

#### DIAGNOSTIC IMPACT OF Gd-DTPA IN MR-IMAGING OF INTRA- AND PARASELLAR TUMORS

A. Kampf (1), G. Birbamer (1, 2),  
S. Felber (1, 2), F. Aichner (1, 2),  
F. Gerstenbrand (2)

MR-imaging has already proved to be useful in evaluation of patients suspected processes in the sella turcica. To assess the role of Gd-DTPA enhanced MR-imaging 40 patients harbouring of intra- or parasellar space occupying lesions were studied retrospectively. All MRI-studies were performed on a 1.5 Tesla Magnetom using a circular polarized head-coil (FOV = 25 cm). The imaging protocol consisted of T1 and PD, T2 weighted images. Additional T1 weighted scans were obtained immediately after injection of Gd-DTPA (0.1 mmol/kg). In 6 patients a 3D FLASH sequence was performed which further improved the anatomical resolution. 25 patients had pituitary adenomas, 10 patients had parasellar meningioma. In one patient a teratoma of the third ventricle and in one case a craniopharyngeoma and a ganglioneurinoma was diagnosed. Two patients had parasellar granulomatous inflammatory processes. Gd-DTPA improved the differential diagnosis in 20 of 40 patients, 3 patients with a pituitary microadenoma and 2 patients with a parasellar meningioma were identified only by the use of Gd-DTPA. In conclusion the use of Gd-DTPA in diagnosis of sellar and parasellar processes further improved the well-known advantages of MR-imaging.

Dept. of Magnetic Resonance (1) and Dept. of Neurology (2), University of Innsbruck, Anichstraße 35, 6020 Innsbruck, Austria

#### DIAGNOSIS OF CERVICAL DISK DISEASE

##### MRI VERSUS CERVICAL MYELOGRAPHY

G.Perneczky\*, F.W. Böck\*, A. Neuhold\*\* and M. Stiskal\*\*

In a prospective study of 63 surgical patients nuclear magnetic resonance imaging (MRI) was compared with myelography to establish whether invasive diagnostic studies of cervical compression syndromes can be omitted. Surgery was done along the anterior route throughout. 45 patients had herniated disks without bony compression. In 10 patients bony compression of the dural sac or nerve root without disk herniation was found to be present. 5 patients presented with both herniated disks and severe osteophytic narrowing of the spinal canal or the intervertebral foramen. While MRI in the T1-weighted and gradient echo modes matched the diagnostic accuracy of invasive myelography (95%), T1 and T2-weighted MRI images alone were associated with an error rate of 10%. In patients with medial protrusion myelography did not always show the true extent of compression, whereas MRI tended to miss small laterally protruding disk fragments. Cervical myelography continues to have a place in the diagnosis of cervical disk disease, whenever clinical signs and symptoms do not agree with MRI data.

\*Krankenanstalt Rudolfstiftung Wien, Neurochirurg. Abt., Juchgasse 25, A 1030 Wien  
\*\* Privatkrankenhaus Rudolfinerhaus, Billrothstr. 78 A 1190 Wien

#### Progressive multifocal leucoencephalopathy (PML) in a patient with non Hodgkin's lymphoma.

Hitzberger P (1), Alesch F (5), Kumpan W (3), Lindner K (1), Neuhold A (2), Schindlbauer M (4), Grisold W (1)

Progressive multifocal leucoencephalopathy (PML) is a clinically progressive asymmetric disorder of the central nervous system. It is usually associated with disorders of immunodeficiency. A number of studies have identified JC papovavirus in brain tissue as the causative agent.

We report a 49 year old white male patient suffering from non Hodgkin's lymphoma (immunocytoma) of the skin. He received immunosuppressive treatment for several years.

A CCT scan was performed due to the occurrence of acute hemianopia and aphasia. A hypodense lesion was located in the left occipital lobe and a cerebrovascular cause was suggested. Clinically the patient deteriorated. The CCT lesion remained constant and MRI showed multiple white matter lesions in both hemispheres. Brain biopsy was performed and PML was confirmed histologically.

