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Abstracts
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Quality control of stroke unit management: Evaluation of intensive care unit admission after modification of selection criteria

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Background: Experiences with our comprehensive stroke unit showed that only 28% of acute stroke patients were admitted to the intensive care unit (ICU), partly because of limited resources. in addition, criteria for admission to ICU were not always followed. Thus, two interventions were prompted: First, a time budget for stroke patients on ICU was given by the hospital administration ("24h ICU each day"). Second, criteria for ICU admission were modified.
Methods: For 6 months in 1999 management of all patients with acute ischemic stroke was prospectively assessd using standardized, prespecified criteria. We evaluated whether modified criteria were realized in clinical practice and whether management on ICU within the time budget was feasible. Further, we compared stroke profile and medication on ICU between 1999 (modified criteria) and the same period in 1997 (initial criteria).
Results: In 1999, 71 of 195 (36%) stroke patients were admitted to ICU, compared to 41 of 162 (25%) patients in 1997 ($p<0.05$). In 1999, 1 patient (0.5%) had no ICU admission despite fulfilled criteria and 4 of 71 ICU patients (5.6%) were admitted without fulfilling selection criteria. Mean time on ICU was 39.8 ± 33.3h, compared to 44.5 ± 51.1h in 1997 ($p>0.1$). Total ICU time was 2902h in 1999, which was higher than in 1997 (1821), but lower than the given time limit of 4416h. Patients with lacunar infarcts were less often admitted to ICU in 1999 (10%) than in 1997 (27%) ($p<0.05$). Antihypertensive drugs were less often used in 1999 (11.3%) than in 1997 (32%, $p<0.02$).
Conclusion: Modified criteria for ICU admission were implemented with a low rate of misplacement. ICU was available for more patients than previously, and total ICU time was shorter than the allocated time limit. Patients with lacunar syndromes were less likely treated on ICU.

Antithrombotische Therapie bei Karotisdissektion – eine systematische Metaanalyse

P.A. Lyrer, S.T. Engelter (Basel)

Die extrakranielle Dissektion der A. carotis interna (Karotisdissektion) ist nach kardiogenen Embolien die häufigste Ursache von Schlaganfällen bei Erwachsenen unter 45 Jahren. Unter der Vorstellung einer thromboembolischen Infarktgenese wird häufig die Antikoagulation als Therapie der Wahl empfohlen. Anhand einer systematischen Metaanalyse nach den Grundsätzen der Cochrane Collaboration sollte anhand der bisher publizierten Studien die Evidenz einer solchen Empfehlung objektiviert werden.
Es wurden keine randomisiert kontrollierten Studien identifiziert. Von 49 Fallstudien erlaubten 24 Studien mit insgesamt 286 behandelten Patienten eine vergleichende Beurteilung zwischen der Behandlung mit Thrombozytenaggregationshemmern und mit Antikoagulation. Weder für den Endpunkt "Tod" (odds ratio (OR) 2.41, 95% CI 0.27.21.80) noch für "Tod oder bleibende Behinderung" (OR 1.65, 95% CI 0.5-5.42) konnte jeweils bis zum Ende der Beobachtungsperiode ein Unterschied zwischen beiden Behandlungsoptionen

erkannt werden. Ein Vergleich zu einer Placebogruppe war nicht möglich. Zwei intrakranielle Hämatome wurden bei Antikoagulierten berichtet. Aufgrund der vorliegenden Daten besteht keine gesicherte Evidenz, dass eine gerinnungsaktive Therapie für die Behandlung von Patienten mit Karotisdissektion nützlich ist. Es bestehen keine Hinweise, dass die Antikoagulation den Thrombozytenaggregationshemmern überlegen wäre. Die Verordnung von Thrombozytenaggregationshemmern kann bei Patienten mit Karotisdissektion gefahrlos erfolgen.

Frequency and clinical spectrum of Bickerstaff's Benign Brainstem Encephalitis

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Background: In 1951 BBBE was described as a disorder consisting of acute ophthalmoplegia, dysfunction of other cranial nerves, ataxia, and benign course. Most series of BBBE also included patients (pts) with viral encephalitis, or with Fisher's cranial polyradiculitis. Hence, the clinical spectrum of BBBE remains unclear.
Design/Methods: We reviewed all pts seen at our institution over the last 20 years fullfilling the following criteria for BBBE: (1) subacute onset, (2) brainstem symptoms/signs, (3) no apparent etiology despite extensive workup (always including CSF analysis, brain CT/MRI, serologies), (4) monophasic and benign course.
Results: There were 10 pts (M:F=6:4) with a mean age of 33 years (range: 15–64). The clinical syndrome included flu-like prodromi (n=6); somnolence/coma (n=7); ophthalmoparesis/nystagmus (n=8); facial palsy (n=5) or paresthesias (n=5); dysarthria/dysphagia (n=5); corticospinal signs (n=7) including Babinski sign (n=5); limb sensory symptoms/signs (n=4); gait ataxia (n=4) and limb ataxia (n=2). Myotactic reflexes were normal (n=3), absent (n=1), diminished (n=1), or exaggerated (n=5). Liquor pleocytosis (n=6), hyperproteinorrhachia (n=2), and oligoclonality (n=2) were occasionally present. Anti-GQ1b antibodies were found in 2 of 3 pts tested. Brainstem hyperintense T2-signal abnormalities were seen in 2 of 7 pts examined by MRI. All pts greatly improved, mostly with no or only minimal residual deficits (n=8).
Conclusions: This series supports the existence of BBBE as a distinct, rare condition characterized by a variable, occasionally dramatic brainstem dysfunction and a benign evolution.

