

A-46. The Vascular Response of the Vertebral Artery to Acutely Increased Cerebrospinal Fluid Pressure

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Changes in the vertebral and common carotid blood flows were investigated with electromagnetic flowmeters under normal and hypercapnic conditions, when the cerebrospinal fluid (CSF) pressure was acutely increased over 40 mmHg by the technique of infusion of blood into the cisterna magna in dogs.

Under normal conditions the vertebral blood flow showed biphasic fluctuations in all 7 dogs and the common carotid blood flow showed them in 4 of 7 dogs. Under hypercapnic conditions the former showed them in 3 of 7 dogs and the latter showed them in 2 of 7 dogs.

The time during which the CSF pressure continued above 40 mmHg under hypercapnic conditions was about 270 seconds and three times longer than under normal conditions.

It has been verified that there exist some differences in their vascular responses to acutely increased CSF pressure between the vertebral and common carotid arteries. The differences of changes in their blood flows were considered as the results from both their vascular responses and vein-sinus dysfunction.

A-47. Morphological Studies on the Methylnitrosourea Induced Tumors of the Nerve Roots and Peripheral Nerve

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Tumors arising from nerve roots and peripheral nerves are variously named because of controversial opinions as to the origin of the tumors. Penfield and others considered these tumors to be formed from perineural fibroblast and proposed the name 'perineural fibroblastoma,' while Masson, Rio-Hortega and Stout believed the type cell to be the sheath of Schwann and called the tumors 'Neurilemmoma' or 'Schwannoma.'

In order to test the cell of origin light and electron microscopic studies were carried out on the nerve tumors produced in rats with intravenous injection of methyl-nitrosourea (MNU).

A total of 103 Donryu rats, 3–4 weeks old weighing 30–40 g, were divided into three groups. Group A rats were weekly given 10 mg/kg MNU dissolved in sterile saline and group B 5 mg/kg via the lateral tail vein, Group C were given only sterile saline as a control.

On a total of 79 rats given NMU, 54 developed tumors of the nervous system. Survival times were ranged 137 to 365 days. Tumors produced were multiple in some animals and the numbers of tumors amounted to 73. There was no difference in tumor incidence between group A and B rats. The sites of tumor development were as follows, brain 11, spinal cord 1, cranial nerves 8 (trigeminal nerve 6, cerebello-pontine angle 2), spinal nerve roots 41, and peripheral nerve 11.

Gross tumors of the nerve roots and peripheral nerve appeared as a spheroidal or fusiform mass of somewhat elastic consistency with gelatinous or semitranslucent color. Cysts were frequently found on section of the tumors of the peripheral nerves.

Microscopically, the tumor was composed of closely packed interwoven long bipolar spindle cells arranged in interlacing bundles. They had ovoid or rod-shaped central nuclei containing various amount of chromatin. Reticulin stain disclosed numerous fine argyrophil fiber which accompanied the cells. Myelinated nerve fibers were occasionally found in the tumor tissue. Some of the tumors acquired cellular features of sarcoma as indicated by increased cellularity, definite cell anaplasia and mitotic figures.

Observations were also made on the spinal nerve roots at an early stage of neoplastic cell proliferation. Two types of cell were found participating in the tissue growth, perineural and endoneural cell.

Electron microscopy disclosed most of the proliferating endoneural cell to hold axons. Their cytoplasmic membranes were covered by basement membrane. It is considered that Schwann cells play a principal role in the endoneural cell growth.

A-48. Monkey Brain Tumors Induced by Rous Sarcoma Virus

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