

## 馬の肺に原発した軟骨形成をともなう顆粒細胞腫

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## An Equine Case of Granular Cell Tumor with Chondroplasia

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The incidence of primary pulmonary tumors is very low in horses and only a few cases of granular cell tumor have been reported [9, 12, 14, 16]. This note is to describe pathologic findings of the granular cell tumor in an 8-year-old female thoroughbred.

Clinically the patient had rales in the right lung and severe dyspnea, and radiographic diagnosis was that she had multiple abscesses 25 cm in diameter. The animal was subjected to euthanasia without any treatment.

At necropsy the right lung appeared normal, and the left milky white in color was 3 to 4 times larger than the right. The left primary bronchus had a nodule 3×3×6 cm in size protruding into the lumen; besides smaller nodules 1.5 to 3 cm in diameter were found in most bronchi and bronchioles. The bronchial and bronchiolar spaces were distended with a large amount of purulent exudate around neoplastic nodules. Several tumor masses 20 cm in diameter were encountered in the lung tissue (Fig. 1). Several worms of *Setaria equina* were found in the abdominal cavity, and adults of *Strongylus vulgaris* were seen in the colon in association with an aneurysm at the stem of the cranial mesenteric artery.

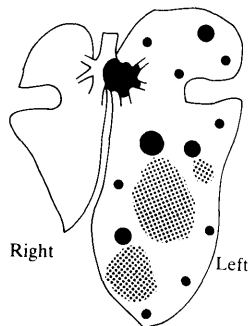


Fig. 1. Distribution of tumor nodules (●) and abscesses (⊗) in the left lung.

Tissues were taken from various organs and fixed in 10% neutral buffered formalin. Two to 4  $\mu\text{m}$  sections were made and stained with hematoxylin and eosin (HE) and others if necessary. Avidin-biotin-peroxidase immunohistochemistry was performed according to Hsu *et al.* [7] using rabbit antiserum to either cow S100 protein (Dako, Denmark) or human myoglobin (Cappel, U.S.A). For electron microscopy neoplastic tissues were sampled, fixed in glutaraldehyde and osmium tetroxide, dehydrated, and embedded in Epon 812. Ultra-thin sections were stained with uranyl acetate and lead citrate and examined using a JEM 100S electron microscope at 80 kV.

The pulmonary nodules were located beneath the apparently normal bronchoepithelial layer and consisted of proliferated neoplastic cells and loose connective tissue stroma. At the center of

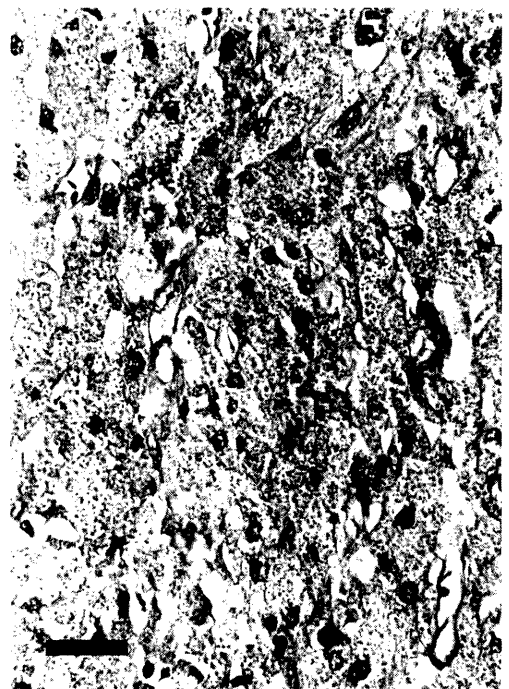


Fig. 2. PAS positive granules within the cytoplasm of tumor cells. HE. Bar=20  $\mu\text{m}$ .