Acute disseminated encephalomyelitis: a reappraisal of clinical, CSF, EEG and MRI findings

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Over a period of three years 10 adult patients with a post- or parainfectious disseminated (diffuse or multifocal) syndrome of the CNS conforming to an ADEM were observed. Age ranged from 21 to 69 years, there were three men. Presenting neurological symptoms and signs as well as paraclinical findings (EEG, CSF, MRI) were very variable. MRI was completely normal in 5 patients and only midly abnormal in the remaining patients. CSF was completely normal in 6 patients and only midly pathologic in 4. EEG was abnormal in all 8 patients in whom it was performed. All patients survived and were followed prospectively over a period of 23 months (range 4 to 40 months). 9/10 patients were left with some residual defects, consisting most often of mild cognitive impairment. The diagnostic and therapeutic aspects of ADEM are discussed. EEG as the only investigation of brain function can be crucial in establishing the organic nature of disease. MRI may be normal despite impressive neurological deficits. The importance of clinical and paraclinical findings for establishing the diagnosis is outlined.

McLeod syndrome – X-linked choreoacanthocytosis

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McLeod Syndrome is a X-linked hereditary disorder characterised by progressive chorea, acanthocytosis, elevated creatine kinase levels, and absent Kx erythrocyte antigens. It is caused by mutations of the Xk gene that encodes a putative membrane transport protein with 10 trans-membrane domains. The Xk protein corresponds to the Kx erythrocyte antigen, but its physiological function is not known to date.
We assessed a large family with McLeod syndrome. Five men manifested with psychiatric symptoms (depression, bipolar disorder, personality changes), two others with chorea. During the course all affected men developed chorea of variable degree. Cognitive testing revealed figural memory deficits and subcortical dementia in affected men but also

in female transmitters. FDG-PET showed impaired striatal glucose metabolism, and MRI volumetry demonstrated atrophy of caudate nucleus and putamen in affected men. The alterations correlated with the severity of movement disorder and duration of symptoms, and impaired glucose metabolism preceded structural changes. Noteworthy, two female gene carriers also showed impaired striatal glucose metabolism without structural changes. The neuroradiological findings and the discrete cognitive impairments are compatible with partial X-inactivation in female gene carries in McLeod syndrome. Predominance of psychiatric symptoms, the characteristic neuro-psychological findings, and a significantly younger age at onset separated our cases from the ones reported. Underlying to the distinct phenotype we found a novel point mutation in exon 3 of the Xk gene.

Hess screen test in three dimensions with scleral search coils

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In orthotropic subjects and patients with strabismus, both eyes are recorded with dual scleral search coils in a three-field magnetic system. Prior to mounting the search coil annuli onto the eyes, the voltage offsets of each channel and the relative magnitudes of the three magnetic fields are determined. Subjects are only required to monocularly fixate a single reference target with either eye (contralateral eye occluded). During fixation of targets on the Hess screen by the uncovered eye, 3D eye position of both the occluded and the viewing eye are measured.
For clinical interpretation, we developed an easy to understand graphical description of the 3D Hess screen test. Positions of both orthotropic and strabismic eyes tend to follow Listing's law, which allows the determination of the primary position of each eye. In normal subjects, the primary positions of the two eyes show a horizontal divergence of about 10 degrees. In patients with strabismus, primary position can deviate from the normal position. The 3D Hess screen test with binocular dual search coils in a three-field magnetic system is an objective method to assess a phoria/tropia in three dimensions. This helps the clinician to determine the best method of therapeutic intervention.

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Brain GABA, Vigabatrin and responder identification

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The new antiepileptic drug (AED) vigabatrin (VGB) increases the human brain γ-aminobutyric acid (GABA) by irreversible inhibition of GABA-transaminase. It is assumed that in epileptic patients the GABAergic inhibition is deficient and that VGB has a favorable influence on the relation between inhibitory and excitatory neurotransmitters. The aim of this study was to identify responders and non-responders. For this purpose we measured the GABA-levels with MRS using a localized editing sequence for selective enhancements of GABA signals, developed at our site to measure the GABA signal which is hidden by the overlapping creatine peak. For the measurement of the other metabolites we used short (TE=30 ms) and long (TE=136) echo time resonance spectra in the normal tissue near the presumed epileptic focus and on the contralateral side.
Methods: GABA concentrations were measured in the occipital lobe in 9 epileptic patients with temporal lobe (TL) epilepsy, and in the TL and occipital lobe (OL) of 2 patients with OL epilepsy. In a third group of 4 patients we measured GABA, NAA, Cre, Cho, Glu/Gln in the normal tissue near the epileptic focus. In the first group (n=9) we measured GABA in the OLs and also NAA, Cre, Cho and Myo-inositol in the presumed epileptic region when possible. Patients were measured before the treatment and after a titration period of one month (1 g/d VGB during the 1st week, 1.5 g/d week during the 2nd, and 2 g/d during the last two weeks) and after a maintenance period of 3 months during which the dose could be increased to 3g/d if necessary. At the end of the maintenance period all patients had a steady dose for at least one month. In the OL the volume was 8 ccm, in the lateral TL region it was 7.8 ccm. The TL measurements were also performed in three healthy, untreated volunteers. Patients with a reduction of seizure frequency of ≥50% were classified as responders.
Results: Responders had lower mean ipsilateral baseline GABA levels compared to the non-responders. During the treatment phase the mean GABA increase in the ipsi- and contralateral hemisphere was steeper in the responder group than in the non-responder group, and the GABA increase in the epileptic hemisphere was steeper in the epileptic than in the non-epileptic hemisphere.

