10-year-old, female spayed, British shorthair cross cat with pruritus in right periocular, neck and ear region.

What is the process for the dermal cartilage deposition?

1) Neoplastic
2) Metaplastic (secondary to prolonged inflammation)
3) Metaplastic and proliferative (secondary to repeat injury)
4) Dystrophic
5) Dysplastic CORRECT

Signalment: 10-year-old, female spayed, British shorthair cross cat

History: Pruritus in the right periocular, neck and ear region that was initially responsive to prednisone at .25 mg/kg BID. Pruritus recurred and patient was treated with cyclosporine (dose unknown). Biopsy performed due to failure to respond to cyclosporine.

Clinical Presentation: Patchy alopecia with crusts along the pinnal margins, periocular region and neck with moderate to severe pruritus.

Histopathologic Description: The epidermis is hyperplastic and spongiotic. The superficial dermis contains a mild to moderate inflammatory infiltrate consisting of eosinophils and mast cells (Figures 1-4). There is widespread eosinophil exocytosis. In the section from the pinna, there is extension of the cartilage into the superficial dermis. The cartilage is convoluted, fragmented, and composed of numerous chondrones (Figures 2-4). Chondrocytes show mild variation in cell size. The section from the periocular region includes a small crust, and deeper sectioning fails to reveal any evidence of acantholysis (Figure 1).

Morphologic diagnosis: EOSINOPHILIC AND MASTOCYTIC SUPERFICIAL DERMATITIS AND CHONDRODYSPLASIA, PINNA, FELINE

EOSINOPHILIC AND MASTOCYTIC SUPERFICIAL DERMATITIS WITH SEROCELLULAR CRUST, PERIOCULAR REGION, FELINE

Comment: The interesting feature of this case revolves around character of the dermal cartilage within the sections from the pinna (Figures 2-4). This biopsy was actually taken from the cutaneous marginal pouch of the pinna. The cartilage is disorganized, and arranged in tongues that extend to the superficial dermis. The cartilage matrix varies in its basophilia. The chondrocytes are tightly packed and arranged in chondrones and small sheets (Figures 2-4). The case history, distribution and inflammatory infiltrate are supportive of allergic skin disease.

Upon further inquiry, this patient is a Scottish Fold. The Scottish fold and American curl cats are considered “mutation breeds” and they differ from other older established breeds and the domestic feline population based on a spontaneous mutation of a single gene locus. In this case the affected gene is fd (fold-eared gene). This is compared to “established breeds” that have evolved by selective breeding, and “variant breeds” that differ from the established breeds based on an outcross introduction of a single allele and a backcross to establish a desired trait (ie, Persian and Himalayan cats, respectively). The Scottish fold was initiated in 1961 by William Ross, a shepherd in the Tayside
Region of Scotland, who breed the first white barn cat, “Susie”, with this phenotype. The Scottish Fold was granted championship status by the (American) Cat Fanciers’ Association (CFA) in 1978. This breed is not recognized in the United Kingdom, or France.

Up to 4 weeks of age, Scottish fold kittens have erect pinnae, and then the tips of the ears begin to fold or curl. All Scottish fold cats with the folded-ear phenotype, including heterozygotes, suffer from some degree of osteochondrodysplasia of the distal limbs. The phenotype is inherited as an autosomal monogenic dominant trait with variable expression. Homozygotes exhibit a more severe disease phenotype that can lead to debilitating osteoarthropathy. A recent genome-wide association study on 99 Scottish fold cats localized the trait to feline chromosome D3, and analysis revealed a missense mutation within a calcium channel involved in cartilage homeostasis and skeletal dysplasia (inherited osteoarthropathy in people).

Severely affected Scottish fold cats are characterized by short malformed distal limbs, and may be lame with a stiff gait, or an inflexible and kinked tail. Affected bones includes those of joints in the distal limb, vertebrae and secondary degenerative arthropathy ensues with the potential for exostoses. Physeal cartilage columns are thick, disorganized and islands may extend from articular cartilage into epiphyses. The articular cartilage may have necrotic foci and a discontinuous tide mark. Breeders will outbreed Scottish fold cats (in this case a British short hair) to reduce the severity of the phenotype while maintaining the desirable pinnal folding. Due to the osteochondral abnormalities associated with this breed and potential for severe osteoarthropathy potentially leading to euthanasia there are current legislative efforts to ban their breeding. For this reason the breed is not accepted by either the Governing Council of the Cat Fancy or the Fédération Internationale Féline (FIFe).

References:

2) About the Scottish Fold, Cat Fanciers Association Inc. Ohio, USA http://cfa.org/Breeds/BreedsSthruT/ScottishFold.aspx, accessed June 2017

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Figures

Figure 1

Figure 2