589

EVALUATION OF THE EFFECT OF TUMOR THERAPY BY USING IN VIVO 31P-NMR

S. Naruse, Y. Horikawa, C. Tanaka, T. Higuchi, S. Ueda and K. Hirakawa. Department of Neurosurgery, Kyoto Prefectural University of Medicine, Kyoto.

The effects of several kinds of therapies on living tumor tissue in rats were investigated by measuring the 31P-NMR spectra using the surface coil method. Rat glioma cells (EA285) were inoculated subcutaneously in the lumbar region of CDF rats. After the tumor grew over 1.5 cm in diameter, several kinds of therapies were made on the rats; (1) chemotherapy with various dose of vincristine, cyclophosphamide and methotraxate, (2) photoradiation therapy and (3) RF hyperthermia using the same surface coil in the NMR spectrometer. Before and after these therapies, in vivo 31P-NMR spectrum was measured sequentially with a SCM-200 spectrometer (JEOL, Japan). In the pre-treatment group, peaks of ATP and phosphomonoesters (PME) were high and a Pi peak was low. After a large dose administration of each chemotherapeutic agent, peaks of ATP and PME decreased and a Pi peak increased, resulting in a dominant Pi peak pattern after several hours. In the photoradiation group with preinjection of hematoporphrine derivertives, 31P-NMR spectrum became a dominant Pi pattern within one hour after the 60-min irradiaion with white light. In the RF hyperthermia group, 31P-NMR spectrum became a dominant Pi pattern immediately after 60-min RF heating at 8 watt. These changes in the spectrum occurred much earlier than the histological changes. Measurements of in vivo 31P-NMR spectrum proved useful not only to investigate the energy metabolism in tumor tissue but also to detect the effects of tumor therapies.

590

PERIVENTRICULAR HIGH INTENSITY IN NMR-CT.

S.Ono,T.Matsuzawa,K.Yamada,S.Yamada, S.Yoshioka and T.Hishinuma.The Department of Radiology and Nuclear Medicine,the Institute of Tuberculosis and Cancer, Tohoku University.Sendai.

The frequency of periventricular high intensity(PVH) in NMR-CT was examined, that was related with aging. PVH is thought to correspond to periventricular lucency in X ray CT and to be detected better than with X ray CT. Results were that the frequency of PVH increased during aging and much more increased in cases of cerebrovascular disease. These results showed that PVH related with the factor common to aging and crerebrovascular disease.

591

MAGNETIC RESONANCE IMAGING OF THYROID GLAND.

H.Fujimoto,S.Nawano,J.Okada,J.Itami, K.Imazeki,K.Uno,Y.Kuniyasu,T.Hotta, S.Takeda,T.Miyoshi,M.Kawana,F.Morita, S.Uematsu and N.Arimizu.Chiba University School of Medicine,Chiba.

Magnetic resonance (MR) imaging of thyroid gland was studied with a 0.256 tesla superconducting MR scanner (VISTA MR, Picker International) Installed in April 1984. Transverse MR images were routinely obtained by spin-echo and inversion recovery sequences. Computed T1 and T2 images were taken from these. Since June 1985,a newly developed surface coil for cervical region has been used. With this surface coil,scanning time has shortened to about a half of that with body coil,and spatial resolution has been mainteined equally. But computed T1 and T2 values with the surface coil tended to be different from those with body coil,and images were disturbed by remarkable halation in some cases,so the surface coil should be used with care.

592

EVALUATION OF NUCLEAR MAGNETIC RESONANCE IMAGE IN HEAD AND NECK TUMORS.

Y.Sekiya,N.Yui,F.Kinoshita,F.Shimada,*N. Fukuda,*H.Ikehira,*Y.Tateno and**N.Arimizu. Chiba Cancer Center Hosp.,*National Inst.of Radiological science and**Chiba Univ.,Chiba.

Magnetic resonance image (MRI) was performed on sixteen patients with nasopharyngeal carcinoma and in 8 of them, results were compared with those of X-CT and bone SPECT with Tc-99mMDP. NMR system with 0.1 T resistive magnet (Asahi MARK-J) was used.

On MRI, bone invasion to skull base was mainly judged by sagital images. When the low intensity area representing bone cortex of the nasopharyngeal roof was continuous, we judged as intact, and when it was intermitted by iso or high intensity area, as positive bone invasion.

In seven of the 8 cases, positive results suggesting skull bone invasion were obtained by SPECT. Five of the 7 cases were judged as positive bone invasion with MRI, and 4 cases with X-CT. By conbination of X-CT and MRI, 6 of 7 cases were judged as positive. Those results were same as that of bone SPECT.

Epipharyngeal carcinomas were visualised as iso or slightly high intensity masses in SE images, and so it is difficult to define the demarcation of the lesion from the surounding soft tissues.

Some cases of maxillar sinus carcinoma, parapharyngeal space benign tumor and malignant melanoma in the base of tongue were also discussed.