

CEREBROSPINAL FLUID MONONUCLEAR PLEOCYTOSIS IN A TETRAPARETIC DOG.

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Signalment and history

A 5-year-old, female, mixed-breed dog presented with a history of ataxia and neck pain of one-week duration.

Clinical findings

Abnormalities were limited to the nervous system. The dog showed a depressed mental status and non ambulatory tetraparesis. Hopping and proprioceptive positioning were abnormal in both thoracic and pelvic limbs. Right head turn, ventrolateral strabismus, and neck pain on palpation and extension were also present. A diffuse, intracranial lesion was suspected. Differential diagnoses included CNS inflammatory/infectious disease (cryptococcosis, neosporosis, toxoplasmosis, bacterial meningoencephalomyelitis, granulomatous meningoencephalitis-GME, necrotizing meningoencephalitis-NME, necrotizing leukoencephalitis-NLE, meningoencephalitis of unknown origin-MUO) or neoplastic condition (primary or secondary neoplasm). Complete cell blood count, biochemical profile and urinalysis were within normal limits.

In T2-weighted magnetic resonance (MR) images, a diffuse lesion extended bilaterally from brainstem to cranial medulla. At the level of the pons, a right lateralization was evident. After administration of a paramagnetic contrast medium the lesion showed marked enhancement.

Cerebrospinal fluid (CSF) examination

Cerebrospinal fluid was collected from the L4-L5 intervertebral space. CSF was colourless with increased turbidity. Albumin detection with protein reagent strip was more than 30 mg/dL and Pandy test revealed high

globulin concentration. WBC count, performed using a haemocytometer, was 2389 cell/mm³ and RBC count was 22 cells/mm³.

A cytological sample prepared by sedimentation was air dried and stained with Romanowsky stain (May-Grunwald Giemsa).

The prevalent population consisted of round mononucleated lymphoid cells (98% of TNCC), with small amounts of blue cytoplasm, and 7-15 microns in diameter, round, rarely indented nuclei, with finely granular chromatin and rare single or multiple nucleoli. Only a few monocytoïd/macrophage cells were seen. Microorganisms were not detectable on cytological examination. The pleocytosis was classified as mononuclear and a presumptive diagnosis of CNS lymphoma was made.

The dog was humanely destroyed and necropsy was performed. Abnormalities were found only in the CNS: macroscopically, a focal extensive adhesion between right cerebral hemisphere and the periosteum was observed

Histological examination revealed multifocal to coalescing perivascular cuffs of inflammatory cells expanding the meninges and Virchow-Robin space in the white matter. Perivascular cuffs were composed predominately of lymphocytes, occasional macrophages, rare plasma cells and neutrophils. In the white matter, multifocal intraparenchymal and perivascular aggregates of macrophages were also evident. Moderate and diffuse gliosis and endothelial cell hypertrophy were present. A histological diagnosis of granulomatous meningoencephalitis (GME) was made. Immunohistochemistry revealed that perivascular cuffs were composed of a mixed population of CD3 and CD20 positive lymphocytes. In CSF, prevalence of single monomorphic population of lymphocytes in the absence of other inflammatory cells was seen in some animals with CNS lymphoma (Long et al., 2001). Usually, diagnosis of canine CNS lymphoma is not challenging when immature lymphocytes (lymphoblasts) are seen in CSF. By contrast, the predominance of small and well-differentiated lymphocytes could not rule out lymphocytic pleocytosis (Freeman and Raskin, 2001; Long et al., 2001) that may be found in other diseases such as ehrlichiosis, toxoplasmosis, neosporosis (Rand et al., 1994; Thomas, 1998; Radaelli and Platt, 2002). The typical CSF cytological findings during GME are a mixed cell pleocytosis composed of

lymphocytes, monocytoïd cells/macrophages, neutrophils and a few to rare eosinophils and plasma cells (Di Terlizzi et al., 2009). In our case, LCS cytology was more consistent with CNS lymphoma, based on prevalence of a single, monomorphic population of small to medium-sized lymphoid cells with some malignant features, such as prominent nucleoli, in the absence of significant percentages of macrophages, plasma cells and neutrophils.

The present report suggests that GME can still be a differential diagnosis in dogs with CSF cytology showing a single monomorphic population of lymphoid cells with malignant features.

