Spontaneous Medulloblastoma with Myoblasts in a Sprague-Dawley Rat

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ABSTRACT. A primary cerebellar tumor found in a 14-week-old Sprague-Dawley rat, was noted to be extremely cellular and consist of small undifferentiated cells with hyperchromatic or vesicular nuclei and scanty cytoplasm. Mitotic figures were frequently observed. Solid masses of neoplastic cells were often separated by thin fibro-vascular septa, and a few pseudorossets were present. Many myoblasts were seen in a certain portion of the tumor. The tumor was diagnosed as medulloblastoma, a variant of medulloblastoma.—KEY WORDS: brain tumor, medulloblastoma, rat.


The incidence of spontaneous brain tumors in the rat is low, but, various types of neoplasms have been reported [4, 5, 7–9, 12, 14, 15]. Among these, astrocytoma is most frequently encountered [4, 5, 9, 12, 14]. Medulloblastoma in rats has rarely been reported [6]. In the present research, a spontaneous medulloblastoma with myoblastic components in a Sprague-Dawley (SD) rat was examined.

A 14-week-old SD rat having domed head, was sacrificed due to inactivity and paralysis of the left hind leg. At autopsy, a yellowish white neoplastic mass about 10 mm in diameter was found in the cerebellum. It covered and compressed the neighboring cerebrocerebral region.

Histologically, the neoplastic tissue was extremely cellular, consisting of small undifferentiated cells with somewhat oval, hyperchromatic or vesicular nuclei and scanty cytoplasm (Fig. 1). Mitotic figures were frequently observed. The neoplastic cells were often separated by thin fibro-vascular septa (Fig. 2), and a few pseudorossets were present (Fig. 3). Neither glial fibers nor neurofilaments were observed in the neoplastic tissue by PTAH, Holzer and Bodian silver stains.

Fig. 1. Densely packed small undifferentiated neoplastic cells. HE. ×300.

Fig. 2. Islands of neoplastic cells enclosed by fibro-vascular septa. HE. ×150.
Nerve cells were occasionally scattered among the small undifferentiated neoplastic cells (Fig. 4). In a certain portion of the tumor, many myoblasts, some with distinct striations and forming small bundles, were apparent (Fig. 5). Neoplastic tissue in the cerebellum extended into the subarachnoid space in the cerebrum without infiltrating the parenchyma (Fig. 6). By silver stain for the reticulin, this tumor could be differentiated from cerebellar sarcoma by the absence of any pericellular meshwork pattern [1, 11]. Extracranial metastasis was not observed.

These histological appearances were identical with those of medulloblastoma, the most common primitive neuroectodermal tumor in man [1–3, 11, 13]. Both neuronal and glial
differentiation would be consistent with medulloblastoma [3, 13]. In the present case, a few nerve cells in the tumor may possibly have indicated neuronal differentiation of neoplastic cells, but this point could not be confirmed.

Many myoblasts were present in a certain portion of the neoplastic tissue, and thus this tumor could be classified as “medulomyoblastoma”, a variant of medulloblastoma [2, 3, 10, 11, 13]. The rat in this study was the first case of spontaneous medulomyoblastoma found in animals.

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REFERENCES