Patients who developed tolerance to VGB during the treatment phase exhibited a decrease in the GABA-levels. There were no changes of the NAA, Cre and Cho resonances during the treatment phase in the long-echo-time MR-spectra in the presumed epileptic focus and the contralateral regions. The GABA content in the epileptic hemisphere could be an lateralization indicator just as the NAA content. The GABA-levels in the TL of the 3 healthy volunteers showed a clear right/left difference (a mean of 1 mmol/l on the right and 1.5 mmol/l on the left side).
Conclusion: Our results show that the GABA editing MRS-sequence allows for a non-invasive monitoring of the therapeutic effects of GABA-ergic AEDs on GABA levels in epilepsy patients and may be helpful in predicting responders. Non-responders had higher baseline GABA-levels ipsilateral to the epileptic focus and a lower increase of GABA during the treatment. Patients who developed tolerance during the treatment phase had a decrease in the GABA-levels which corresponded to loss of seizure control.

Repeatability of cortical auditory evoked potentials in the assessment of central nervous system effects of anti-migraine drugs

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STUDY1: IDAP was recorded at intervals of 1, 2, and 24h in two centers in 22 healthy volunteers as described by Wang et al. (1996). Settings were modified to compare fixed vs random stimulus repetition rate, and 30Hz/100Hz low pass filters. Repeatability was assessed by correlations and a method described by Bland and Altman (1986). Group means did not differ between centers, the 2h or 24h retest, or different settings. For the 1h retest we observed an order effect. Fixed repetition rate and the 30Hz filter improved repeatability. IDAP group means can be compared between centers, for retest intervals of 2h/24h and different settings. Variability is too large to compare individuals (PSS/KIR/MDF/JGvD/JS; Cephalalgia, 19: 873-80, 1999).
STUDY2: IDAP was measured before and 2 hours after oral naratriptan 5mg (N=19) or zolmitriptan 5mg (N=19) in healthy volunteers. Naratriptan tended to increase ASF-slope (mean difference 0.23±0.62μV/10dB, p=0.06) and zolmitriptan (0.08±0.95μV/10dB, p=0.35) did not. Based on study 1 we calculated the trade-off between the size of the expected drug effects (ASF-slope difference) and the necessary sample size. The sample size needed to detect a 0.25-0.5μV/10dB ASF-slope increase ranged from 12 to 80 subjects. ASF-slope changes of less than 0.25μV/10dB were not detectable with an acceptably low number of patients. In conclusion, 5mg dosage of naratriptan and zolmitriptan are too small to lead to a significant increase in IDAP in 19 subjects, IDAP allows measuring of central effects of antimigraine drugs. The design of trials using this method requires a trade-off between sample size and expected drug effects (KIR/PSS/GGS/FPLL/JS, MDF/JGvD; Cephalalgia, 19: 880-6, 1999).

Langzeit-Erfahrungen mit der lokalen Botulinumtoxin A Behandlung

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Wir berichten über die Erfahrung an 125 Patienten, die wegen Dystonien und anderer Indikationen mit Botulinumtoxin A behandelt wurden. Von 125 Fällen verfügen wir bei 108 Patienten (86.4%) über Verlaufsdaten. Diese Erfahrung erstreckt sich kumulativ auf 248.7 Patientenjahre. Die fünf häufigsten Indikationen haben einen Anteil von 214.7 Patientenjahren (86.3%): Hemispasmus facialis (40.0%), Blepharospasmus (19.8%), Meige-Syndrom (27.8%), Schreibkrampf (24.3%), Zervikale Dystonie (19.8%). Die Therapieerfolge wurden zusammen mit dem Patienten kategorisiert, bei Übereinstimmung als signifikant oder fehlend und bei diskordanter Beurteilung als fraglich bewertet. Der Behandlungserfolg war sehr effektiv beim Hemispasmus facialis und beim Meige-Syndrom, zufriedenstellend beim Blepharospasmus und intermediär bei der Zervikalen Dystonie. Beim Schreibkrampf liess sich ein eindeutiger Therapieerfolg nur in ca. 26% der Fälle erreichen. Relevante Nebeneffekte waren vor allem iatrogene Paresen beim Schreibkrampf (7.7% der Behandlungszyklen) sowie Schluckstörungen bei der Zervikalen Dystonie (1.7%). Niedere Dosen Botulinumtoxin A bis 50 IU wurden in 73.6% der Fälle angewandt, z.B. bei Blepharospasmus, Meige-Syndrom, Schreibkrampf und Hemispasmus facialis, mittlere Dosen zwischen 50 und 100 IU bei 17.6%, vor allem bei Zervikaler Dystonie, hohe Dosen von mehr als 100 IU in weiteren 8.8%, bei fokaler Spastik. Die Aufarbeitung des Krankengutes gibt uns Kriterien, die Langzeit-Behandlung differenziert in Bezug

auf wahrscheinliche Effektivität und Nebenwirkungen einzusetzen. Im Moment basiert die Durchführung dieser Therapie vor allem auf der jeweiligen Empirie des behandelnden Arztes. Mehr objektive Daten und an einem standardisierten Protokoll orientierte Arbeitsweise wären wünschenswert.

