



# Latin Comparative Pathology Group

## The Latin Subdivision of the CL Davis Foundation

### Diagnostic Exercise

Case #: 56 Month: May Year: 2015

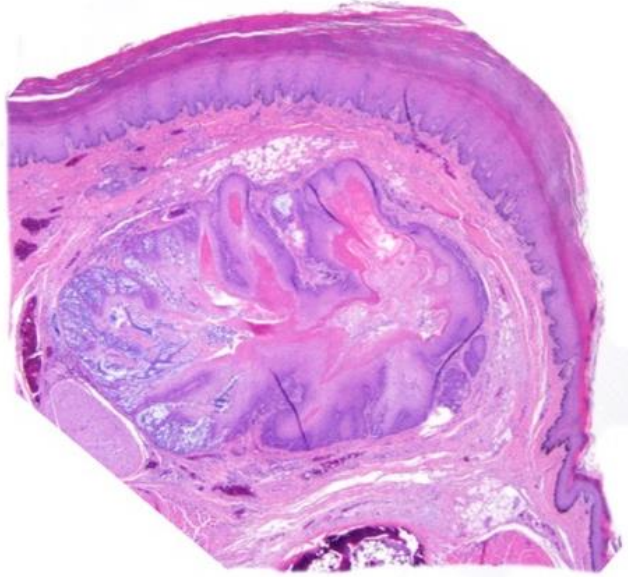
*Answer Sheet*

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**Morphologic Diagnoses:** (1) Oral cavity (tongue, choana, nasopharynx, and glottis): severe, chronic circumferential pharyngeal gland squamous metaplasia (consistent with vitamin A deficiency); (2) Parathyroid glands: severe, chronic, bilateral hypertrophy (consistent with secondary hyperparathyroidism)

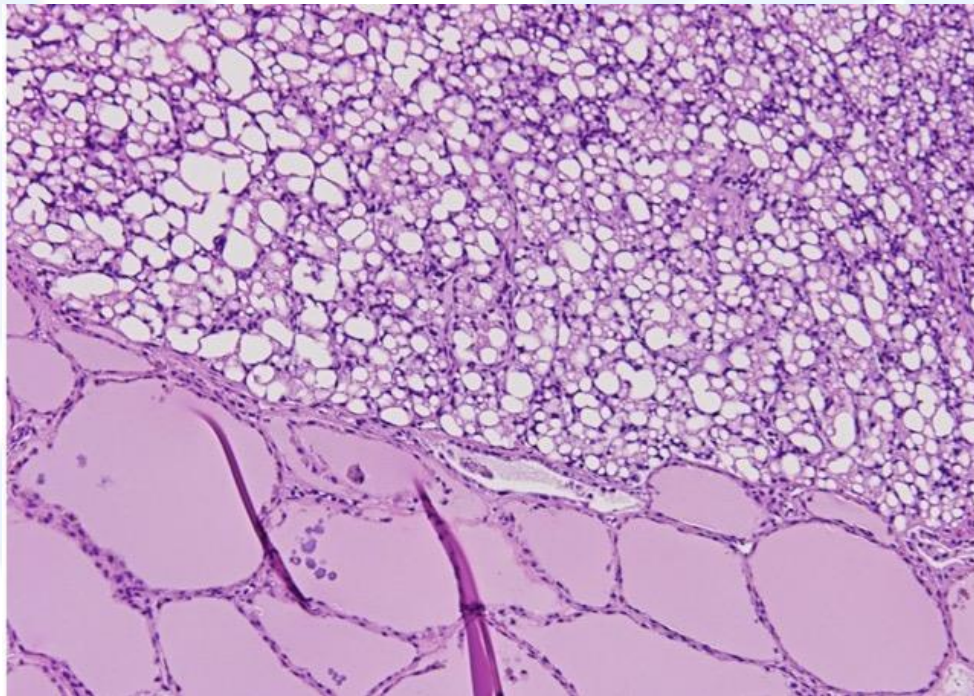
**Typical Gross findings:** Squamous hyperplasia, parathyroid hyperplasia, mineralization.

**Microscopic findings:** Histologic examination of the proliferative lesions within the nasal and oral pharynx revealed marked multifocal squamous metaplasia resulting in a mass-like effect (Figure 1). These lesions were characterized by well-differentiated nodules of squamous epithelium showing organized lamellar maturation from basaloid cells into keratinized epithelium. The centers of these nodules were frequently severely inflamed with abundant neutrophils and necrotic debris. A focal area of squamous metaplasia with hyperkeratosis was also identified in the urodeum.



**Figure 1**

Examination of the thyroid and parathyroid glands confirmed marked bilateral parathyroid hyperplasia and hypertrophy with individual cells were characterized by marked cytoplasmic vacuolation (Figure 2).



**Figure 2**

In addition, multiple areas of presumed metastatic mineralization were identified within the koilin membrane of the ventriculus and the interstitium of the lungs.

**Discussion:** Vitamin A analysis of the liver revealed undetectable vitamin A, based on the reporting limit of 0.20 ppm. This is consistent with a vitamin A deficiency. Transformation of glandular epithelium into squamous epithelium in response to vitamin A deficiency is a well-characterized form of metaplasia reported in numerous species including birds (1). This condition was much more common in avian species prior to advances in avian nutrition and the creation of pelleted diets. In this case, the distribution of the lesions was consistent with transformation of the pharyngeal glands and in some sections, this metaplastic transition was directly apparent. A similar distribution of lesions has been observed in turkey poults fed a vitamin A deficient diet (2). In this case, a diagnosis of squamous metaplasia secondary to vitamin A deficiency was supported by the lack of detectable vitamin A levels within submitted sections of liver.

**References and Recommended literature:**

1. Lawrence, DJ. HA Bern. 1963. *Vitamin A and mucous metaplasia. Annals of the New York Academy of Sciences. 646-653.*
2. Cortes PL, AK Tiwary, B Puschner, RM Crespo, RP Chin, M Bland, HL Shivaprasad. 2006. *Vitamin A deficiency in turkey poults. J Vet Diagn Invest 18:489-494.*

Please send your comments/questions to the whole LCPG list by hitting "reply to all".

A final document containing this material with answers and a brief discussion will be posted on the C. L. Davis website by the end of the current month ([http://www.cldavis.org/lcpg\\_english.html](http://www.cldavis.org/lcpg_english.html)).