

# Latin Comparative Pathology Group

## The Latin Subdivision of the CL Davis Foundation

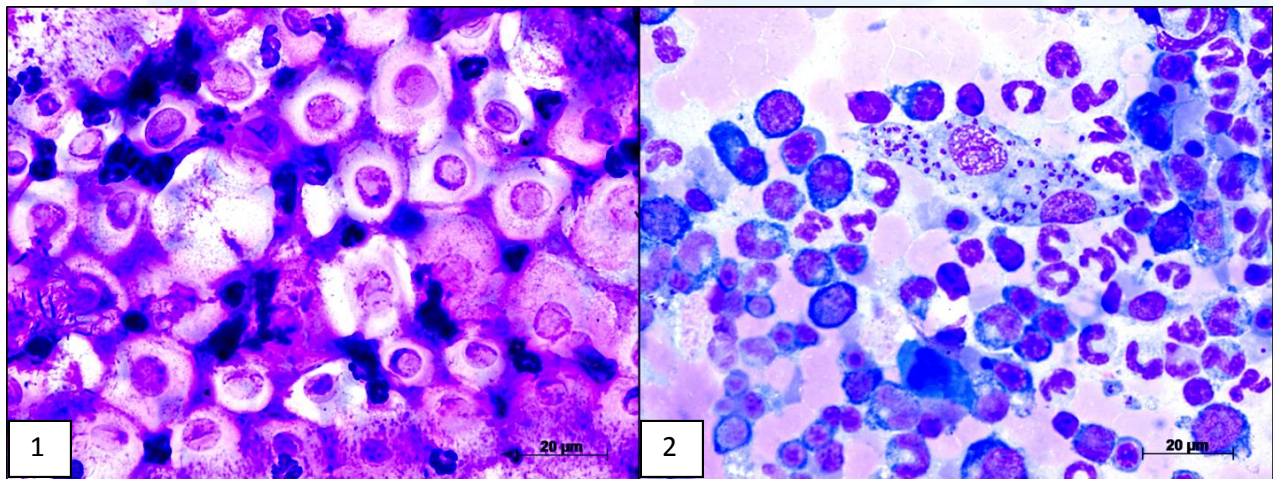
### Diagnostic Exercise

Case #: 39 Month: December Year: 2013

*Answer sheet*

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**Clinical History:** A 7-year-old male intact dog presented with weight loss and a few days history of nasal hemorrhagic discharge and nasal swelling that became ulcerated. Also noted were multiple enlarged superficial lymph nodes.



**Figure 1.** Nasal swelling aspirate cytology smear. Panoptic stain. 40x; **Figure 2.** Bone marrow aspirate cytology smear. Panoptic stain. 40x.

**Follow-up questions (images 1 and 2):** cytological description, etiologies, etiological diagnosis.

**Cytological description:** 1- There are numerous 10-15 µm wide round yeast organisms, which are individually surrounded by a 5-10 µm in thickness clear (nonstaining) halo (capsule), admixed with moderate numbers of viable and degenerate neutrophils and small amounts of cellular debris. Some yeasts display narrow base budding (not readily shown in the image provided). 2- Interspersed with hematopoietic precursor cells are occasional histiocytes-

macrophage cells laden with myriad 1-2 um in length oval amastigotes containing each a single nucleus and a kinetoplast. Occasional amastigotes are present extracellularly within the smear background.

**Etiologies:** *Cryptococcus neoformans*/ *Leishmania* sp.

**Etiological diagnosis:** Mycotic (cryptococcal) rhinitis/ Canine Visceral Leishmaniasis.

Canine visceral leishmaniasis (CVL) is an infectious vector borne zoonotic disease transmitted by phlebotomine sand flies. *Leishmania chagasi* is the etiological agent of CVL in the geographical region where this dog lived. Domestic dogs are very efficient reservoir hosts for this infection. *Cryptococcus neoformans* and *C. gatti* are considered important pathogens for a broad range of animal species including dogs, cats and humans worldwide. Cryptococcosis is a sporadically occurring systemic mycosis. Nasal cryptococcosis is a rare condition in dogs and infection is thought to occur through inhalation of the organism from the environment and subsequent colonization in the nasal passages and paranasal sinuses. In dogs, a variety of other parenchymal organs may be affected, including the kidneys, pancreas, liver, adrenal glands, urinary bladder, heart, and gastrointestinal tract. Additionally, dogs may be more likely to develop CNS involvement compared to cats.

Cryptococci (*C. neoformans*) are opportunistic organisms which act as primary pathogens in immunosuppressed dogs and cats, although *C. gatti* is notorious for infecting and causing disease in immunocompetent hosts. The immunosuppression caused by visceral leishmaniasis (VL) can promote the concurrence of other infectious agents, such as the etiological agents of cryptococcosis, neosporosis and ehrlichiosis. The diagnosis of both conditions can be made by examination of cytological preparations of the affected tissues. Definitive diagnosis is made by demonstration of cryptococcal or *Leishmania* organisms by cytologic and/or histologic examination. Additionally, *Cryptococcus* sp. can be cultured from an affected tissue. CVL can be further confirmed by serological assays, immunohistochemistry, and PCR.

#### References:

CHANDRA, H.; CHANDRA, S.; KAUSHIK, R.M. Visceral leishmaniasis with associated common, uncommon, and atypical morphological features on bone marrow aspirate cytology in nonendemic region. J. Trop. Med., v. 2013, doi: 10.1155/2013/861032.

SHARIFDINI, M.; MOHEBALI, M.; KESHAVARZ, H.; HOSSEININEJAD, M.; HAJJARAN, H.; AKHOUNDI, B.; FOROUSHANI, A.R.; ZAREI, Z.; CHAREHDAR, S. Neospora caninum and Leishmania infantum co-infection in domestic dogs (Canis familiaris) in Meshkin-Shahr district, Northwestern Iran. Iran J. Arthropod Borne Dis., v. 5, 60-8p, 2011.

VORATHAVORN, V.I.; SYKES, J.E.; FELDMAN, D.G. Cryptococcosis as an emerging systemic mycosis in dogs. J. Vet. Emerg. Crit. Care (San Antonio), v. 23, 489-97p, 2013.

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.cdavis.org/lcpg\\_english.html](http://www.cdavis.org/lcpg_english.html)).