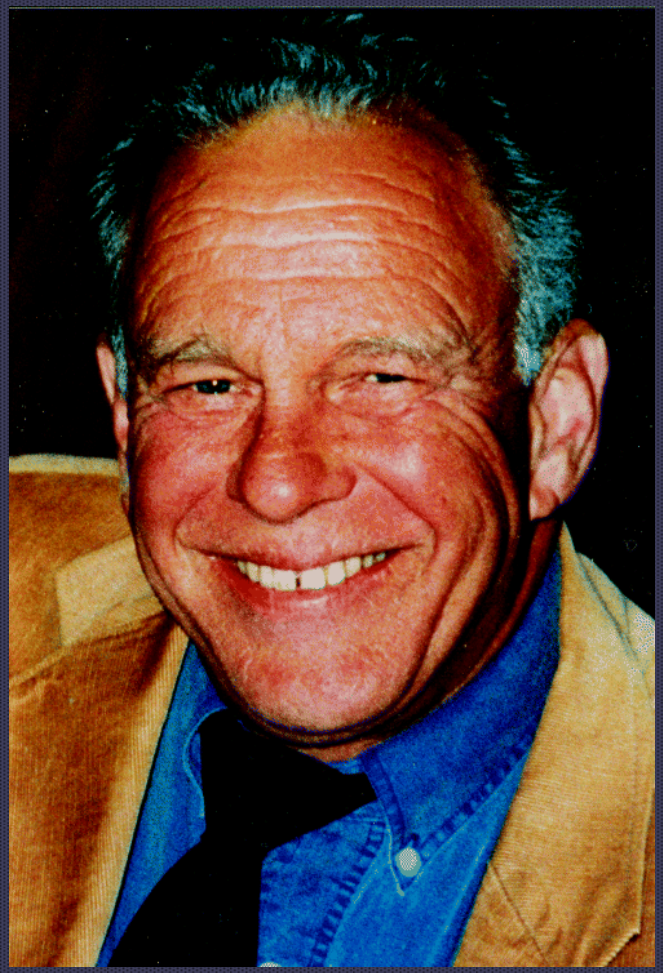
Equine Dermatology

Elizabeth A. Mauldin
School of Veterinary Medicine
Laboratory of Pathobiology and Toxicology
University of Pennsylvania

Many Species. One Medicine. ™

Outline

- Congenital Diseases
- Immune-mediated disease
- Alopecia in the horse
- Cornification defects
- Nodular Lesions
- Miscellaneous and Classics



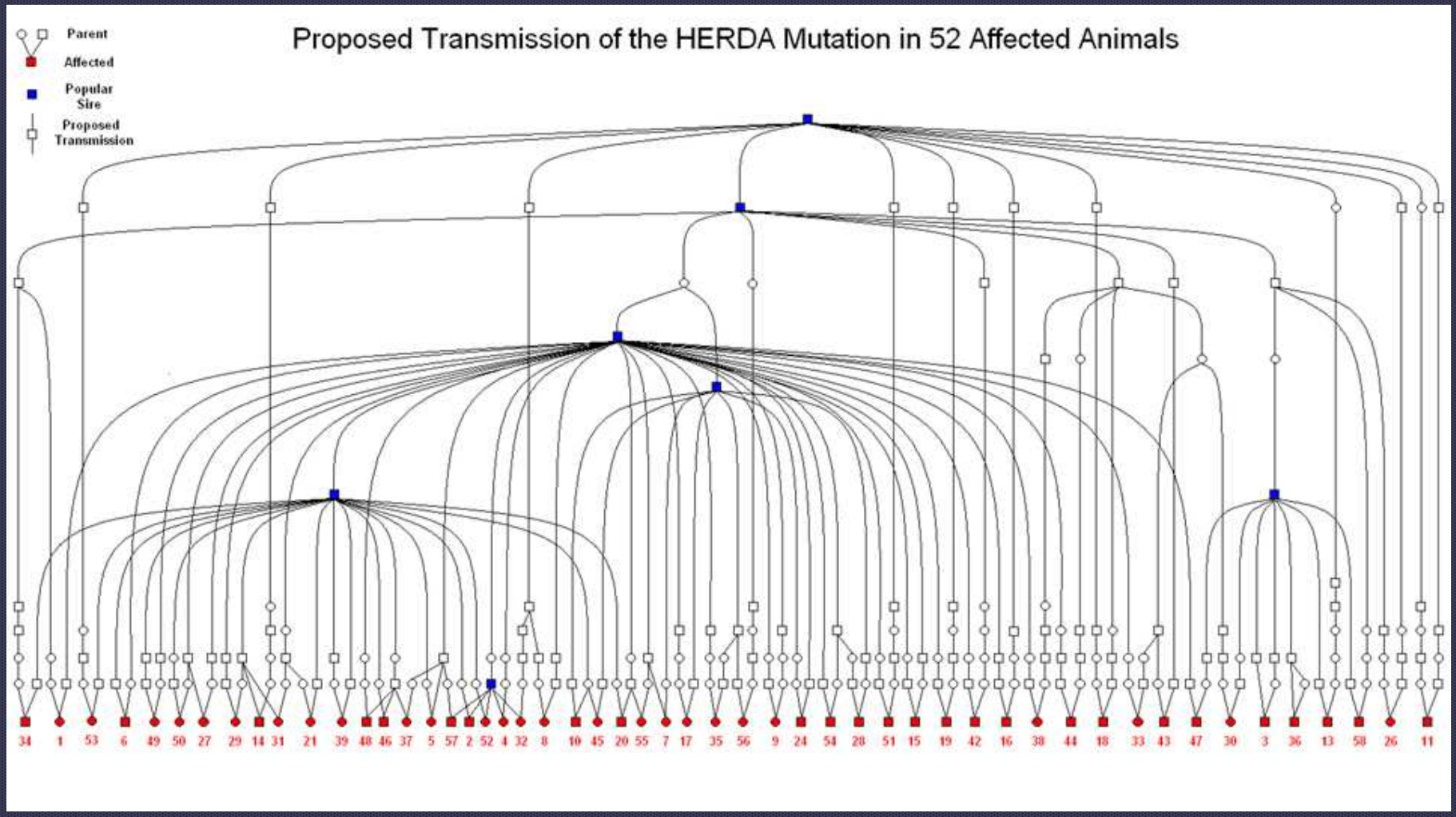
Stannard’s Illustrated Dermatology Notes, Vet Derm Vol 11, 2000.

Congenital Diseases

HERDA

- Hereditary Equine Regional Dermal Asthenia ("Hyperelastosis cutis")
- Quarter horses, paints and appaloosas (rarely other breeds)
- Defect: deep dermal collagen fibers
- Autosomal recessive
- Usually noticed by 2 years of age

The following slide presentation on HERDA is the courtesy of Dr. Steve White University of California-Davis



Courtesy R. Tryon

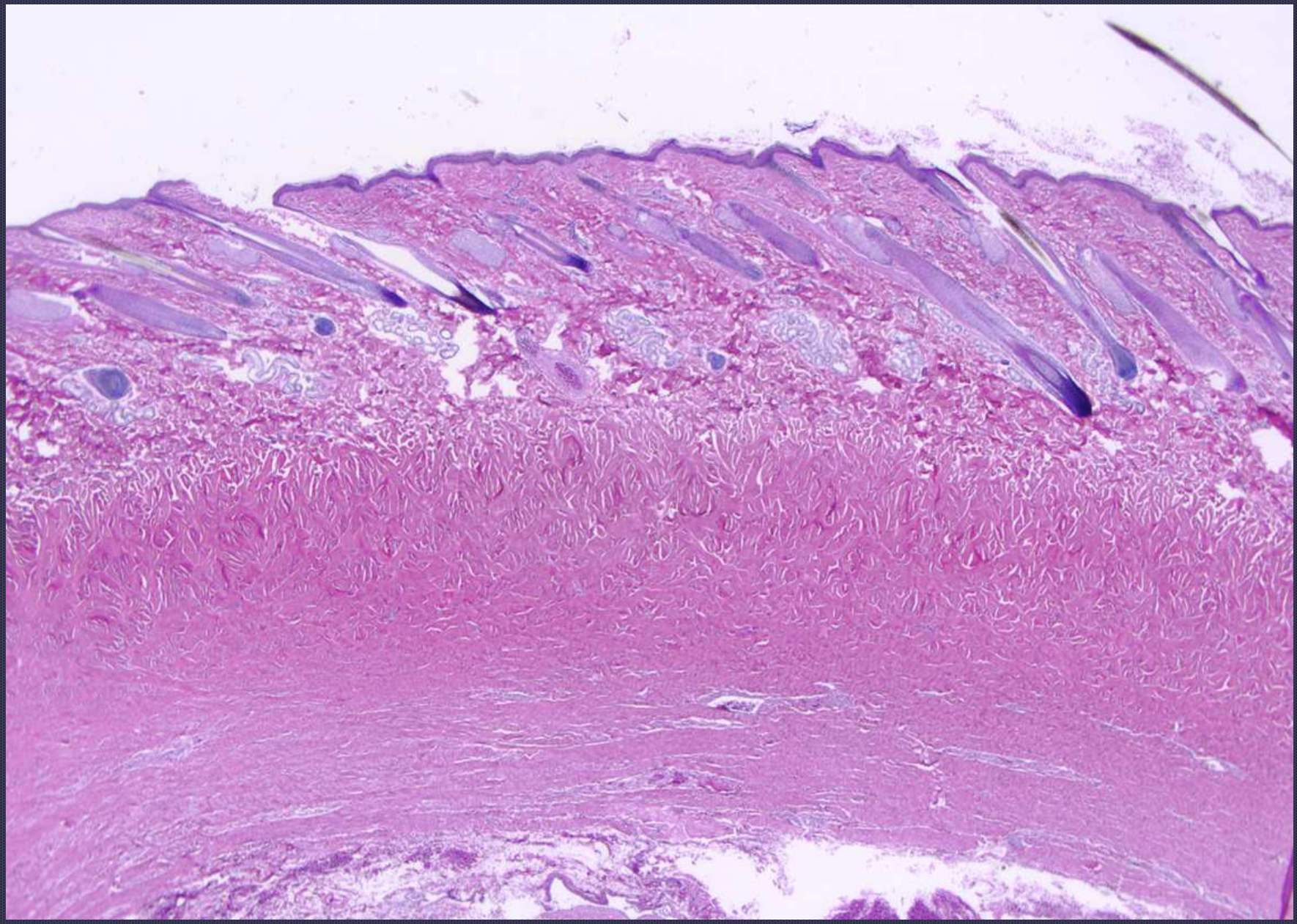
HERDA

- Lesions: dorsum, sides of the neck, legs; easily torn, stretched skin and/or ulcers, seromas and hematomas
- Healing usually OK, often leaves scars

Courtesy Dr. T. Newell

HERDA

- Histology (sometimes subtle): “clumped”, poorly organized collagen fibers in deep dermis, or zonal deep dermal separation
- Collagen stains normally with Masson’s trichrome



Normal horse skin

Veterinary Dermatology 2001, **12**, 219–224

Case report

Zonal dermal separation: a distinctive histopathological lesion associated with hyperelastosis cutis in a Quarter Horse

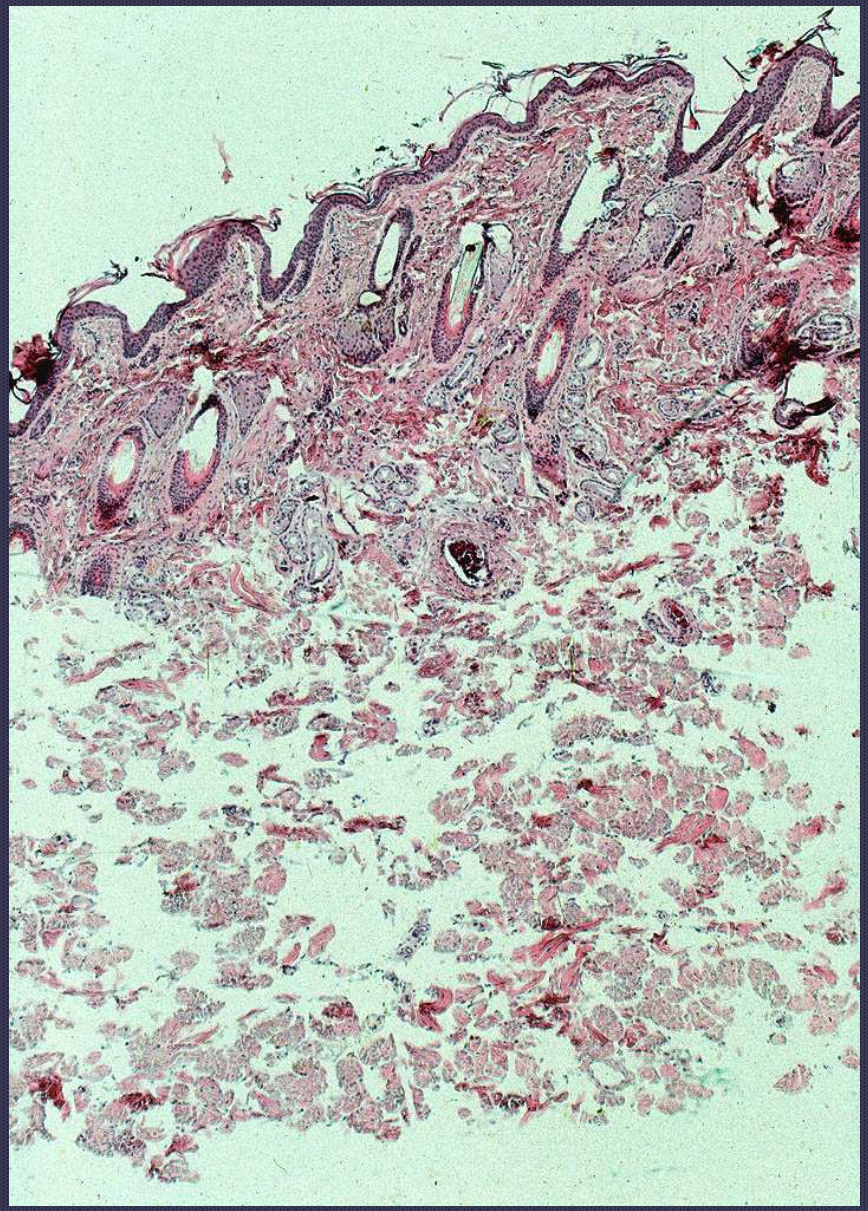
SABRINA H. BROUNTS,* ANN M. RASHMIR-RAVEN* and SHARON S. BLACK†

*Animal Health Center and
†Diagnostic Laboratory Services, College of Veterinary Medicine, Mississippi State University, Mississippi State, Mississippi, USA

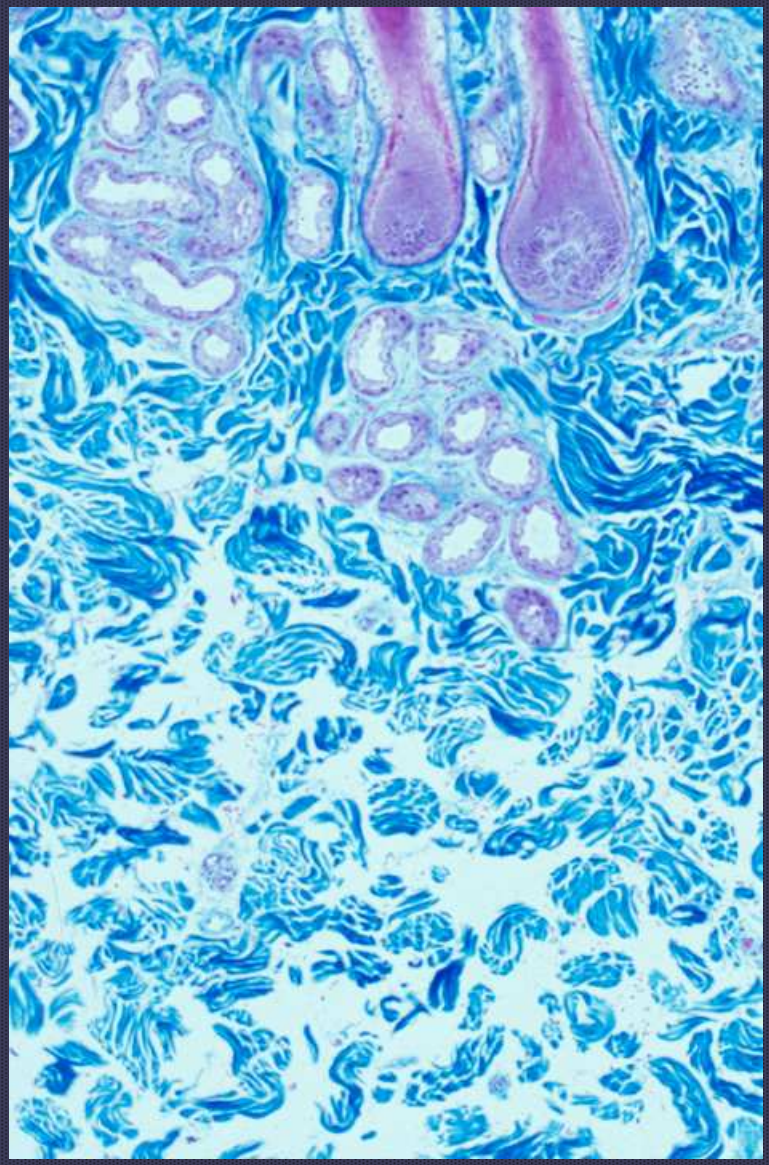
(*Received* 10 *October* 2000; *accepted* 10 *February* 2001)

Abstract This case report describes a distinctive deep cutaneous lesion in a 1-year-old Quarter Horse filly with hyperelastosis cutis. The horse had a typical clinical presentation of hyperelastic skin associated with a 6-month history of cutaneous wounds that developed following minor cutaneous trauma. Punch biopsies of skin from the affected horse were thinner than similar biopsies from an age- and breed-matched control. Significant microscopic lesions were not seen in cutaneous punch biopsies stained with haematoxylin and eosin and Masson's trichrome stains, but the ultrastructure of the dermis from the affected horse was characterized by variation in collagen fibre diameter and loose packing of collagen fibres within bundles. The horse was euthanized and necropsied, and full-thickness sections of skin were collected and examined microscopically. Affected skin was of normal thickness; however, the deep dermis contained a distinctive horizontal linear zone in which separation of collagen bundles resulted in the formation of large empty cleft-like spaces between the upper and lower regions of the deep dermis. We suggest the term 'zonal dermal separation' for this microscopic lesion. Incisional full-thickness skin biopsies should be taken in suspected cases of equine hyperelastosis cutis because punch biopsies may not obtain enough deep dermis to adequately represent pathological change in the skin of horses with this disorder.

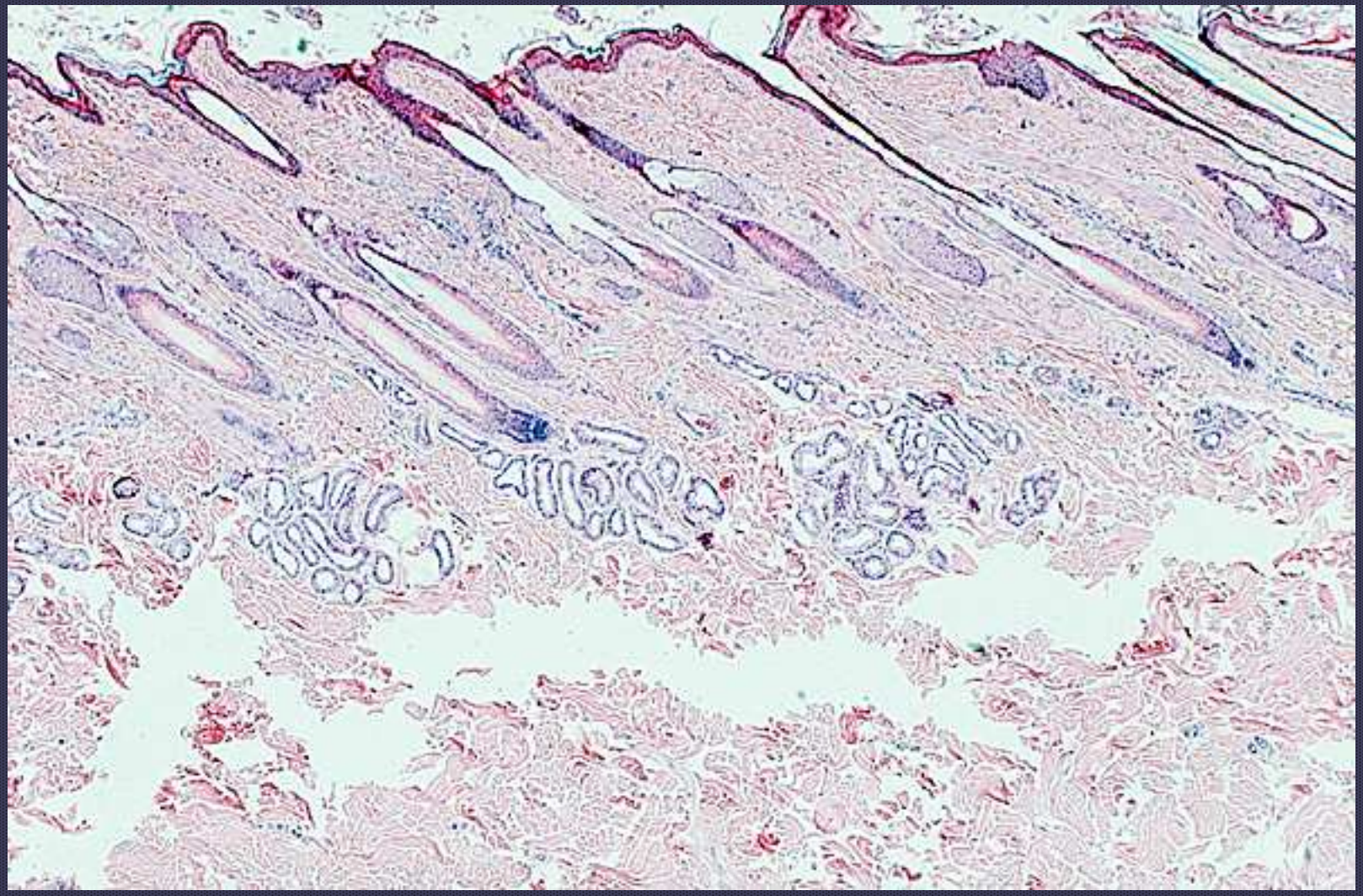
Keywords: connective tissue disease, equine, hereditary disease, hyperelastosis cutis, Quarter Horse.



Poorly organized collagen fibers in mid- to deep dermis



Normal-staining collagen with Masson's Trichrome



Deep dermal zone of separation

HERDA

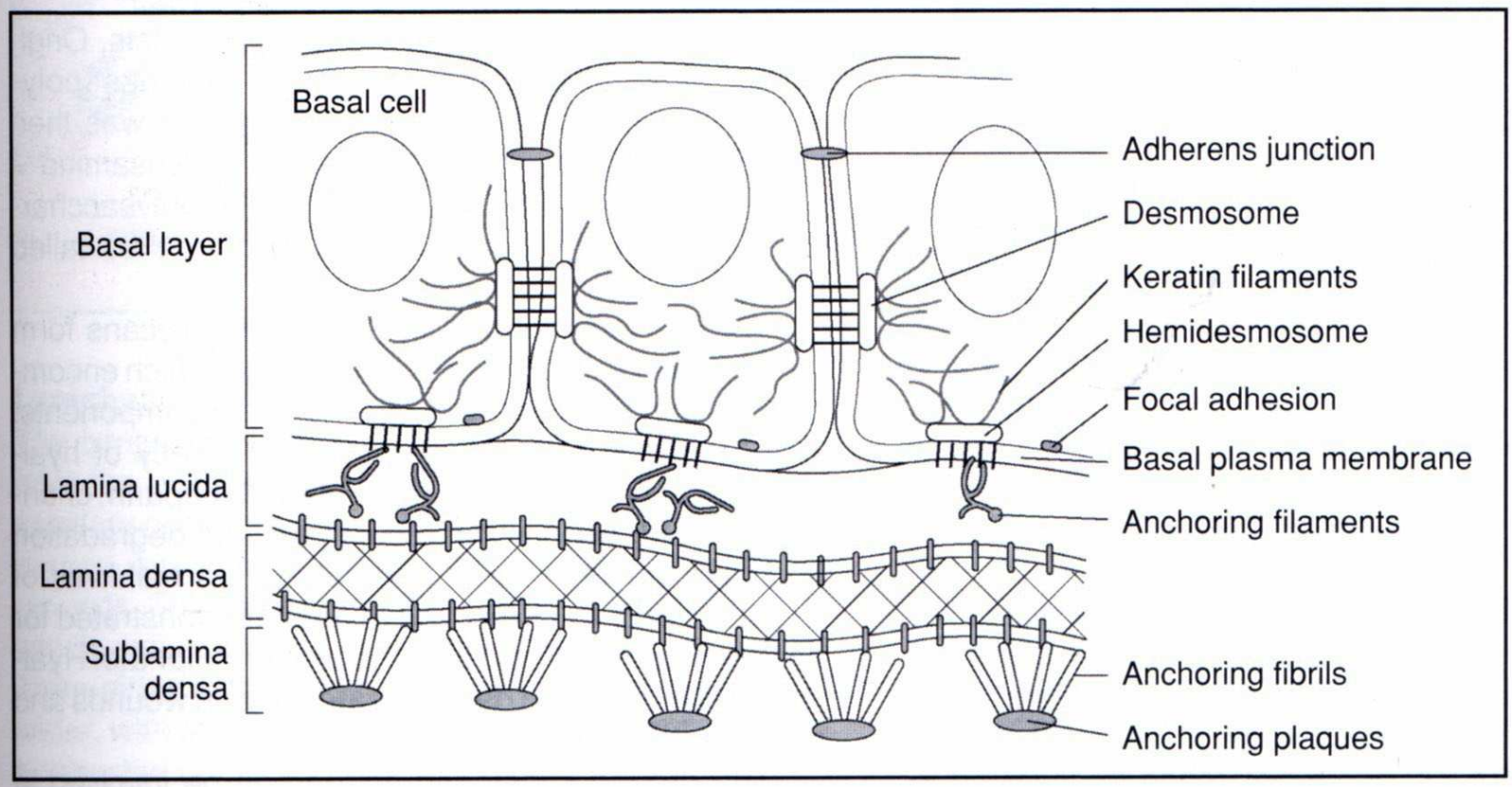
- Dx: clinical signs
- No diagnostic blood test commercially available for either affected horses or carriers
- Rx: avoid trauma, take parents out of breeding program

Components of BMZ

- **Hemidesmosomes** of basal cells
- **Lamina lucida**- clear zone seen on electron microscopy
- **Lamina densa**- contains primarily Type IV collagen
- **Sublamina densa**- anchoring fibrils

Hereditary Epidermolysis Bullosa
From superficial to deep

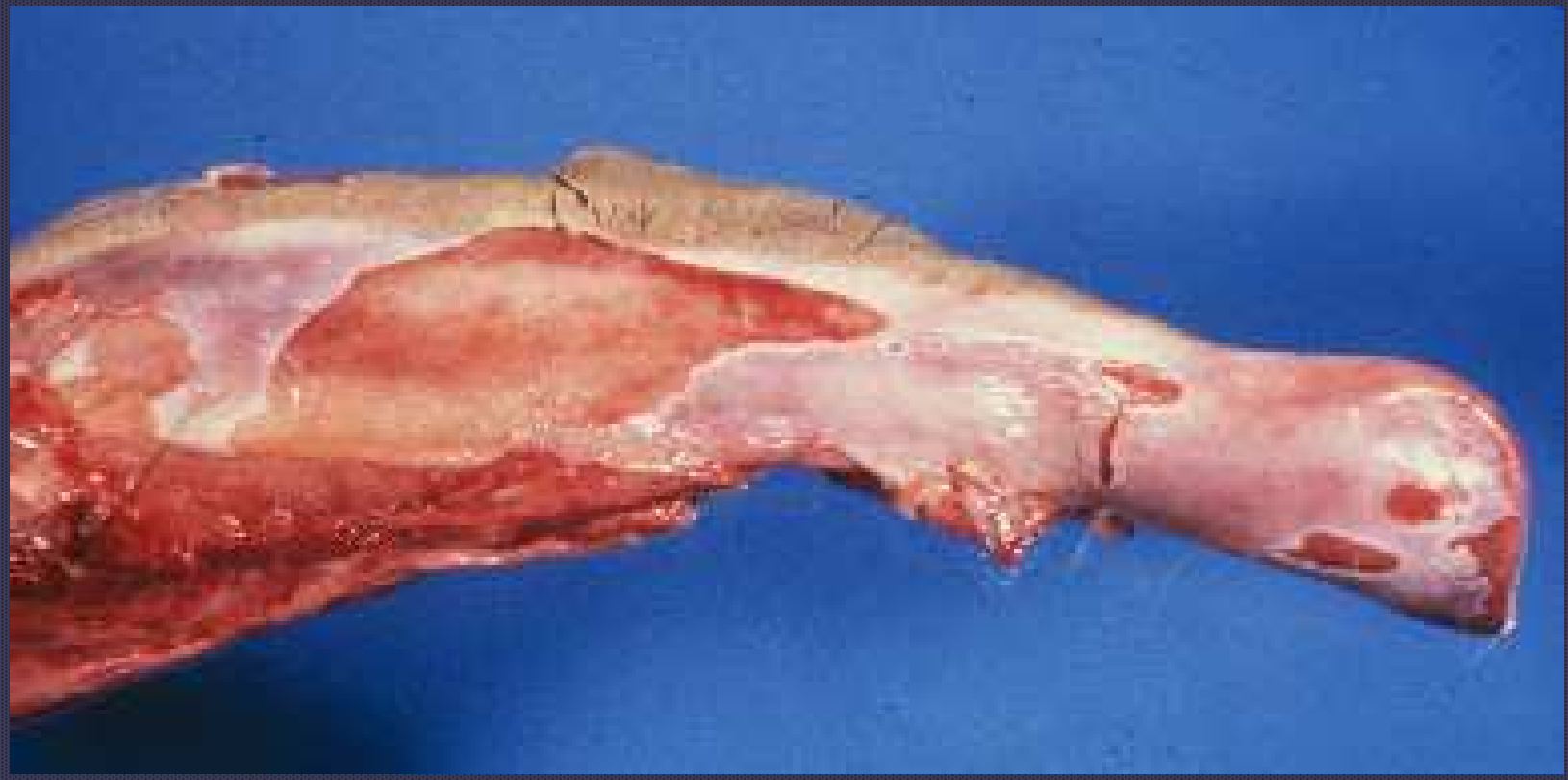
- **EB simplex** – plectin– attaches to keratin IF
  - Cleavage in stratum basale
  - Single case report in one foal
- **Junctional EB** - defect laminin-5
  - Cleavage in lamina lucida
  - American Saddlebreds
  - Belgian draft horses
- **Dystrophic EB-** anchoring fibrils (Collagen VII)
  - Cleavage in superficial dermis



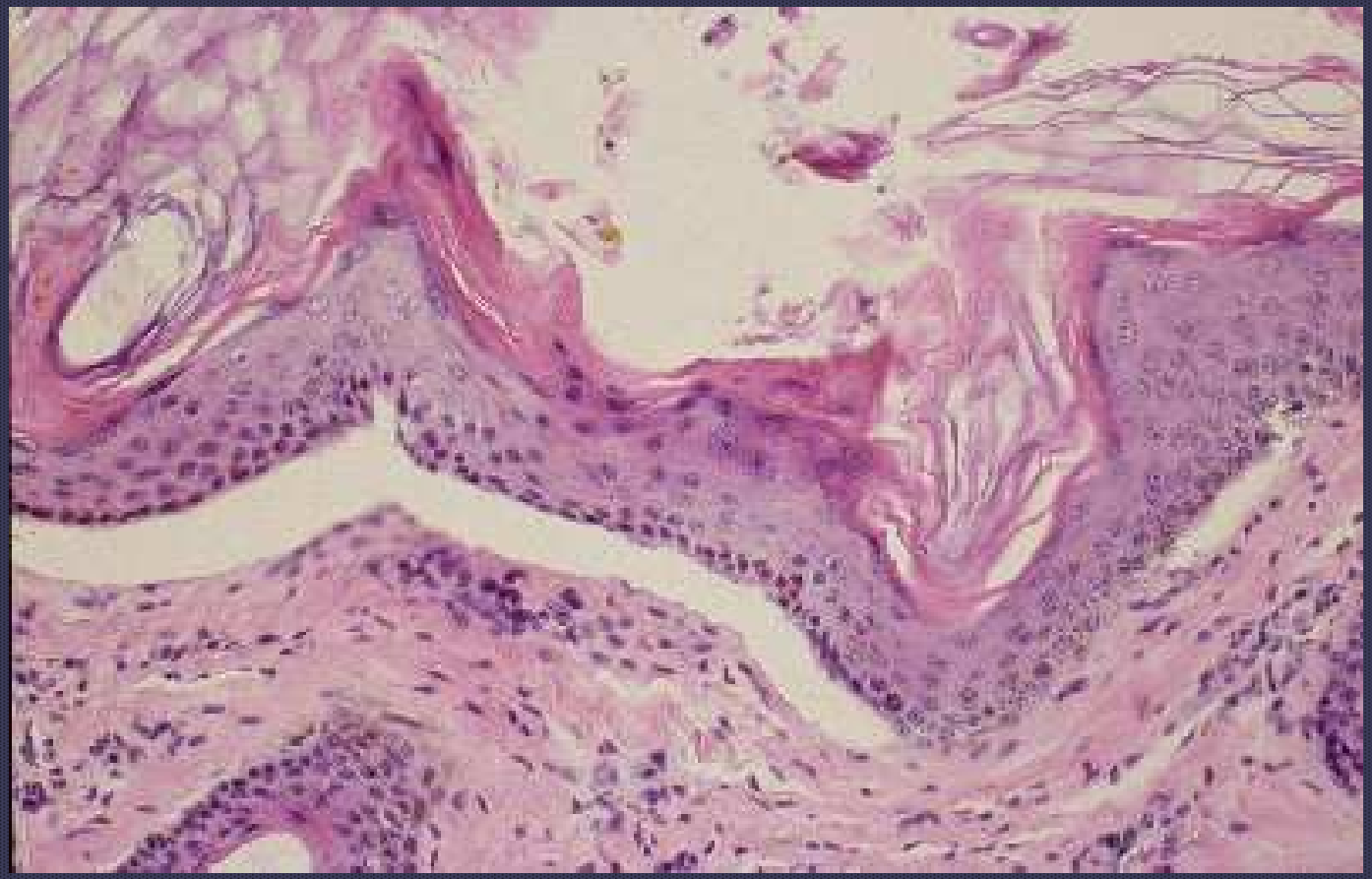
1.13
Diagrammatic representation of structural components of the dermoepidermal junction.
© Anita Patel.