- (1) Neurologische Abteilung und Ludwig Boltzmann Institut für klinische Neurobiologie, Kaiser Franz Josef Spital, 1100 Wien, Kauderstr. 3
- (2) Röntgeninstitut der Krankenanstalt Rudolfinerhaus
- (3) Röntgeninstitut des Kaiser Franz Josef Spitals
- (4) Neurologisches Institut der Universität Wien
- (5) Neurochirurgische Universitätsklinik, Wien

#### Preoperative MR Tomography in Congenital Scoliosis

H. Judmaier, M. Lener, K. Wicke, H. Wendtner

Conventional radiological methods are widely used for the planning of orthopedic surgical interventions in congenital kyphoscoliosis. Plain films of the vertebral column, including bending films, tomography and computed tomography are ideally suited to assess the degree of scoliosis and to depict vertebral malformations. Since bony deformities of the spine are frequently combined with malformations of neural structures, it is important to diagnose malformations of the spinal cord prior to surgery, which can not be done adequately using X-Ray procedures.

Therefore we included MR tomography (MRT) in the standard work up protocol of scoliotic patients. In 20 patients we could find 7 abnormalities of the myelon including two myelomeningoceles, two tethered cord, two diastematomyelia, two diplomyelia and one syringomyelia.

The superb soft tissue contrast of MRT allows direct imaging of the spinal cord structures without the use of contrast agents and is especially helpful in ruling out intraspinal lipomas, dermoid or epidermoid tumors. The multiplanar scanning capability of MR allows to achieve orthogonal slices in respect to the severely distorted anatomy. By applying three-dimensional volumetric acquisition techniques it is also possible to reconstruct images in a curved plane, thus projecting the spinal structures in a single plane and simulating the postoperative status. The lack of ionizing radiation is another important advantage in these young patients, since repeated exams pre- and postoperatively using X-Ray techniques are inevitable. The relatively long duration of the MRT examination is its major drawback. Uncooperative patients have to be examined under sedation or using general anesthesia. It is essential to position the patient as comfortably as possible in the magnet to avoid motion artefacts. However, in none of our patients did the malformation of the spine prove to be incompatible with a successful exam.

MR Institut, Klinik Innsbruck, Anichstr. 35, 6020 Innsbruck

# Journal of

# NEUROLOGIA

**Volume 237 Number 8 1990** Last issue of this volume

## Editorial

**G. V. Sawle, D. J. Brooks:** Positron emission tomography studies of neurotransmitter systems 451

## Original investigations

**A. F. Donk, T. J. C. Faes, D. Broere, E. A. van der Veen, F. W. Bertelsmann:** Quantitation of skin vasomotor control in normal subjects and in diabetic patients with autonomic neuropathy 457

**J. A. Koziol, W. Hacke:** Multivariate data reduction by principal components, with application to neurological scoring instruments 461

**J. Heller, G. Holzer, K. Schimrigk:** Immunological differentiation between neuroborreliosis and multiple sclerosis 465

**M. L. Sales Luís, A. Hormigo, C. Maurício, M. M. Alves, R. Serrão:** Magnetic resonance imaging in motor neuron disease 471

**M. Feldmann, E. Voth, D. Dressler, T. Henze, K. Felgenhauer:** <sup>99m</sup>Tc-Hexamethylpropylene amine oxime SPECT and X-ray CT in acute cerebral ischaemia 475

**T. Mizutani, R. Shiozawa, T. Nozawa, Y. Nozawa:** Unilateral asterixis 480

## Short communications

**K. Kamakura, M. Kawai, K. Arahata, H. Koizumi, K. Watanabe, H. Sugita:** A manifesting carrier of Duchenne muscular dystrophy with severe myocardial symptoms 483

**W. Barnett, P. Vieregge, G. Jantschek:** Further notes on Munchausen's syndrome: a case report of a change from acute abdominal to neurological type 486

**M. Giroud, C. Mousson, J. M. Chalopin, G. Riffe, R. Dumas:** Miller-Fisher syndrome and pontine abnormalities on MRI: a case report 489

**K. Inui, R. Namba, Y. Ihara, K. Nobukuni, M. Taniike, M. Midorikawa, H. Tsukamoto, S. Okada:** A case of chronic GM<sub>1</sub> gangliosidosis presenting as dystonia: clinical and biochemical studies 491

## Letters to the editors

**R. Gold, B. Meurers, H. Reichmann, W. Kress, C. R. Müller:** Duchenne muscular dystrophy: evidence for somatic reversion of the mutation in man 494

**T. Kuntzer, H. Reichmann, J. Bogouslavsky, F. Regli:** Emetine-induced myopathy and carnitine deficiency 495

**F. Leblhuber, B. Brucker, F. Reisecker, F. Steinparz, E. Windhager, J. Trenkler, E. Deisenhammer:** Single photon emission computed tomography in subjects at risk for Huntington's chorea 496