Magnetic Resonance Diffusion Imaging Applied in Stroke

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The magnetic resonance (MR) T-2 weighted imaging demonstrates infarcted tissue, but often cannot differentiate the acute from the chronic stroke. Conversely, MR diffusion imaging provides detection of cerebral ischemia within minutes of onset and the differentiation between an acute and chronic stroke. Thus, MR diffusion imaging can in an early stage direct the treatment of an acute ischemic stroke. The ability to rapidly assess the extent of tissue at a risk of infarction, soon after insult, is central to initiating an appropriate and early intervention. Considering the potential of diffusion imaging to demonstrate an acute ischemic but potentially salvageable tissue, this technique could have significant impact on the future management of stroke, and has become the focus of many investigations. There is a debate over the pathophysiology that underlines the diffusion changes and the reversibility of these changes to normal after reperfusion in humans.
MR diffusion imaging has great potential for helping to direct the treatment of acute ischemic stroke. Further investigation is needed to optimize the possible contributions of diffusion imaging.

Ursachen für ischämische Insulte bei jungen Patienten: M. Fabry

S. Müller, A. Studer, K. Hess (Zürich)

Die Autoren berichten über eine 27-jährige Frau, die einen meso-bidiencephalen ischämischen Insult erlitt. Anamnestisch litt die Patientin seit dem 11. Lebensjahr an v.a. bei Fieber auftretenden schmerzhaften Akroparästhesien. In den weiteren Abklärungen wurde ein heterozygoter M. Fabry diagnostiziert. Der Fall wird anhand der aktuellen Literatur diskutiert.

Early stroke related to factor V Leiden mutation: a rare cause of pharmacoresistant epilepsy

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Factor V Leiden mutation is the most common genetic pre-disposition to venous thrombosis, known since 1993. Its role in perinatal cortical infarction is reported since a few years. Adjacent cortex to infarcted tissue may become epileptic, sometimes leading to pharmacoresistant epilepsy. We report on a 33-year old patient with a positive family history, in whom this mutation was discovered at the age of 32. Since childhood, brief periods of "absences", speech problems and a feeling of anxiety were noted. Epilepsy was diagnosed at the age of 12 and the work-up revealed a left temporal lesion which was interpreted as an arachnoid cyst. A decompression was carried out at age 25 without seizure relief. Presurgical evaluation in our laboratory, together with the patient's history, led us to conclude that the lesion is in fact a porencephalic cavity, probably due to intrauterine venous thrombosis. The remaining temporal neocortex showed high epileptogenicity. An EEG-triggered fMRI confirmed the concordance of the abnormal cortex and seizure focus. He was operated and is seizure-free since.

Acute meningoencephalomyelitis associated with human herpesvirus-6 in an immunocompetent 16 year old girl with dramatic improvement under highdose prednisolon

P. Baumberger, B. Tettenborn (St. Gallen)

We present the case of a 16 year old previously healthy girl who developed after a flu-like illness drowsiness, meningismus, horizontal nystagmus, dysarthria, paraparesis, urinary and fecal incontinence. CSF examination showed pleocytosis (310x106/L). Blood examination was normal, especially chemogram incl. CRP and hematology. All serological testings and PCR for viruses (HSV 1+2, HHV6, VZV, CMV, Enterovirus, EBV, HIV 1+2), bacteria esp. *Mycobacteria legionella* and *Listeria* were negative in both, blood and CSF. EEG showed rhythmic bitemporal theta-delta activity. Cranio-cerebral and vertebro-spinal MRI revealed marked basal leptomeningitis and ventriculitis, a hypodense cortical and subcortical

lesion of the right temporal lobe and severe diffuse hyperdense lesions within the brainstem and the complete spinal cord. Therapy with acyclovir was initiated. Due to the clinically progessive course a biopsy of brain tissue was performed. In the brain tissue we could detect human herpesvirus-6 with PCR, all other viruses were negative. Following brain biopsy a probatory treatment with high-dose methylprednisolon 1gr/d was started. Within the following days she showed dramatic improvement, brainstem-signs resolved, within 1 week she could walk on crutches. She was no longer incontinent. There was no mental deficit. After 2 weeks she left hospital for further rehabilitation with only mild paraparesis.

Stroke as presenting feature of a benign purulent meningitis: a case report

C. Gobbi, C. Staedler, C. Tosi (Lugano)

We describe a case of a 48-year old woman treated for a purulent maxillary sinusitis who presented with a minor vertebrobasilar stroke.
The work up discovered a clinically benign purulent meningitis and severe plurifocal narrowing of the large vessels of the anterior and posterior circulation.
The clinical course rapidly improved on antibiotic therapy whereas the vessels alterations are still not completely regressed after two months.
Cerebrovascular complications involving large brain arteries are know in bacterial meningitis especially in children and are associated with a complicated course of the disease, but are unusual as presenting feature of a benign purulent meningitis.
The pathogenesis, Doppler, angio-MRI findings and literature review will be discussed.

Idiopathic parietal meningoencephalocele and late onset epileptic seizure: a case report

M. Raimondi, R. Renella, C. Tosi, C. Gobbi, C. Staedler (Lugano)

We describe a case of an occult idiopathic parietal meningoencephalocele in a 59-year old man presented with an inaugural epileptic seizure.
The unusual magnetic resonance images are discussed and compared with the intraoperative findings.
Parietal meningoencephalocele accounts for about 12 to 13% of all meningoencephaloceles, and result from an incomplete saggital fusion of the parietal bones.
Concomitant intracranial malformations are frequent, whereas the association of convexity meningoencephalocele and epileptic seizure is rare.