BSAVA Manual of Small Animal Dermatology, 2003

Epidermolysis Bullosa



Epidermolysis Bullosa



Aplasia Cutis Congenita (Epitheliogenesis Imperfecta)

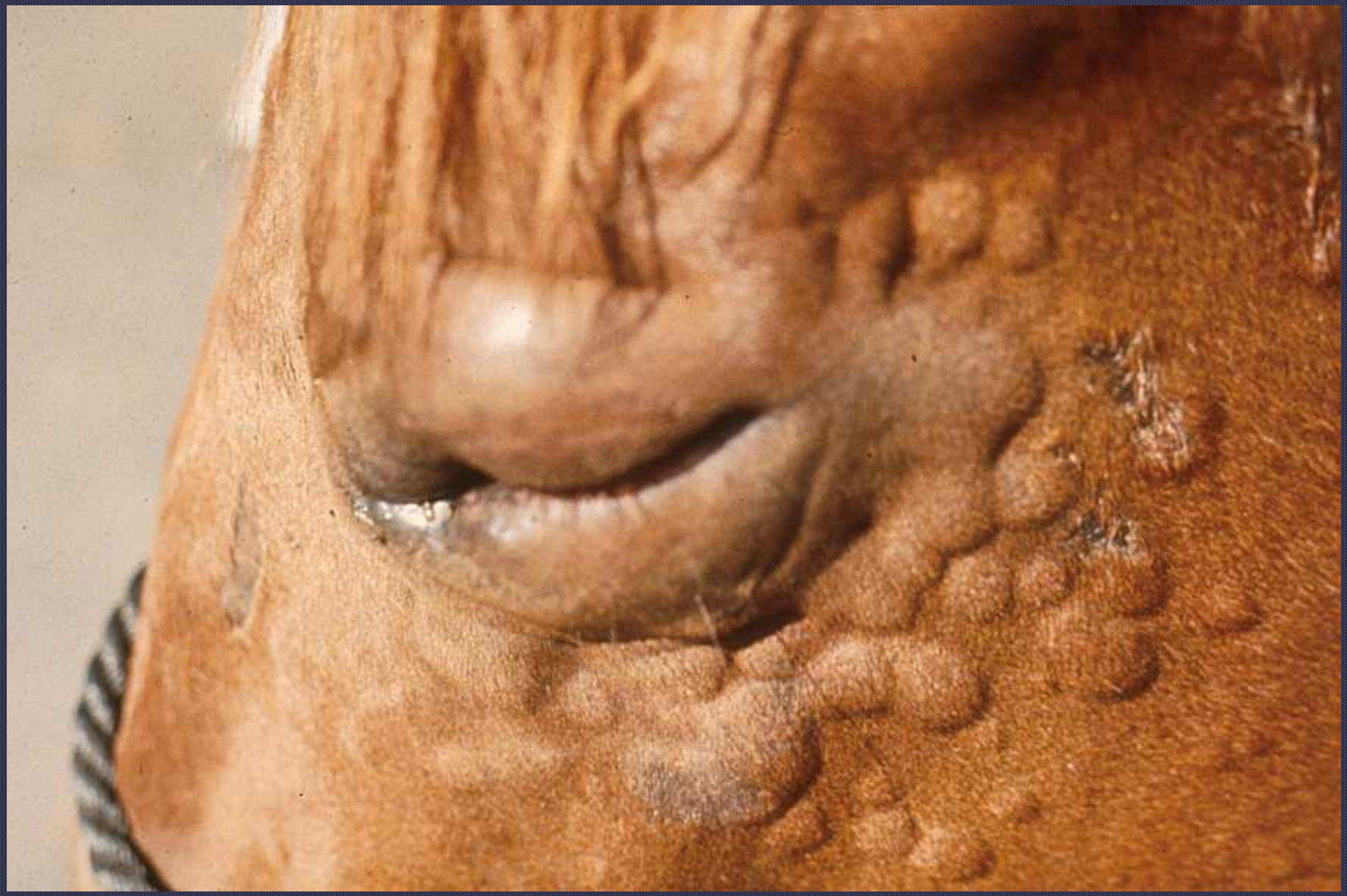
Stannard's Notes Vet Derm 2000 11: 211-215

Immunologic Diseases

Urticaria

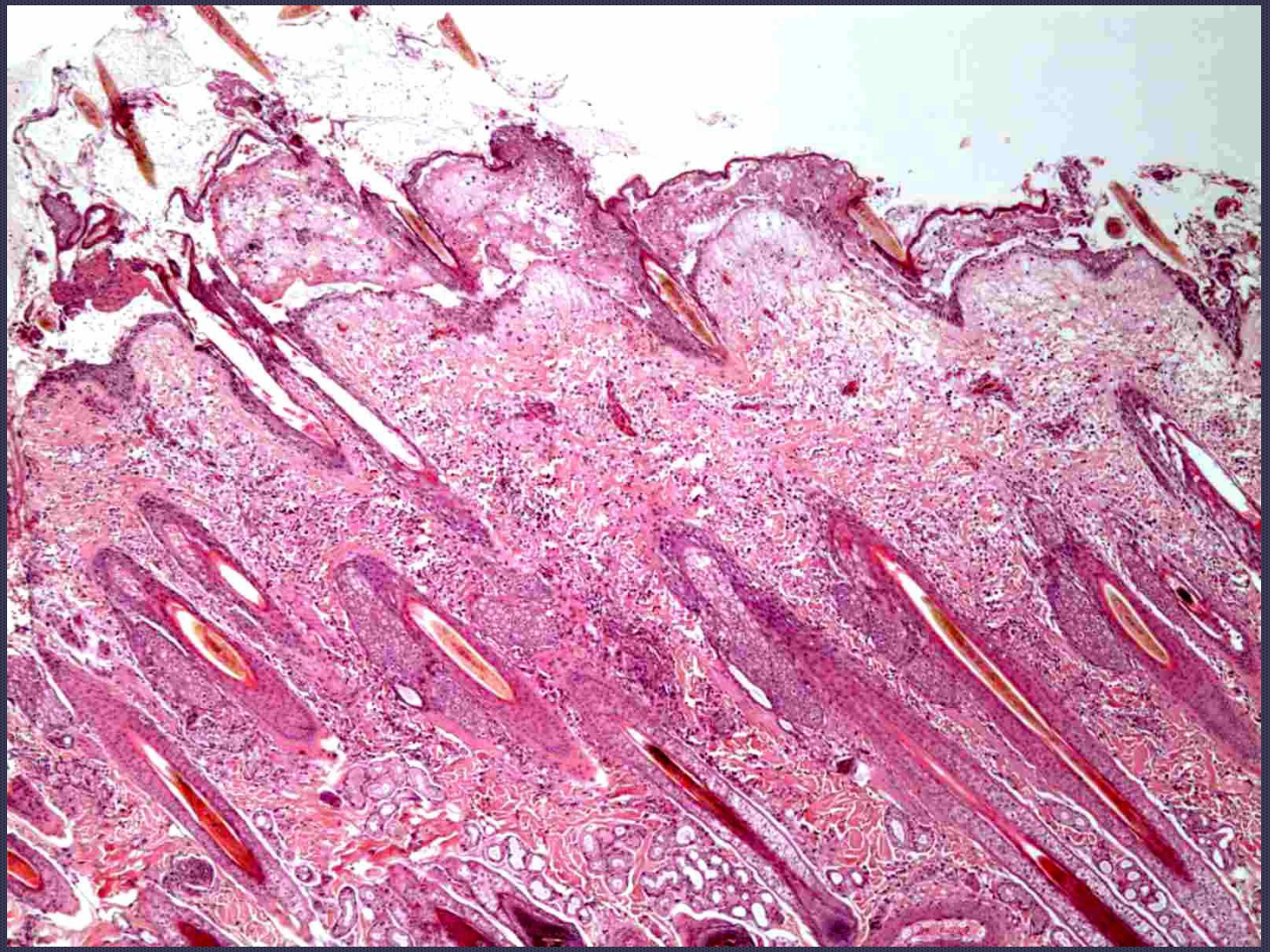
Urticaria

Dermatographism

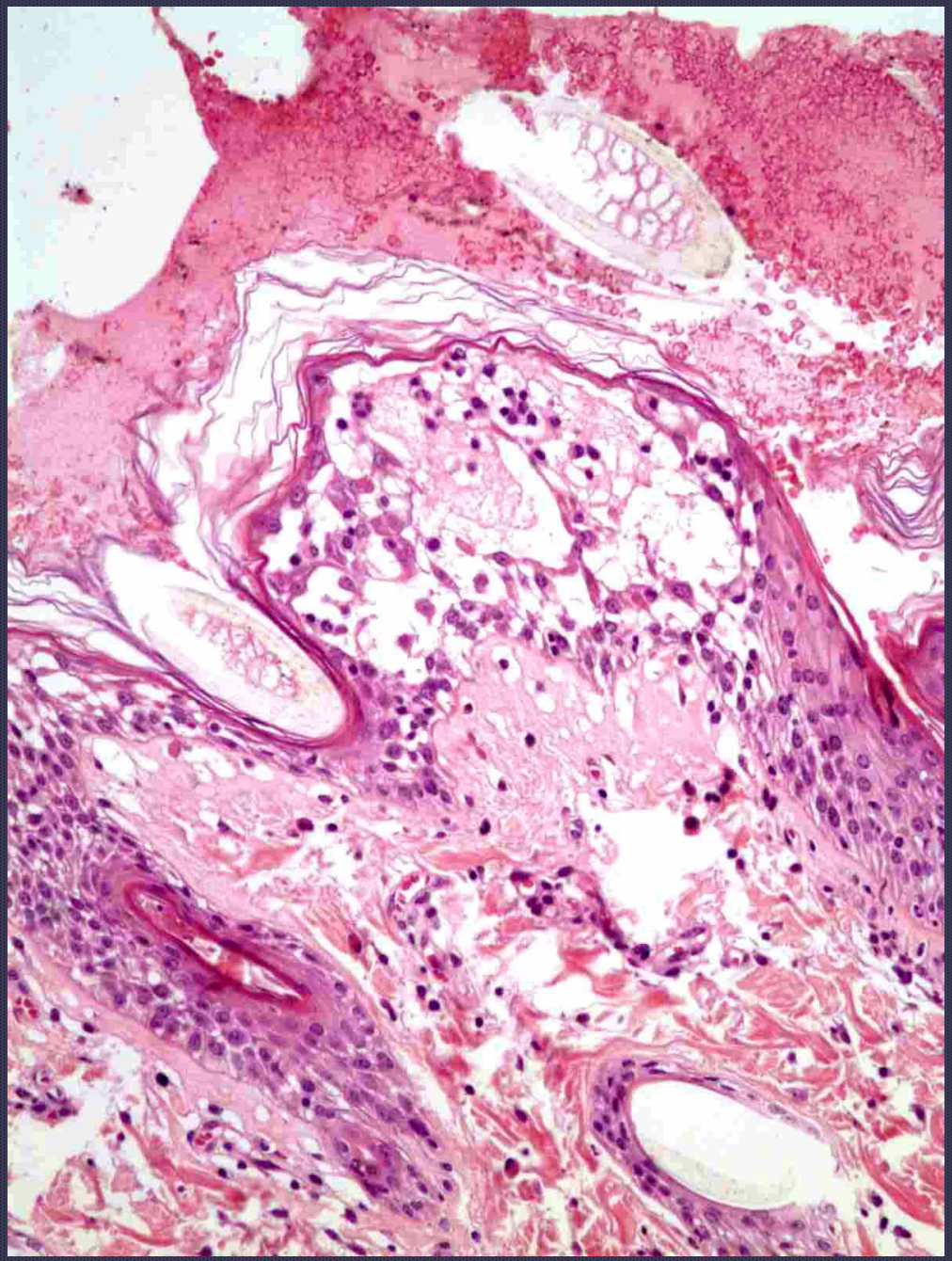


Urticaria

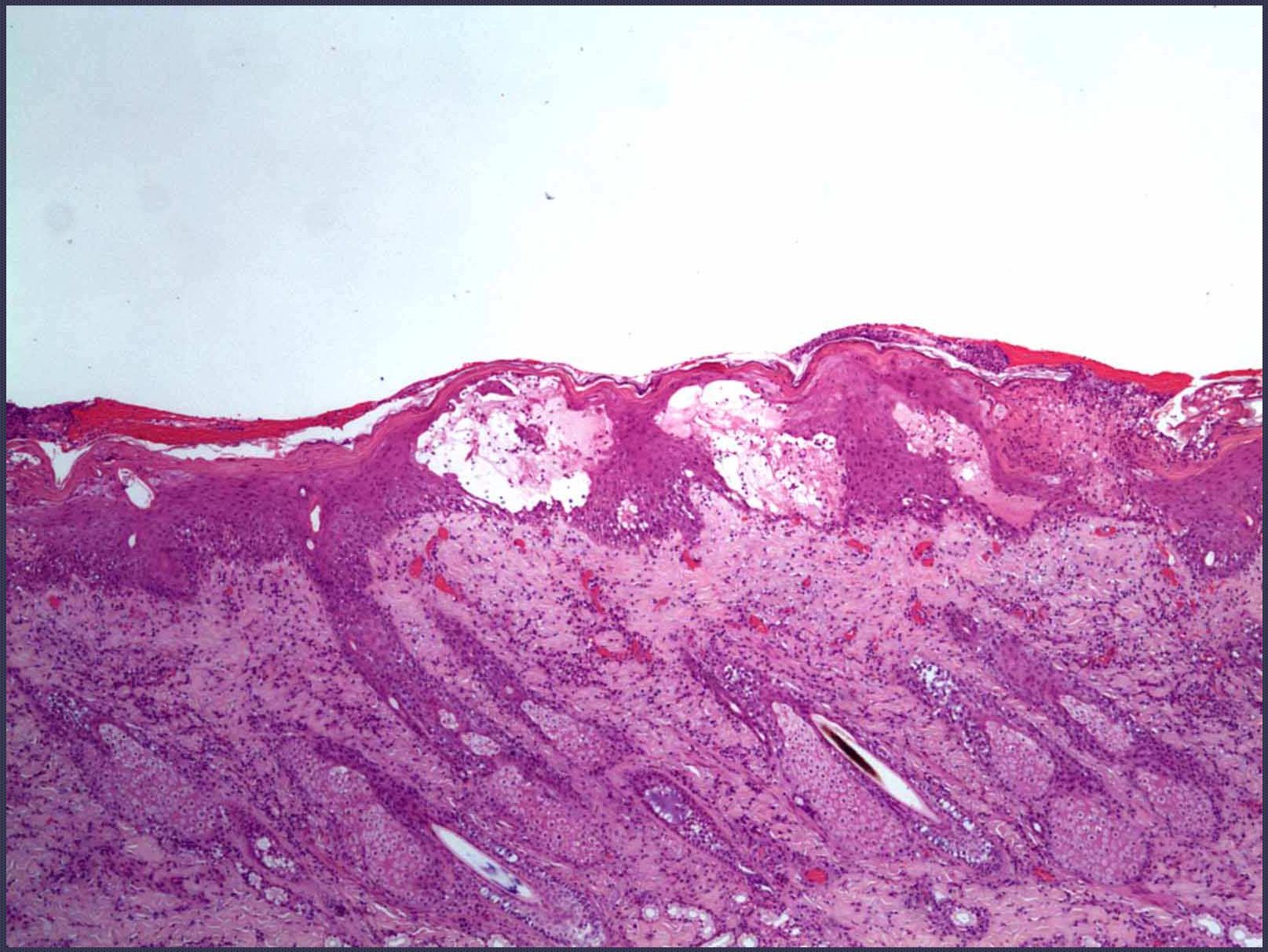
Spongiotic Vesicular Dermatitis



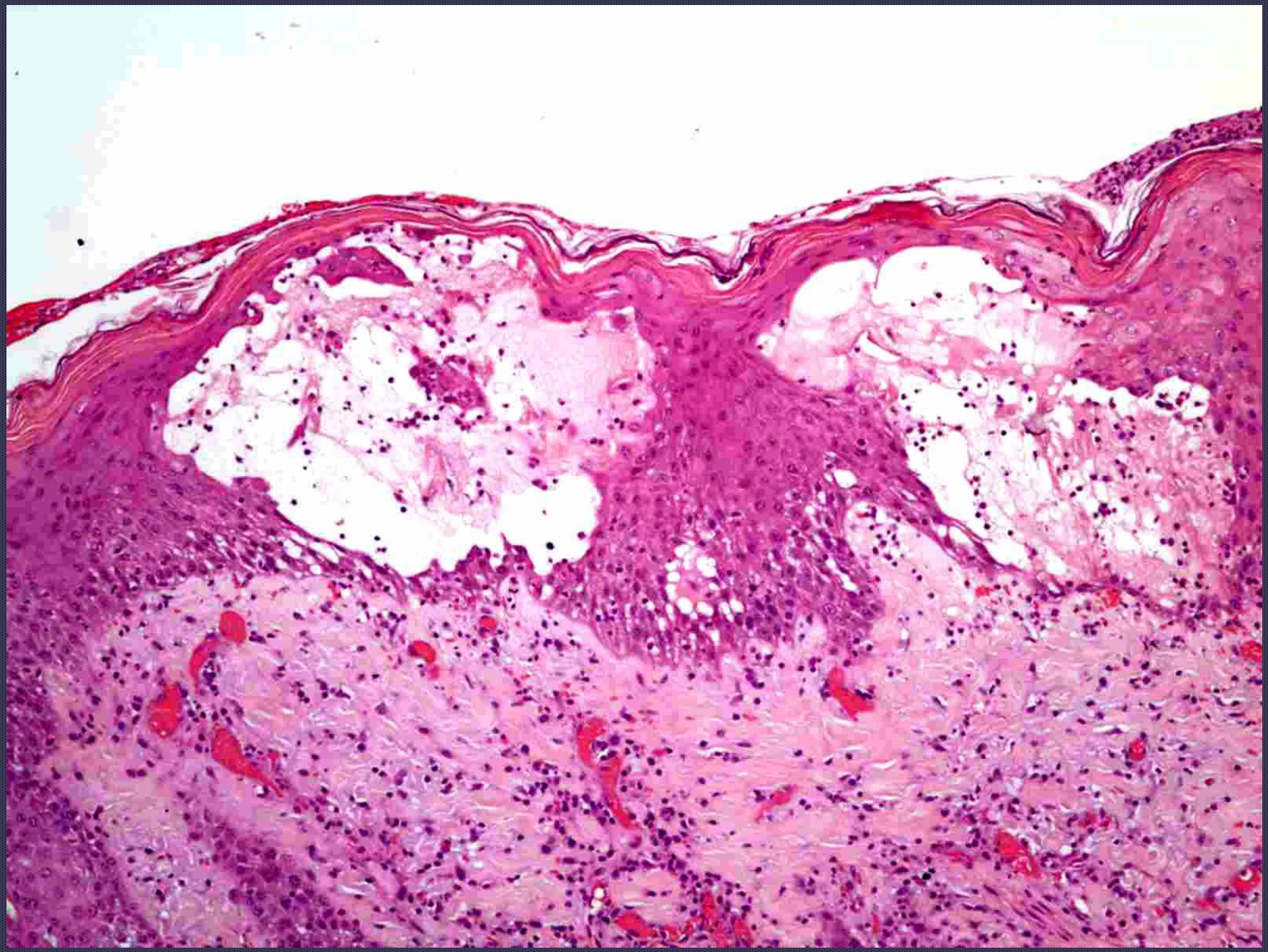
Dr. Anne Hargis



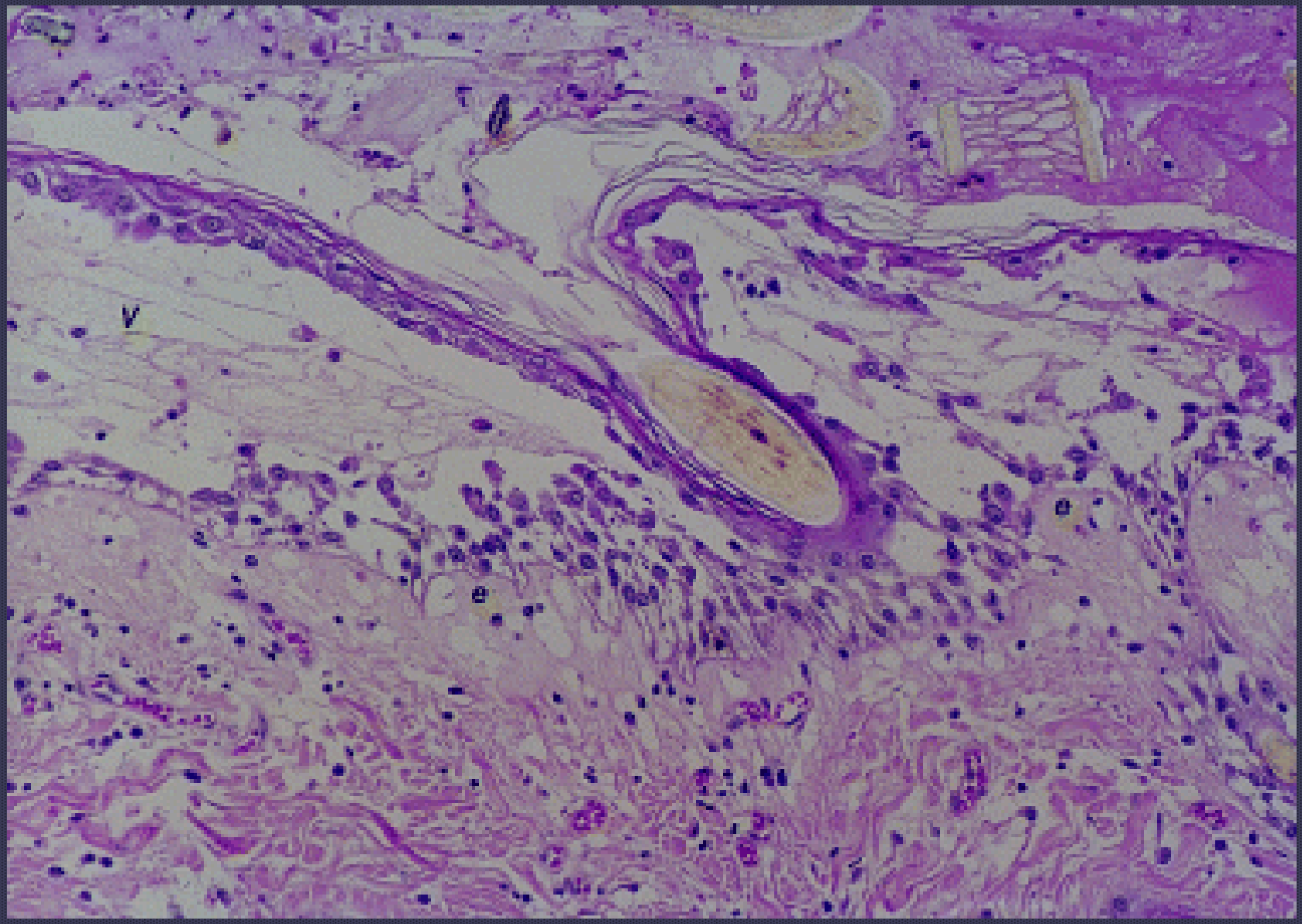
Dr. Anne Hargis



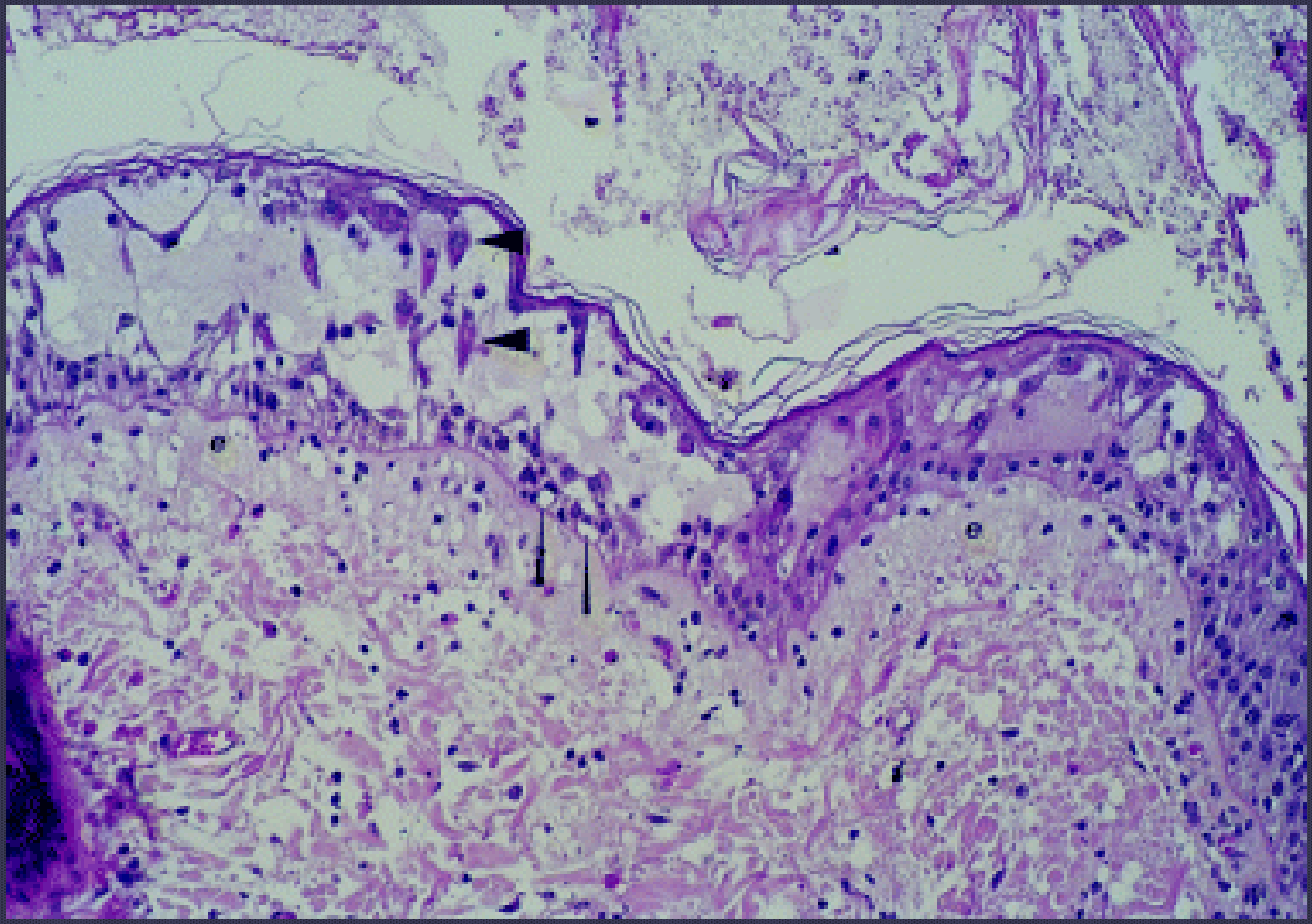
Dr. Anne Hargis



Dr. Anne Hargis



Dr. Anne Hargis



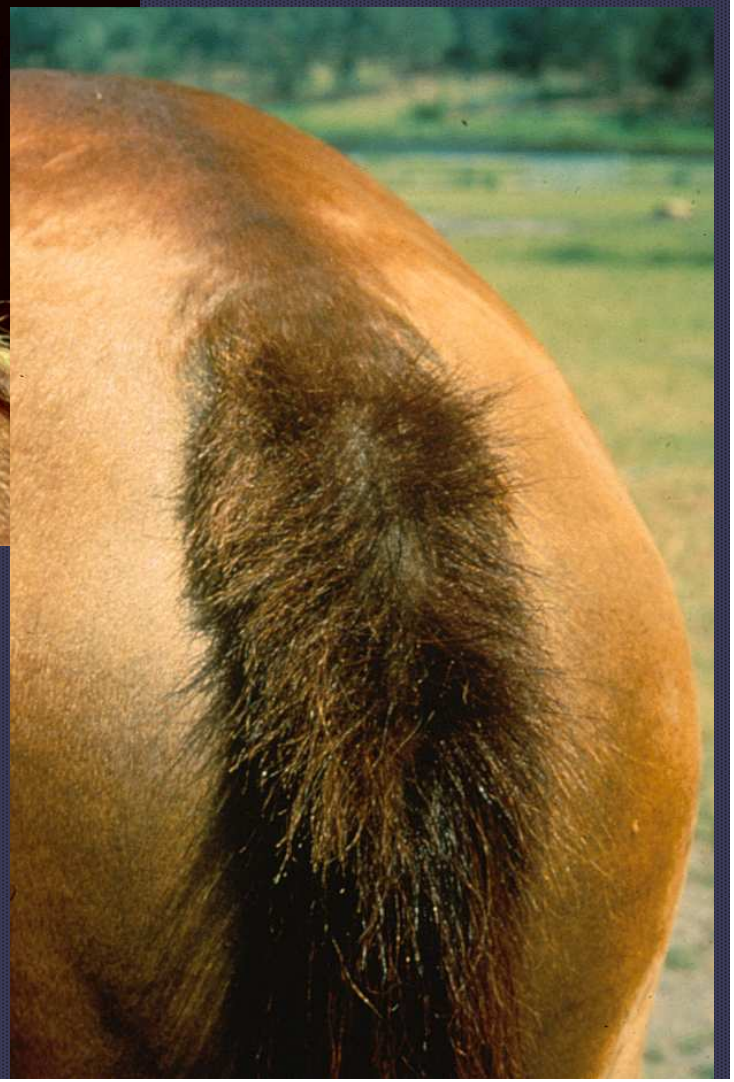
Spongiotic Vesicular Dermatitis

- Cutaneous reaction pattern
- Not specific to cause
- Hypersensitivity reaction
- Severe epidermal edema→ acantholysis→ do not confuse with autoimmune disorder