*Acknowledgement to referees* 499

*Forthcoming meetings* 500

## Abstracts

**Annual Meeting of the Austrian Society of Neuroimaging held in Linz, Austria, 17 November 1990** 501

*Contents of Volume 237*

*Indexed in Current Contents*

*Abstracted in Core Journals in Clinical Neurology*



**Springer International**

415 J Neurol ISSN 0340-5354 JNRYA9 237(8) 451-506 (1990)  
Printed on acid-free paper

December 1990

## Annual Meeting of the Austrian Society of Neuroimaging

held in Linz, Austria  
17 November 1990

Chairpersons: F. Aichner and E. Deisenhammer

REPRODUCIBILITY OF HMPAO - BRAIN UPTAKE. I. Podreka, S. Asenbaum, T. Brucke, S. Wenger, W. Lang, G. Goldenberg, M.

Study was undertaken in order to investigate, if quantitative data on CBF can be obtained in the same subject from HMPAO-SPECT investigations.

Repeated SPECT studies separated by  $8.6 \pm 4.4$  days were performed in 17 subjects  $49.6 \pm 16.9$  years of age (5 normals, 12 patients with peripheric neurological or chronic CNS diseases). After system calibration (dual head gamma camera), counts in SPECT slices could be converted into Ci. For global HMPAO-uptake estimation, pixels of single slices (3.125 mm thick) which contained 36% or more of the maximal pixel content were summed together. Multiplication of the pixel sum by the pixel volume gave the brain size in ml. HMPAO-uptake was then expressed in % of the injected dosis/100 ml brain tissue. For regional HMPAO-uptake evaluation a total of 17 ROIS/hemisphere, covering predominantly gray matter, were drawn on 4 adjacent 21.9 mm thick transversal sections. Correlation and regression analysis was used for statistical evaluation.

Global and hemispheric HMPAO-uptake values were highly reproducible ( $r=0.957$ ,  $r=0.947$ ,  $r=0.955$  respectively, all  $p < 0.001$ ). %-difference of global HMPAO-uptake in the two measurements was  $0.167 \pm 6.0\%$ , for the left hemisphere  $0.615 \pm 6.7\%$  and  $0.493 \pm 6.3\%$  for the right hemisphere. Regional correlation coefficients were all significant ( $r=0.881$  to  $r=0.973$ , all  $p < 0.001$ ). However %-difference varied between 6.7% and 25.2% through the regions. The highest variation was recorded in small ROIS over the central or mesiotemporal cortex or the thalamus.

As our data show, calculation of %-HMPAO brain uptake from SPECT images is reproducible. The best results were obtained, as expected, for global and hemispheric tracer uptake. The maximal difference between two studies was 12.7%, which is also known to be for PET studies separated by 1-8 days. The ROI size, cortical atrophy, as well as the slight variations in repositioning of the subjects were mostly responsible for regional uptake differences. Considering these results, the described method can be used routinely for the approximative calculation of intraindividual CBF changes caused by drugs or by neurophysiological stimulation.

Neurologische Universitätsklinik Wien, Lazarengasse 14, A-1090 Wien, Österreich.

BRAIN SPECT USING A BENZODIAZEPINE(BZD)-RECEPTOR-LIGAND (IOMAZENIL)

Deisenhammer E., Diem R., Schuber P.A., Brucker B.

Specific receptors are thought to mediate the various pharmacological effects of BZD administered for therapeutic purposes. These receptors may either be changed reversibly in hepatic encephalopathy and seizures or altered irreversibly in degenerative disorders. BZD receptors were imaged by SPECT with Iomazenil (I). After i.v. injection, the initial regional uptake in the brain tissue depends on regional blood flow. Later, regional distribution of BZD receptors. A SPECT study done within a period of 15 minutes post i.v. injection of I therefore permits tomographic imaging of regional blood flow in analogy to other CBF markers. A delayed SPECT scan performed 120 minutes post injection shows the distribution of receptors. This justifies using I for the imaging of rCBF and doing a delayed scan for the imaging of receptors. The tracer was used for diagnostic purposes in different neurological diseases including epilepsy. A total of 72 patients were investigated; in 56 of them, a SPECT study using a different CBF marker was done within a few days. The SPECT of hypoactive lesions in the various diseases obtained by the initial study with I the delayed study with I and the study with another CBF marker showed no essential differences. So far SPECT studies in various diseases have not furnished any additional information beyond the results obtained with other CBF markers.

Wagner-Jauregg-Krankenhaus  
A-4020 Linz, Austria