Epilepsy and Obstructive Sleep Apnea

P. Höllinger, M. Gugger, Ch.W. Hess, C.L. Bassetti (Bern)

Background: Three publications recently documented the coexistence of epilepsy and obstructive sleep apnea (OSA). The extent, nature, and clinical relevance of this association remain poorly known.
Patients/Methods: A diagnosis of epilepsy was made in 25 (3.6%) of 700 patients (pts) with OSA seen at our Sleep Center over the last six years. Characteristics of epilepsy, sleep history, presence of excessive daytime sleepiness (Epworth Sleepiness Score=ESS), and response to continuos positive airway pressure (CPAP) were assessed. Clinical follow-up was obtained in all pts at a median of 26 months (range: 2-102 months) after the diagnosis of OSA.
Results: There were 21 men and 4 women with a median age of 55 years (range: 37-79). The median Apnea-Hypopnea-Index was 44 (range: 10.3-85.1) and 48% of pts had an ESS >10. Epilepsy was generalized in 11 pts and focal in 14 pts. In 14 pts epilepsy was idiopathic, and in five pts seizures were state-dependent. In 24 pts epilepsy appeared one month to 44 years before the diagnosis of OSA. In 17 pts the onset of OSA-symptoms coincided with a clear increase in seizure frequency or first appearance of a status epilepticus. Treatment with CPAP was continued with good compliance in 12 pts and led to a significant reduction of both ESS and seizure frequency in four pts.
Conclusions: (1) The frequency of pts with epilepsy and OSA is greater than expected by pure coincidence, (2) a detrimental effect of OSA on seizure frequency was likely in >50% of our pts with epilepsy, (3) treatment with CPAP improved seizure control in at least 1/3 of pts, who all presented excessive daytime sleepiness.

Brain electric tomography (LORETA) in healthy subjects who believe or disbelieve in paranormal phenomena

L. Gianotti, D. Pizzagalli, P. Faber, P. Brugger, D. Lehmann (Zürich)

Healthy subjects who strongly believe or disbelieve in paranormal phenomena (pre-screened using the "Mischo" scale) were examined for differences in brain electric state under resting conditions. 33-channel eyes-closed EEG from 16 disbelievers and 22 believers was analyzed (mean: 72 artifact free seconds/subject) in seven frequency bands, using Low Resolution Electromagnetic Tomography (LORETA: 7 mm resolution, 2394 voxels) to compute the 3-D distribution of current density, normalized across subjects. The brain electric gravity center (computed from the LORETA results) of the alpha1 (8.5-10 Hz) band activity tended to be more posterior in believers than disbelievers, and vice versa for alpha2 (10.5-12 Hz). LORETA functional imaging showed statistically interesting differences (Holmes-corrected for multiple testing) between the groups, maximal posterior left in alpha1 (stronger activity in believers, $p<.1$) and temporal right in alpha2 (stronger activity in disbelievers, $p<.05$). Conventionally assuming that alpha band activity is indicative of absence of functional activation, the lateralization of the maximal differences in our analysis suggests a relative left hemispheric functional preponderance in disbelievers and (in agreement with other reports) a relative right hemispheric functional preponderance in believers.

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Differences of brain electric activity between high and low hypnotizable healthy subjects

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We studied brain electric activity in high and low hypnotizable, healthy subjects during resting (6 males, 6 females, age: 26.7±7.3 years, all right-handed; 8 high, 4 low hypnotizables). Hypnotizability was rated after the subjects ability to attain a deep hypnotic condition (amnesia). 20 seconds/subject 19-channel EEG was analyzed using FFT Dipole Approximation, Low Resolution Electromagnetic Tomography (LORETA) and Global Dimensional Complexity (GDC).

The FFT Dipole Approximation source locations (orthogonally projected onto the 3-dimensional vector between the two groups' mean locations) of the frequency bands (delta: 1.5-6 Hz, theta: 6.5-8 Hz, alpha1: 8.5-10 Hz, alpha2: 10.5-12 Hz, beta1: 12.5-18 Hz, beta2: 18.5-21 Hz, beta3: 21.5-30 Hz) were tested for group differences. Mean source locations differed significantly ($p<0.04$) for theta, beta1 and beta2. Post-hoc tests showed that this was due to more posterior sources in high than low hypnotizables ($p<0.04$, $p<0.17$ and $p<0.07$, respectively). LORETA imaging identified the involved cortical areas more precisely. GDC was significantly higher for high than low hypnotizables (5.2 vs 4.7, $p<0.02$).

Thus, before hypnosis, high and low hypnotizable subjects are in different brain states, with more posterior brain activity gravity centers and increased dimensional complexity in high hypnotizables.

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Brain electrical tomography (LORETA) of different emotions in healthy subjects

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Emotional and neutral faces were presented to 17 healthy volunteers on a computer screen while a continuous 25-channel-EEG was recorded. Evoked potentials were computed for different emotions and neutral condition. Paired topographic analysis of variance was computed for the evoked potentials to find times of onset of significant differences in emotional responses compared to neutral response. Based on these results a statistical analysis of functional LORETA images showed the active brain regions for the different emotions. When the different emotions were compared to neutral condition, the activation was mainly in right frontal brain regions, Brodman Areas (BAs) 45, 46, 47, sometimes also BAs 10 and 11. Additional activation was found for happiness in right BAs 6,8,24 and 32, for sadness in left BAs 1, 2, 3 and 40 and right BAs 6, 21, 22 and 38, for anger in left BAs 18 and 19 and for fear in left and right BAs 21 and 22. When happiness was compared to sadness, happiness showed activation in left temporal BAs 21, 22 and 42.