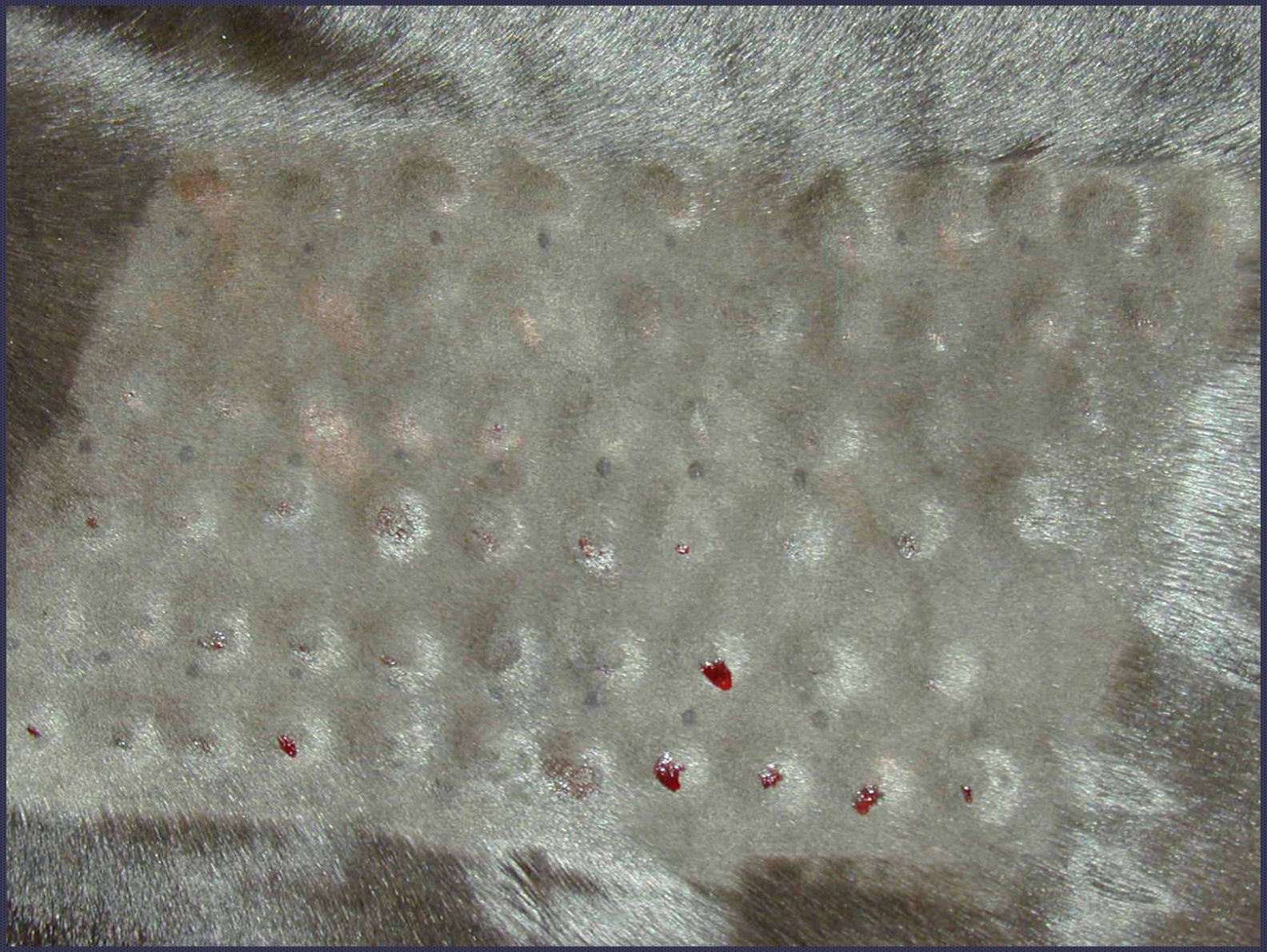
Vet Derm 2001; 12: 291-6

Pruritic horses

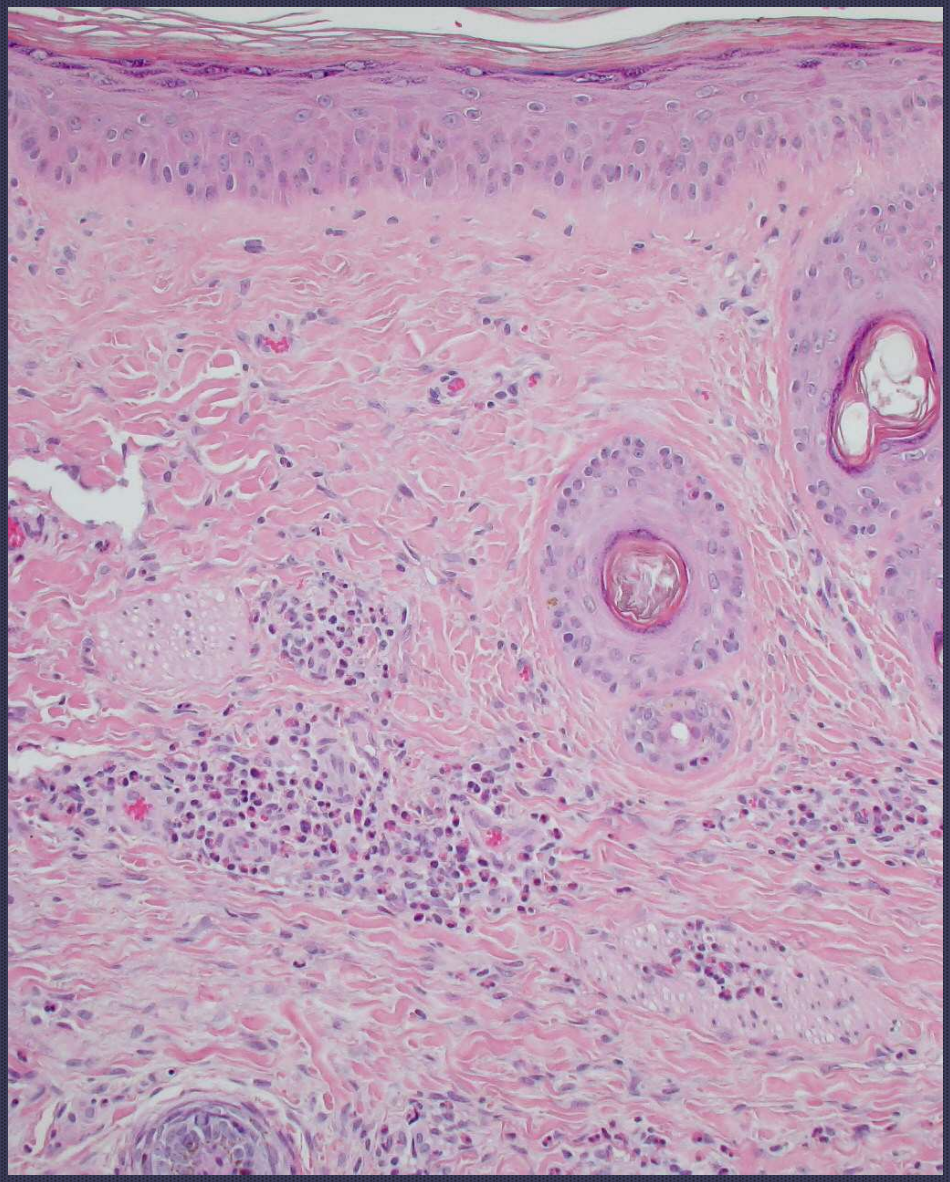
Culicoides hypersensitivity



Culicoides hypersensitivity



Intradermal skin test



Eosinophilic perivascular dermatitis

Pemphigus foliaceus

- Most common autoimmune skin disease
- Middle-aged horses (8.5-9 yrs)
- Better prognosis in young horses (< 1yr or younger)
- No age/breed/sex predilection

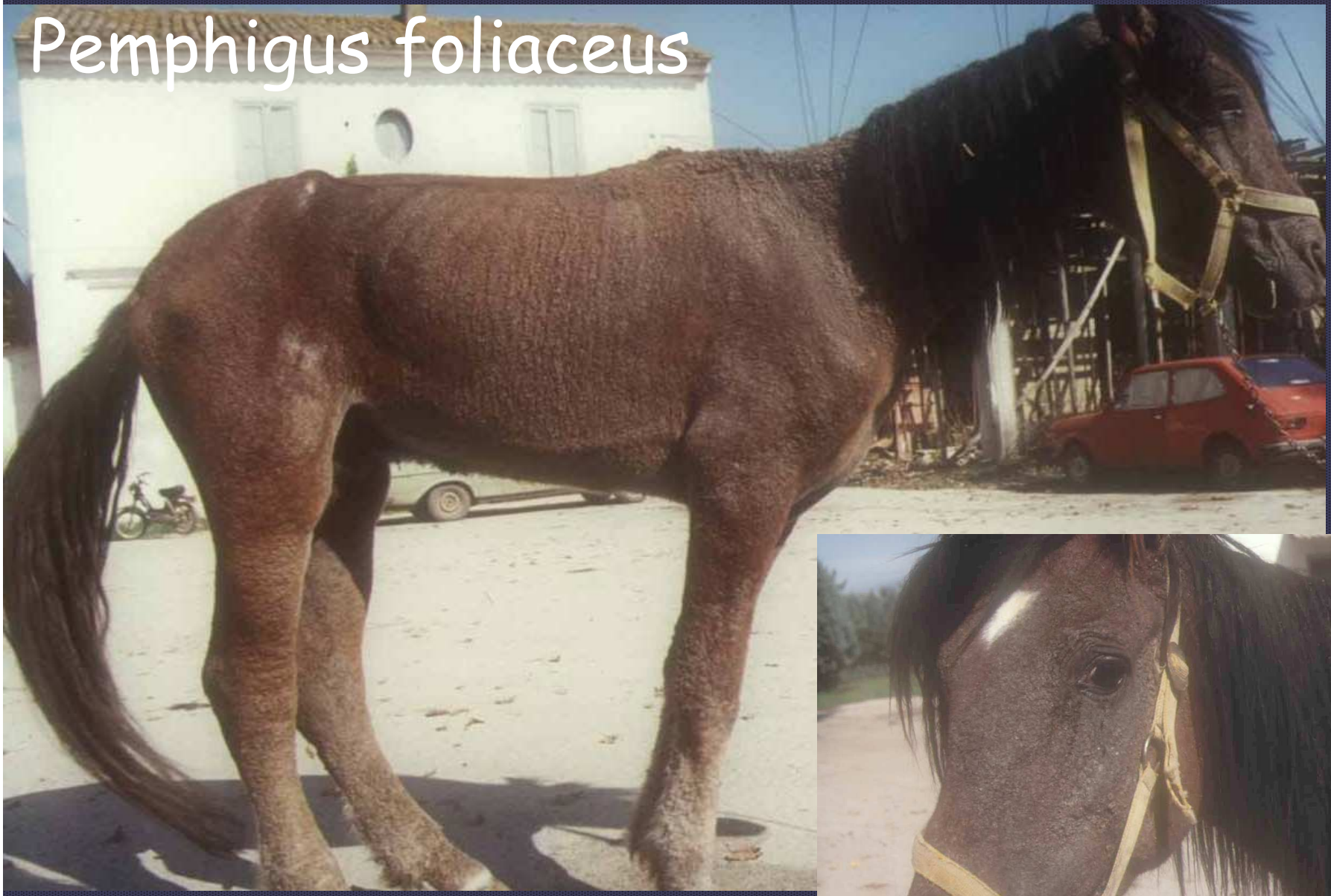
Two recent retrospectives

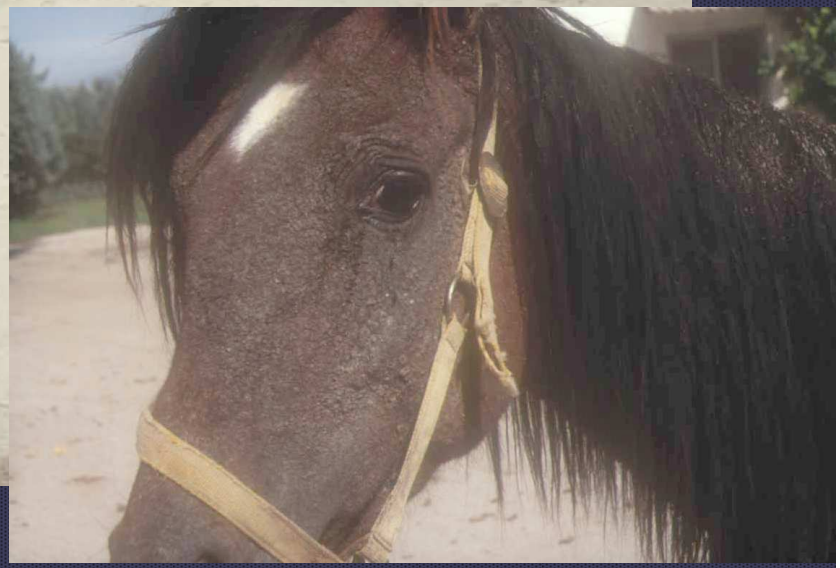
- Vet Derm
- Vet Record

Vandenabeele SI, White SD, et al. Pemphigus foliaceus in the horse: a retrospective study of 20 cases. Veterinary Dermatology 2004; 6: 381-8.

Zabel S, Mueller RS, Fieseler KV et al. Review of 15 cases of pemphigus in horses and a survey of the literature. Veterinary Record, 2005; 15: 505-9.

