Magnetic Resonance Imaging in a Dog with Choroid Plexus carcinoma

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Abstract. Choroid plexus carcinoma was diagnosed in a 10-year-old maltese dog with chief complaint of progressive ataxia and head tilt. No abnormalities was observed on hemogram, radiographs of the skull, and electroencephalogram (EEG). Neurological examination suggested central vestibular lesions. On the magnetic resonance imaging (MRI) examination, images after contrast enhancement with Gadolinium DTPA-dimeglumine showed a rough circular lesion with an increased signal intensity in caudal fossa. This lesion was histopathologically confirmed to be choroid plexus carcinoma.—Key words: canine, choroid plexus carcinoma, MRI.


The incidence of neoplasms of the central nervous system tends to increase in dogs [9, 13], however, the location of lesions was rarely determined by a history, physical examination, neurological examination, laboratory data, radiographs of the skull, electroencephalogram (EEG), and cerebrospinal fluid (CSF) analysis [1, 2, 4]. Recently, X-ray computed tomography (CT) and magnetic resonance imaging (MRI) were available for the clinical evaluation of the precise location, size, and extent of brain neoplasms in animals [6, 12-14]. Surgical biopsy or removal of intracranial neoplasms is often required more accurate diagnosis and treatment of the neoplastic mass [4, 5].

This notes deals with MRI findings and surgical biopsy in a dog with choroid plexus carcinoma.

A 10-year-old castrated male maltese dog was referred to the Veterinary Teaching Hospital of University of Osaka Prefecture with progressive ataxia and head tilt for 1 month. These conditions were aggravated gradually despite of treatment with antibiotics and topical irrigation for otitis externa. Physical examination was almost normal. No abnormalities was observed on ophthalmoscopisc examination, however, pupillary light reflex and menace response of the left eye were slightly weak. Abnormal postural reactions were observed in left front limb. Spinal reflexes, sensory perception, and muscle tonus were normal. Neurological examinations suggested central vestibular lesions.

No abnormalities were observed on blood and blood chemistry profile, radiographs of the skull, and EEG findings. Then, MRI examination was carried out with a MR imager (CSI, 4.7T, General Electrics, U.S.A.) operating at 4.7 Tesla using the spin echo pulse sequence. The dog was restrained in sternal recumbency under general anesthesia after administration with dexamethasone (0.2 mg/kg, SC) to prevent cerebral edema. Sagittal and transverse T1-weighted images were obtained at repetition time of 600 msec and echo delay time of 24.5 msec. Section thickness was 4 mm. Since no abnormalities was observed on T1-weighted images, contrast enhanced images were performed with Gadolinium DTPA-dimeglumine (Gd-DTPA, 0.02 mmol/kg, IV). In contrast images, a roughly circular area suggested neoplasia was remark-

Fig. 1. Sagittal (a) and transverse (b) T1-weighted contrast enhanced MRI images with Gd-DTPA in a dog with choroid plexus carcinoma. High intensity mass (arrow) was observed in the caudal brain and extended from 4th ventricle to cerebellum (a). A roughly circular mass (arrow) with enhanced signal intensity was also demonstrated on the left side of cerebellum to superior colliculus (b).

ably enhanced at the region of caudal fossa, showing initially on the left side of cerebellum to superior colliculus and finally on the 4th ventricle (Fig. 1). A tentative diagnosis of intracranial neoplasm was made.

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The suboccipital craniectomy was carried out according to the method described by Oliver [8]. After premedication with dexamethasone (0.5 mg/kg, IM), atropine (0.05 mg/kg, SC), and diazepam (1.0 mg/kg, IM), anesthesia was induced using thiameyal sodium (5.7 mg/kg, IV) and maintained with isoflurane mixed in oxygen. The midline incision was made through the cerebellar vermis after brain exposure. A mass was visible grossly beneath cerebellum and was removed bluntly using a small scraper. The complete removal of lesions was not successful. In the surgical termination, the dura was not sutured and the bone flap was not also preserved. The subcutis and skin were closed in a routine manner. Histopathological examination of the biopsy sample revealed the choroid plexus carcinoma characterized by papillary structures without ciliated, pleomorphic cuboidal, and columnar epithelium with many mitosis (Fig. 2-a). The dog was euthanized on 10 days after surgery, since no improvement was shown during a medical therapy with glycerol (0.5 g/kg, IV) for 2 days, ampicillin (30 mg/kg, SC) and prednisolone (2 mg/kg, PO) for 10 days. On macroscopic examination, remaining neoplastic tissues were detected on the left side of the 4th ventricle and compressed the cerebellum (Fig. 2-b).

Choroid plexus tumors derived from the epithelial cells lining the choroid plexus are usually benign as choroid plexus papilloma [3, 10, 15]. However, Turrell et al. [13] reported that 5 cases of 50 dogs with primary brain tumor were choroid plexus tumor. Routine neurological examinations included skull radiographs, EEG, and CSF analysis were occasionally useful for the location of intracranial neoplasmas [1, 2, 5]. Prata and Garillo [11] reported that no abnormalities on those examinations were observed in cerebellar, pituitary, and small hypothalamic tumors and/or deep lesions of the brain, like as in this case. Findings of CT and MRI were closely reflected the precise location, size, and extent of brain neoplasmas [12–14]. In this case, T1-weighted MRI was not demonstrated abnormal findings, however, contrast enhanced images showed an increased signal intensity of the roughly circular mass. Both T1-weighted and T2-weighted MRI images showed similar signal intensity to normal tissues in 10% of the tumors [7]. Contrast enhanced MRI images were considered to be necessary for the delineating the presence and extent of brain tumors.

In conclusion, the MRI examination is available technique for more accurate diagnosis and treatment of the intracranial neoplasmas.

REFERENCES