The results of this study show that reaction to emotional faces generally activates regions in the

right frontal lobe but also activates different brain regions for different emotions.

Different meditation-induced, altered states of consciousness show different EEG source locations

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The state of consciousness can be altered by willed, mental self-induction (i.e. meditation, self-hypnosis, autogenic training) leading to different subjective experiences. The question arises whether objective measures (EEG) differ with different subjective experiences. 27-channel EEG was recorded from a long-term meditator during 5 different modes of meditation, each with a different focus of mental attention; this sequence was repeated in 3 sessions. The 3-D gravity centers of brain electric activity (source locations) were computed for 7 independent frequency bands via FFT dipole approximation, and analyzed with MANOVA's. There were significant differences in source location for the delta (1.5-6 Hz) and beta1 (12.5-18 Hz) frequency bands between meditation modes ($p<0.02$ and $p<0.0005$, respectively), but not between sessions (and no interaction). Post-hoc tests showed that in the delta band, the source location during meditation 1 was more anterior than during meditations 4 ($p<0.01$) and 5 ($p<0.04$), while in the beta1 band, the source location during meditation 1 was more inferior than during meditation 3 ($p<0.0001$).
The results indicate that different mentally self-induced alterations of consciousness are associated with changes of brain functional state as measured in the brain electric field.

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Multicenter P300 brain mapping of impaired attention to cues in hyperkinetic children

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Objective: Multicentric brain mapping data was recorded from children with and without hyperkinetic disorders (HD) during a cued continuous performance test (CPT) to examine attentional P300 effects for deficits in HD children and for consistency across clinics.
Method: CPT performance and P300 maps to cues and distractors from 148 children were tested for differences between age- and sex-matched groups with and without HD (N=57 each), and between clinics (N=5).
Results: Consistency of performance, P300 measures, and amplitude increases plus topographic changes for P300 maps to cues compared to distractors was established across most clinics. HD children missed more targets, made more false alarms, and had larger N1 and smaller P3b map amplitudes after cues than control children. Cue-P300 amplitude correlated positively with detecting subsequent targets. P300 topography and latency did not differ between HD and control children. Tomographic source solutions revealed posterior P300 sources which were attenuated in HD children.
Conclusions: Phasic covert attention to cues preceding potential targets is already impaired in HD, determines performance with subsequent targets, and activates the posterior brain. These findings extend previous results obtained for children with Attention Deficit Hyperactivity Disorder and demonstrate the usefulness of clinical multicenter studies using cognitive brain mapping.

Brain electric tomography (LORETA) in Alzheimer's disease under rivastigmine medication

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Alzheimer type dementia (DAT) patients were examined before and after rivastigmine (Exelon®) treatment, a new brain-selective acetylcholinesterase inhibitor. 19-channel eyes closed resting EEG was recorded in 10 DAT patients before and after at least three months of rivastigmine medication and analyzed in seven frequency bands (delta, theta, alpha1, alpha2, beta1, beta2 and beta3) using Low Resolution Electromagnetic Tomography (LORETA, 7 mm resolution, 2394 voxels) to compute the 3-D distribution of current density, normalized across subjects. The brain electric gravity center (computed from the LORETA results) of the theta, alpha1 and alpha2 frequency bands showed significant shifts

to the right after rivastigmine (theta: p=.06; alpha1: p=.03; alpha2: p=.1), and a more anterior location of the alpha2 gravity center (p=.08). LORETA functional imaging showed significant increases (Holmes-corrected for multiple testing) after medication (p<.05), maximal in Brodmann Area 31 (cingulate gyrus, parietal lobe) in beta2 and beta3.
Our findings thus suggest that rivastigmine increases the activity of this area of the parietal cortex which is known to be involved in memory functions.

Motorisch evozierte Potentiale (MEP) vom M. Masseter nach direkter transkranieller magnetischer Stimulation (TMS) der Pyramidenbahn

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Einführung: Die Registrierung von MEPs vom M. Masseter ist ungleich schwieriger als die Registrierung der MEPs von Fazialis-innervierten Gesichtsmuskeln. Bis heute ist ungeklärt, inwieweit methodische Gründe der Registrierung oder der Kortexreizung bzw. anatomisch-physiologische Ursachen dafür verantwortlich sind. Aufgrund der ganz unterschiedlichen Funktion ist es denkbar, dass die kortikale Repräsentation der Gesichts- und Kaumuskulatur grundsätzlich verschieden ist.
Methode: Wir haben die TMS und die Ableitmethode für den M. Masseter optimiert und insbesondere den Einfluss der Spulenorientierung erarbeitet. Ausserdem wurde die TMS-Technik mit den Resultaten bei transkranieller elektrischer Stimulation (TES) verglichen.
Resultate: Die medio-laterale Spulenorientierung war viel effizienter als die fronto-dorsale Orientierung (p<0.001), was kontrastiert zu den Befunden bei Gesichtsmuskeln. Die MEPs des M.Masseter nach TMS waren bezüglich Latenz, Form, Amplitude und deren Variabilität identisch zu den MEPs nach TES, was für eine direkte Reizung der Pyramidenbahn spricht.
Schlussfolgerungen: Die optimale Spulenrichtung für die MEPs des M. Masseter ist medio-lateral und die direkte Stimulation der Pyramidenbahn ist hier einfacher als die transsynaptische Aktivierung der Pyramidenzellen. Wir vermuten, dass die Projektionen zu den Pyramidenzellen der Kaumuskulatur weniger stark ausgebildet sind als bei den Gesichtsmuskeln und deswegen der transsynaptischen Aktivierung mittels TMS schlechter zugänglich.