Pemphigus foliaceus

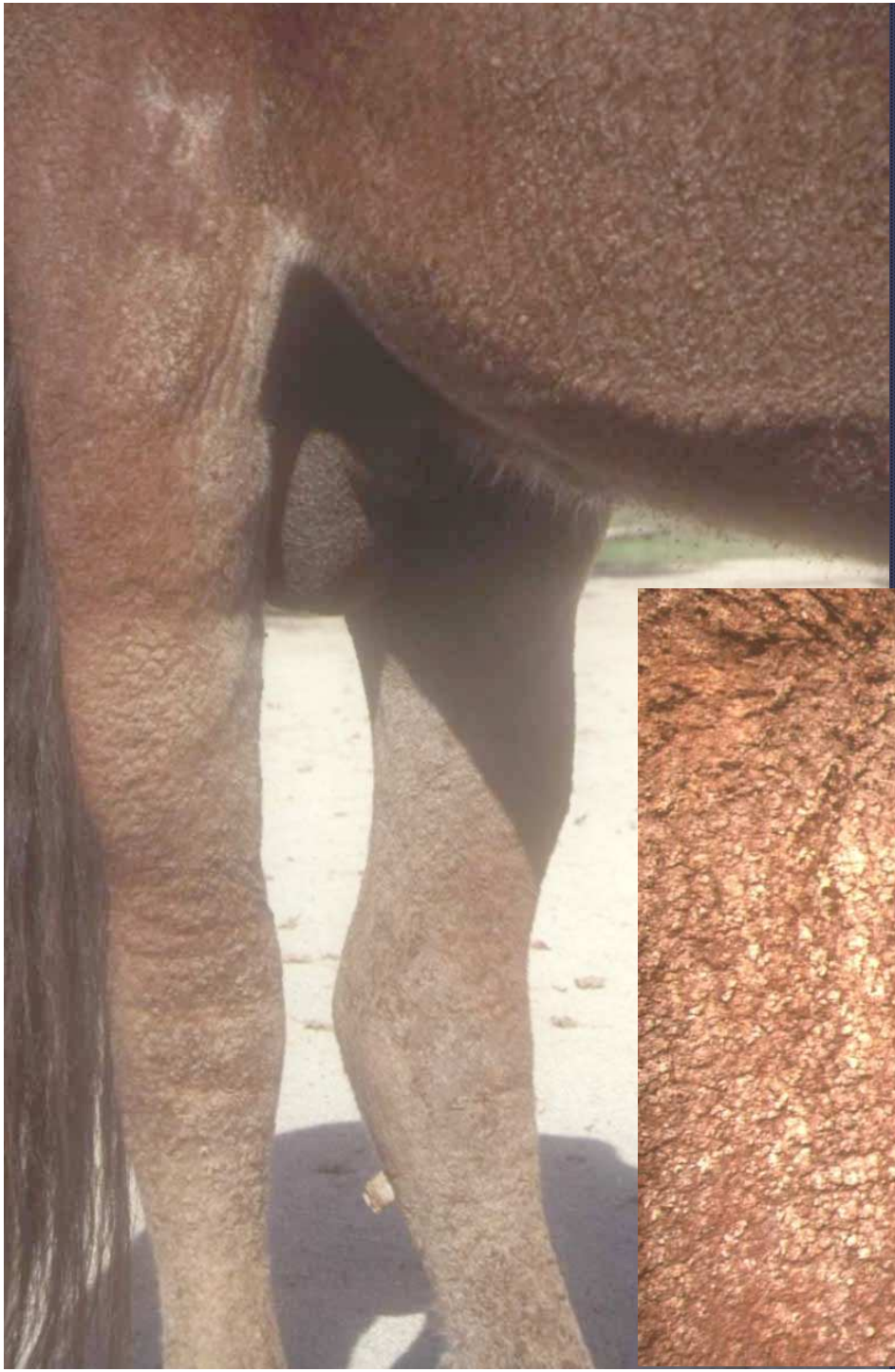


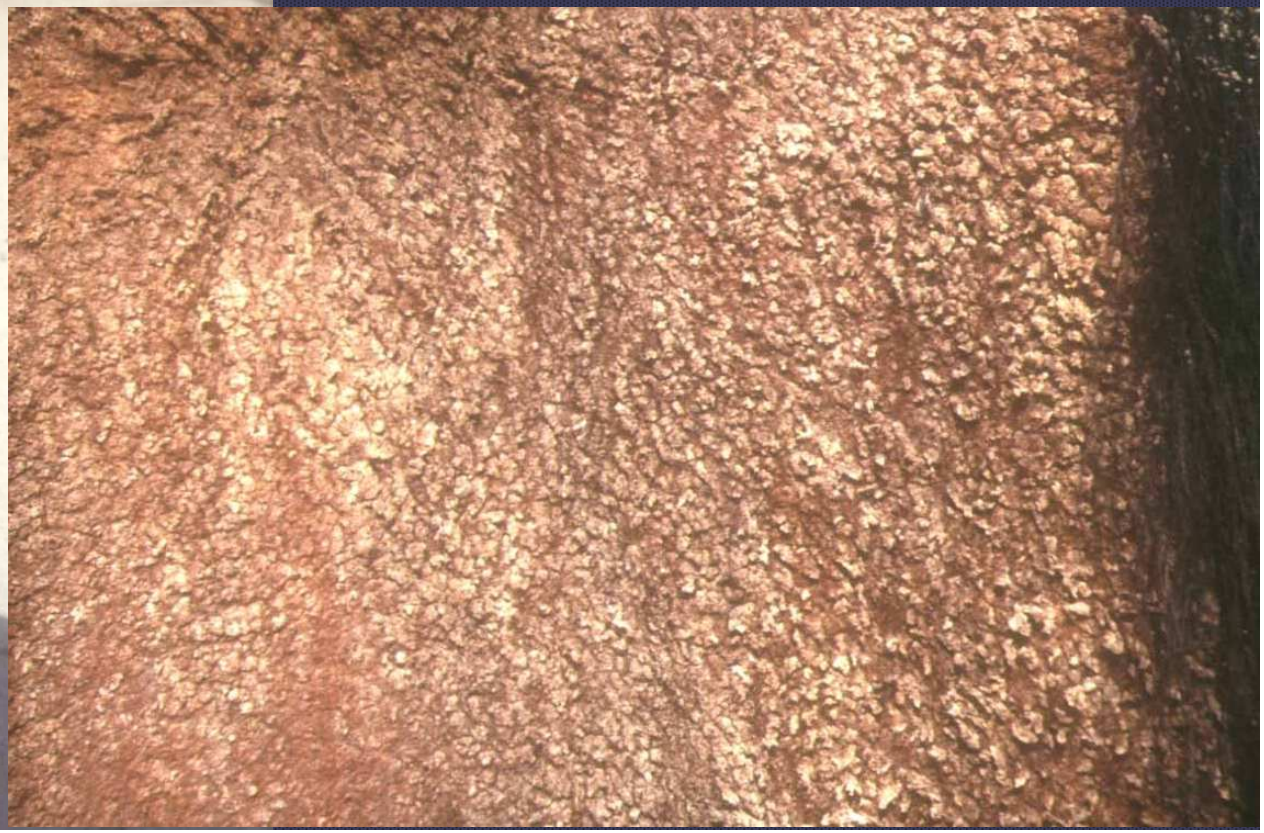


Slide courtesy of R. Cerundolo

Pemphigus foliaceus

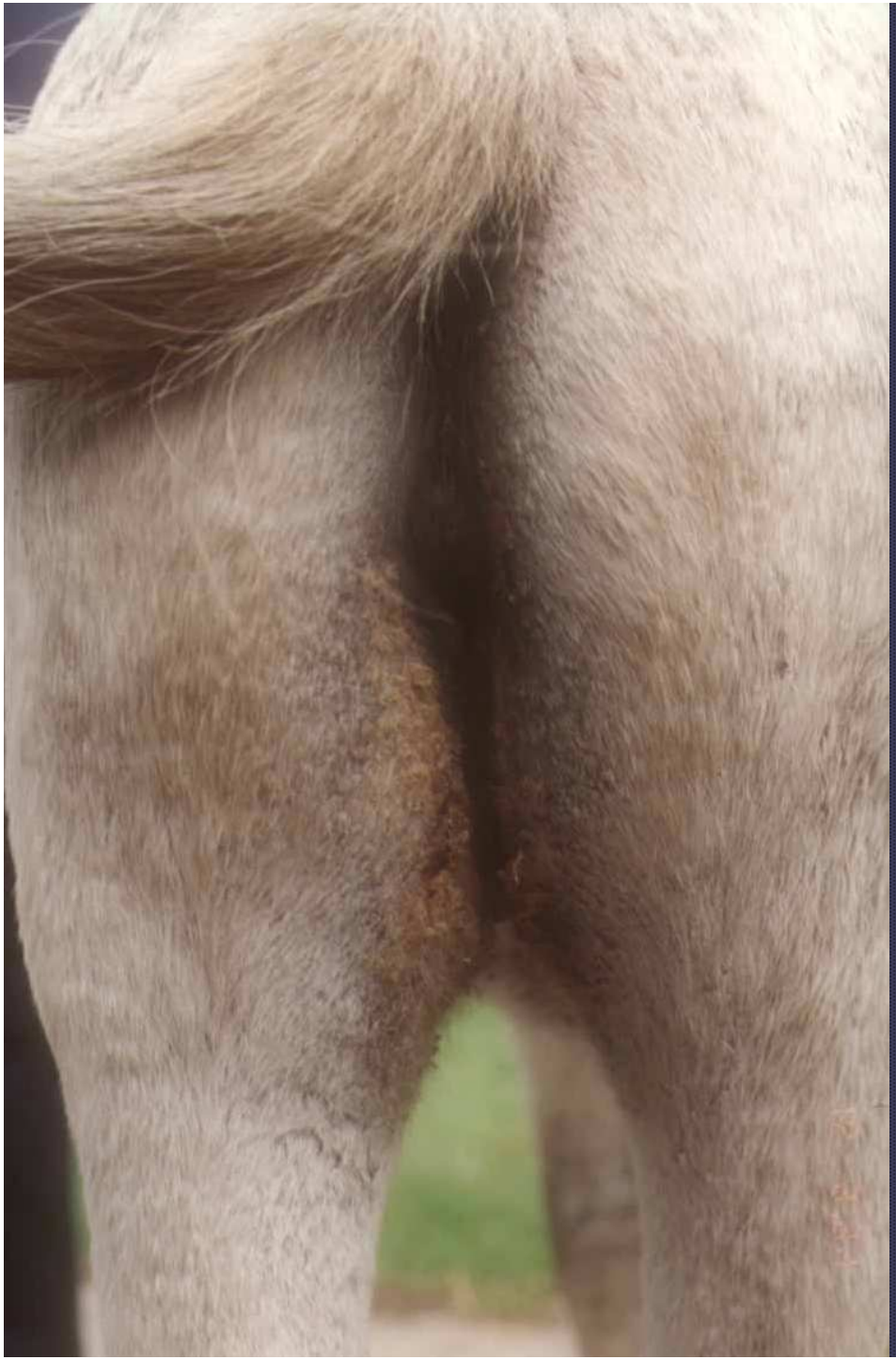
Slide courtesy of R. Cerundolo





Pemphigus foliaceus

Slide courtesy of R. Cerundolo



Pemphigus foliaceus

Slide courtesy of R. Cerundolo

Pemphigus foliaceus

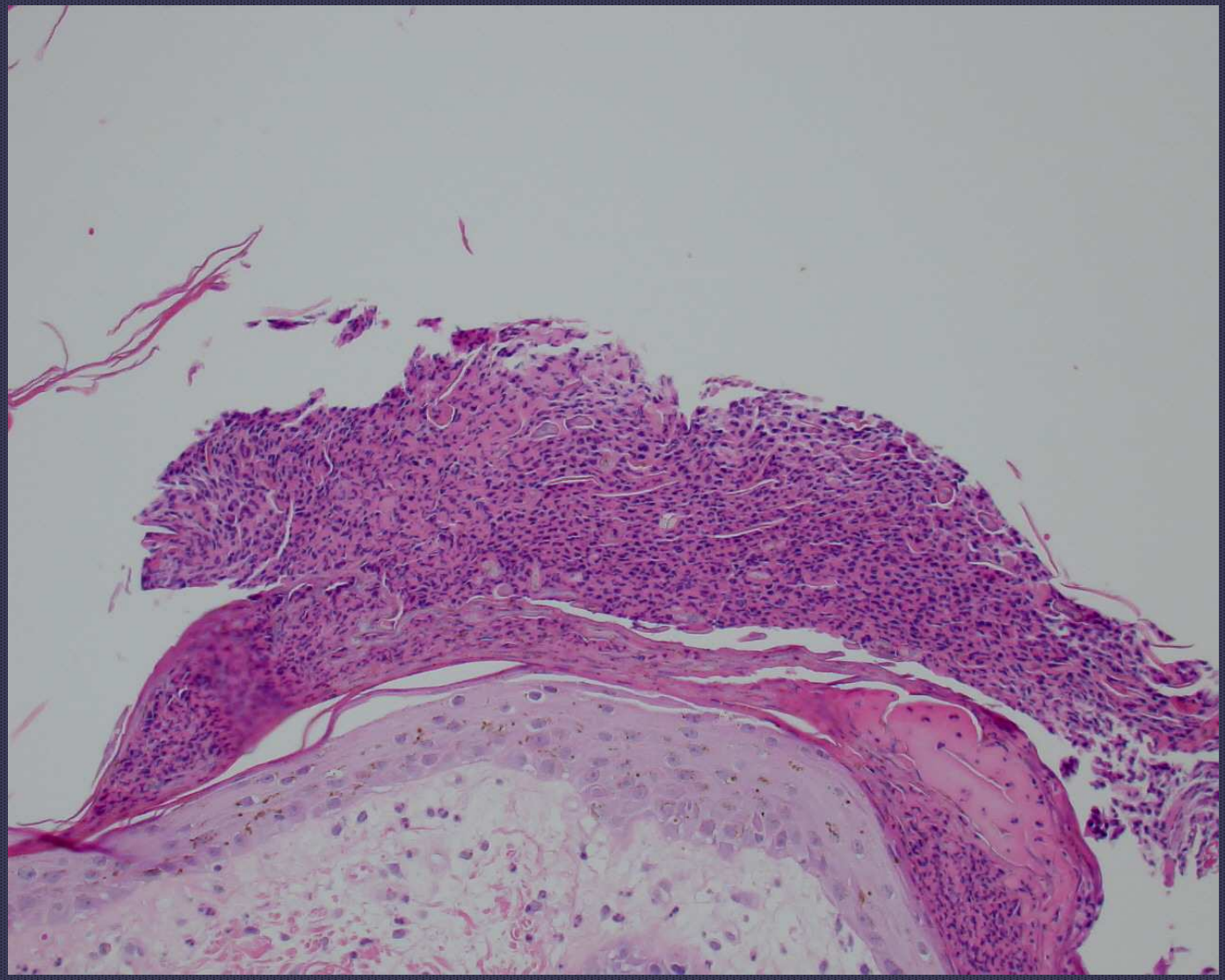
Slide courtesy of R. Cerundolo

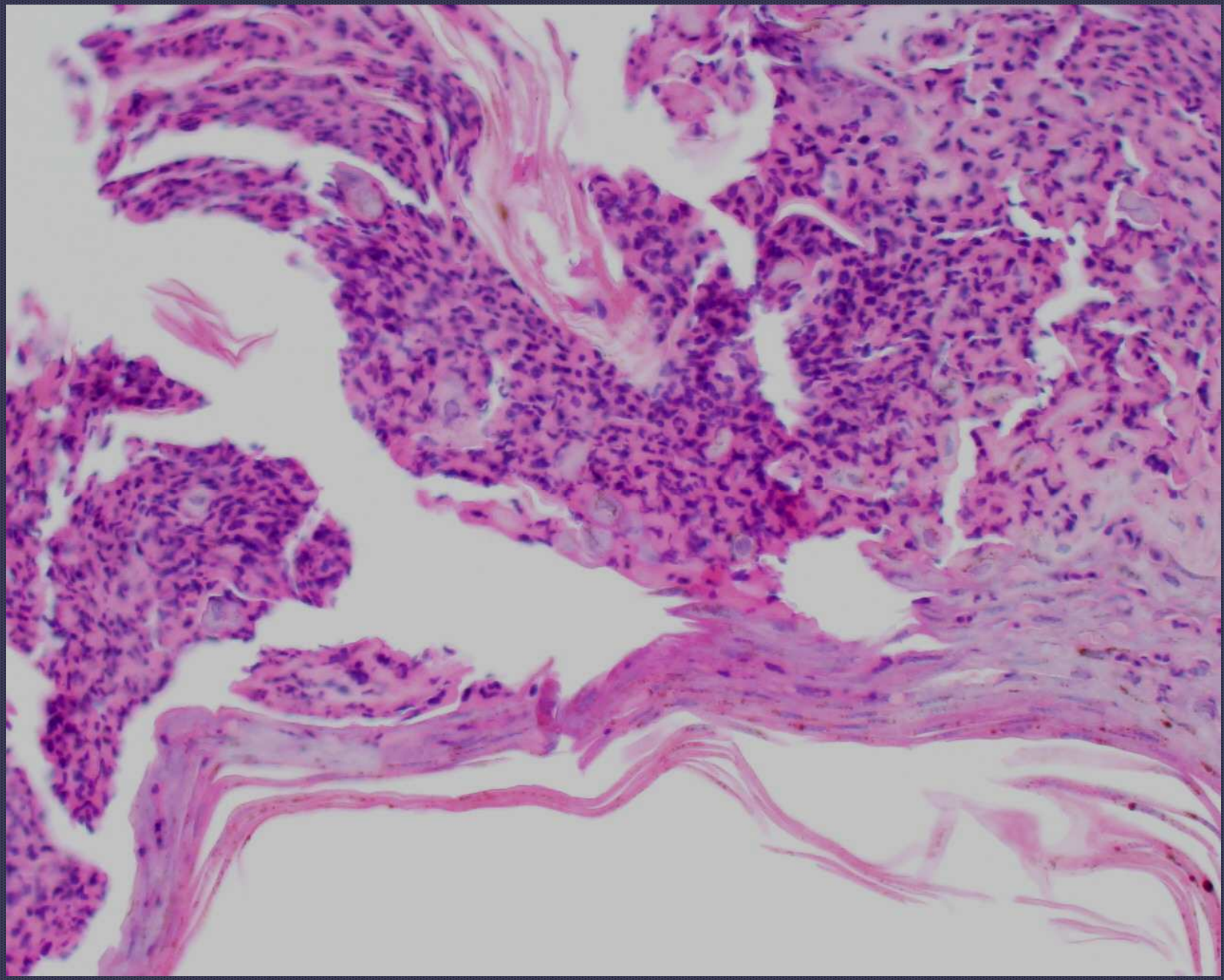
Slide courtesy of R. Cerundolo

Pemphigus foliaceus

Slide courtesy of R. Cerundolo

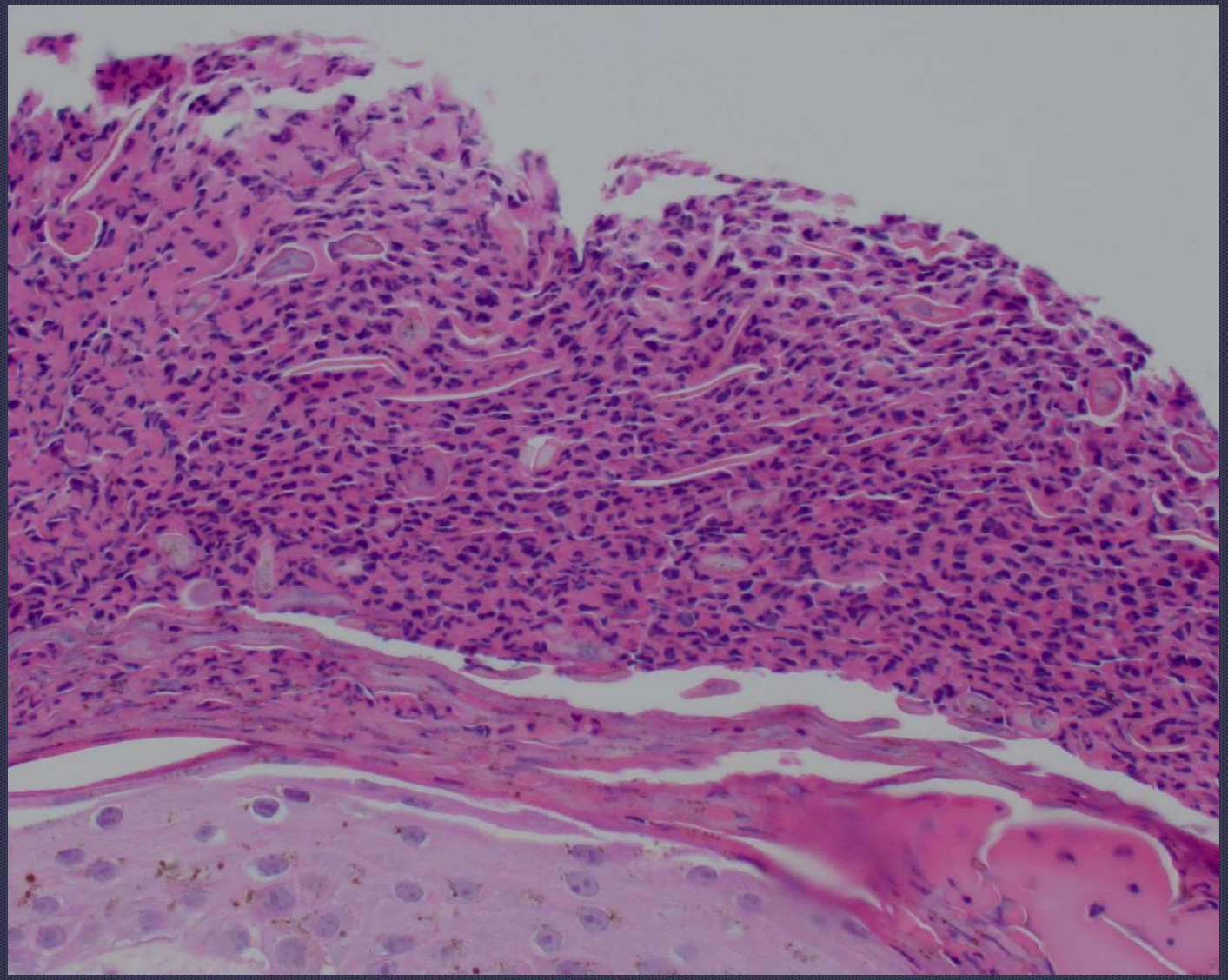
Pemphigus foliaceus (PF)

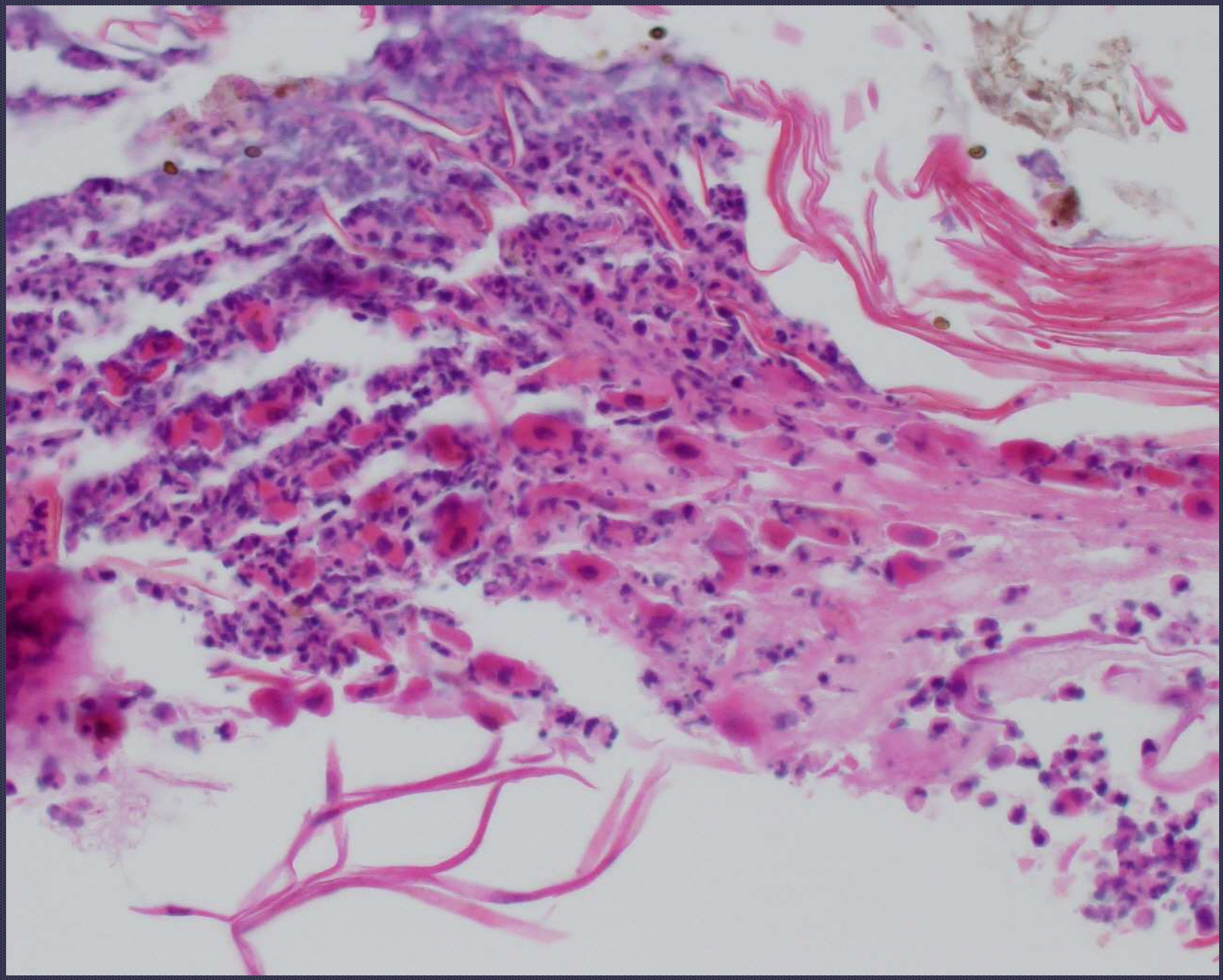




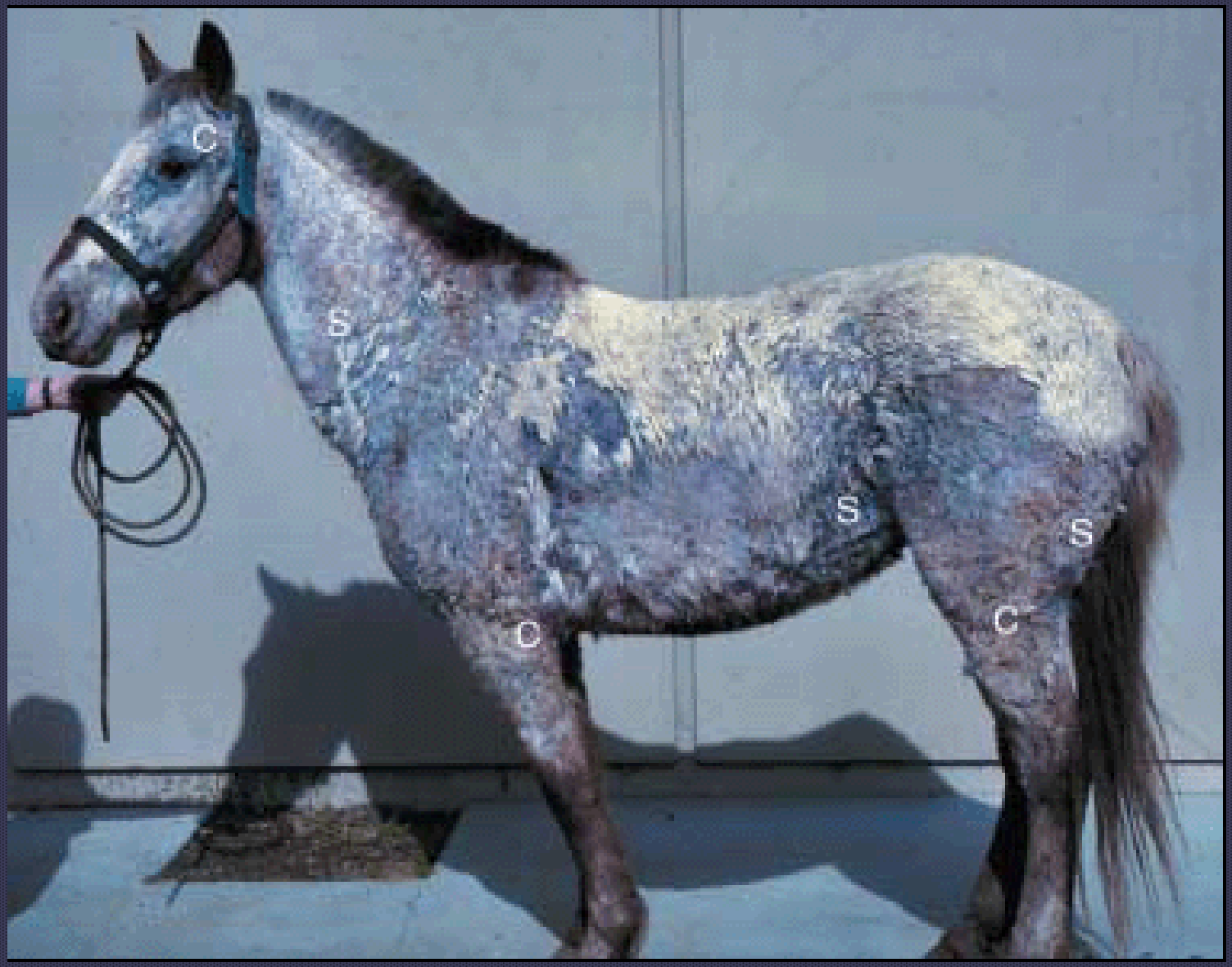
Pemphigus foliaceus

Pemphigus foliaceus





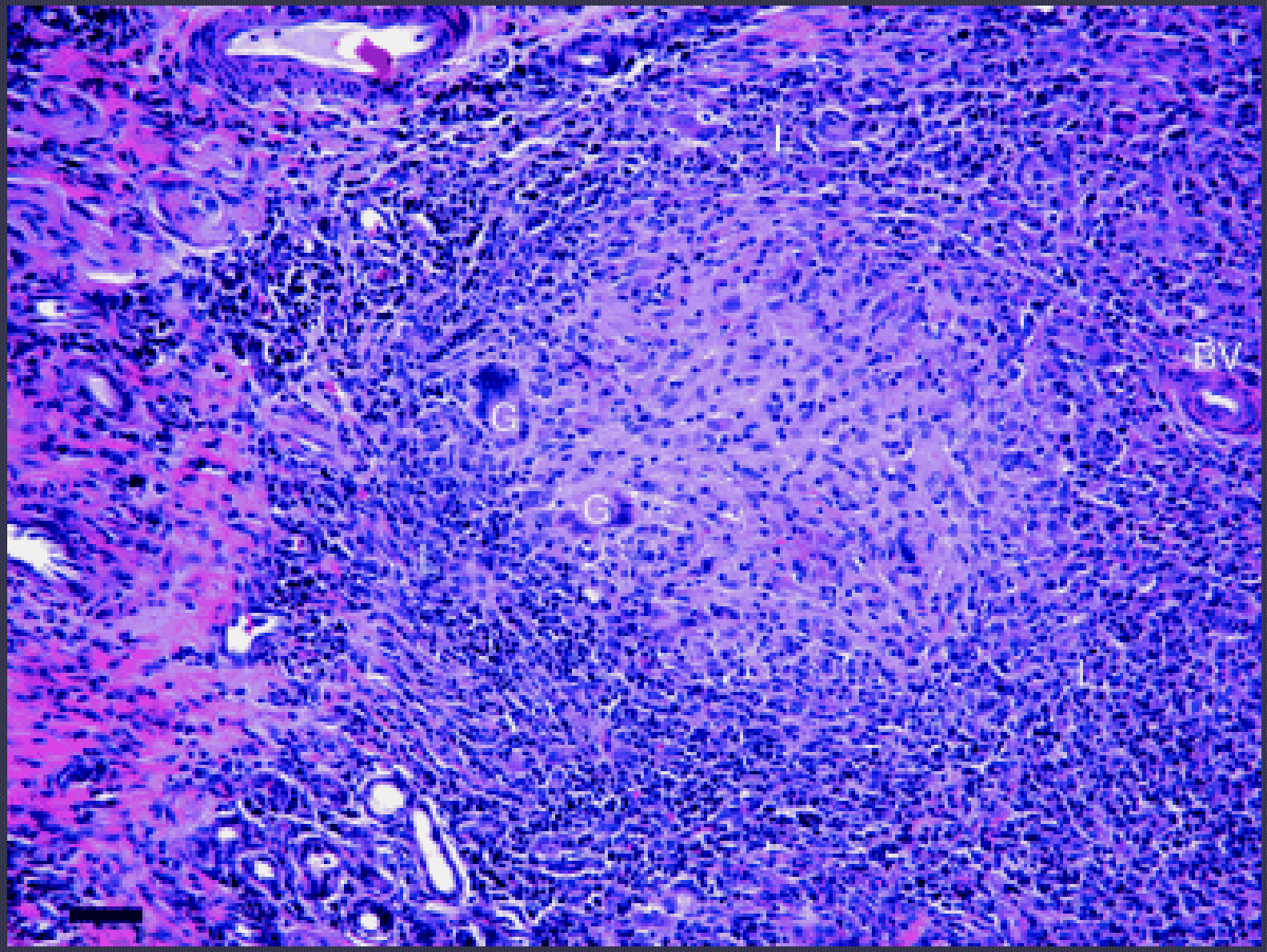
Aged acantholytic cells in crust
Pemphigus foliaceus



Sarcoidosis (aka systemic or generalized granulomatous disease)

Vet Derm 2006; 17: 51-62

Sarcoidosis (systemic granulomatous disease)

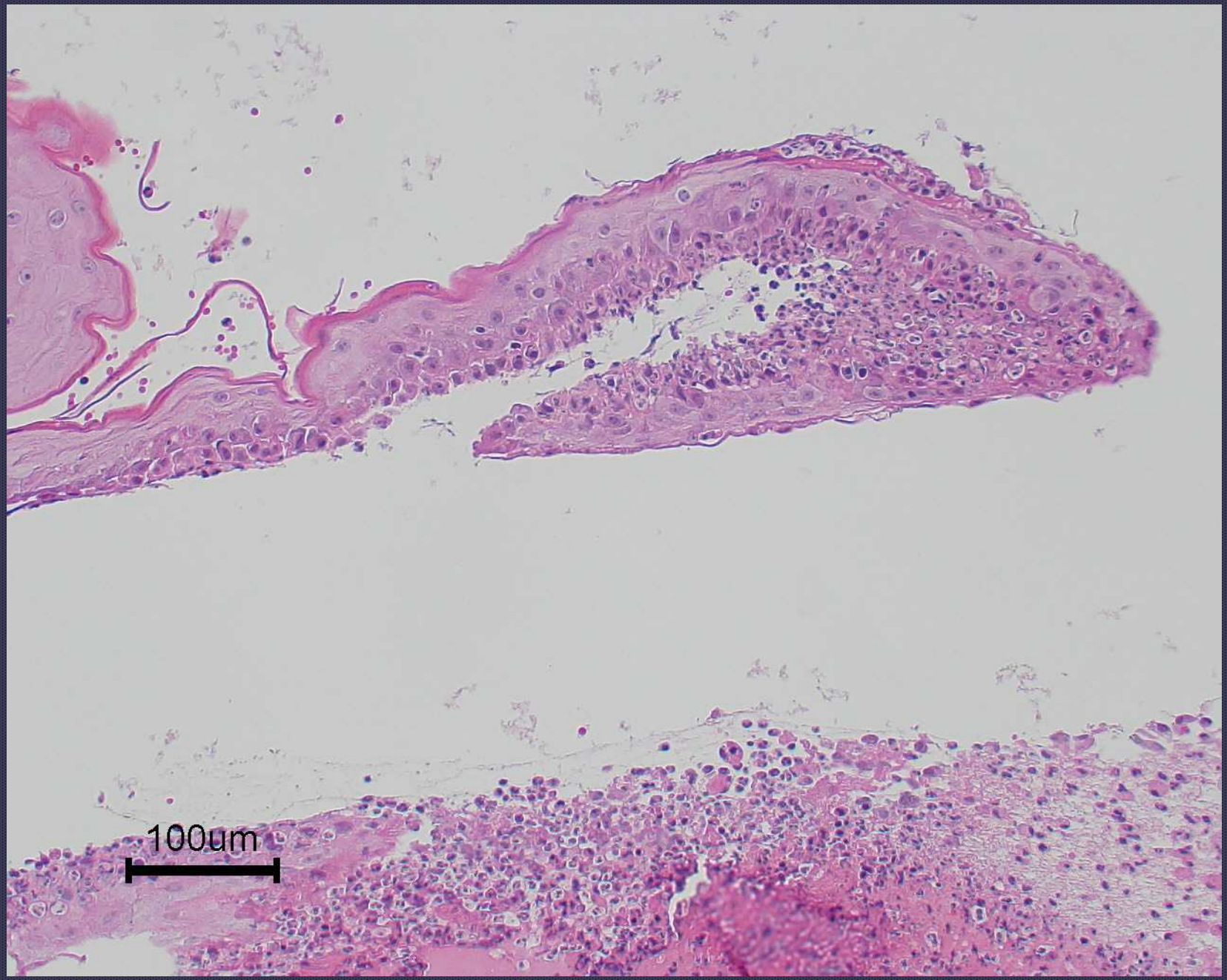


Sarcoidosis (systemic granulomatous disease)

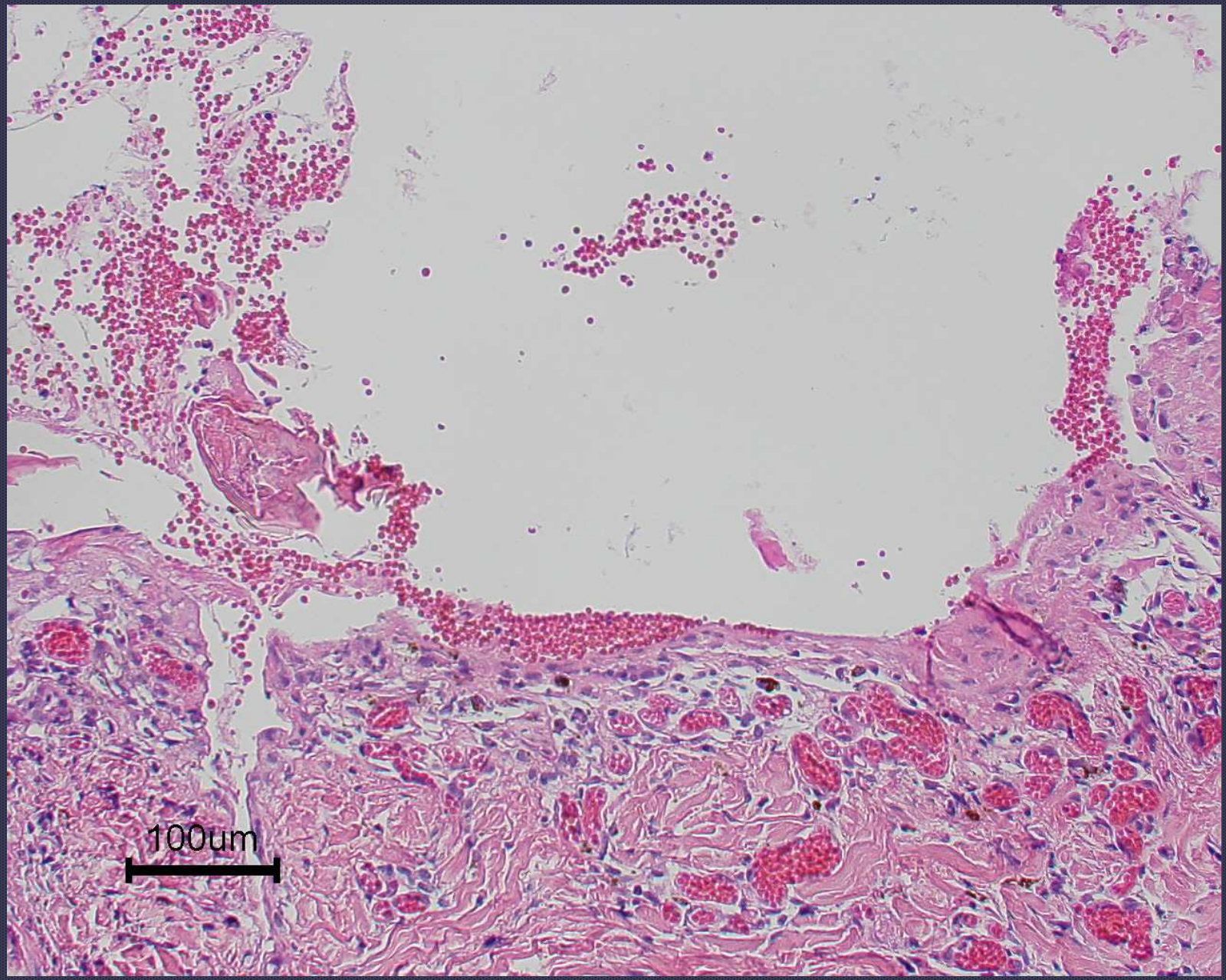
Systemic Granulomatous Disease (Sarcoidosis)

- Recent study re-addressed archival material
- Histochemical stains, PCR, IHC
- No bugs
- Horses do OK if the lesions are confined to the skin
- Steroid responsive

Vet Derm 2006; 17: 51-62



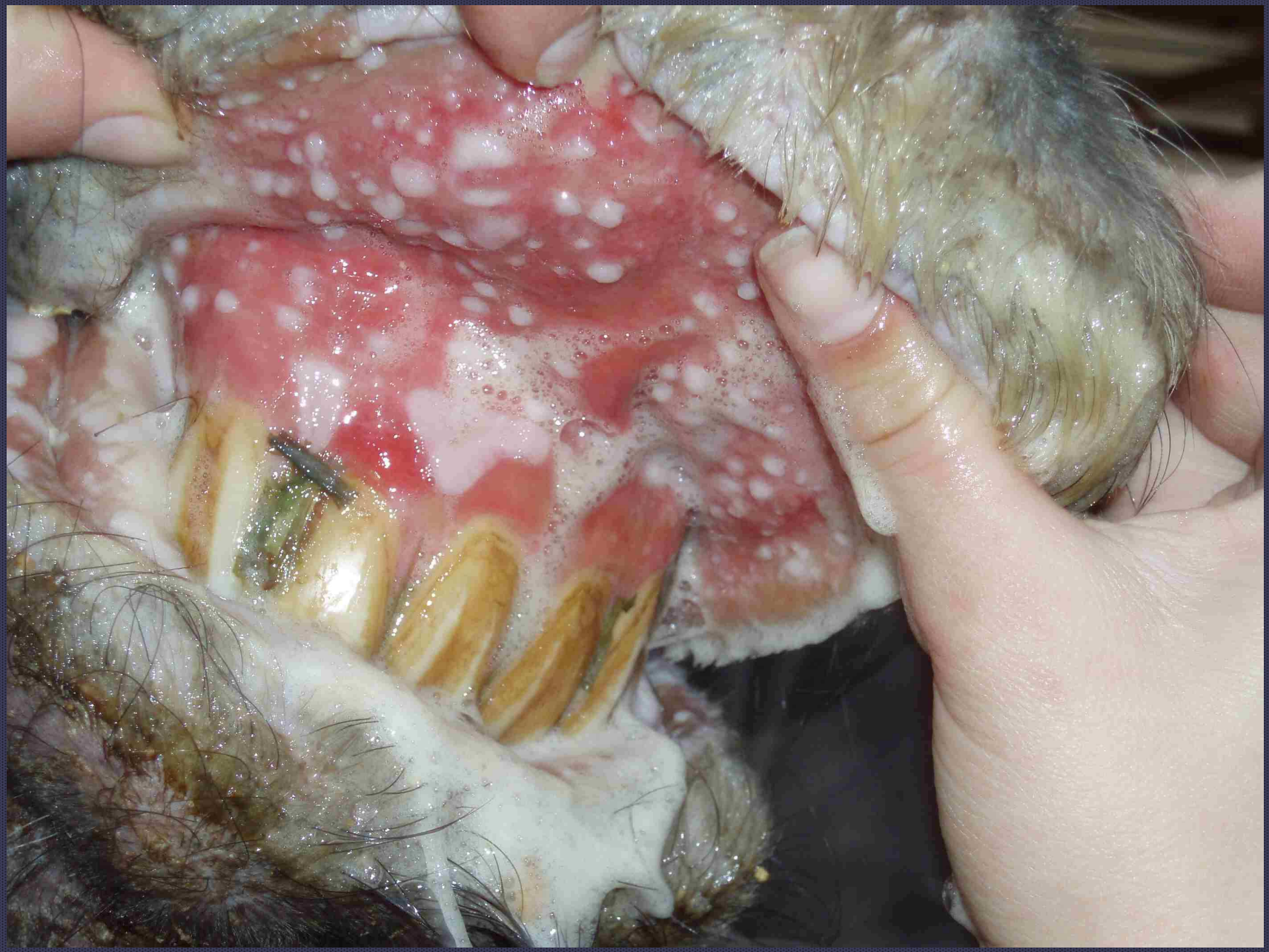
Large vesicle in a horse with Bullous Pemphigoid



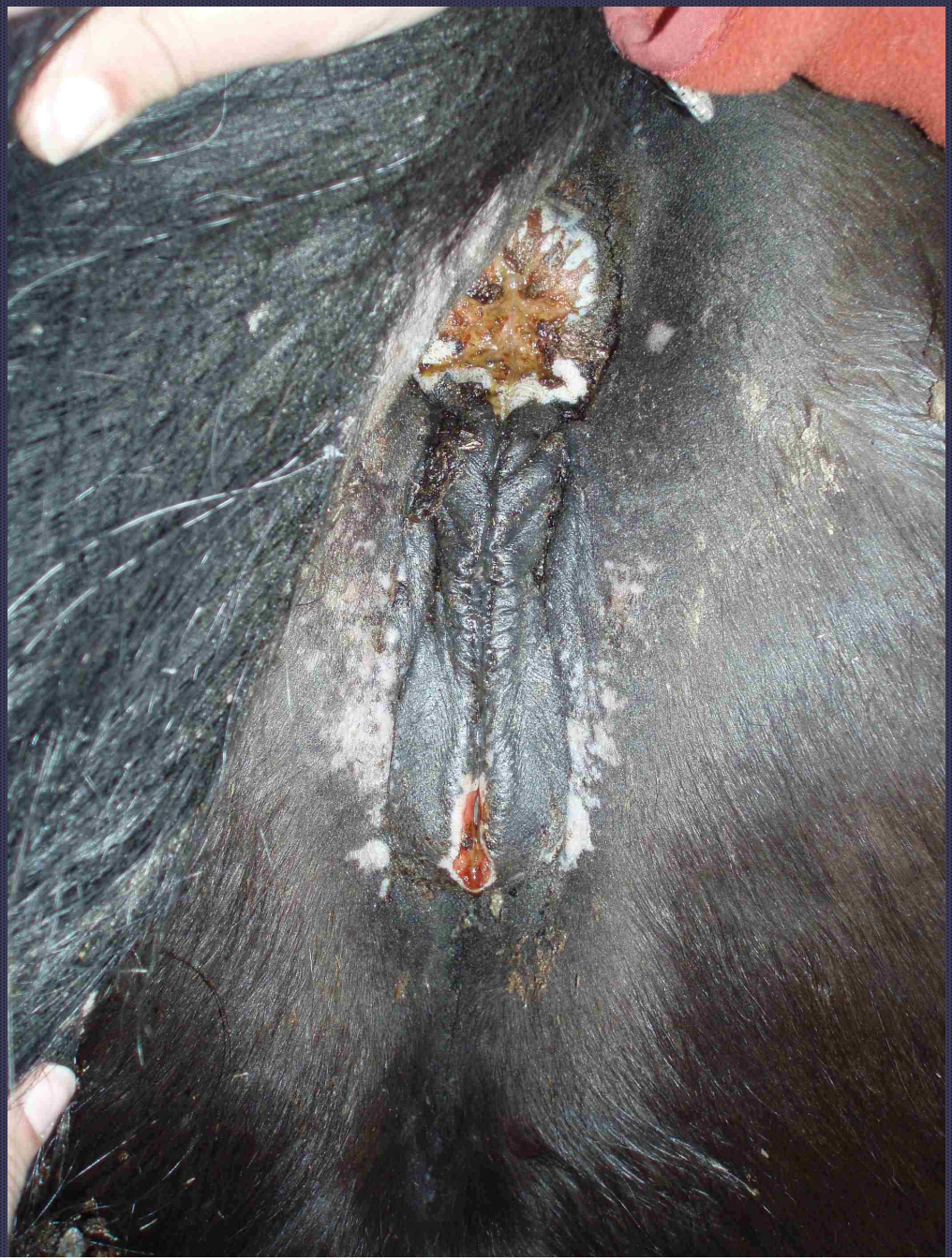
Complete epidermal separation from dermis- Bullous pemphigoid

