**NOTE**

**A Case of Astrocytoma in an Aged Rat**

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An astrocytoma occurring at the putamen/nucleus caudatus, thalamus and mid brain was experienced in a male 24-month-old Wistar rat. Ultrastructurally, tumor cells showed abundant subcellular organelles with lipid droplets in the cytoplasm and amount of glial filaments in processes.—**Key words:** Astrocytoma, Glial filament.

There are unusual tumors naturally occurring in the central and peripheral nervous systems of the rat. The morphological details of the tumors remain indefinite in many aspects [1, 3-7]. This report describes pathomorphological findings of astrocytoma spontaneously occurred in a male rat.

The animal was one of 30 Wistar rats which were kept in a controlled room with a semibarrier system for investigation of aging changes, and sacrificed at the age of 24 months. The rat showed no clinical signs.

On several transverse cut surfaces of the brain at necropsy, there were dilatation of lateral ventricles, a small discolorated focus in the nucleus caudatus† putamen and a few small to large cavitations in the thalamus and midbrain.

Histologically, the tumor mass seen as a discolorated area in the right cerebral hemisphere compressed the left cerebral one (Fig. 1). In the center of the tumor mass liquefactive necrosis with fibrinous fluid and cell debris was observed. In areas adjacent to the necrosis a few histiocytes with PAS-positive large granules were present. At the periphery of the tumor mass, vascularization with swelling of capillary endothelial cells, perivascular edema and hemorrhages was scattered among well-differentiated gemistocytic astrocytes (Figs. 2 and 3). There were round cells with small round nucleus and scant cytoplasm, presumably oligodendrocytes in peripheral areas of the tumor, however, mitotic figures and inflammatory cells were hardly seen.

There were no particular structural patterns of the tumor cells, though perivascular pseudorosette formation was occasionally present. The tumor cells were cuboidal to ovoid in shape, and had faintly PAS-positive cytoplasm, relatively large round to oval nucleus poor in chromatin, and one or two distinct nucleoli (Fig. 4). Fiber formation was almost negative with Holzer and Cajal gold-sublimate stains [8].

Electronmicroscopically, the tumor cells had a large round or irregular nucleus which consisted of a light matrix intermingling with interchromatin and a few perichromatin granules as well as less frequent anastomosis of nucleoli. In the cytoplasm of the tumor cells there were prevalent rough endoplasmic reticulum, polysomes, mitochondria, and Golgi apparatus. The cytoplasm also contained numerous small and large lipid droplets, a few
dense bodies and glial filaments, which were especially prominent in the sparse processes (Figs. 5 and 6). Any findings suggesting fine structural entity of the light microscopic PAS-positive material were not obtained.

Morphological structures of the tumor examined in the present study were identical to those of astrocytoma reported in rats. Astrocytoma is said to show a wide diversity of histological appearances such as cellular or nuclear pleomorphism, focal necrosis in more rapidly growing tumors, and occasional cysts or pseudorosette formation [4, 6, 12]. Abundant fiber formation is also observed in some of 22 rats with astrocytoma, while it is minimal in others [4]. Most astrocytomas are
confined to the cerebrum [4, 12], especially to the thalamus which is known as a predilection site [2, 11]. Electronmicroscopically, the presence of filaments [9, 10], together with characteristic histopathological pictures, appeared to be a key for diagnosis of astrocytoma.

REFERENCES

Fig. 5. A tumor cell has a large round nucleus, less anastomosing distinct nucleolus, and abundant cytoplasm with polysomes, mitochondria, endoplasmic reticulum, Golgi apparatus and lipid droplets. Uranyl acetate and lead citrate stain. Bar=500 nm.

Fig. 6. A tumor cell contains an irregular-shaped nucleus and scattered glial filaments. Uranyl acetate and lead citrate stain. Bar=25 nm.
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要約

ラットにおける星腫細胞腫の1例（短報）：相内聖峰・内海文枝・小林賢一・黒崎映子・佐久間貞重（日本アップジョン総合研究所）——24カ月齢の雄Wistarラット1例に脳腫瘍がみられた。剖検では灰白色帯が右側被蓋、尾状核、視床および中脳にみられ、原発巣と考えられる視床には大小の囊胞形成が認められた。組織学的には、腫瘍細胞は明瞭な核小体をもつ大型の明るい円形ないし卵円形の核を有し、PASに染まる豊富な細胞質を有していた。電顕的には細胞質内には脂肪滴を含む発達した細胞内小器官を有しグリア線維が主に細胞突起に多数に認められた。以上の所見から、この腫瘍は星腫細胞腫と診断された。