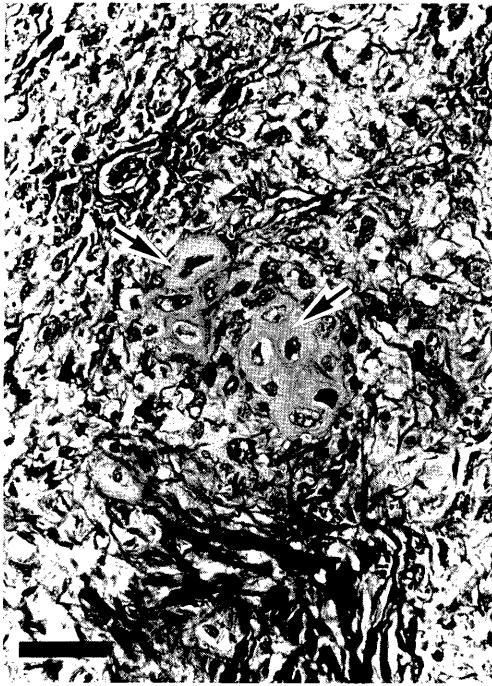


Fig. 3. Chondroplasia in a tumor nodule (arrows). Bar=50  $\mu$ m.

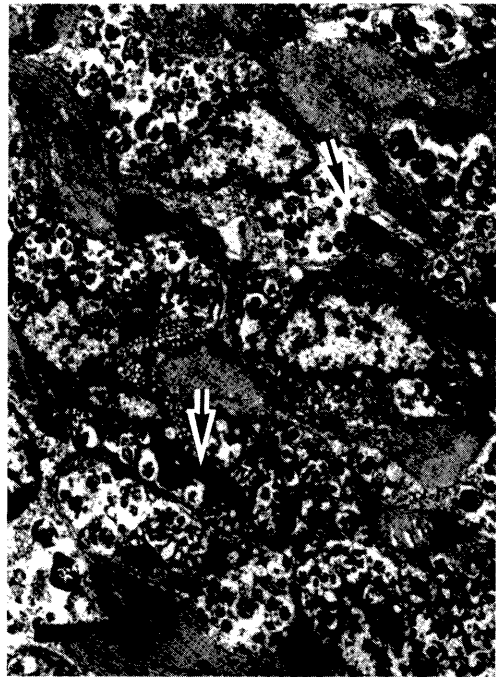


Fig. 4. Needle-shaped crystallines in tumor cells (arrows). Bar=1  $\mu$ m.

neoplastic nodules there were small masses of tumor cells surrounded by abundant collagen fibers with capillary proliferation. Tumor cells were round or oval having an eccentrically located small nucleus. Mitotic figures were rare. A large number of eosinophilic, periodic acid-Schiff (PAS) positive and diastase-resistant granules were seen in the cytoplasm (Fig. 2). These cytoplasmic granules were shown to combine with antiserum to S100-protein, which reacted also with the cell membrane and nucleus of tumor cells as well as chondrocytes. No reaction was seen with antiserum to human myoglobin. Needle-shaped crystallines 10 to 40  $\mu$ m long were frequently observed in the neoplastic cells as well as interstitial connective tissue, chondrocytes and cartilage. They were strongly eosinophilic and stained blue with phosphotungstic acid hematoxylin and red with azan. Some cartilage formed in the neoplastic nodules (Fig. 3). The border between the tumor and bronchial cartilage was not clear.

By electron microscopy the nucleus of tumor cells had a moderate amount of chromatin and an irregularly waved nuclear membrane (Fig. 4). The cytoplasmic granules were pleomorphic and

variable in size, shape and electron density, and they were surrounded by a limiting membrane (Fig. 5). Occasionally, myelinoid figures were seen within the cytoplasm. The needle-shaped crystallines had a high electron-density being surrounded by a limiting membrane (Fig. 4). No intercellular junctions were seen between neoplastic cells.