Severe clefting/vesicle formation in Bullous pemphigoid

Bullous pemphigoid



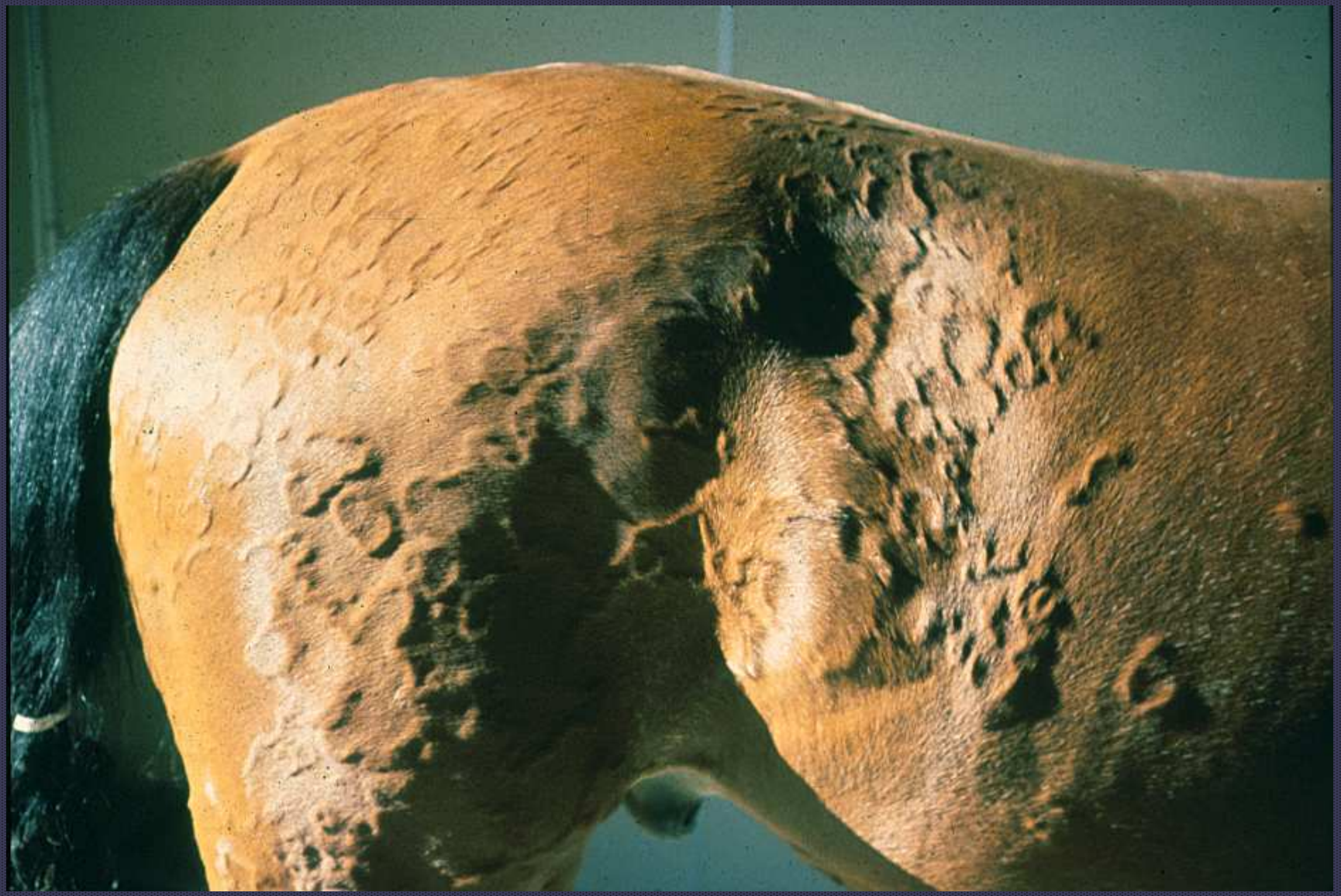
Bullous pemphigoid



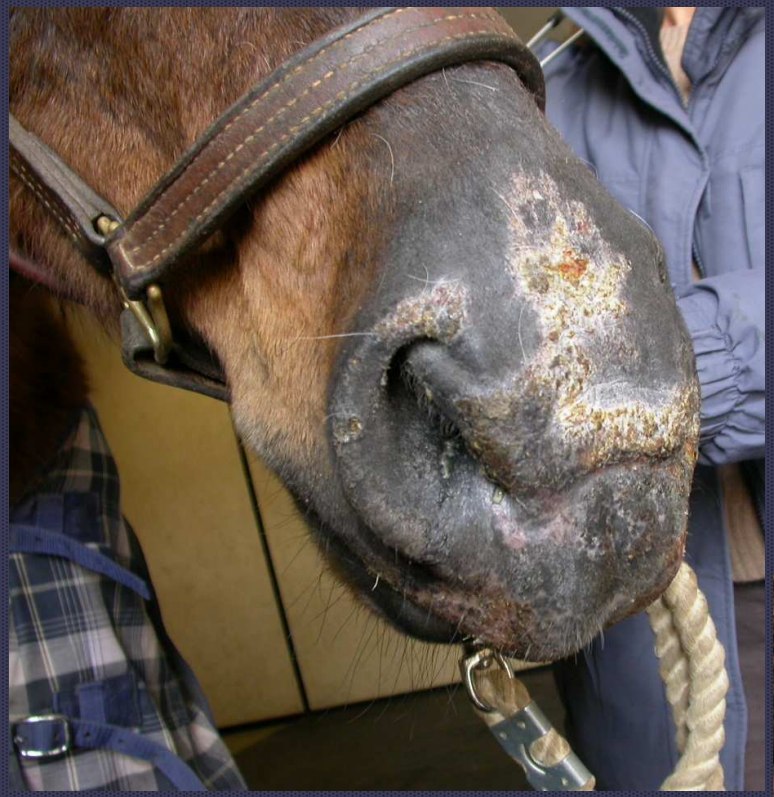
Bullous pemphigoid

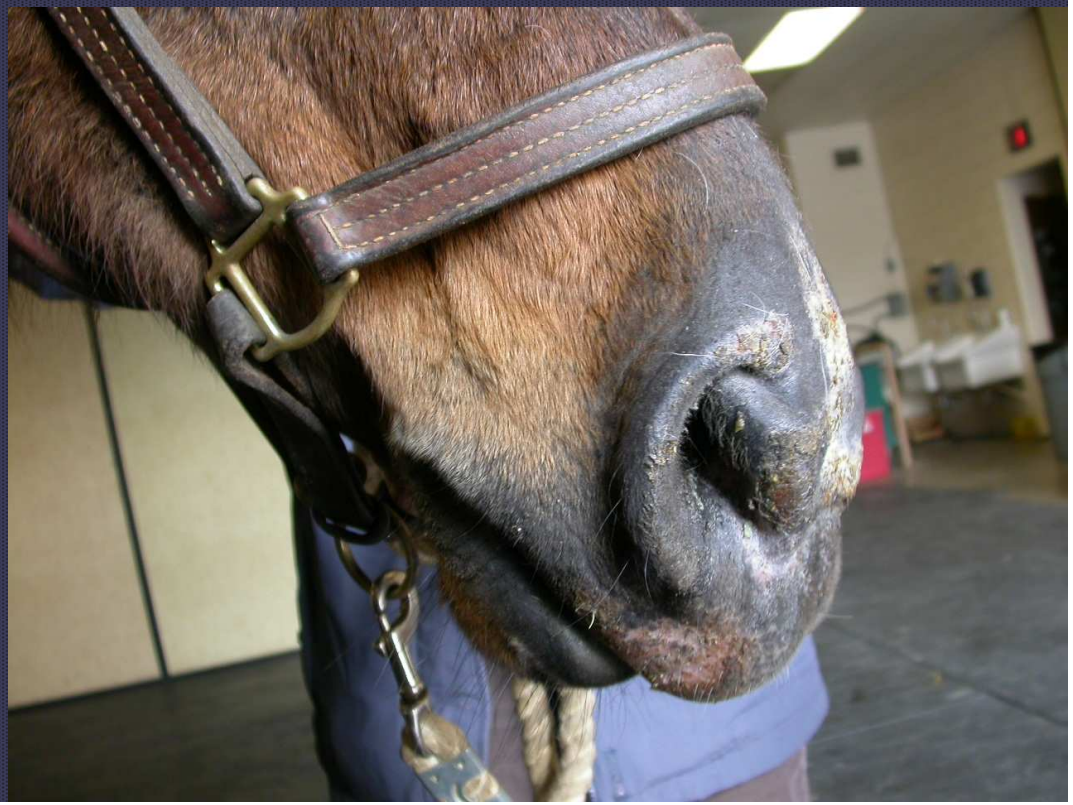
Bullous Pemphigoid

- Acquired autoantibody to component of hemidesmosome
- BP180/BPAG2
- Poor prognosis in horses
- Three cases reported-euthanized
- Transient vesicles→ ulcers covered by crusts
- Lethargy and anorexia

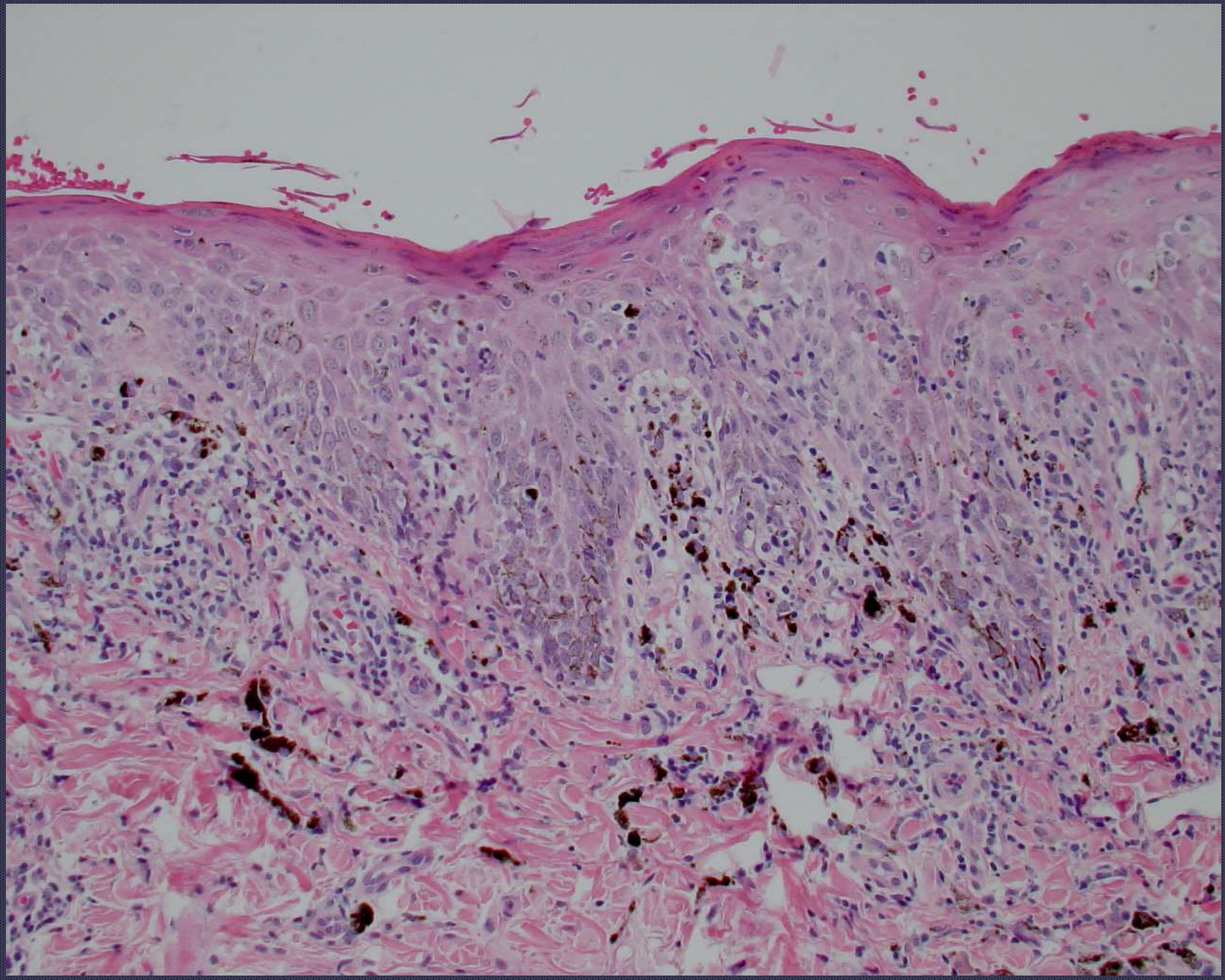


Erythema multiforme



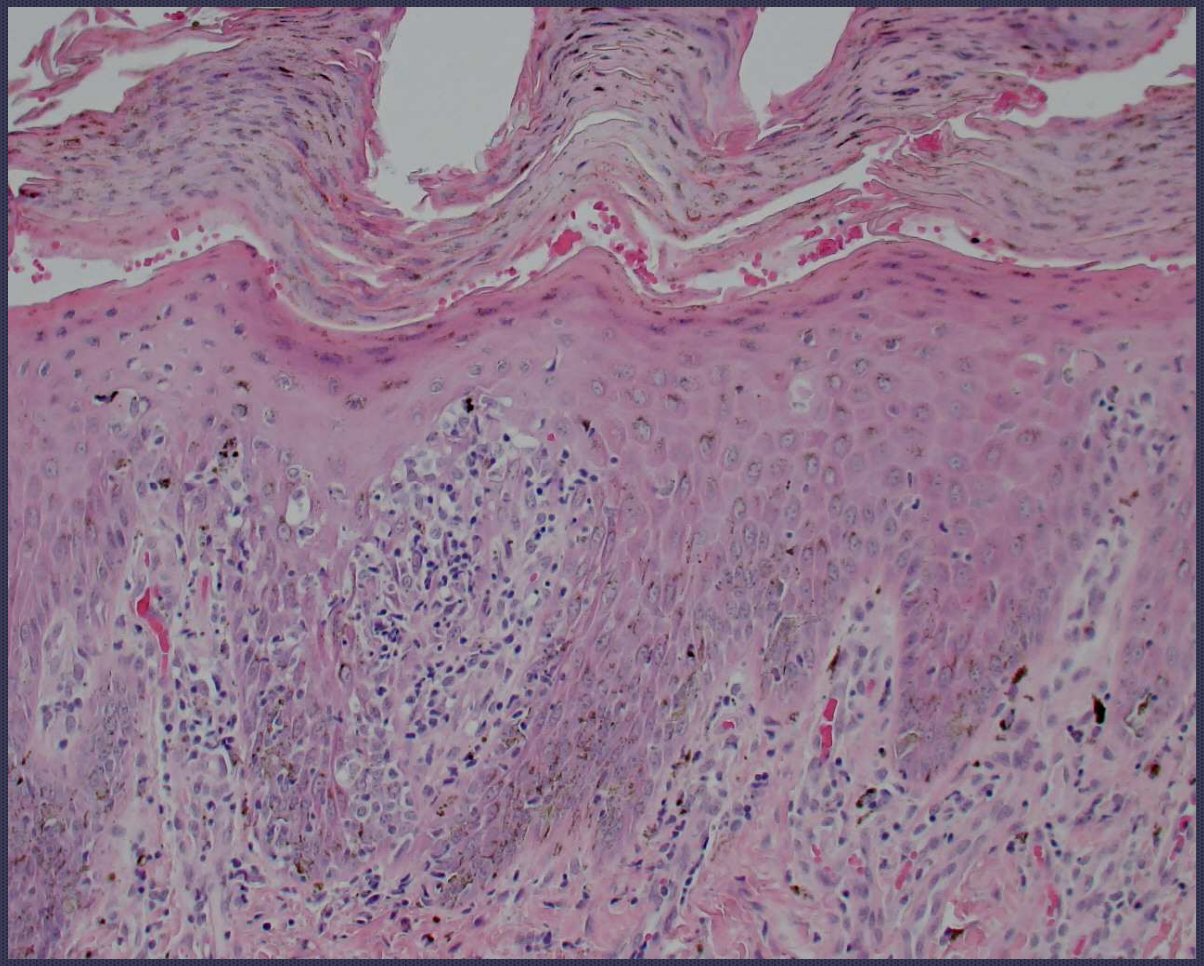


Cutaneous lupus erythematosus-localized



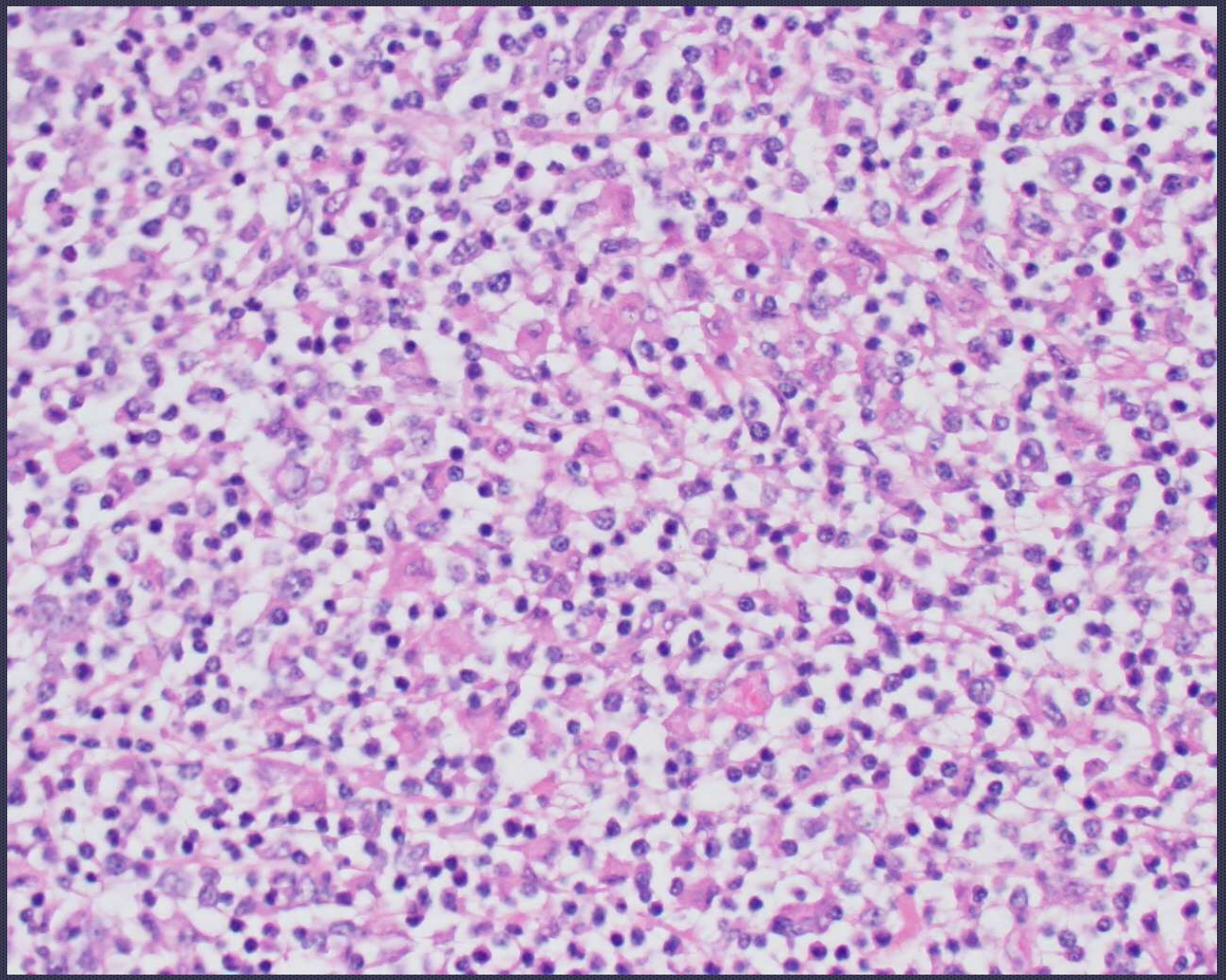
Interface dermatitis (Cutaneous lupus)

Equine cutaneous lupus

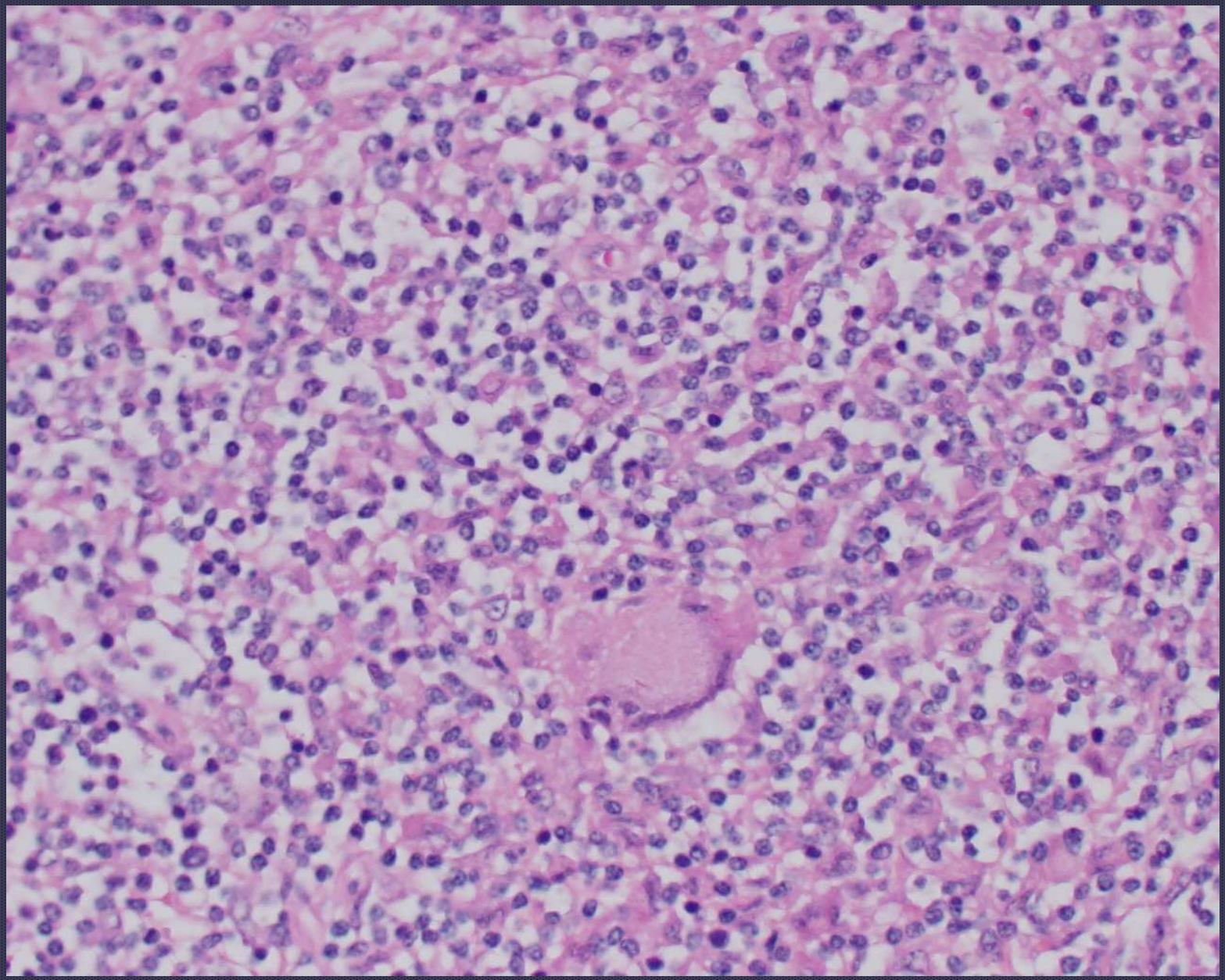


Equine Dermpath Part II

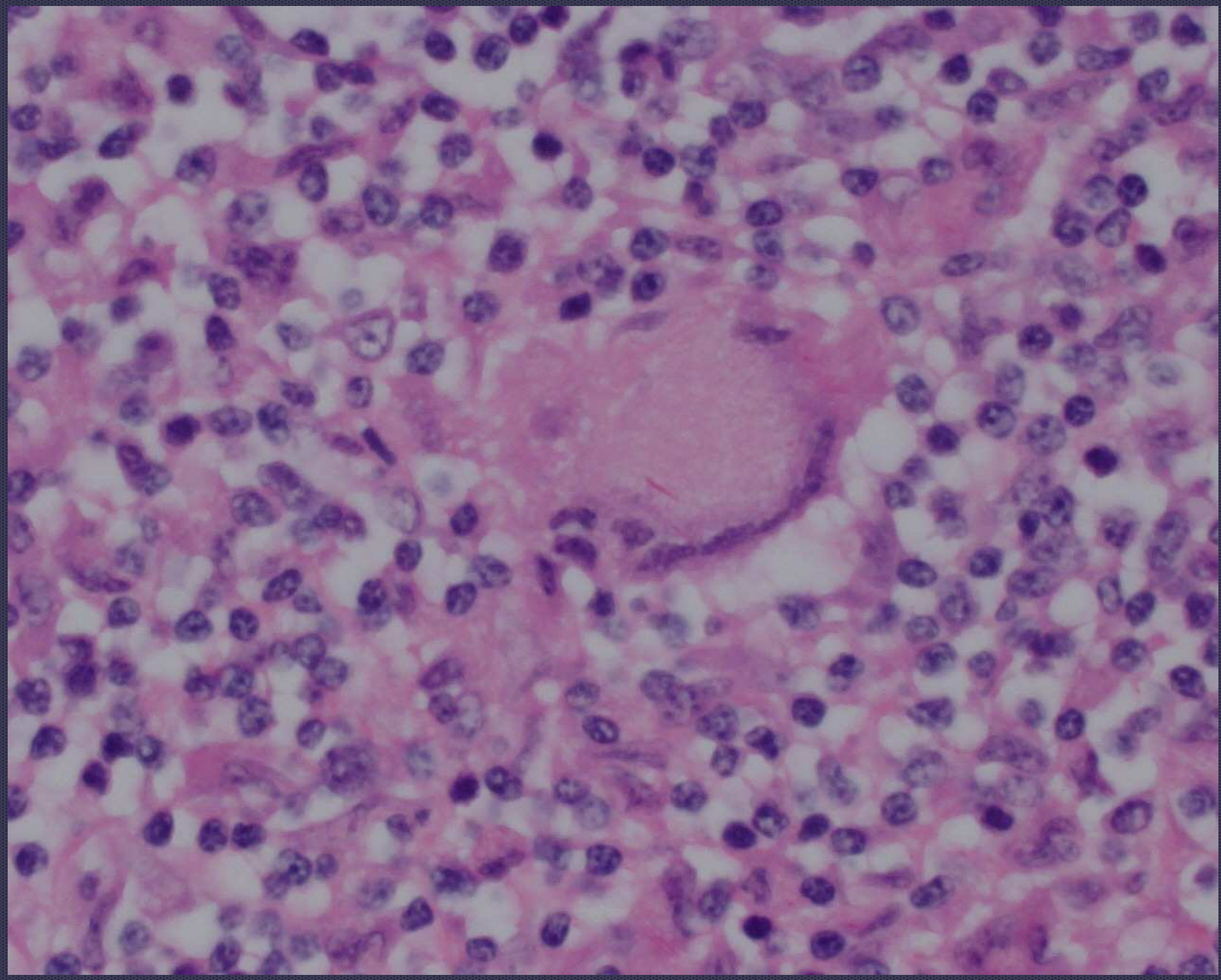
Nodular diseases



Lymphohistiocytic lymphoma



Lymphohistiocytic lymphoma



Lymphohistiocytic lymphoma (note mixed cell type and giant cells)

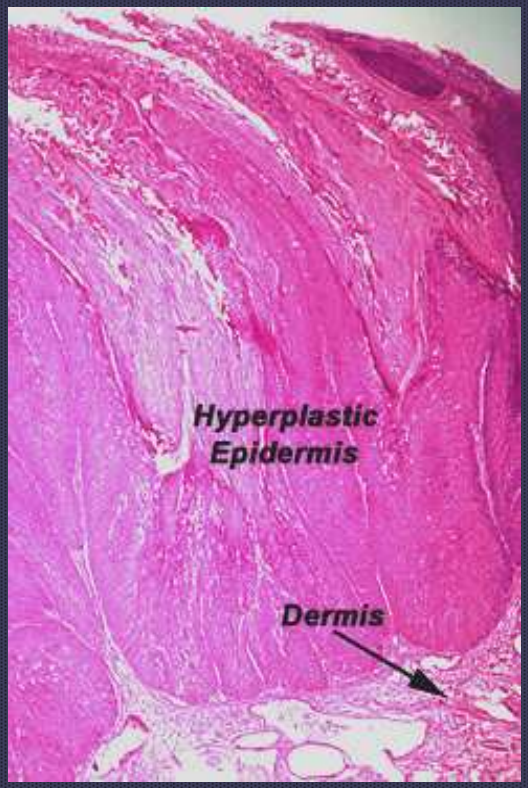
- *Meyer J, DeLay J and Bienzle D. Clinical , Laboratory and Histopathologic Features of Equine Lymphoma. Vet Pathol, 2006: 43: 914-924.*