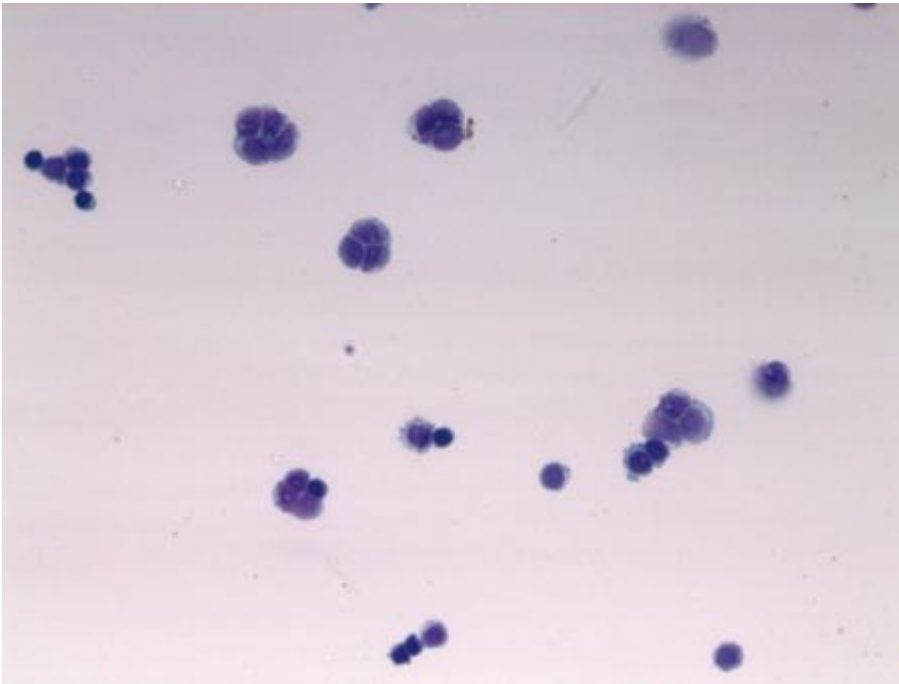


Fig. 1
CSF sedimentation, 20X, MGG

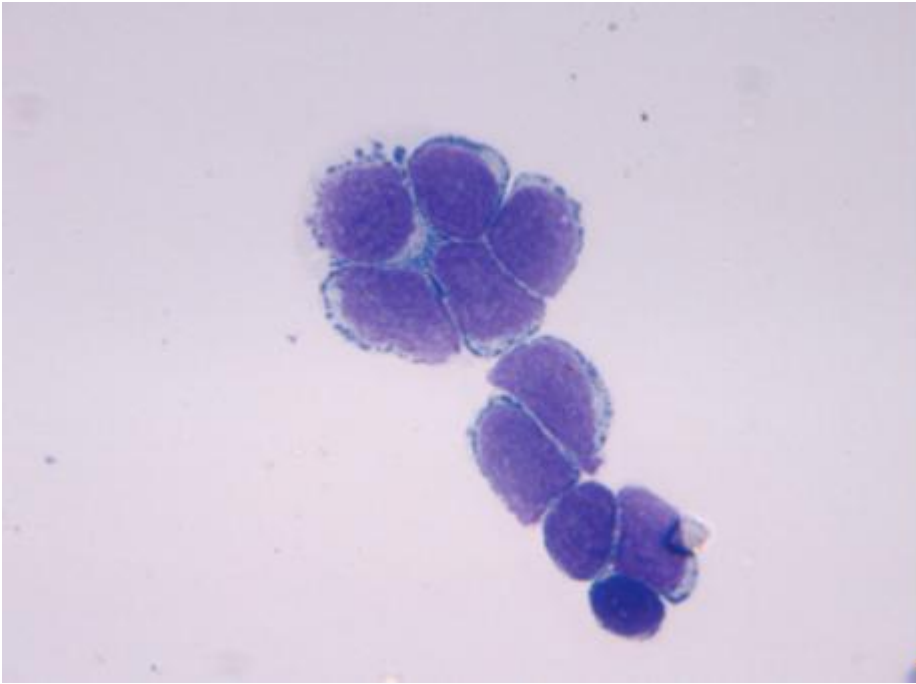


Fig. 2
CSF sedimentation, 100X, MGG

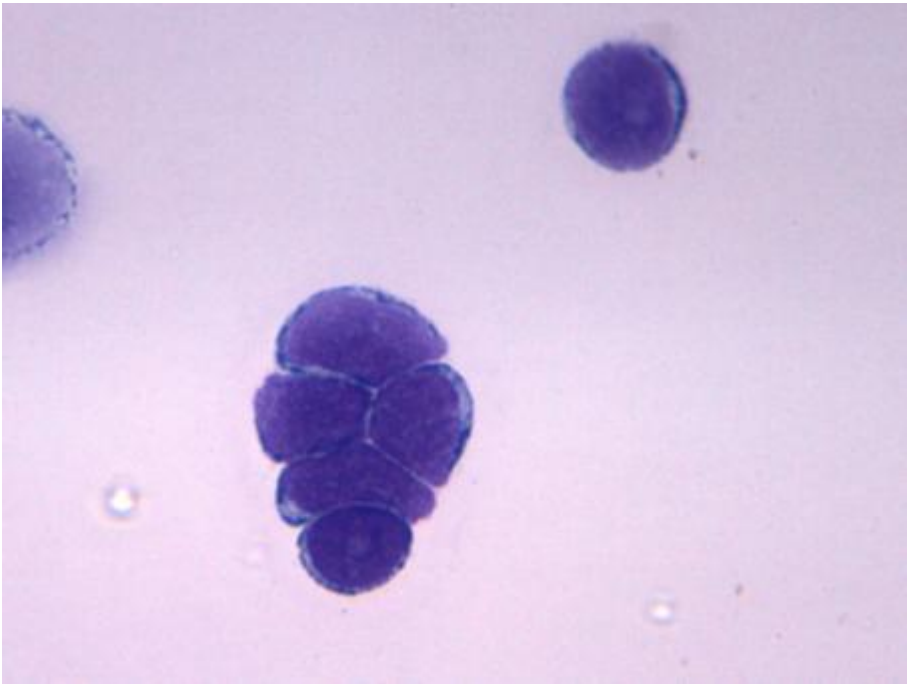


Fig.3
CSF sedimentation, 100X, MGG

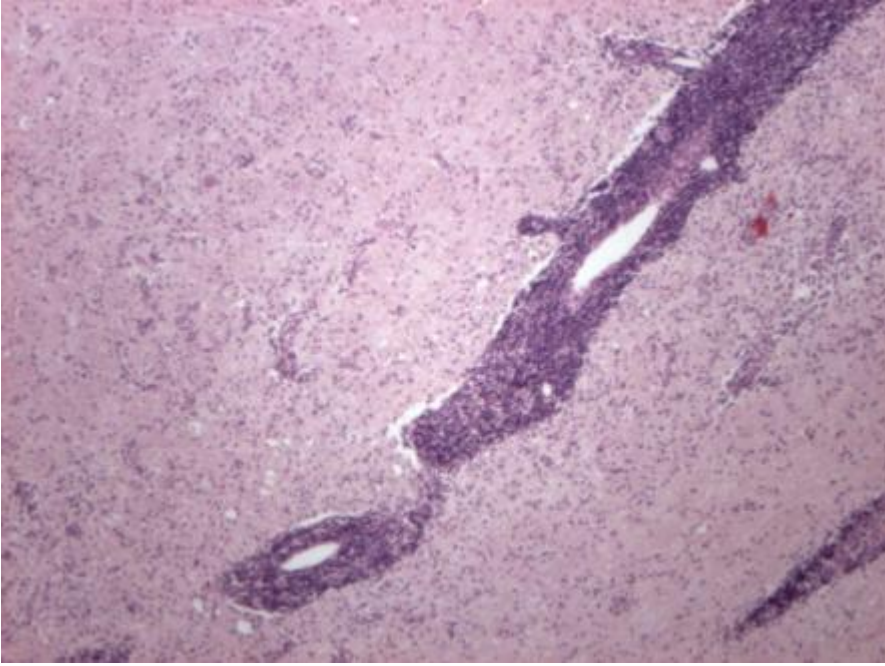


Fig. 4
Brain histology, 4X, HE

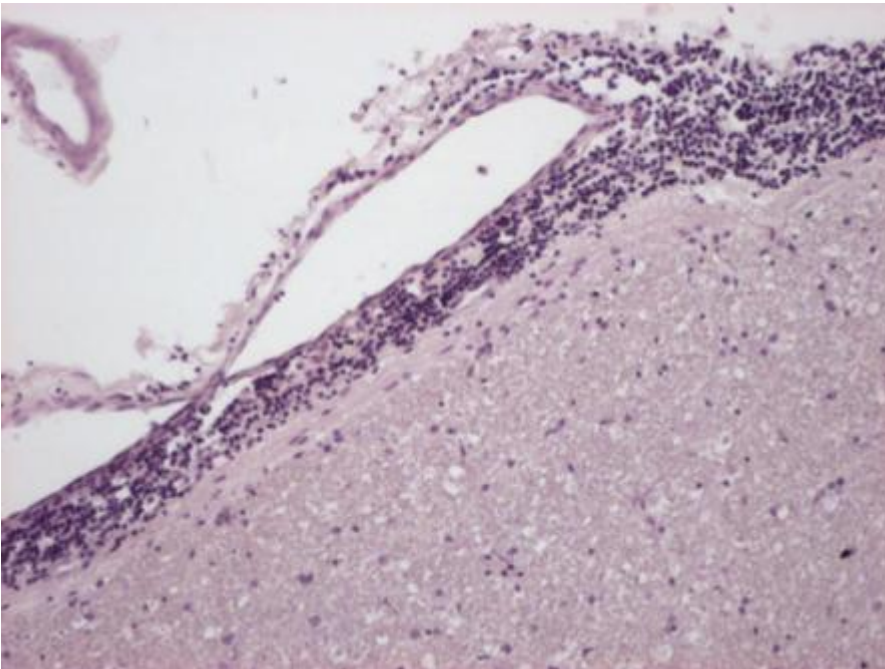


Fig. 5
Brain histology, 10X, HE



Fig. 6
Immunohistochemistry labelling for CD20 (B-lymphocytes), 10X

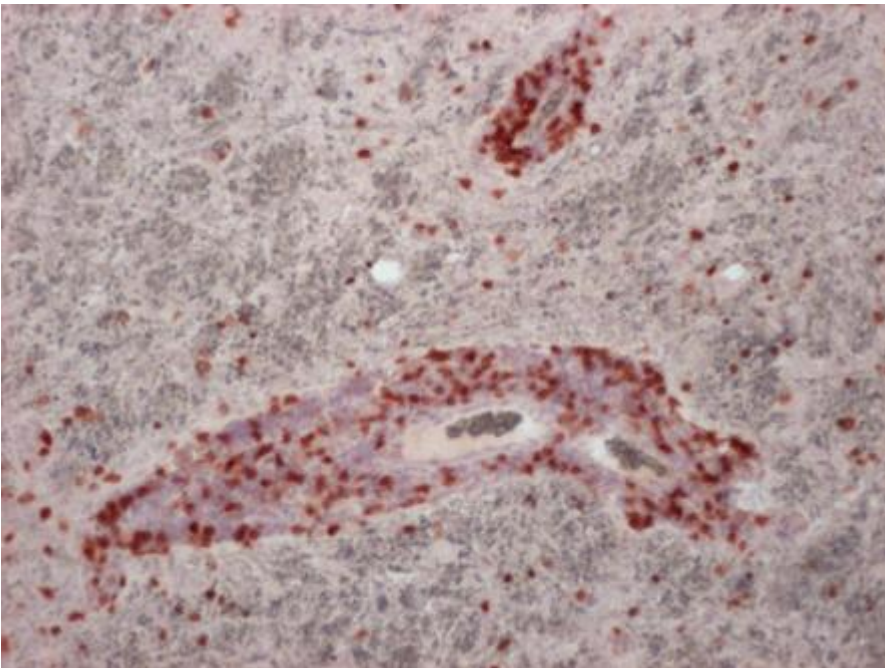


Fig. 7
Immunohistochemistry labelling for CD3 (T-lymphocytes), 10X

References

- Di Terlizzi R, Platt SR (2009). The function, composition and analysis of cerebrospinal fluid in companion animals: Part II – Analysis. *Vet J*, 180:15–32
- Freeman RA, Raskin RE (2001). Cytology of the central nervous system. In: Raskin RE, Meyer DJ (Eds.). *Atlas of Canine and Feline Cytology*. Saunders, Philadelphia, pp. 325–365
- Long SN, Johnston PE, Anderson TJ (2001). Primary T-cell lymphoma of the central nervous system in a dog. *J Am Vet Med Assoc*, 218:719–722
- Rand JS, Parent J, Percy D, Jacobs R (1994). Clinical, cerebrospinal fluid, and histological data from twenty-seven cats with primary inflammatory disease of the central nervous system. *Can Vet J*, 35:103–110
- Radaelli ST, Platt SR (2002). Bacterial meningoencephalomyelitis in dogs: a retrospective study of 23 cases (1990–1999). *J Vet Intern Med*, 16:159–163
- Thomas WB (1998). Inflammatory diseases of the central nervous system in dogs. *Clin Tech Small Anim Pract*, 13:167–178