

Abstracts of oral presentations at the RSSA Neuroradiology and Body Imaging Advances Congress, Sandton, 28 - 30 August 2009

MAGNETIC RESONANCE IMAGING OF MILIARY TUBERCULOSIS OF THE CENTRAL NERVOUS SYSTEM IN CHILDREN WITH TUBERCULOUS MENINGITIS

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Background. Tuberculous meningitis (TBM) is closely associated with miliary tuberculosis, and a pathogenetic relationship is suspected, although it has been proposed that the two processes are unrelated.

Objective. To describe miliary tuberculosis of the central nervous system (CNS) on MRI in children with TBM.

Materials and methods. A retrospective descriptive study of 32 paediatric TBM patients referred for MRI. The presence of miliary nodules in the CNS was recorded. Lesions were categorized according to their distribution, enhancement pattern, size and signal characteristics.

Results. A miliary distribution of nodules was present in 88% of patients. All patients with a miliary distribution had leptomeningeal nodules, and 18% of these patients had deep parenchymal nodules in addition. At least one tuberculoma with central T2 hypointensity was identified in 39% of patients.

Conclusion. The high prevalence of miliary leptomeningeal nodules in the CNS of children with TBM is significant because it points to a pathogenetic relationship that has long been suspected on epidemiological grounds. Our findings challenge the concept that miliary tuberculosis is only an incidental finding in TBM patients, and suggest that it plays an integral part in the pathogenesis.

DETERMINATION AND COMPARISON OF THE TERMINATION OF THE DURAL SAC TIP IN A SOUTH AFRICAN POPULATION: CLINICAL SIGNIFICANCE IN CRANIOSPINAL IRRADIATION

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Objectives. To determine, using MRI, the level of termination of the dural sac in the South African population, comparing our results with findings from international studies.

Methods. We retrospectively reviewed the lumbosacral MRIs of 309 patients, including black and white males and females with ages ranging from 18 to 83, in each case identifying the tip of the dural sac and establishing the level of termination. This level was recorded in relation to the adjacent vertebral body i.e. upper-, middle- and lower-third and adjacent intervertebral disc.

Results. The dural sac tip level ranged from the lower third of L5 to the lower third of S3. The overall mean of the dural sac position was at the middle third of S2. A notable percentage (13.9%) of patients had a dural sac level lower than the lower third of S2, and 15.2% patients had a dural sac level higher than the S1-S2 intervertebral disc. No significant difference in dural sac level was seen between black and

white patients, neither was any significant difference observed between male and female patients. No relation was found between age and the level of the dural sac.

Conclusion. The study failed to demonstrate a difference in the dural sac termination level, as found in the South African population, compared with levels reported in various international studies; nor is there a statistical difference between gender, race and age. Our study shows that routine placement of the spinal field at the lower border of S2 adequately treats the majority of CSI patients. Using spinal MRI to establish the lower border of the CSI spinal field will, however, benefit patients by ensuring adequate coverage of the entire neuroaxis as well as minimising late gonadal toxicity.

NEURORADIOLOGICAL FEATURES OF THE PARADOXICAL TUBERCULOSIS-ASSOCIATED IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME

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Objective. Paradoxical tuberculosis-associated immune reconstitution inflammatory syndrome (TB-IRIS) is an important complication in HIV-1-infected tuberculosis patients who start combination anti-retroviral therapy (ART). Neurological manifestations occur in more than 10% of TB-IRIS cases. Apart from a few case reports, the radiological features of neurological TB-IRIS have not previously been described. Our objective was to describe the radiological features of paradoxical neurological TB-IRIS.

Methods. We reviewed neuroradiological imaging of 16 patients with neurological manifestations of paradoxical TB-IRIS. Computer tomography (CT) (N=13) and magnetic resonance imaging (MRI) (N=3) were reported by 2 neuro-radiologists, blinded to clinical presentation.

Results. Neurological TB-IRIS manifestations included: meningitis (4), intracranial space occupying lesions (SOLs, presumed tuberculoma) (5), both meningitis and SOLs (5), radiculomyelitis (1) and spondylitis (1). In 10 patients with tuberculoma IRIS, we observed a high prevalence of (i) low-density lesions on non-contrast enhanced CT

(all lesions), (ii) multiplicity of lesions (in 5 of 10 patients), (iii) perilesional oedema (17/22 lesions) and (iv) contrast enhancement of the lesion/s (20/22 lesions). In 9 patients with meningitis, meningeal enhancement ($N=2$) and hydrocephalus ($N=1$) were infrequently observed.