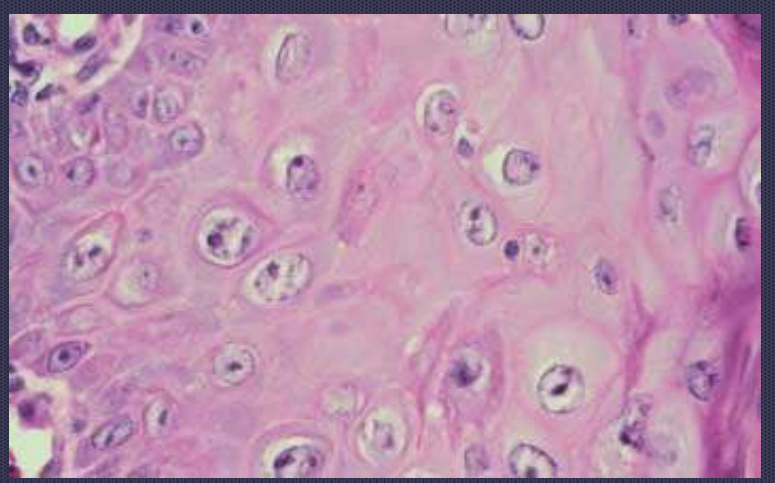
Congenital (nonviral) papilloma

- *White KS, Fuji RN, Valentine BA, et al. Equine congenital papilloma: pathological findings and results of papillomavirus immunohistochemistry in five cases. Veterinary Dermatology, 2004; 15:240-4.*

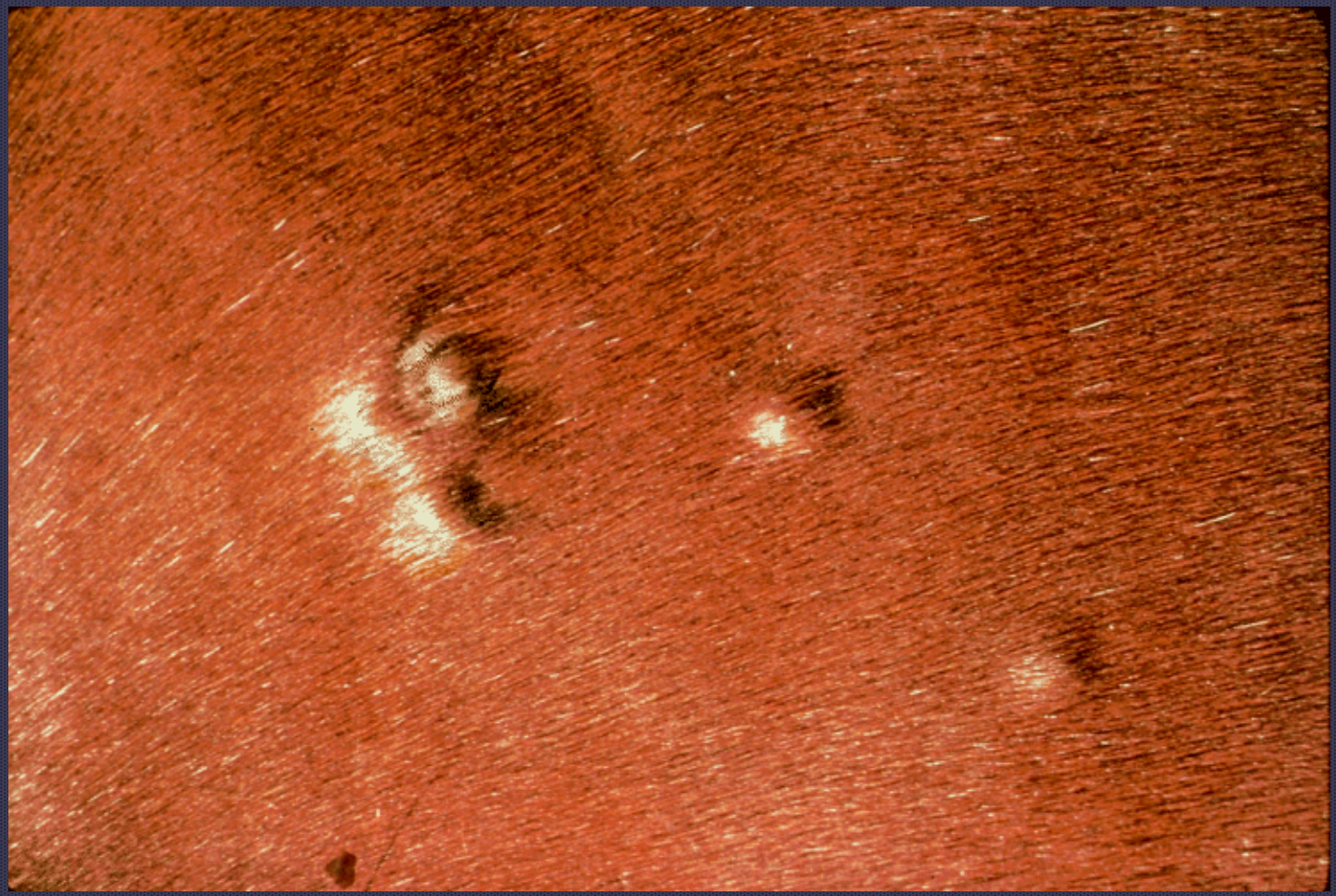
Aural plaque

Papillomavirus infection



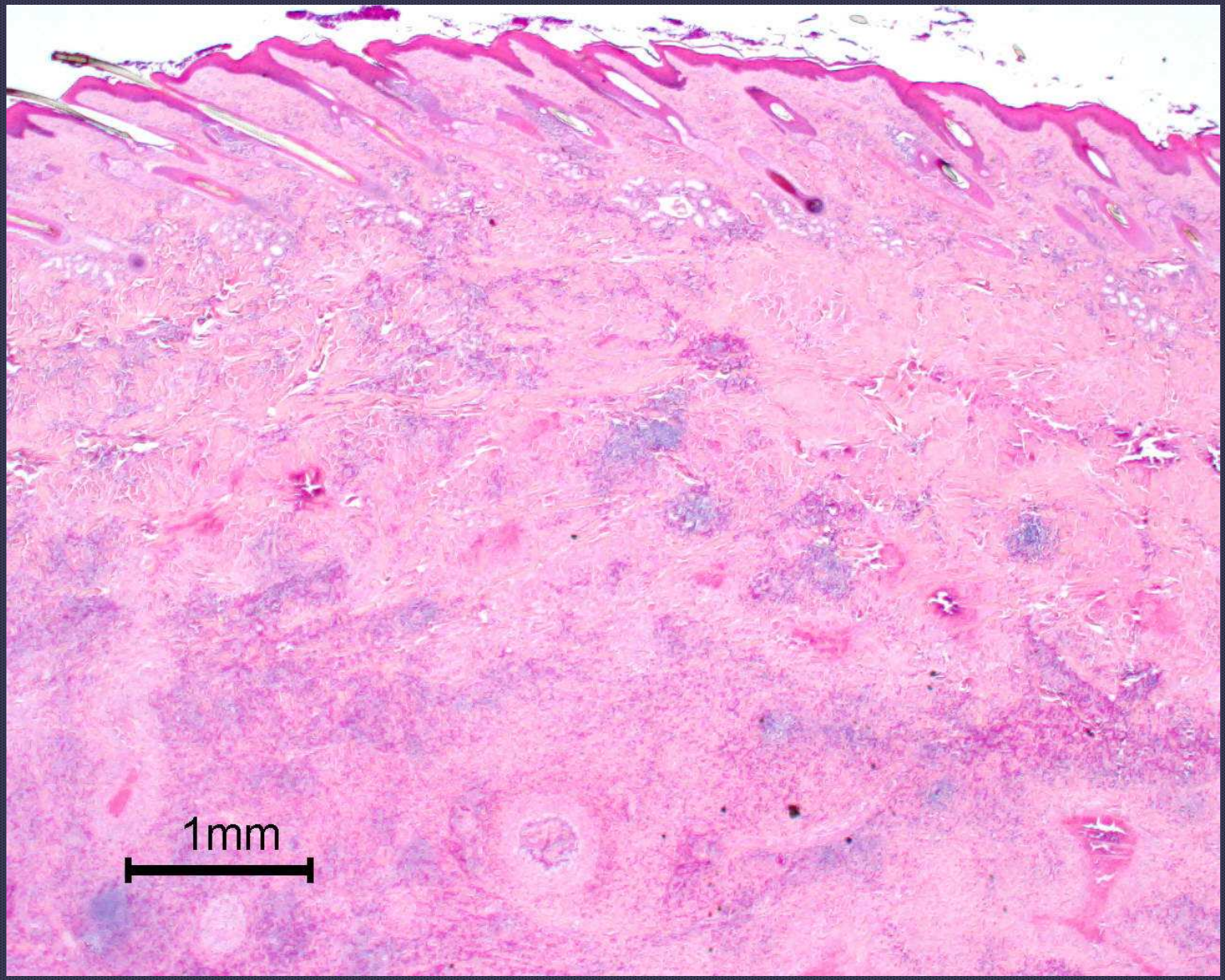


- **Postey, RC et. al. Evaluation of equine papillomas, aural plaques, and sarcoids for the presence of Equine papillomavirus DNA and Papillomavirus antigen,** Can J Vet Res. 2007 Jan;71(1):28-33

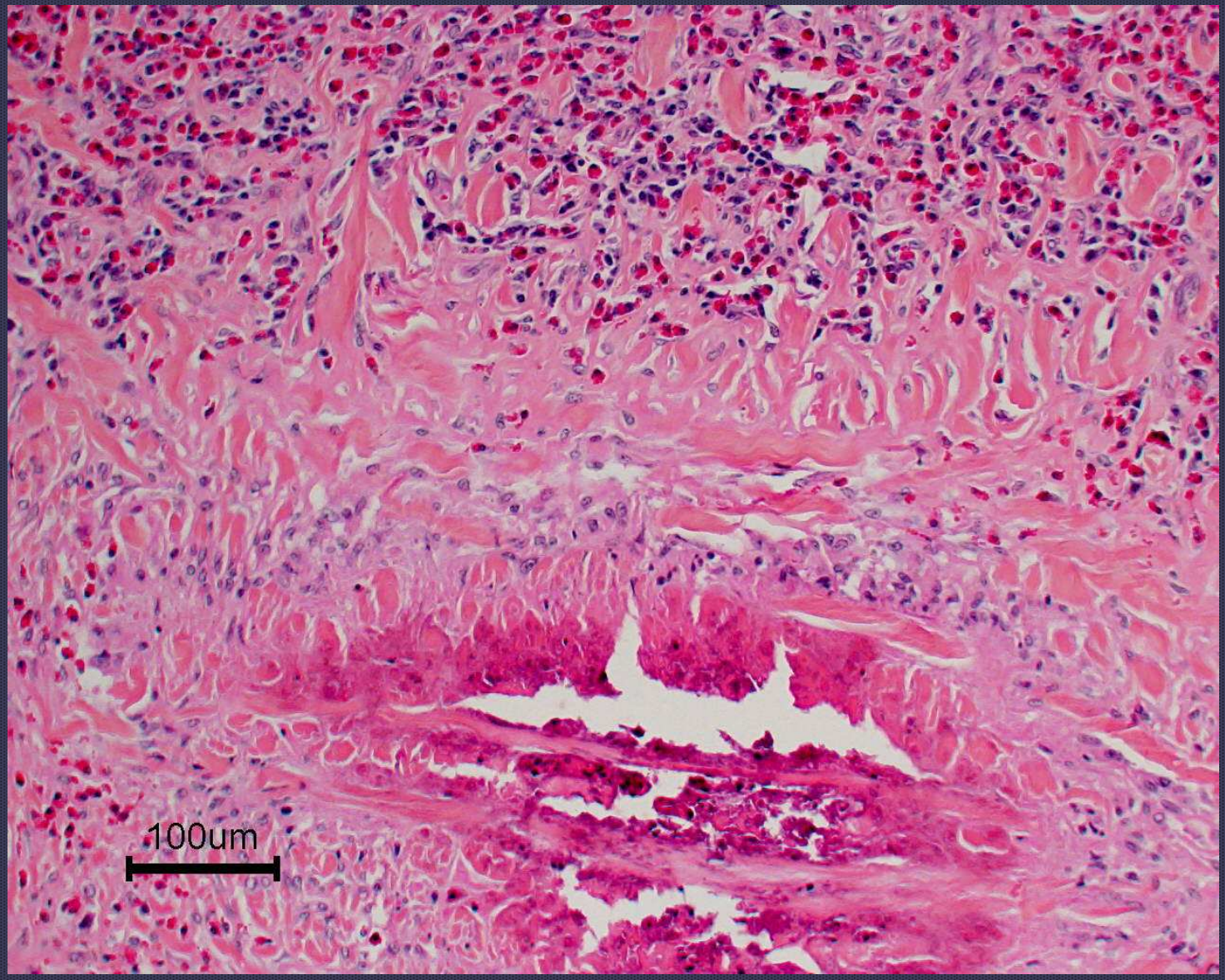


Eosinophilic granulomas

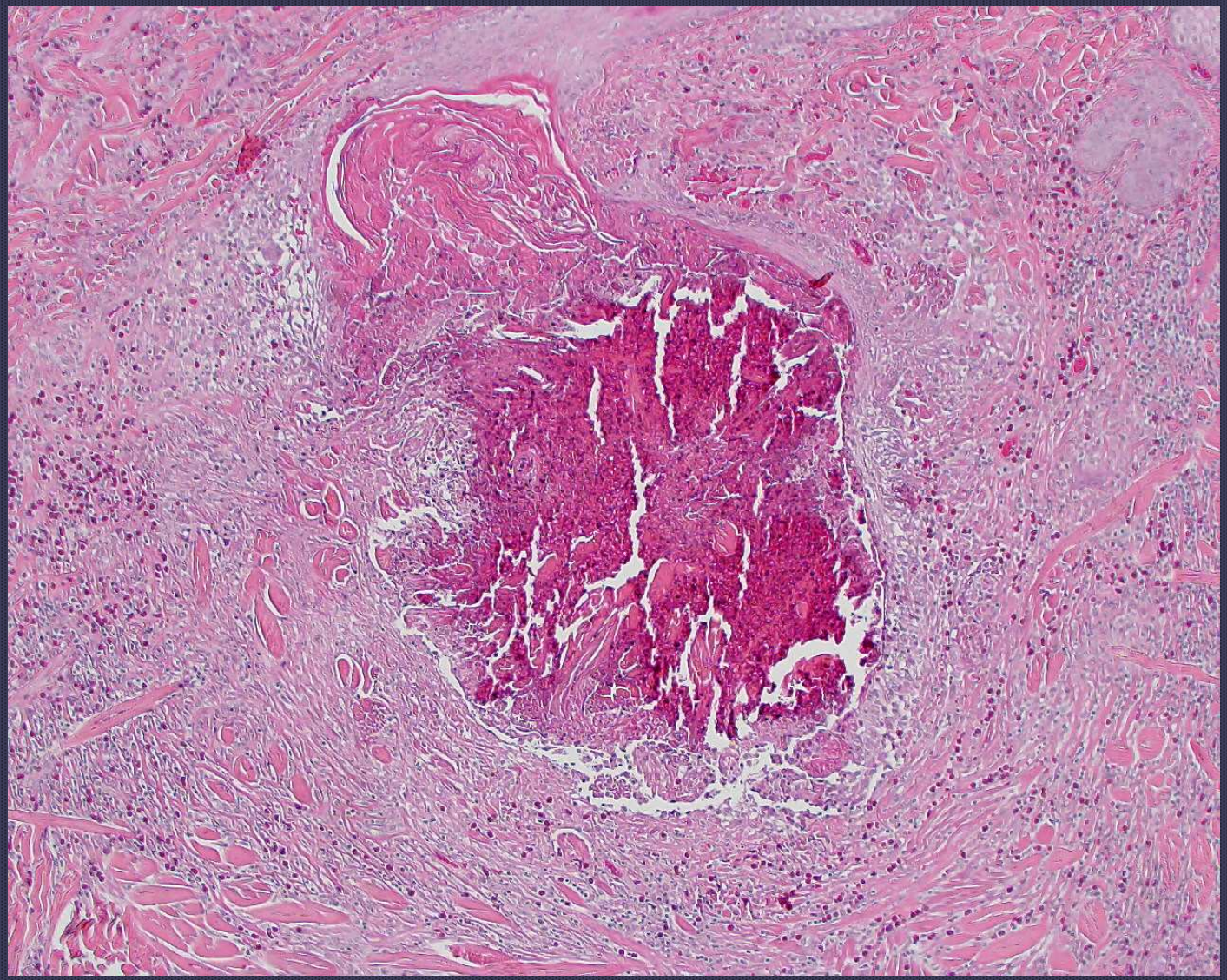
Stannard's notes
Vet Derm Sept 2000



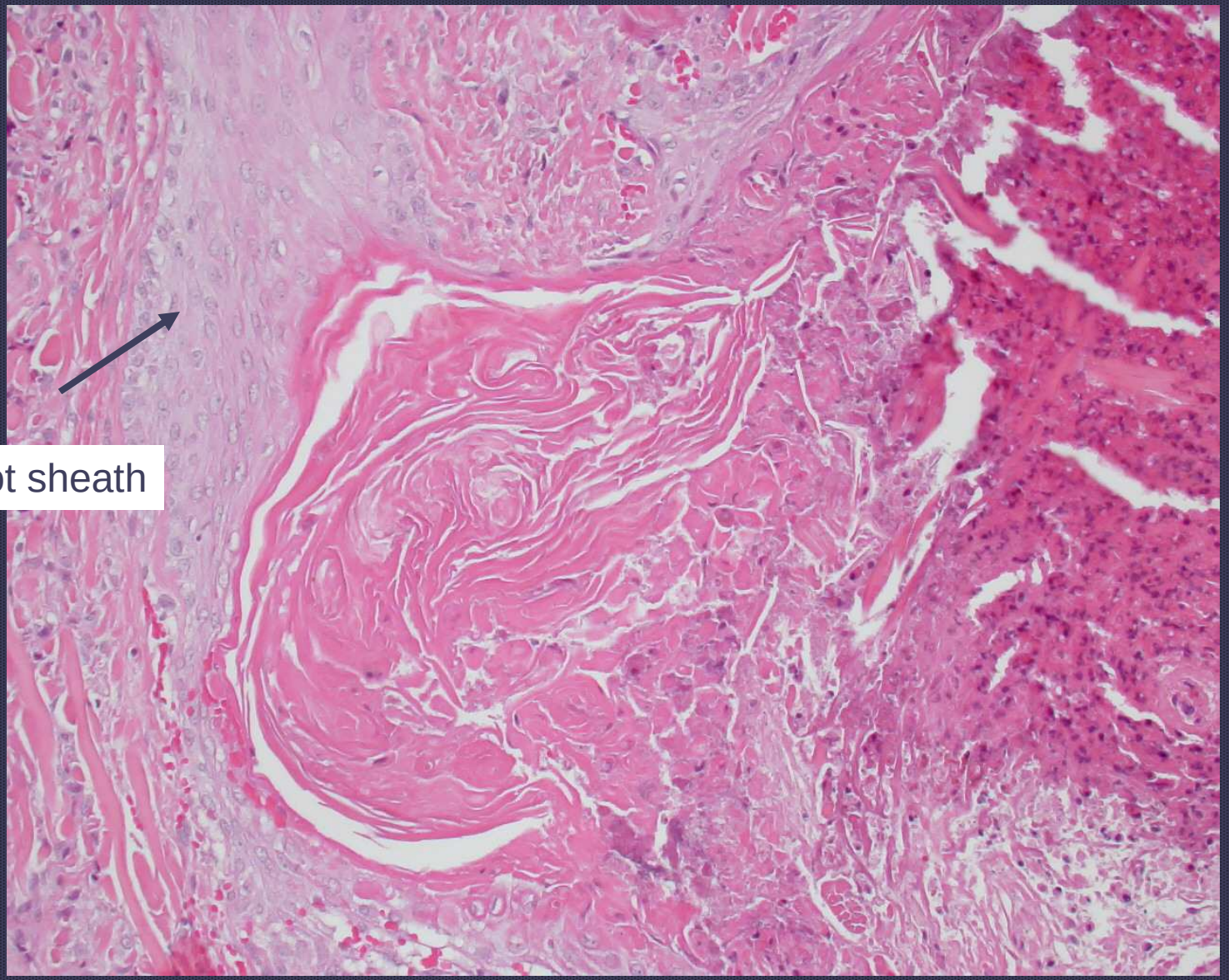
Eosinophilic granuloma



Collagen flame figures in eosinophilic granuloma



This case shows transfollicular elimination of the collagen



Outer root sheath

This case shows transfollicular elimination of the collagen

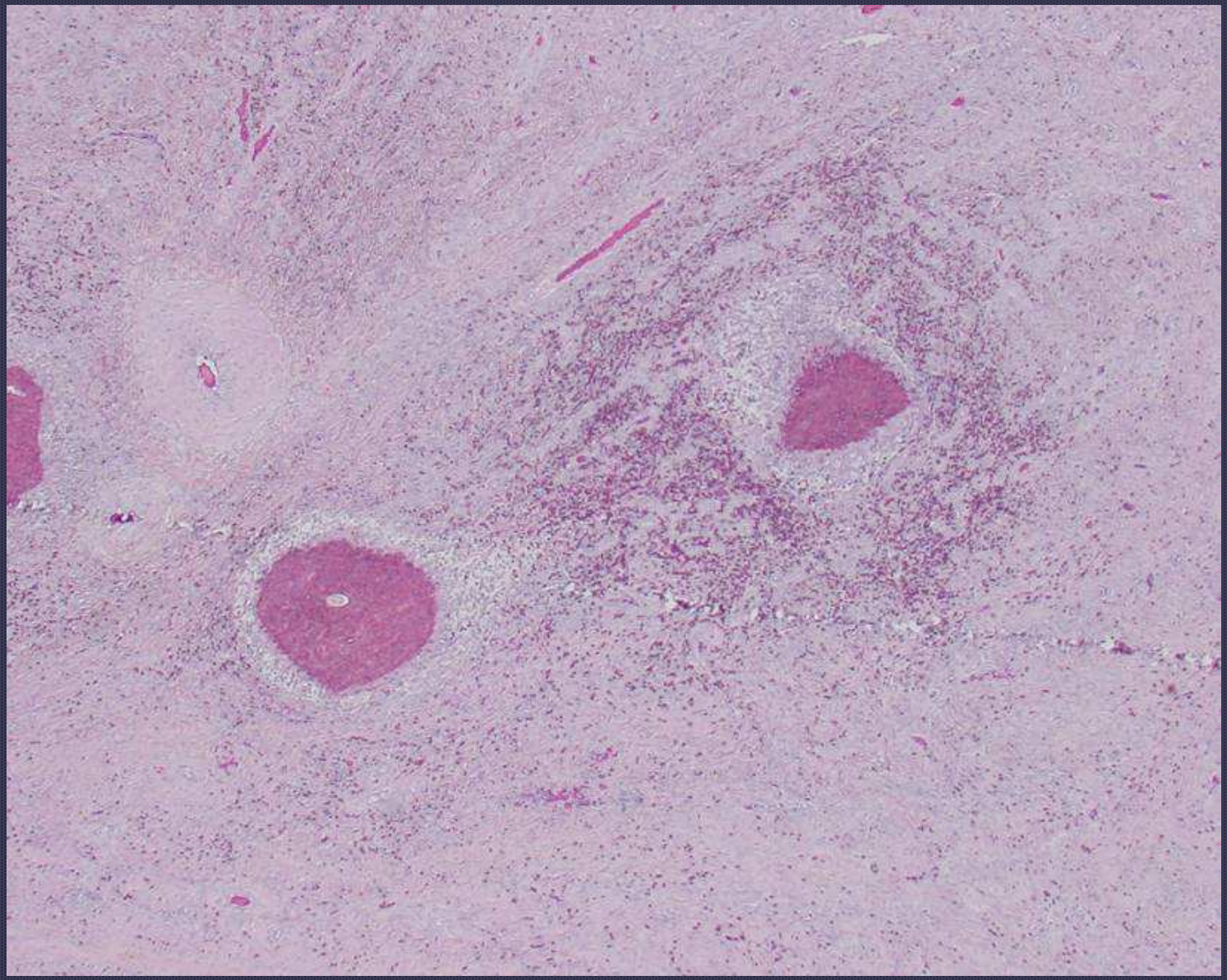
- *Slovis NM, Watson JL, Affolter VK. Injection site eosinophilic granulomas and collagenolysis in 3 horses. Journal of Veterinary Internal Medicine 1999; 13: 606-612.*

Sarcoid

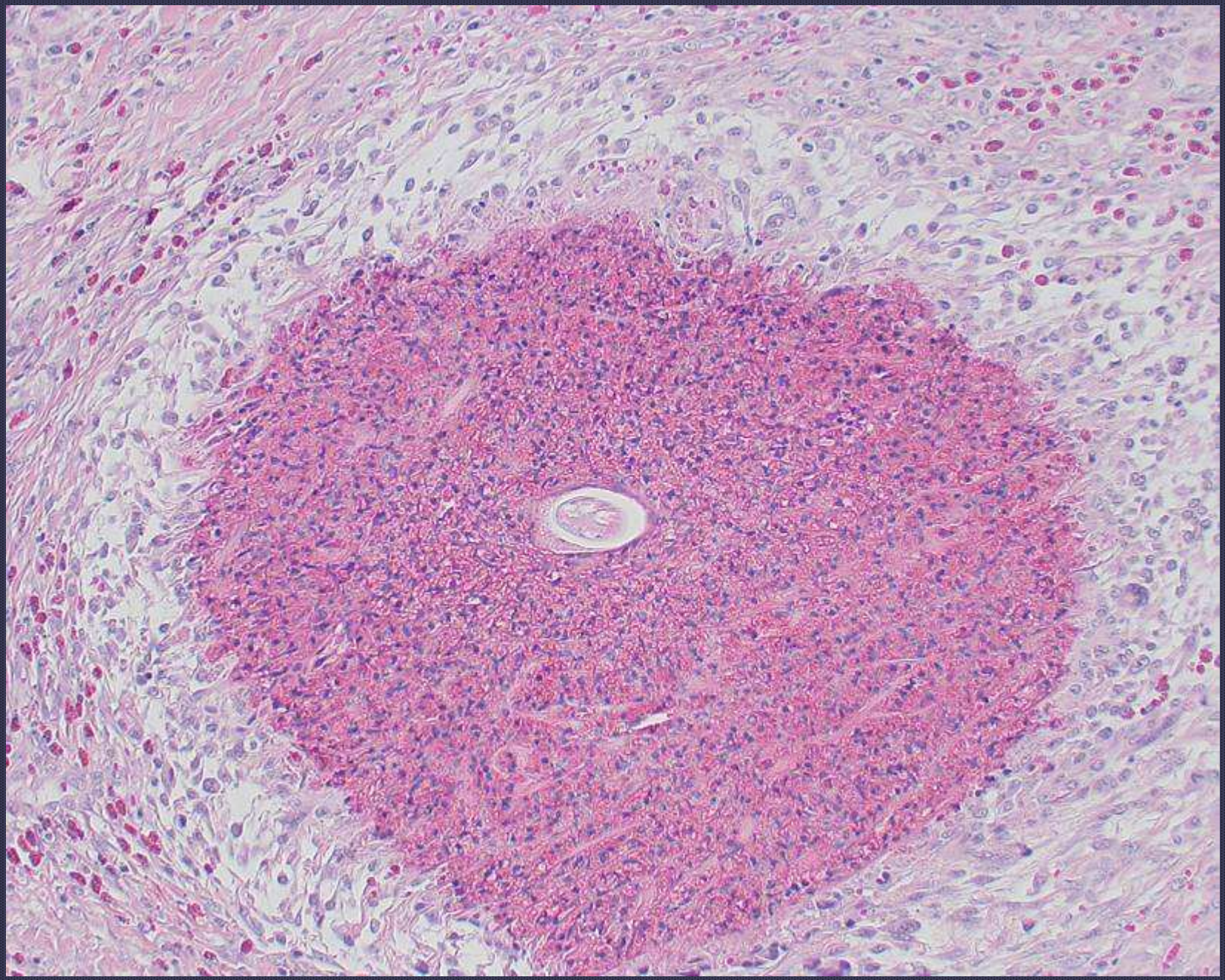
Sarcoid

Nogueira SAF, Torres SMF, *et al.* Efficacy of imiquimod 5% cream in the treatment of equine sarcoids: a pilot study, Vet Derm 2006; 17: 259-265

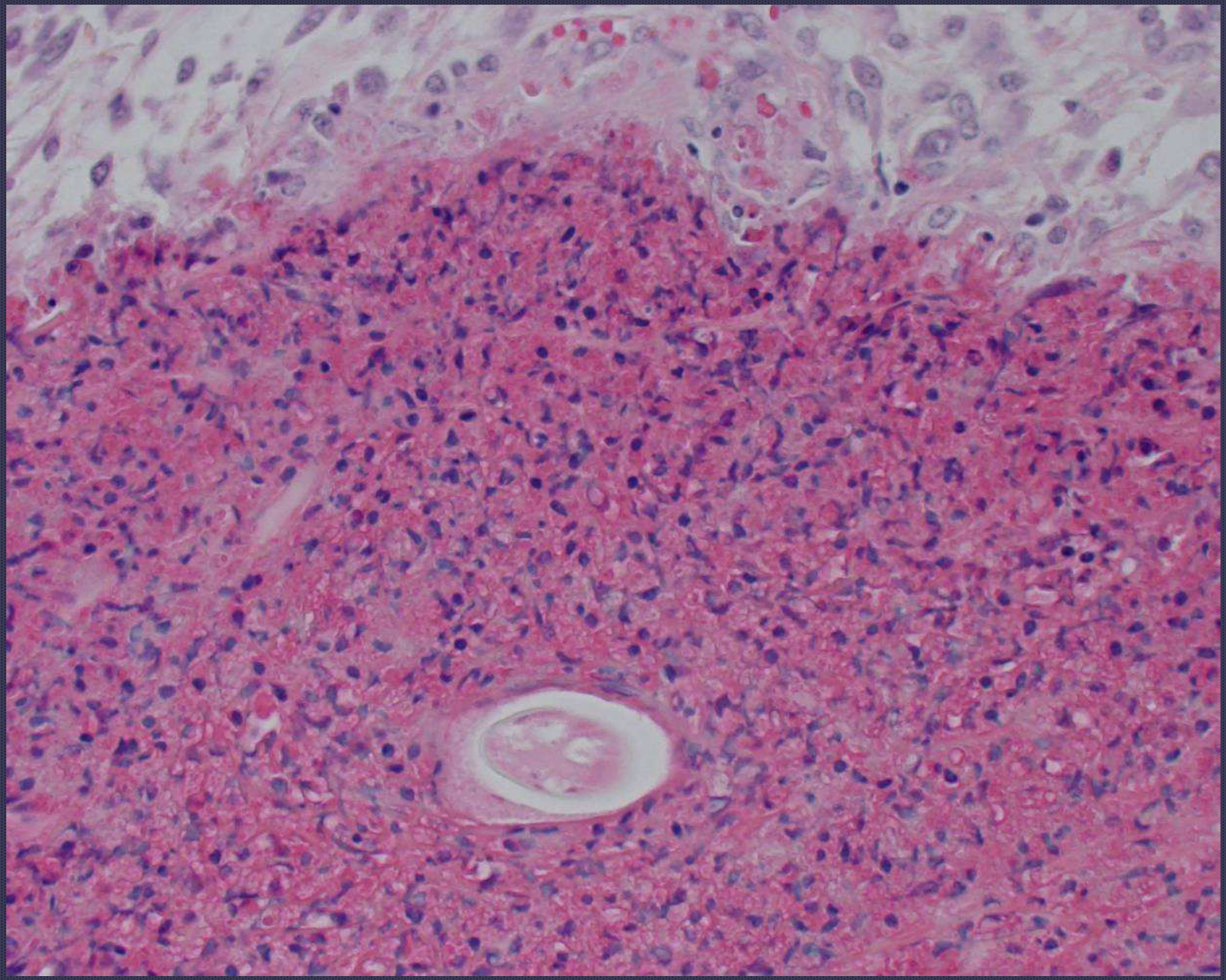
Habronemiasis



Habronemiasis



Habronemiasis- necrotic focus with nematode larva



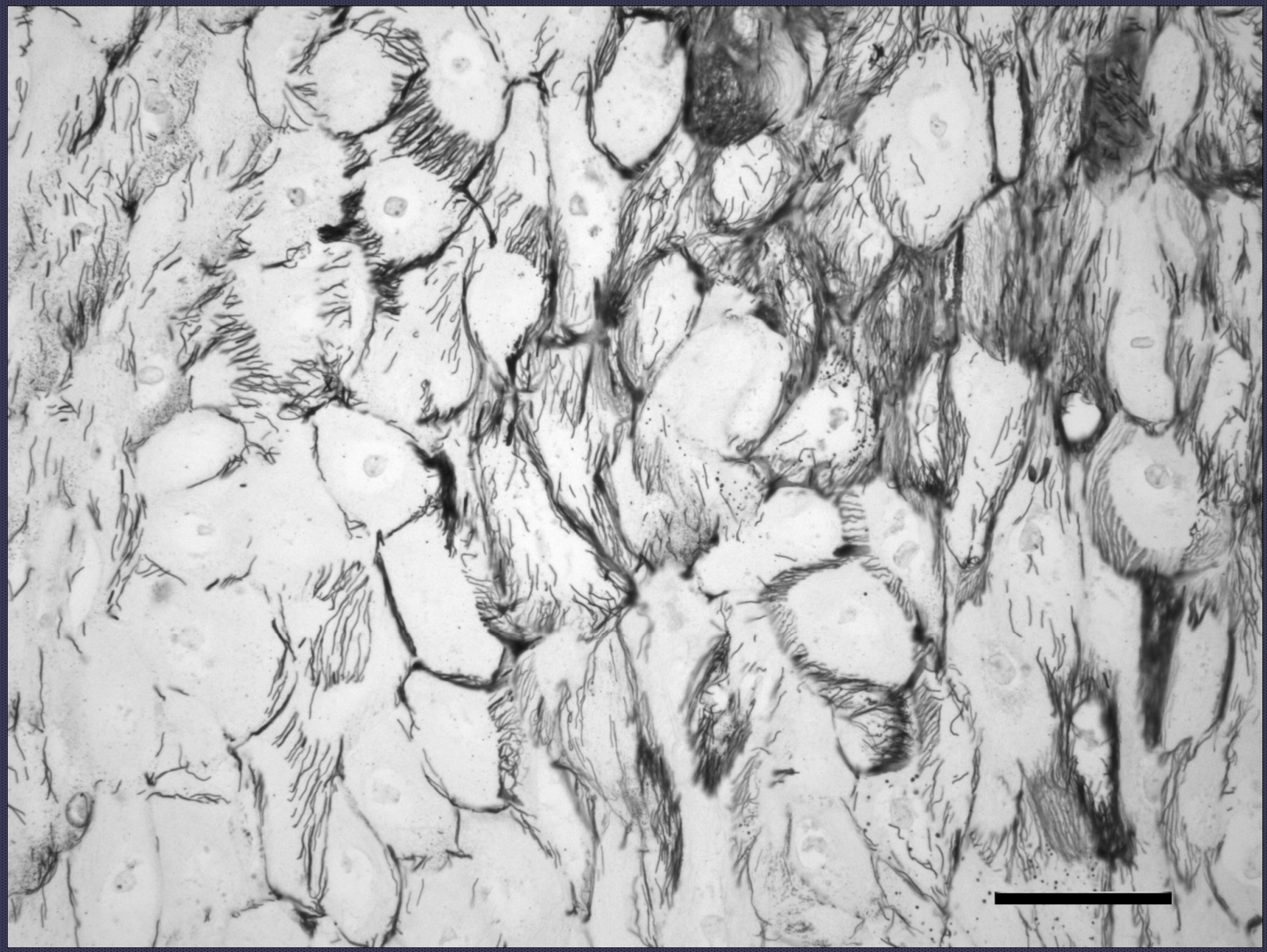
Habronemiasis- necrotic focus with nematode larva

Bovine hairy heel warts

- CM Nagamine, F Castro, B Buchanan, J Schumacher, and LE Craig. **Proliferative pododermatitis (canker) with intralesional spirochetes in three horses** *J Vet Diagn Invest* 2005 17: 269-271.