Preserved oblongness but impaired roughness discrimination in two patients with astereognosis: implications for tactile object recognition

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Astereognosis refers to a loss of tactile object recognition, caused by a disturbed perception of macrogeometrical and microgeometrical properties. The underlying discriminatory somesthetic functions are thought to be processed in different somatosensory areas. To evaluate wether the recognition of macrogeometrical and/or microgeometrical features differentially contributes to tactile object recognition, we studied the ability of oblongness and roughness discrimination in two patients with astereognosis of the right hand. The subjects were tested according to an alternative forced-choice paradigma with cubes of different oblongness, chosen above a critical threshold for conscious perception. In analogy, roughness discrimination was examined by tactile assessment of subtle differences in grating profiles presented above perception threshold as defined in healthy controls. The ability of oblongness discrimination was fully preserved or slightly disturbed in our patients, dependent on the extension of the lesion to the superior parietal lobule. Roughness discrimination was significantly impaired in both patients, due to the involvement of the primary sensory cortex and, possibly, to additional affection of the secondary sensory area in the left parietal operculum. These findings suggest that somatosensory processing during tactile object recognition, involving separate somatosensory areas, critically depends on perception of microgeometrical features of objects, while the appreciation of macrogeometrical dimensions seems to play a minor role.

Kleptomanie bei Frontalhirnstörung

R. Kozian, F.G. Otto (Rheinau/ZH)

Anhand eines klinischen Fallbeispiels wird das komorbide Auftreten der Kleptomanie und einer Frontalhirnläsion dargestellt. Unter Einbeziehung der Kleptomanie in das Spektrum zwanghafter (Obsessive Compulsive Disorder) bzw. affektiver Störungen, wird eine Verbindung zu einer insbesondere bei erstgenannten Störungsspektrum neuropsychologisch und neuroradiologisch nachweisbaren Frontalhirnläsion hergestellt und einer bei beiden Spektren auftretenden Funktions-

beeinträchtigung der Serotonin-Transmission als möglicher pathogenetischer Faktor aufgeführt.

Confusion restricted to two faces – a paramnesia or prosopagnosia?

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A 73-year-old right-handed woman sustained ischemic destruction of the right hippocampus, the parahippocampal, fusiform and lingual gyri, and the posterolateral thalamus. She had dense left-sided homonymous hemianopia, hemispatial neglect and impaired nonverbal memory. Although she was soon freely mobile on the ward and engaged in normal discussions, a striking behavioral feature persisted: she consistently confused the assistant physican (first author) and the chairman of the Clinic. She confused their names, their background and the content of discussions she with them. She had no difficulty distinguishing between other people. In neuropsychological tests, she recognized the faces of famous personalities and correctly distinguished between unknown new faces. In a series of experiments, we found that she exclusively failed to distinguish between photographs (full face or contour) of the two physicians. When presented with two pictures of the same physician, she often considered them two different persons. By contrast, she correctly distinguished between them when only the central part of their face was presented or when faces were presented upside down. Thus, the patient attributed a false identity to these two faces only when they were presented in prototypical, upright fashion. The failure of this patient is reminiscent of reduplicative paramnesia, i.e., the attribution of a false identity to a place or person. A paramnesia referring to two new individuals has not been recognized before. This paramnesia might represent an exclusive prosopagnosia for two individuals, an interpretation suggesting that the right medial temporooccipital junction processes facial information in an individually specific fashion.

Die somatische Seite der Angst

M. Beck-Föhn (Kreuzlingen)

Angst aus realem oder mentalem Anlass entsteht durch Aktivierung der Amygdala aufgrund der bewussten und unbewussten Erfahrungen, und startet die Alarmreaktion des Sympathischen Systems: Noch vor Bewusstwerden der Situation wird adrenerg in der formatio reticularis der fix gekoppelte Komplex "Cardiovasculäre, respiratorische und neuromuskuläre Leistung und Vigilanz" hochreguliert, von da sofort gesteigertes Atemvolumen mit verstärktem CO2-Export. Ohne muskuläre Mehrleistung bleibt das respiratorische CO2-Defizit ungedeckt; diese interne Fehlermeldung erhöht den Sympathicustonus weiter und damit die Atemrate. Hyperventilation und adrenerge Übersteuerung des Organismus mit wachsender Angst können so innerhalb von Sekunden zu Panik und Bewusslosigkeit führen. Gemessen wird der akute Angstzustand anhand des pCO2-Gehalts der Ausatmungsluft. Der chronische Angstzustand ist fassbar mit dem "negativen Base-excess": Nach HV über wenige Stunden kompensiert erhöhte renale Bicarbonat-Excretion die Alkalose. Subjektiv wird statt HV Atemnot wahrgenommen; von aussen ist die chronische HV nicht erkennbar. Geklagt wird der Gesamtkatalog der "Psychosomatischen" Erkrankungen. Solange die Störung nicht anhand eines abnormen Messwerts für den Pat. verstehbar wird, verstärkt sich der circulus vitiosus mit grossem Risiko für extrem hohe Arztkosten, dennoch Invalidität, Depression und Sucht.
Anhand der pCO2-Messung und des HV-Versuchs wird der Mechanismus der Beschwerden für den Patienten verständlich und verliert damit seine angstmachende Potenz, was die rationale Auseinandersetzung ermöglicht.

