

## OLIGODENDROGLIOMA OF THE INTERTHALAMIC : PATHOMORPHOLOGY IN A FRENCH MASTIFF DOG

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**Keywords** : Oligodendroglioma, interthalamic, pathomorphology, dog.

### Introduction

Both animal and human oligodendrogliomas are known to occur predominantly in the white matter of the cerebral hemispheres (Okazaki *et al.* 1988; Summer *et al.* 1994). It was reported that some brain tumors, including astrocytoma, ependymoma, and central neurocytoma, can occasionally exhibit a honeycomb like appearance (Hasson *et al.* 1982; Uchida *et al.* 1999). Oligodendrogliomas usually unencapsulated, typical appearance of neoplastic cells, and have clear cytoplasm with halo and round nuclei. The present study examined the pathomorphology of oligodendroglioma which occurred in the interthalamic region of the brain and demonstrated that routine staining and immunohistochemistry are definitive method in identifying this tumor.

### History

A four and a half-year-old male, French Mastiff dog was introduced to Veterinary Teaching Hospital in a very bad condition. There was no environmental response and all four limbs had myoclonus. The veterinarian gave infusion and corticosteroid therapy, the dog was recovered slowly. Clinical pathology records indicated an increased value of ureum (37 mg/dL) and LED (12 mm/H). Evaluation of creatinine was 0.9 mg/dL. There were no significant changes in the liver functions and other blood sample examinations. One week later the health condition was dropped again, and the condition did not improve after treating. Euthanasia was performed at the owner's request.

### Gross, Histopathology and Immunohistochemistry

Grossly, there was increased in the volume of cerebrospinal fluid and moderate level dilation on both lateral ventricles. A small clear mass was found in the interthalamic region. These mass revealed pale and gelatinous, approximately 1.2 x 2 x 1.2 cm in sized, and has narrow hemorrhagic streaks and necrosis. The mass was transparent, soft in consistency, unencapsulated, and has irregular form. On cross section, these tumor were transparent, soft in palpation, with small number of petechiae in some areas. The heart examination demonstrated that there was thickening of the left atrio-ventricular valves and mild to moderate calcification of myocard. Mild to moderate chronic interstitial nephritis accompanied with multifocal infarction were disseminated diffusely throughout both kidneys. There was no significant lesion found in any other organs.

Tissue samples were fixed in 10% buffered neutral formalin and routinely processed. Paraffin sections were stained with hematoxylin and eosin (HE), and some selected sections of the brain were also stained with Masson's trichrome and Periodic Acid Schiff (PAS). An immunostaining was performed using the Envision polymer method (DAKO Japan Co.Ltd., Kyoto, Japan). The following antibodies were used as primary antibodies; mouse anti-human desmin (Dako Corp., Carpinteria, USA) at a 1 in 10 dilution, mouse anti-swine vimentin (Dako Corp., Glostrup, Denmark) without dilution, and rabbit anti-cow glial fibrillary acidic protein/GFAP (Dako Corp., Denmark) at a 1 in 400 dilution. Primary antibody was omitted in the negative control sections. The immune reaction was evaluated semi-quantitatively as follows: -, no positive cells; +, a small number of positive cells; ++, a moderate number of positive cells; +++, many to numerous positive cells.

Histopathological examination revealed that the mass was unencapsulated, infiltrated the surrounding normal tissue. The tumor mass was located in the white matter, at the interthalamic region and consisted of dense sheets of small, round neoplastic cells with a honeycomb structure. These tumor cells usually had round to slightly ovoid, hyperchromatic central nuclei of various sizes and abundant clear cytoplasm with perinuclear halo. Those cells were also had prominent cytoplasmic membranes but do not express cytoplasmic processes. Immunohistochemical evaluation demonstrated that these cells were shown negative immunoreactivities for desmin, vimentin and glial fibrillary acidic protein/GFAP. Several amount of astrocytes which located in peripheral area of the mass showed moderate positive immunoreactivities for GFAP, and some new capillary walls were positive to vimentin.

## Discussion and Conclusion

Grossly, the present tumor formed soft gelatinous mass. Histopathologic examination it had mucinous accumulation and a honeycomb appearance formed by the sheets of tumor cells with factually clear cytoplasm and central nuclei. These features represent the typical appearance of oligodendroglioma, similar with previously case that reported by Lendan *et al.*, 1998; Nam *et al.*, 1999 and Ushida *et al.*, 1998. However, the negative immunoreactivities of the tumor cells to desmin, vimentin and GFAP may support our diagnosis. It has been reported that some brain tumors including astrocytoma, ependymoma, or central neuroma can occasionally exhibit honeycomb-like structures (Hasson *et al.*, 1982 and Kubota, 1991). Moreover, endothelial proliferation and necrosis were not prominent found in the present tumor. These findings indicate that oligodendroglioma has similar biological characteristics to that of the human form. According to the gross, histopathology and immunohistochemistry evaluations, the present tumor was diagnosed as oligodendroglioma which occurred in the interthalamic region of brain.

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