Proliferative pododermatitis with spirochetes

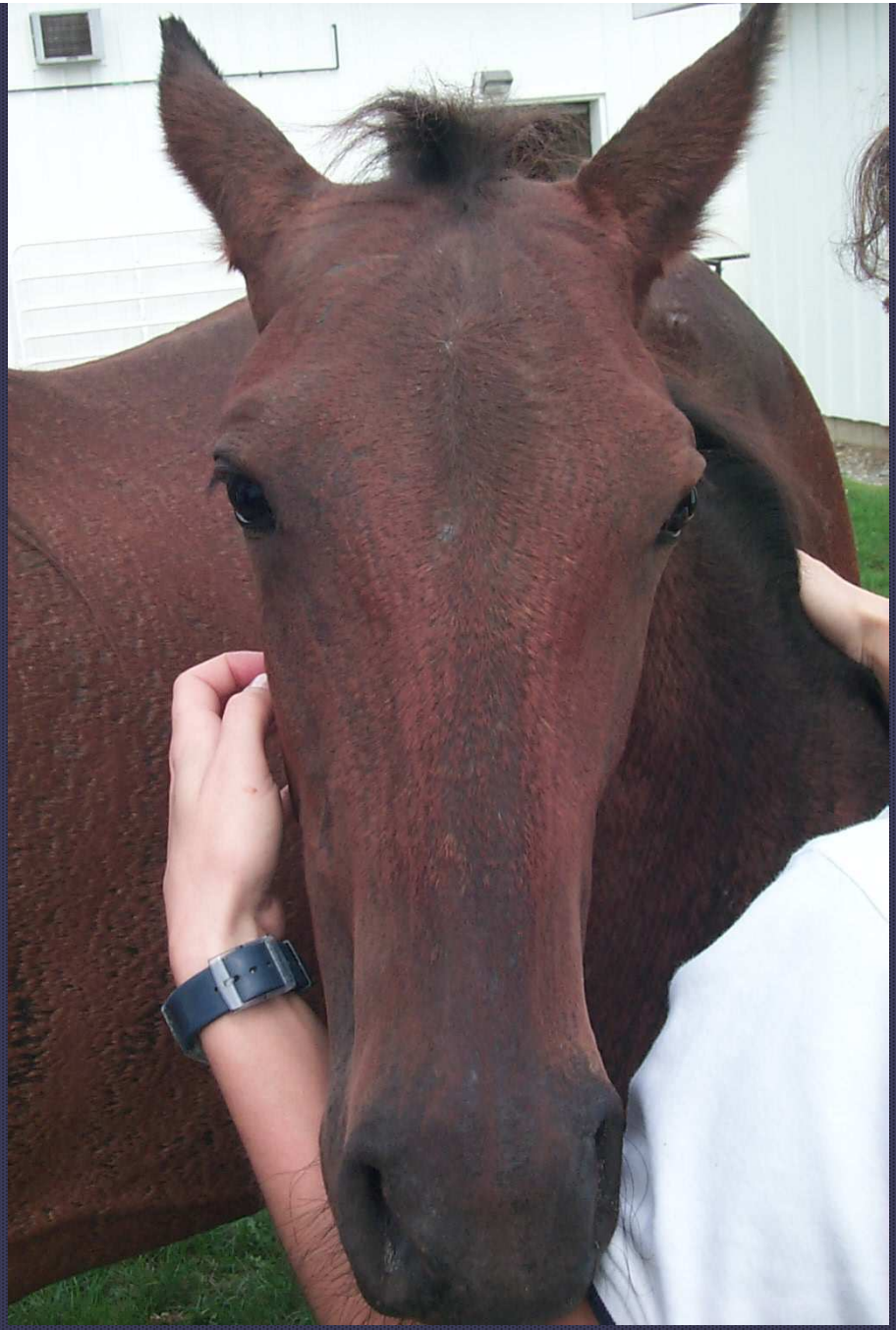
Courtesy of Linden Craig, University of Tenn



Proliferative pododermatitis
with spirochetes

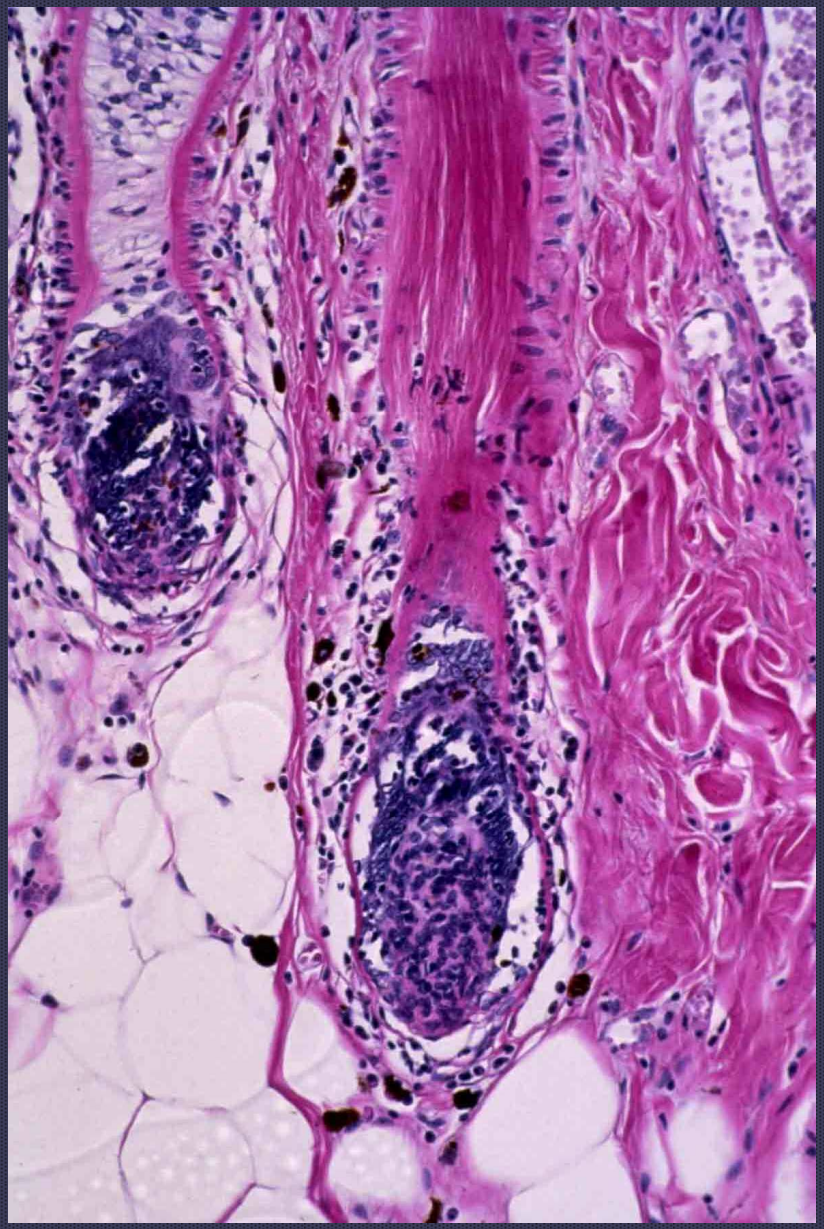
Alopecia in the horse

Alopecia areata



Alopecia areata

Alopecia areata

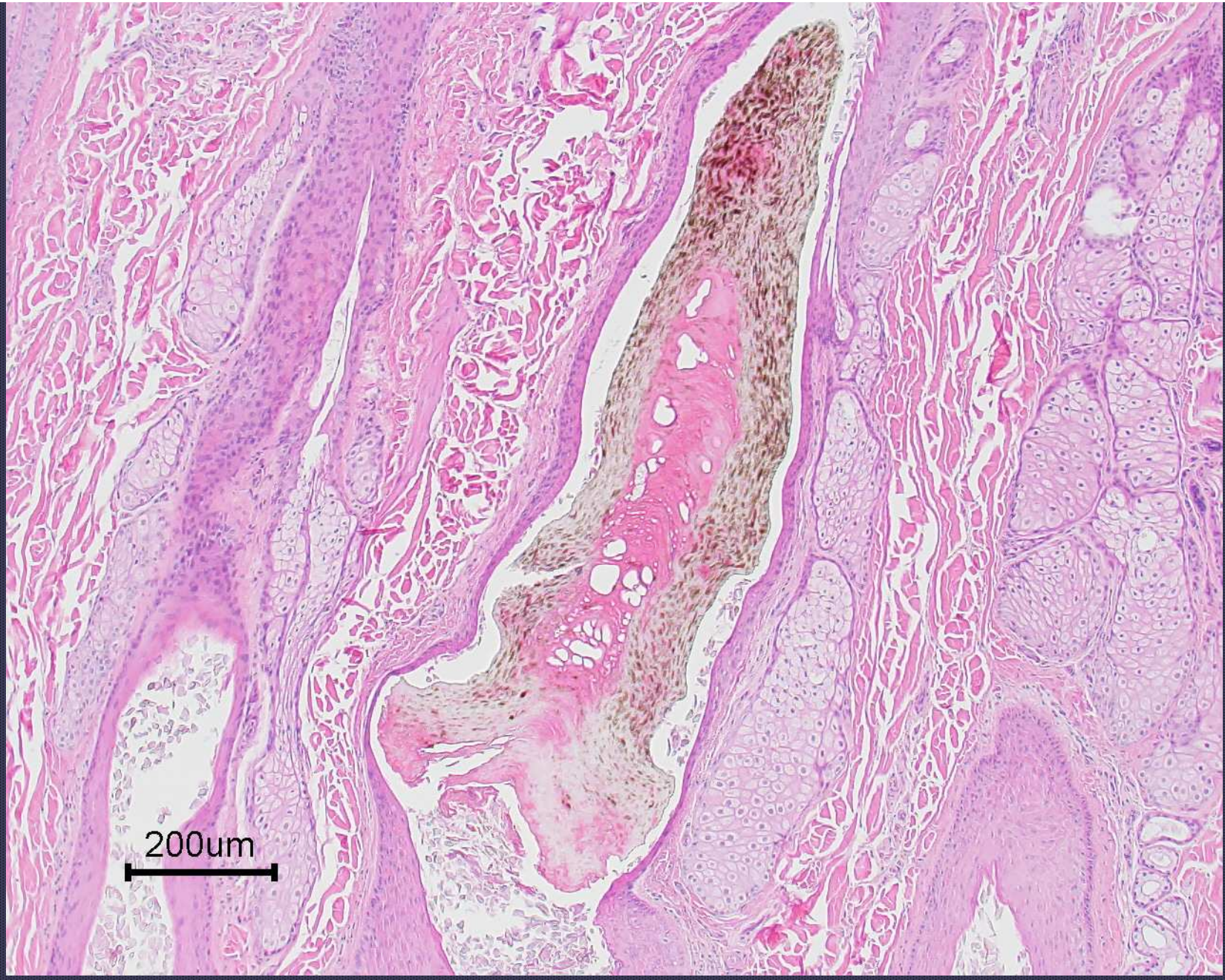


Lymphocytic bulbitis

Follicular dysplasia (Mane and Tail Dystrophy)

Follicular dysplasia (Mane and Tail Dystrophy)

Follicular dysplasia (Mane and Tail Dystrophy)



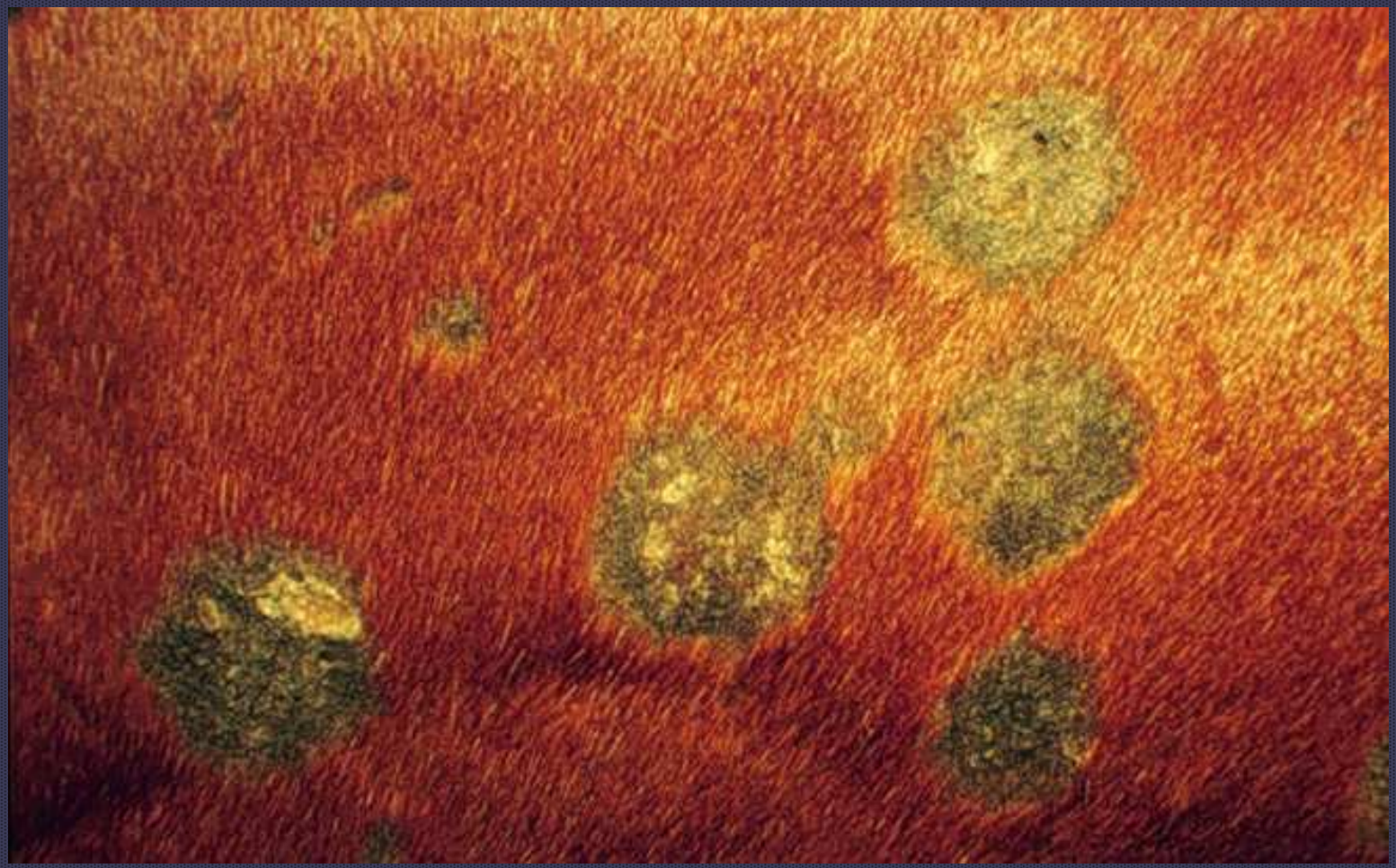
Follicular dysplasia (Mane and Tail Dystrophy)

Follicular dysplasia (mane and tail dystrophy)

Follicular dysplasia (mane and tail dystrophy)

Mane and Tail Dystrophy

- Recognized at birth or few weeks of age
- Short, brittle hair
- Abnormally shaped follicles with dystrophic shafts



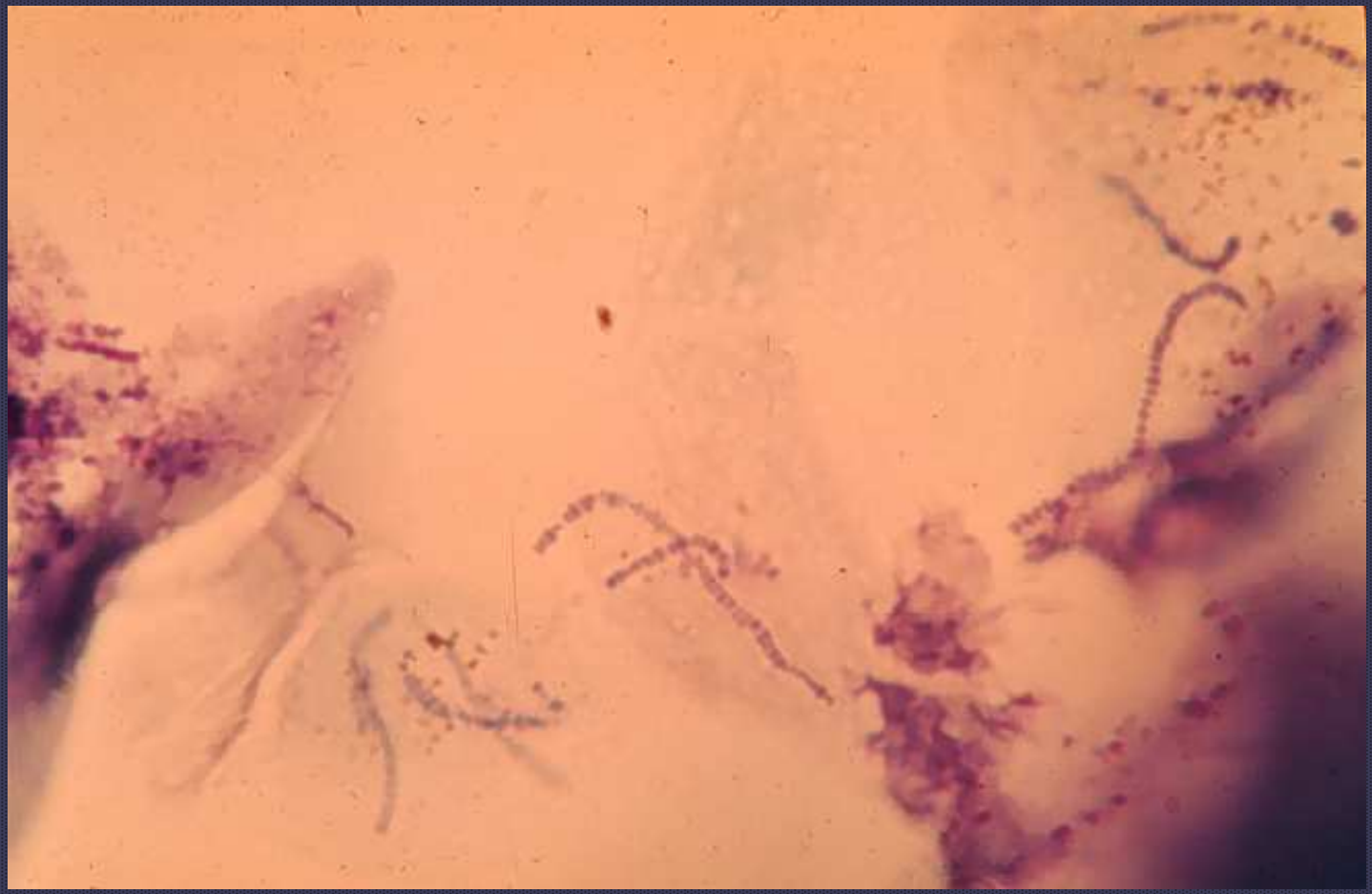
Dermatophytosis

Dermatophytosis

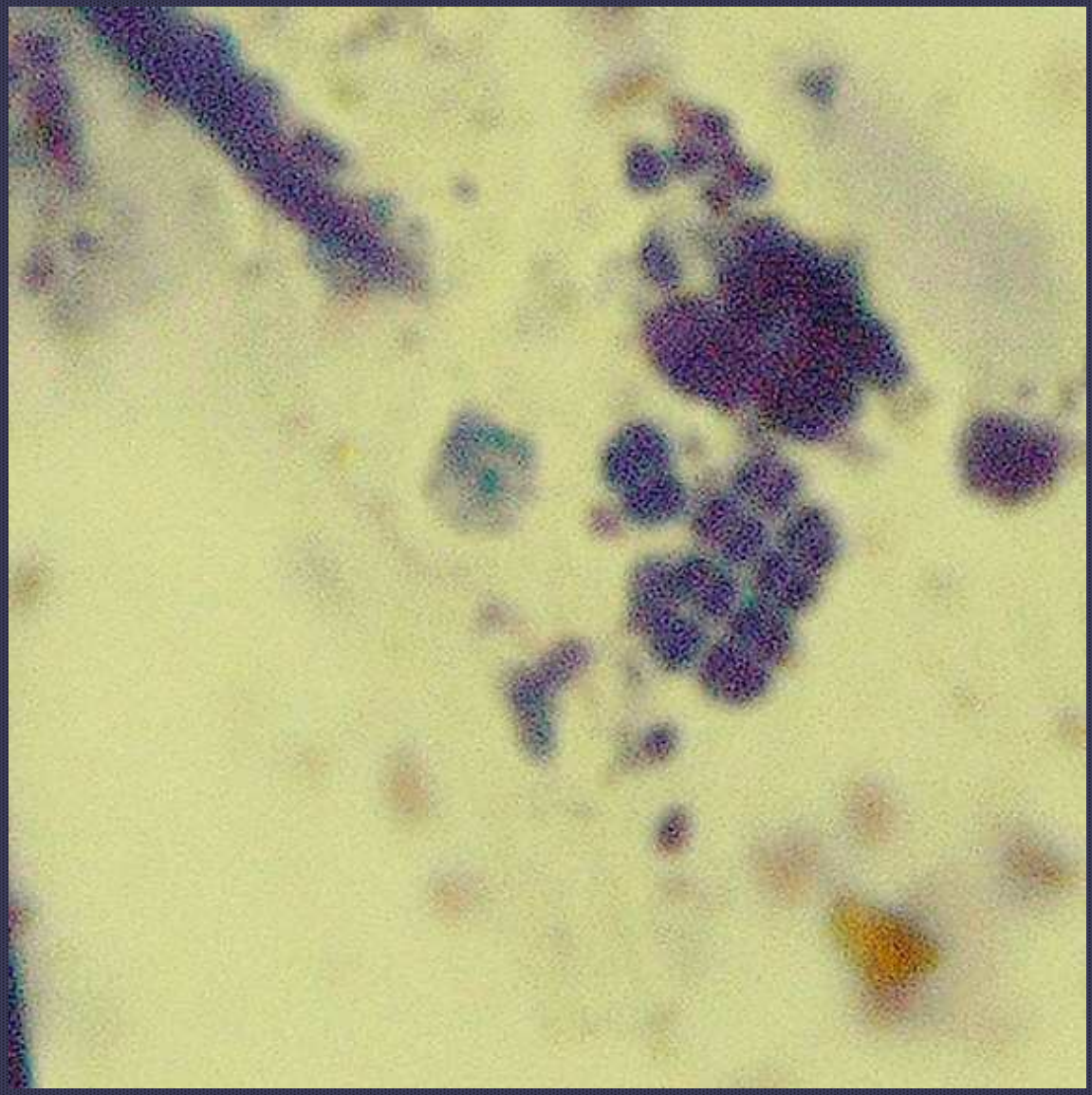
Trichophyton sp.