Isolated optic neuropathy: report of a case of chronic hepatitis C associated with anticardiolipin antibodies

M. Sinnreich, B. Rossillion, R. Sztajzel (Genève)

Optic neuropathy is commonly due to inflammatory diseases, infectious conditions or ischemia caused by atherosclerosis. Rare cases of optic neuropathy in association with hepatitis C and cryoglobulinemia have been described. To our knowledge optic neuropathy related to hepatitis C and anticardiolipin antibodies has not been reported yet. Here we describe a 54 year old patient presenting a right optic neuropathy of abrupt onset. He has a history of malignant lymphoma, treated by chemotherapy and splenectomy in 1983, considered in complete remission. Investigations revealed a chronic hepatitis C and

presence of high titers of IgG type anticardiolipin antibodies. CNS recurrence of lymphoma was ruled out by lumbar puncture and MRI scan. An embolic origin (large vessel or cardiac) was also excluded. Oral anticoagulation and antiviral therapy were initiated resulting in slight improvement. We suggest that hepatitis C and anticardiolipin antibodies should be considered in the differential diagnosis of optic neuropathy of acute onset.

Syndrome de Brown post-traumatique

A. Carruzzo, B. Curty, F. Vingerhoets, F.X. Borruat (Lausanne)

Les diplopies verticales acquises sont fréquemment dues à des parésies des nerfs crâniens (III, IV) ou à un trouble oculomoteur supra-nucléaire (skew deviation), mais surviennent également plus rarement dans d'autres pathologies (myasthénie grave, pseudotumeur orbitaire, orbitopathie thyroïdienne, fracture du plancher orbitaire, etc). Nous rapportons le cas d'une patiente de 37 ans se plaignant d'une diplopie verticale transitoire survenue à la suite d'une chute avec contusion de la région orbitaire gauche plusieurs mois auparavant. La diplopie se manifeste plusieurs fois par jour, et la patiente parvient à la supprimer en massant le globe oculaire gauche. L'examen clinique et ophtalmologique est normal dans l'intervalle. Un CT-scan avec coupes fines montre l'arrachement d'un petit fragment osseux au niveau de la trochlée de l'orbite gauche en région de l'insertion du muscle grand oblique.

A propos de deux cas inhabituels de phénomène de Tullio

B. Curty, F.X. Borruat, A. Carruzzo (Lausanne)

On parle de phénomène de Tullio lorsque les sons déclenchent des phénomènes vestibulaires. Ce phénomène a été décrit dans les fistules périlymphatiques, mais d'autres étiologies ont été rapportées depuis (barotrauma, anomalie de l'os temporal, fractures du crâne latéro-basales, etc).
Cas n°1: un homme de 33 ans aux antécédents d'hypoacousie modérée survenue dans le contexte d'un coup du lapin rapporte un tilt visuel gauche lorsqu'il fredonne; lors de la marche ce phénomène le fait dévier vers la gauche. L'examen clinique révèle un tilt oculaire gauche déclenchable par le fredonnement.
Cas n°2: un homme de 35 ans développe progressivement des oscillopsies à la marche, par la suite également à l'audition de bruits aigus (sirène d'ambulance). L'ophtalmoscopie révèle des mouvements oculaires verticaux avec une composante rotatoire variable, synchrones à la pression sur le tragus gauche, mais aussi un nystagmus antihoraire synchrone au pouls après un effort physique intense. Le CT-scan montre un bombement du canal semi-circulaire antérieur gauche dans le rocher.

Primary intraspinal primitive neuroectodermal tumor: case report and review of the literature

S. Hofer, U.W. Buettner, H. Landolt, H. Laeng (Basel, Aarau)

We report the case of a 33-year-old male patient who presented with progressive sensory deficits in his right arm. The MRI of the upper spinal axis revealed an intraspinal lesion C6. An open myelotomy was performed and the tumor was subtotally resected. Histopathological findings disclosed a very cell rich tumor, consisting of mainly small round cells and scanty cytoplasma. Postsurgery the patients neurological deficits improved for a short while. 5 weeks after surgery radiation of the peritumoral region with 3060 cGy was performed over a 4 week period. Chemotherapy with Vincristine iv and Methotrexate ith was administered simultaneously. During this treatment the tumor disseminated throughout the central nervous system.
Progressive tetraparesis developed. The clinical course was further complicated with an empyema of the pleural space. The patient died 4 months after the initial presentation with neurological symptoms. Neuropathological postmortem work uprevealed no tumor cells in the irradiated sites but extensive dissemination of the tumor throughout the rest of the CNS.
Primary intraspinal PNETs are rare lesions. A review of the literature and discussion of interdisciplinary therapeutic approaches will be presented.

A new disease related to a chronic inflammatory demyelinating polyneuropathy (CIDP): visceral Leishmaniasis. Case report.

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A 34 year old swiss man presented on returning from central Asia with a clinical, CSF and electrophysiological feature of a CIDP. CIDP is usually idiopathic but can be associated with several chronic diseases. In our patient the clinical investigations disclosed a visceral Leishmaniasis.
Dominant neurological presentation of visceral Leishmaniasis is exceedingly rare. One case of acute inflammatory demyelinating polyneuropathy has been published but, to our knowledge, cases of CIDP related to visceral Leishmaniasis have never been reported.