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Abstract

Bovine adenovirus type 3-induced tumor was transplanted subcutaneously through 25 generations in hamsters. Histological character of the tumors showed no basic differences from the primary one through all generations. There appeared metastatic foci in the lung, liver, kidney and lymph nodes in some animals.

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TRANSPLANTATION OF BOVINE ADENOVIRUS- INDUCED TUMOR IN HAMSTER

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Bovine adenovirus type 3 (BAV-3) reveals oncogenicity for hamsters. The tumors developed show histologically cystic and progressive types (1, 2). In the present study histological changes have been examined on 25 serial-transplant generations of the progressive type tumor.

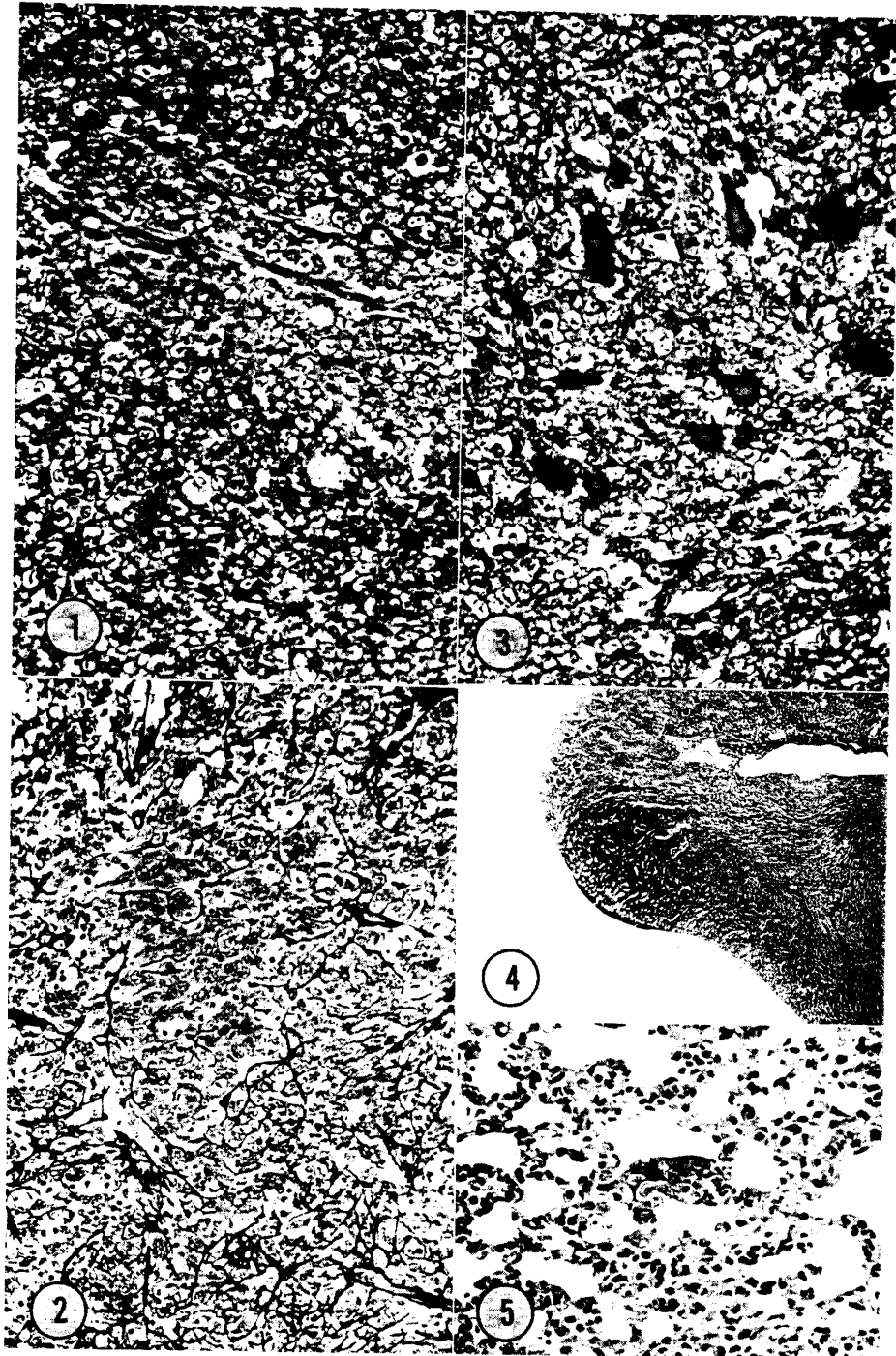
MATERIALS AND METHODS

To newborn hamsters less than 24 hours old, WBR 1 strain of BAV-3 was inoculated subcutaneously, and after the latent period of about 50 days, progressive tumor developing in these animals was used for subcutaneous transplantation into one - or two - month old hamsters. Developed tumor and main organs in each animal were fixed in 20 % formalin, and stained mainly with hematoxylin-eosin (H-E).

RESULTS

The transplanted tumors were palpable from 4 to 6 days, showing a complete transplantability and forming usually nodulated masses accompanied by marked central necrosis.

Histological appearance of the tumors was almost similar to the primary one through all generations (Fig. 1). Polygonal-shaped tumor cells, which have vesicular nuclei with prominent nucleoli and abundant cytoplasm, were arranged in a sheet-like pattern, showing many mitotic figures along with generations. Sometimes, there could be found spindle-shaped or multinucleated tumor cells. Stroma of the tumor was scanty in general but small amounts of collagen and argylophilic fibers were observed in places (Fig. 2). The tumors invaded into adjacent tissues involving muscle tissue (Fig. 3). There appeared metastatic foci in the liver, kidney (Fig. 4), lung (Fig. 5) and lymph nodes in some animals.



DISCUSSION