Dermatophilosis

Dermatophilosis

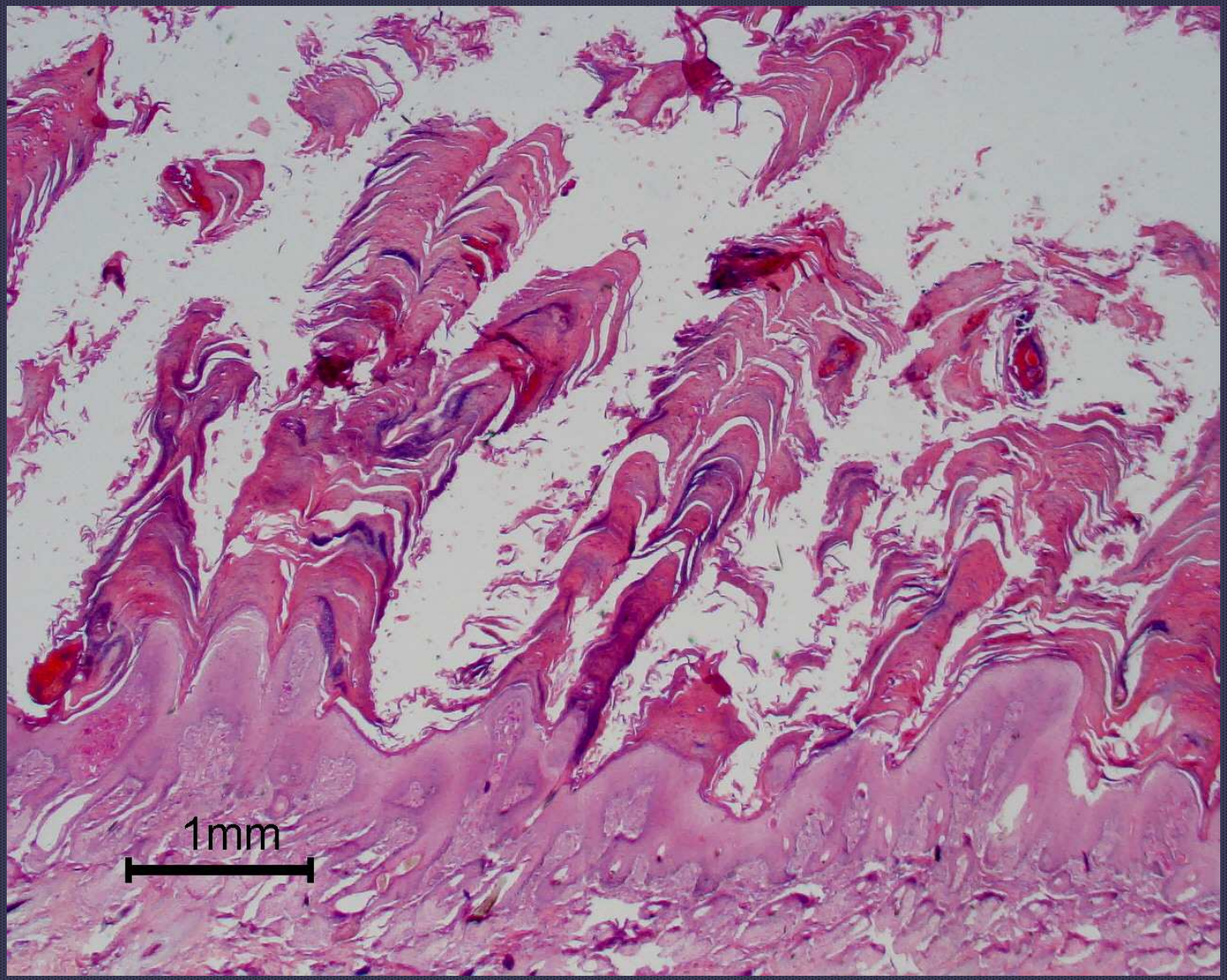


Dermatophilus congolensis

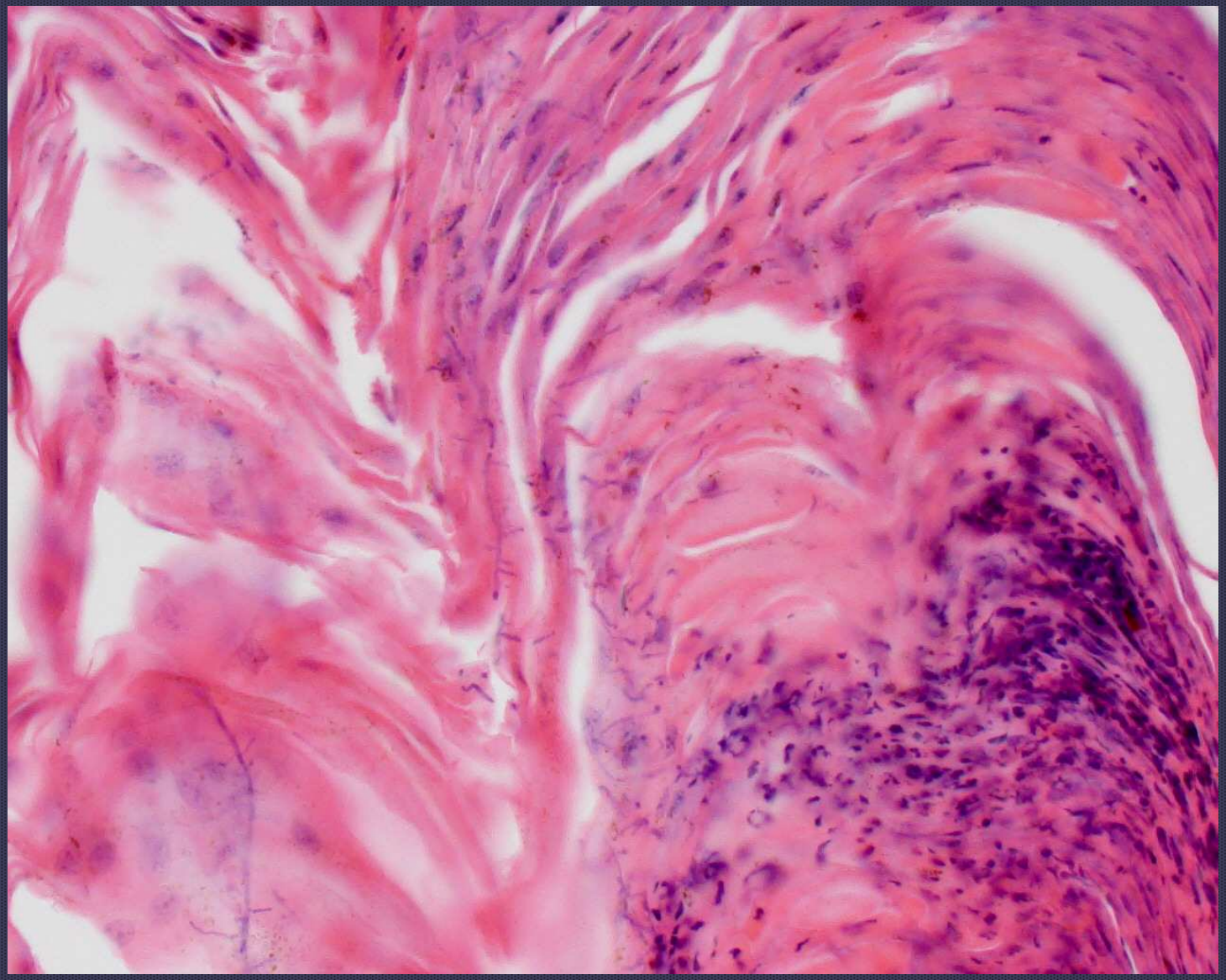


Dermatophilus congolensis

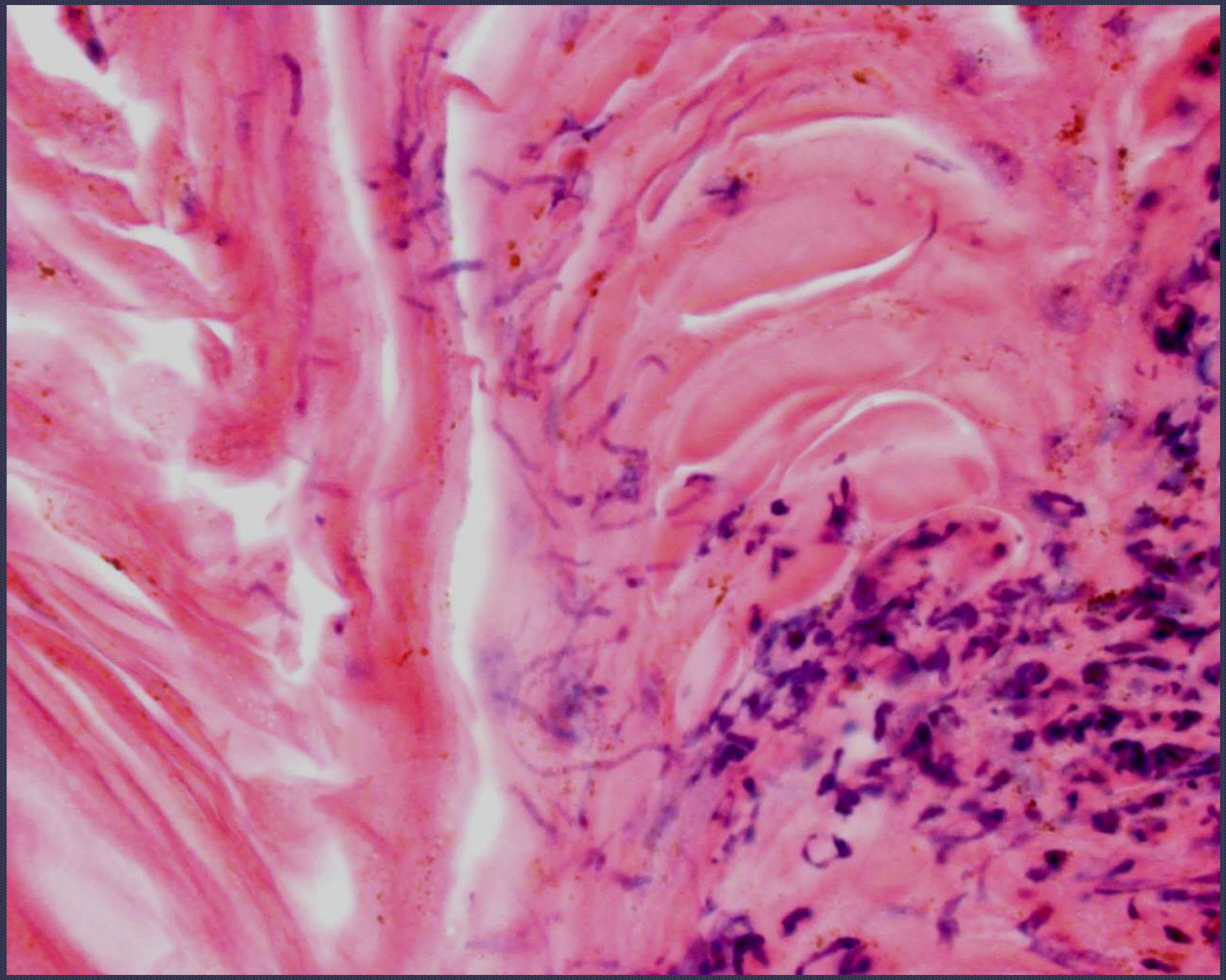
Dermatophilosis



Dermatophilosis



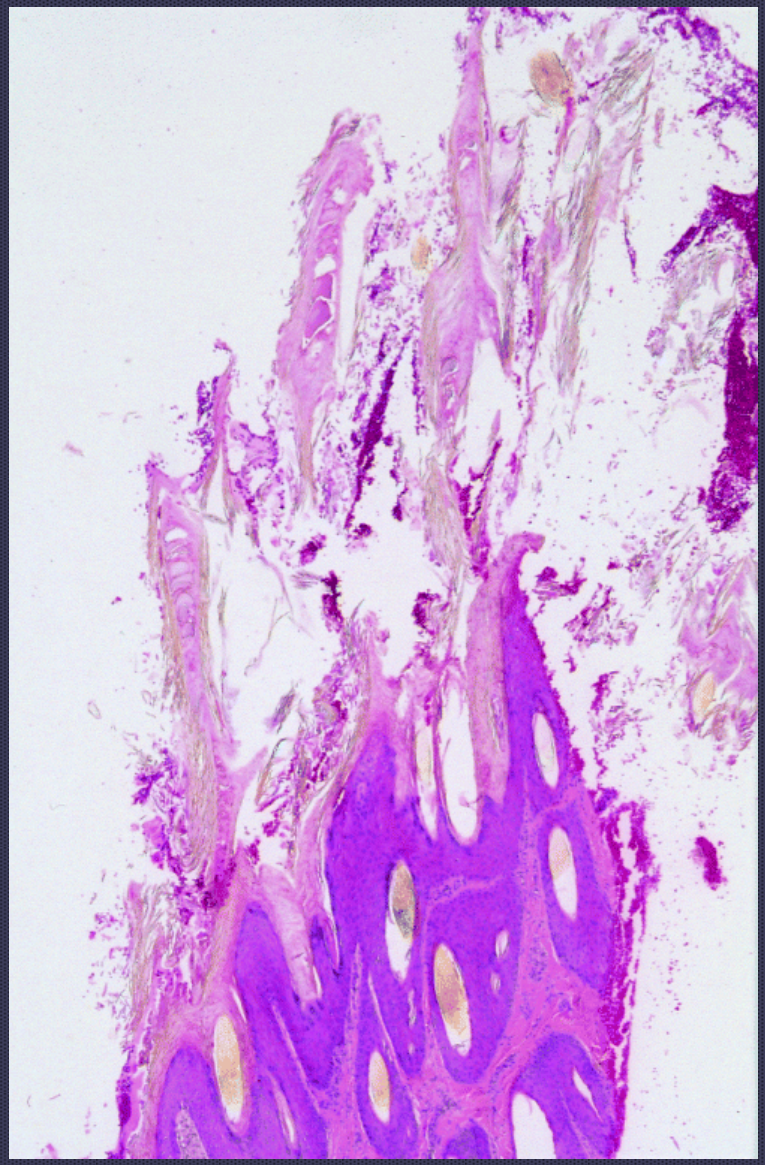
Dermatophilosis



Dermatophilosis

Miscellaneous disorders

Coronary Band dystrophy
Stannard's notes Vet Derm Sept 2000.



Coronary Band dystrophy
Stannard's notes Vet Derm Sept 2000.

Coronary Band dystrophy
Stannard's notes Vet Derm Sept 2000.

- *Menzies-Cow NJ, Bond R et.al. Cornonary band dystrophy in two horses. Veterinary Record, 2002; 150: 665-668.*

Grease heel

Courtesy of R. Cerundolo

Grease heel

Courtesy of R. Cerundolo

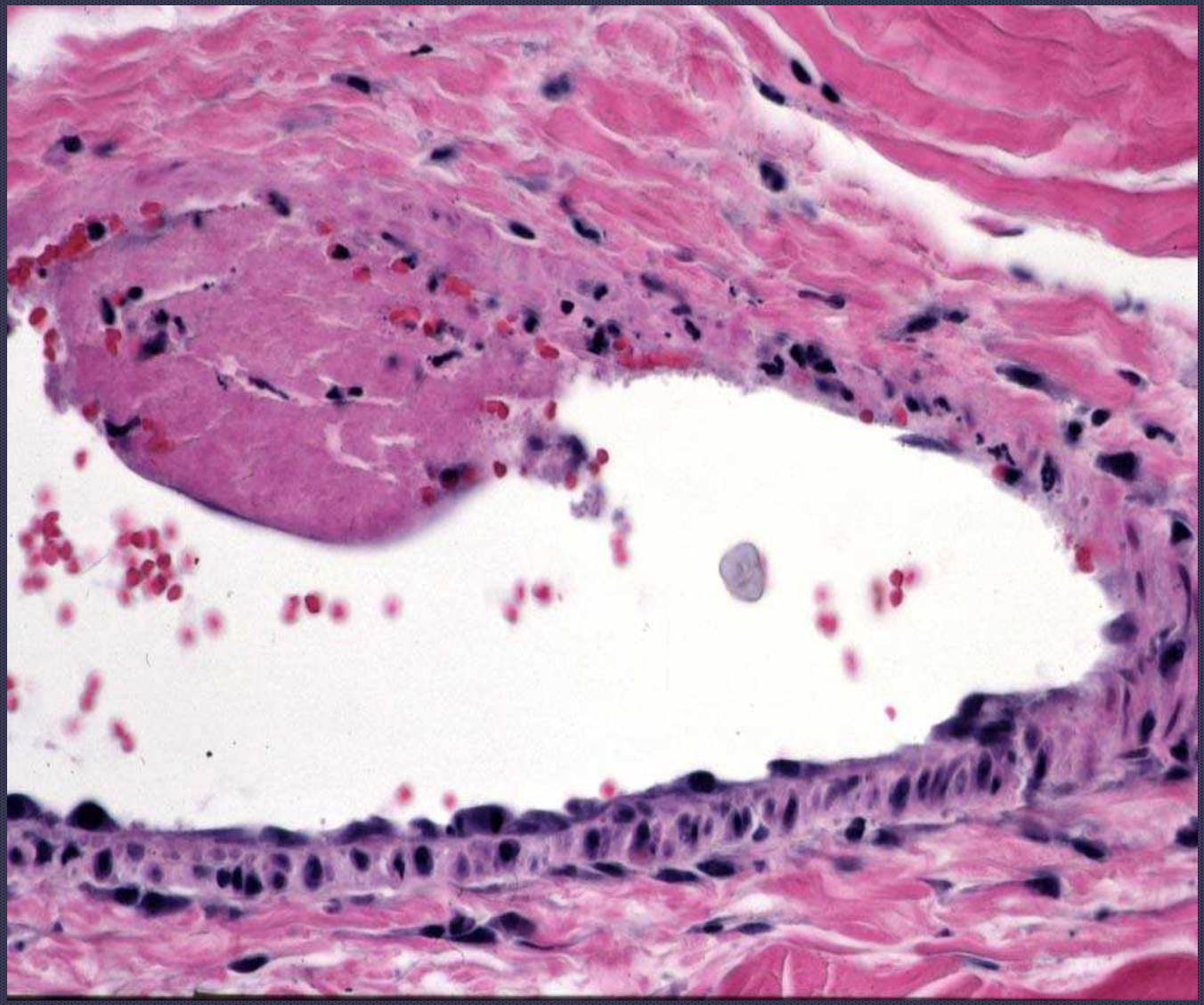
Grease heel

Courtesy of R. Cerundolo

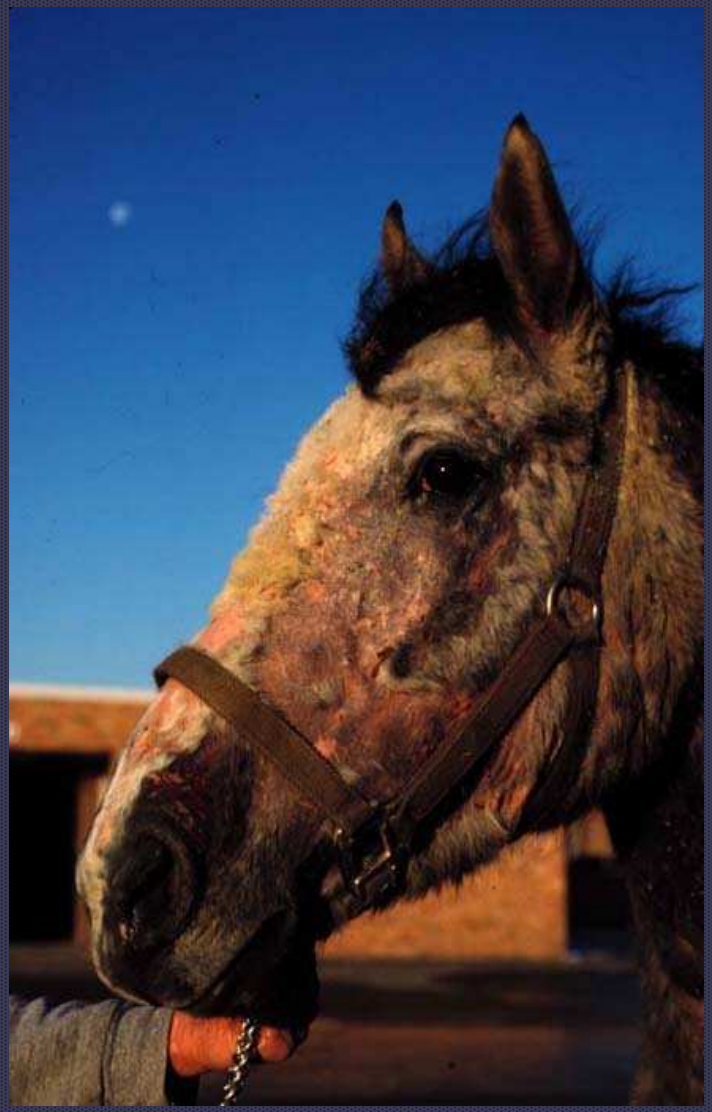
Idiopathic pastern dermatitis in a draft horse

Photosensitization

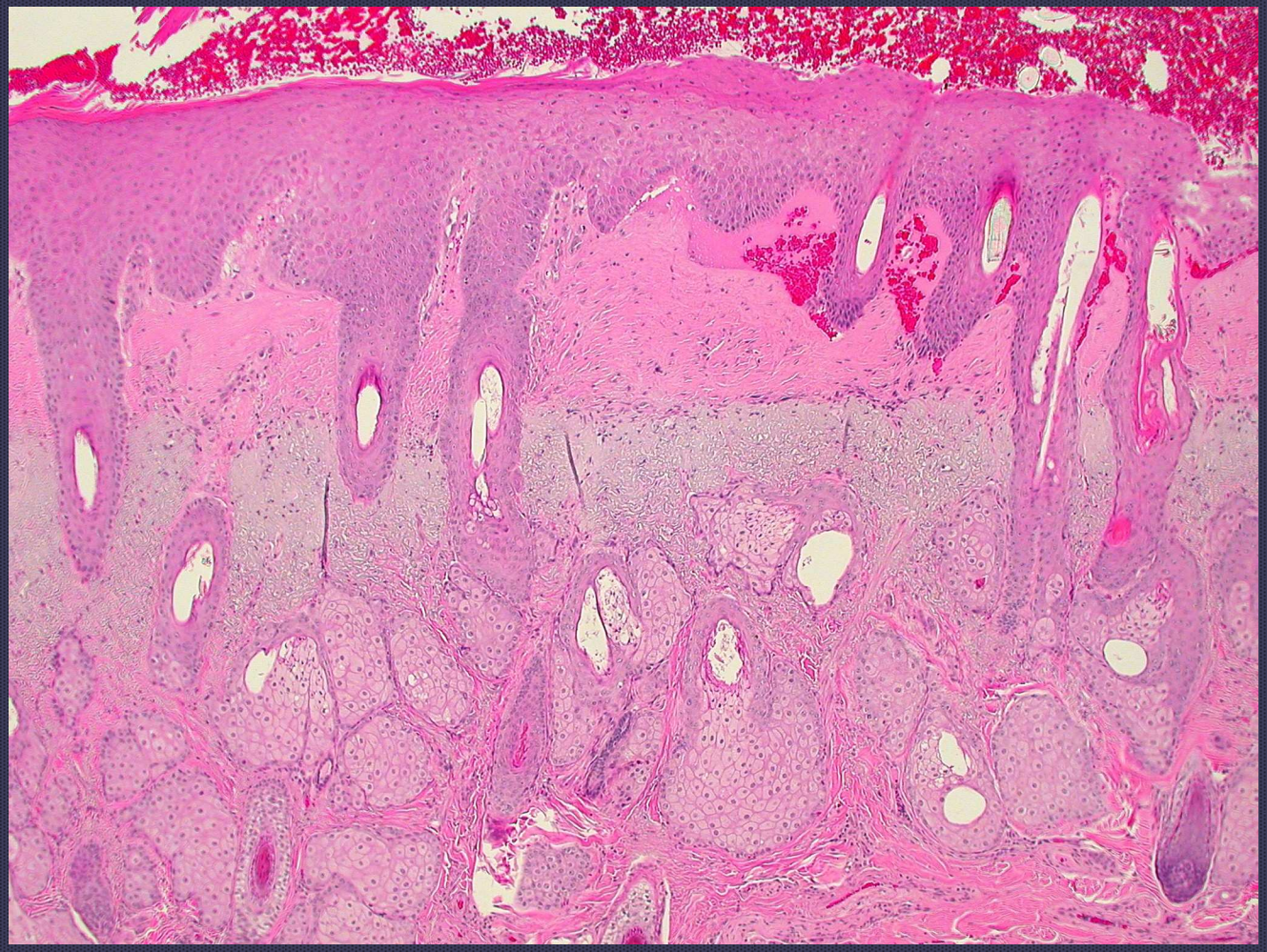
- Type I: Secondary to injestion of photosensitizing agent
- Type II: Congenital
- Type III: Acquired from liver damage



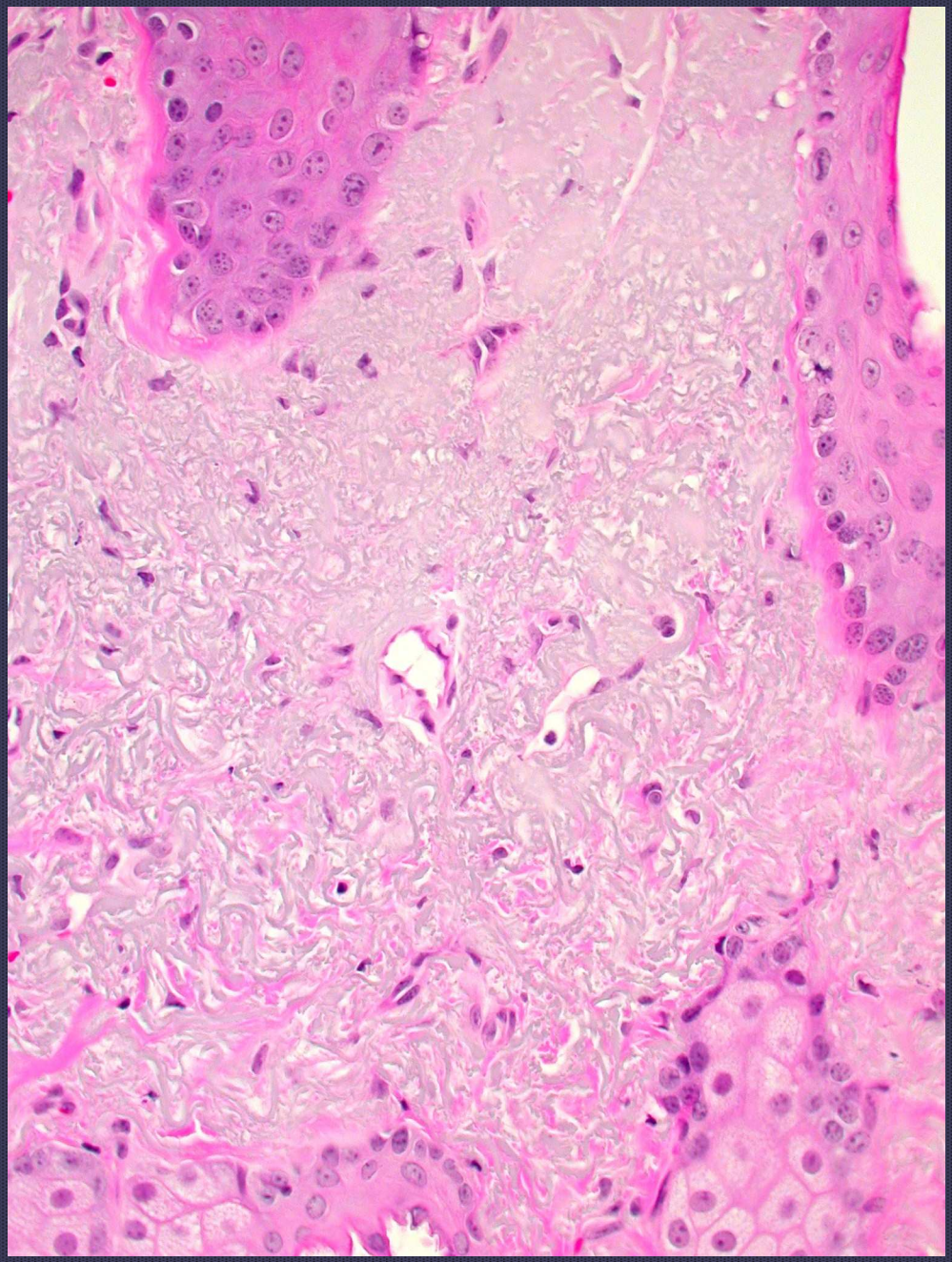
Vasculitis due to photosensitization



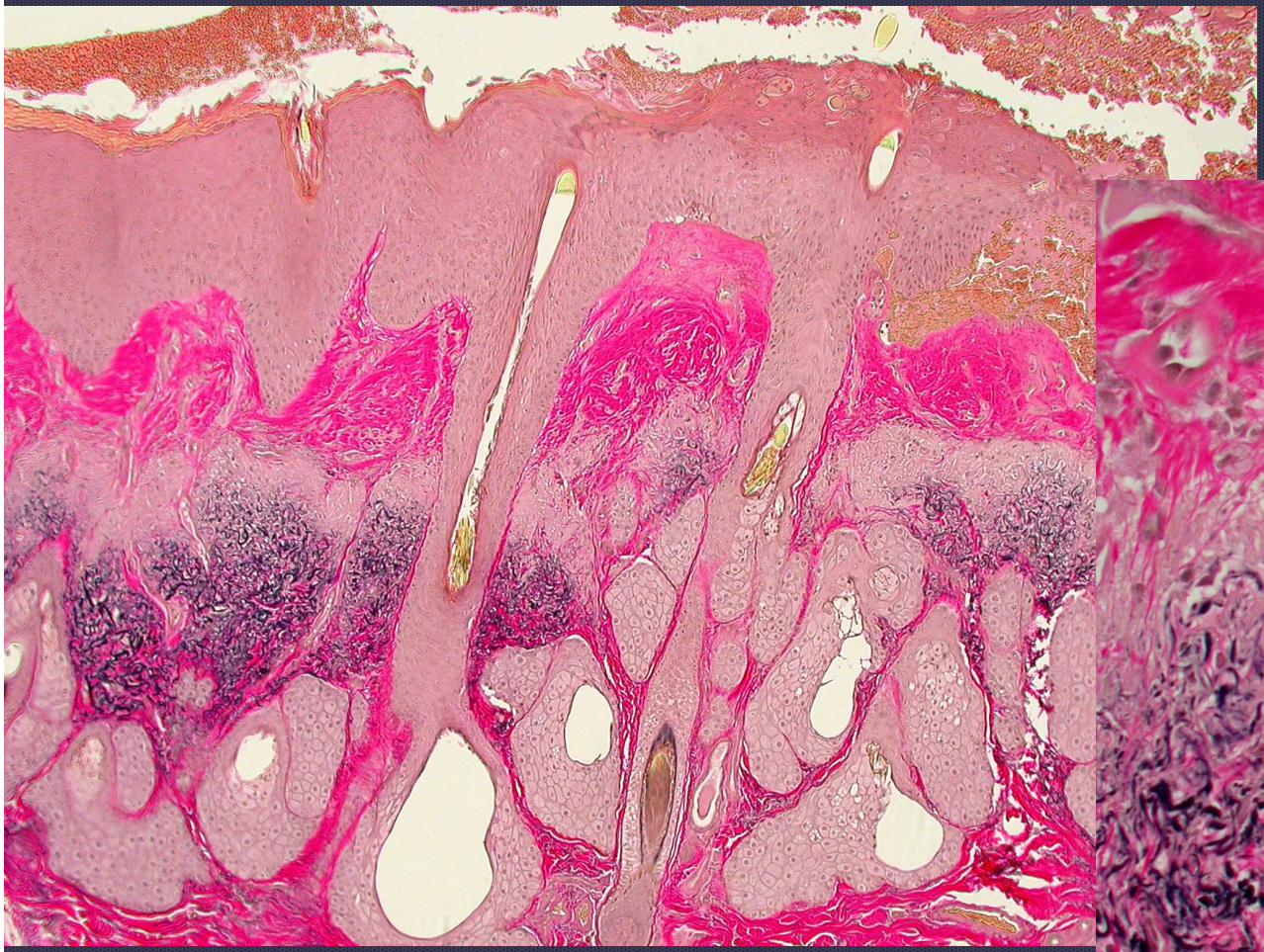
Photosensitization

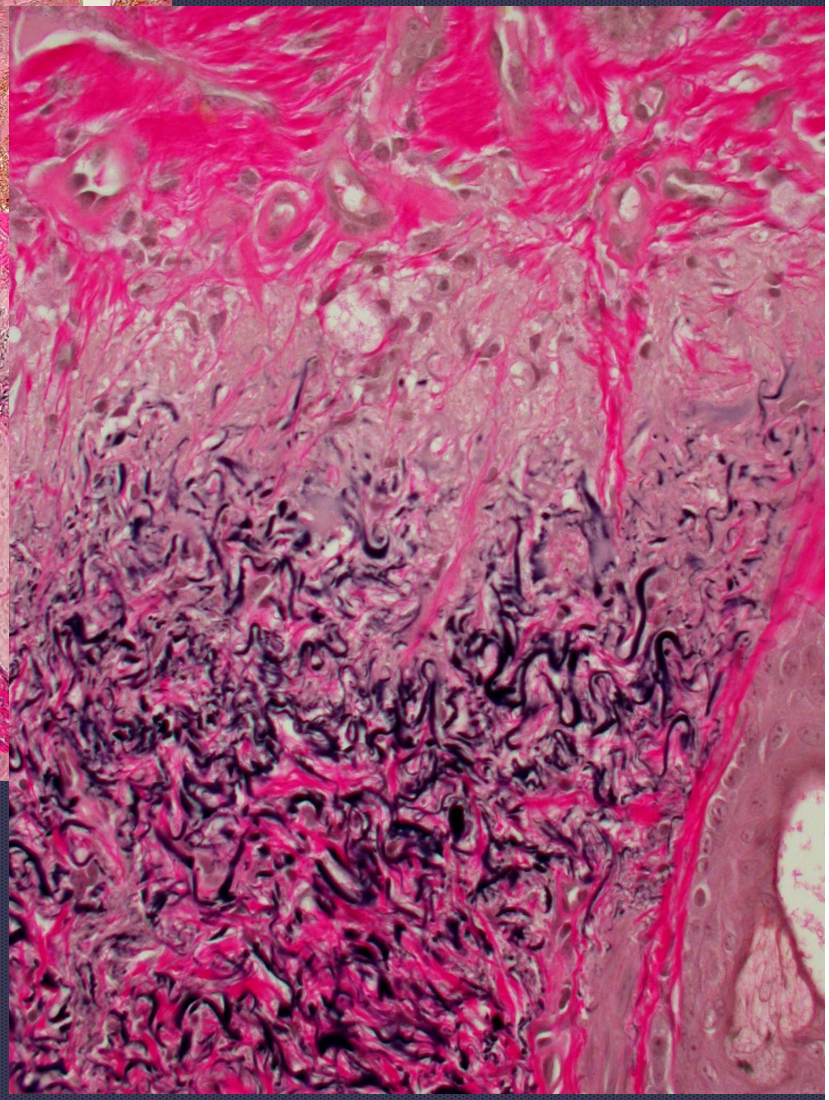


Solar elastosis



Solar elastosis





Solar elastosis
Verhoff elastin stain

Molluscum contagiosum

Leukoderma

Stannard’s case material