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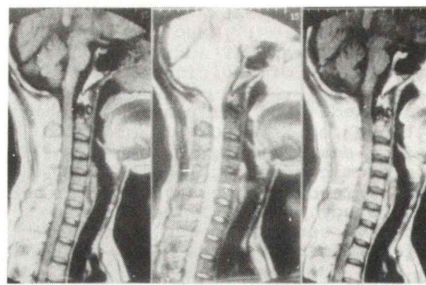
THE APPLICATION OF Gd-DTPA TO MRI OF SPINAL CORD TUMORS. T.Yuyama, J.Okada, N.Arimizu, M.Ri, J.Nagase and S.Inoue. Chiba University School of Medicine, Chiba.

The clinical utility of magnetic resonance imaging (MRI) has been already recognized in spine and spinal cord diseases. Gd-DTPA is a ferro-magnetic contrast medium for MRI enhancement. In this study, we applied Gd-DTPA to patients with spinal cord lesions. Twenty patients with spinal cord disorders (fifteen spinal cord tumors, four syringomyelias without spinal cord tumors and a multiple sclerosis) were examined with Picker MR imager (0.5T superconducting magnet).

Before enhancement, all patients were studied with two pulse sequences: TR=400msec, TE=40msec and TR=2000msec, TE=80msec. Immediately after injection of Gd-DTPA (0.1 mmol/kg), patients were examined with partial-saturation (TR=400msec, TE=40msec). The same section was obtained 10-15 minutes later with the same pulse sequence.

Enhancement was negative in two arteriovenous malformations and four syringomyelias. The other fourteen lesions were positively enhanced (five extradural tumors, three intradural extramedullary tumor, five intramedullary tumors and a multiple sclerosis).

Gd-DTPA was useful to distinguish tumor from spinal cord with partial-saturation. It was especially valuable in differentiation of intramedullary tumor from perifocal edema and syrinx.



Astrocytoma of the cervical cord.
A: Precontrast SE (400/40) Tumor and spinal cord tissue display nearly the same signal intensities.
B: Precontrast SE (2000/80) Both tumor and perifocal edema are hyperintense.
C: Postcontrast SE (400/40) Tumor is hyperintense relative to perifocal edema.

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GADOLINIUM LABELED ANTIMYOSIN MONOCLONAL ANTIBODY FOR MRI CONTRAST MATERIAL.

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Mn^{2+} has been used in experimental studies as the contrast material for MRI in the cardiovascular system. But Mn^{2+} has less effect to shorten proton relaxation time than Gd^{3+} . The contrast material for MRI used in clinic is Gd-DTPA only. Gd-DTPA has been reported to shorten the relaxation time of infarcted region in experimental MIs and patients. But Gd-DTPA distributes throughout body depending on blood flow and does not accumulate in the specific tissues. Because of the reason described above, the contrast materials accumulating in the specific tissues are now under investigation. One of these contrast materials is Gd labeled monoclonal antibody. We produced Gd labeled antimyosin monoclonal antibody (Ab) to depict the lesion of myocardial infarction (MI) by MRI and tried it to experimental canine MI. We labeled Gd to Ab twice in different labeling conditions. Experimental MI was made by 6 hours' ligation of LAD, and MRI and tissue sampling were obtained 24 hours after Ab injection. Each in two trials, two dogs were used. At the first time, Ab was injected into one dog and Gd-DTPA into another. In the second trial, Ab was injected into one dog and none into another. At the first time, MRI could not differentiate between MI and normal myocardium,

but both could be differentiated by NMR spectroscopy. In the second trial, Gd labeled Ab could shorten T1 and T2 relaxation time of the lesion of MI which was confirmed by NMR spectroscopy. The results show us that properly labeled Ab accumulated in the lesion of MI and reduced T1 and T2 relaxation time. The labeling condition from this study could be used to label Gd to antimalignant tumor antibody.