In horses the granular cell tumor has been reported to occur more frequently in the right lung [9, 12, 14, 16]. The present case occurring in the left lung showed morphological features similar to those of already published cases [13, 16] while angular bodies were undetectable. Intracytoplasmic crystalline inclusions with lamellar bodies are frequently encountered in the peripheral nerves of adult horses [6]. Chondroplasia in the tumor has been reported also in an equine case of lung sarcoma [8] showing histopathology similar to that of the present case.

The granular cell tumor in farm and laboratory animals shows characteristic variation in location, occurring in the tongue, skin, heart, cerebrum and meninge, pituitary gland, and uterine cervix [2, 9, 15, 16]. This type of tumors was first described in man [1] and usually referred to as



Fig. 5. Granules, variable in size and electron density, within a tumor cell and surrounded by a limiting membrane. Bar=1  $\mu$ m.

“myoblastoma” or “granular-cell myoblastoma”. A few cases of lung granular cell tumors were speculated to be derived from myocytes [1], Schwann cells [5], or histiocytes [3]. Recent histochemical and electron microscopic studies revealed the presence of degraded myelin products [5], autolysosomes or heterolysosomes [2, 13], or cytosegresomes [5, 13] in the tumor. Immunohistopathological surveys revealed the

existence of S100-protein [4, 10], suggesting that this type of tumor might be of neural origin, as in cases of melanocytes, oligodendroglia, astroglia, and Schwann cells [11].

#### REFERENCES

1. Abrikossoff, A. 1926. *Virchows Arch. Pathol. Anat.* 260: 215–233.
2. Aiuchi, M., Utsumi, F., Kobayashi, K., Kurosaki, E., and Sakuma, S. 1986. *Jpn. J. Vet. Sci.* 48: 399–403.
3. Azzopardi, J. G. 1956. *J. Pathol. Bac.* 71: 85–94.
4. Clark, H. B., Minesky, J. J., Agrawal, D., and Agrawal, H. C. 1985. *Am. J. Pathol.* 121: 96–101.
5. Fisher, E. R., and Wechsler, H. 1962. *Cancer* 15: 936–954.
6. Force, L., Jortner, B. S., and Scarrat, K. 1986. *Vet. Pathol.* 23: 514–518.
7. Hsu, S.-M., Raine, L., and Fanger, H. 1981. *Am. J. Clin. Pathol.* 75: 734–738.
8. Matsukawa, K., and Ono, T. 1962. *Chikusan Shinpo* (331): 785–791 (in Japanese).
9. Misdorp, W., and van Gelder, N. H. L. 1968. *Pathol. Vet.* 5: 385–394.
10. Mukai, M. 1983. *Am. J. Pathol.* 112: 139–146.
11. Mukai, M. 1983. *Byori to Rinsho* 1: 125–132 (in Japanese).
12. Nickels, F. A., Brown, C. M., and Breeze, R. G. 1980. *Mod. Vet. Pract.* 61: 593–596.
13. Parker, G. A., Novilla, M. N., Brown, A. C., Flor, W. J., and Stedham, M. A. 1979. *J. Comp. Pathol.* 89: 421–430.
14. Parodi, A. L., Tassin, P., and Rigoulet, J. 1974. *Rec. Med. Vet.* 150: 489–494.
15. Sanford, S. E., Hoover, D. M., and Miller, R. B. 1984. *Vet. Pathol.* 21: 489–494.
16. Turk, M. A. M., and Breeze, R. G. 1981. *J. Comp. Pathol.* 91: 471–481.

#### 要 約

馬の肺に原発した軟骨形成をともなう顆粒細胞腫（短報）：井上 智・岡田信彦・美土路活男・中山裕之・高橋令治・藤原公策（東京大学農学部家畜病理学教室）——馬の左肺に原発した顆粒細胞腫の1例について病理組織学的に検索した。腫瘍細胞は細胞質内にPAS陽性（ジアスターゼ抵抗性）、抗ウシS100蛋白抗体に反応、抗ヒト・ミオグロビン抗体に反応しない顆粒を豊富に持ち、一部で限界膜に包まれた高電子密度の無構造均質な針状結晶を含んでいた。