It has been reported that after the inoculation of BAV-3 by various routes into newborn hamsters, there developed two types of tumors at the site of injection; cystic and progressive types (1, 2). In our experiment the progressive tumor was used for transplantation, in which we found that the histological pattern of the transplanted tumors was not basically different from the primary one, as already observed with other virus-induced tumors (3, 4, 5). Massive metastases were observed on the primary tumor-bearing hamster after several subtotal tumor resections (2), but distant organ metastasis was very rare on the serial transplantation in our experiment as well as the cases of other virus-induced tumors (3, 5). Although pulmonary and lymphnodal metastases have already been described, we could furthermore observe metastatic foci of liver and kidney.

As for the histogenesis of this tumor, some authors have suggested an undifferentiated sarcoma (1, 3). However, the epithelial origin should be taken into consideration, because of the above mentioned histological picture of the tumors together with findings of electronmicroscopy (6).

SUMMARY

Bovine adenovirus type 3-induced tumor was transplanted subcutaneously through 25 generations in hamsters. Histological character of the tumors showed no basic differences from the primary one through all generations. There appeared metastatic foci in the lung, liver, kidney and lymph nodes in some animals.

Fig. 1 The histological appearance of the tumor in 8th generation, showing many mitotic figures. H-E staining, $\times 200$.

Fig. 2 Silver impregnation picture of the tumor in fourth generation. $\times 100$.

Fig. 3 Involvement of the muscle tissues by the tumor in 14th generation. H-E staining, $\times 260$.

Fig. 4 Renal metastasis of the tumor in third generation. H-E staining, $\times 15$.

Fig. 5 Small metastatic focus of the tumor in the lung in 16th generation. H-E staining, $\times 250$.

REFERENCES

1. DARBYSHIRE, J. H. : Oncogenicity of bovine adenovirus type 3 in hamsters. *Nature* **211**, 102, 1966
2. DARBYSHIRE, J. H., BERMAN, L. D., CHESTERMAN, F. C. and PEREIRA, H. G. : Studies on the oncogenicity of bovine adenovirus type 3. *Int. J. Cancer* **3**, 546, 1968
3. BERMAN, L. D. : Comparative morphologic study of the virus-induced solid tumors of syrian hamsters. *J. Nat. Cancer Inst.* **39**, 847, 1967
4. HABEL, K. and ATANASIU, P. : Transplantation of polyoma virus-induced tumor in the hamster. *Proc. Soc. Exp. Biol. and Med.* **102**, 99, 1959
5. FUJITA, H. : Successive transplantation of adenovirus 12 -induced tumor. *J. Karyopathology* **12**, 133, 1969
6. OHTSUKI, Y. and OHMORI, M. : in preparation.