Conclusions. This is the first substantial series to describe the radiological features of paradoxical neurological TB-IRIS. Compared with published radiological findings of tuberculomas in HIV-1-infected patients (not receiving ART), an increased inflammatory response is evident in tuberculoma IRIS. However, in patients with TB meningitis IRIS, we found no evidence of more frequent leptomeningeal enhancement, compared with what is described in HIV-1 infected patients with TB meningitis not on ART.

LOEFFLER'S ENDOCARDITIS WITH CARDIAC AND NEUROLOGICAL FEATURES: A CASE REPORT

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Hypereosinophilic syndrome is a rare disorder characterised by a persistent eosinophilia of $1\ 500/\mu\text{l}$ for at least 6 months; it can be primary or secondary. Widespread end organ damage occurs in the heart and brain, among others. The neurological presentations include sensory polyneuropathy and encephalopathy. Thromboembolism is the most significant mechanism of neurological injury. The typical neuroimaging findings include multiple high signal lesions on T2W or FLAIR images. As these are infarcts, they are distributed in the watershed/ border zones, and may increase in size if left untreated. Reduction in peripheral eosinophilic count often leads to regression of neurological symptoms and signs. Knowledge of the association between cardiac and neurological symptoms and signs in the setting of hypereosinophilia might prevent an unnecessary delay in diagnosis.

We describe a 37-year-old woman who presented with palpitations and worsening dyspnoea. In addition, a neurological examination revealed dysarthric speech, right arm pronator drift with mild extensor weakness, and reflex asymmetry. The right-sided weakness resolved within 24 hours. An uncontrasted CT scan of the brain preceded an MRI. Axial FLAIR, sagittal T1W pre- and sagittal MPRAGE post gadolinium images were acquired on a 1.5T Siemens MRI. Gyral cortical high signal intensity lesions were present on T1W images in the cortex and subcortical areas of the frontal and occipital lobes and cerebellum. Multiple high-signal lesions were seen on T2W FLAIR images in watershed territories, confirming the CT diagnosis of borderzone infarcts. Low-signal lesions seen centrally in high-signal lesions represented lacunar infarcts. Cardiac echography and MRI revealed obliteration of both apices of ventricles by thrombus and delayed enhancement in keeping with the classic appearance of Loeffler's endocarditis. Low platelets and an eosinophilic count

of 3.08 (normal $0 - 0.45 \times 10^9/\text{l}$) were found. The patient's diagnosis of Loeffler's endocarditis was confirmed histologically post cardiac transplant.

Ethical issues in radiology

The first of a series of short courses entitled Current Ethical Issues in Radiology was presented on 23 January at the Tygerberg Campus of Stellenbosch University by the Radiological Society of South Africa (RSSA).

The workshop was established in response to many requests by RSSA members, as well as the rapidly changing professional, social, technical and political environment, to meet the challenges facing radiologists and other important roleplayers. A national faculty of leading radiologists, a clinician and an academic addressed wide-ranging topics pertinent to the daily practice of radiology, some of which were ethical considerations in cochlear implant patients, paediatric imaging and radiation exposure, and kickbacks and perverse incentives.

Covidien, a leading pharmaceutical company, made an unrestricted educational grant to the RSSA for hosting the event, adding impetus to the initiative. It is envisaged that the course will be repeated in Gauteng during the second half of 2010. Participants will receive 8 CPD ethical points.

We remind readers that a further CPD-accredited ethics resource is the online journal *South African Journal of Bioethics and Law*, available at <http://www.sajbl.org.za/index.php/sajbl>.

RSSA/Stoller Sports Medicine and RSSA/Leuven ear imaging courses

A last-minute reminder that the first and exclusive RSSA/Stoller Update in Sports Medicine course will be presented by Dr David Stoller (MD, FACR), the internationally renowned orthopaedic and musculoskeletal radiologist of San Francisco, USA, on 19 and 20 March 2010 at the BMW Pavilion in Cape Town's V&A Waterfront. Registration details are on the website www.stollercapetownupdate2010.co.za. For enquiries regarding registration, advertisements and exhibitions as well as scientific, general and social programmes, please contact Christelle Snyman, RSSA/Stoller 2010 Update, PO Box 19063, Tygerberg 7505, South Africa, tel. +27 21 938 9245 or email csnyman@sun.ac.za.

And a not-quite-last-minute reminder that the RSSA/Leuven Ear Imaging Course will take place on 16 - 18 April 2010 at the historic and scenic Spier Estate near Stellenbosch in the Western Cape.

This hands-on interactive teaching course on temporal bone imaging is currently in its fourth European cycle. The course is conducted by internationally renowned Belgium and Dutch radiologists, under the leadership of Professor Dr Robert Hermans of the Department of Radiology, University Hospitals, K.U. Leuven, Belgium.

Enrolment is limited to 90 participants and exclusively RSSA members. Course and registration details are online at www.rssa2010earcourse.co.za.