The diagnosis of sacral insufficiency fractures may be difficult and therefore the prevalence underestimated. Weber et al., in 1993 published a prospective study finding that women over the age of 55 who presented to the hospital with low back pain had sacral fractures in 1.8%. The difficulty in accurate diagnosis is easy to understand as the anatomy is poorly delineated on plane x-ray. MRI is the gold standard for diagnosis. Bone scan and CT are utilized if MRI contraindicated.

Sacroplasty assists in sacral stabilization. CT, whether utilized alone or in combination with fluoroscopy, dramatically improves visualization of the sacrum and the critical neural bearing structures within its substance during the sacroplasty procedure. Sacroplasty is an established effective procedure for the treatment of painful osteoporotic sacral insufficiency fractures. Sacroplasty can also be utilized in the management and treatment of painful sacral neoplastic lesions.

**SATURDAY, SEPTEMBER 19, 2015 – POSILLIPO ROOM**

**15:00-16:30 Oral Communications: Diagnostic 6**

**ECO:09:01**

**THALAMIC FUNCTIONAL CONNECTIVITY ALTERATIONS CORRELATE WITH COGNITIVE IMPAIRMENT: COMPARISON BETWEEN RELAPSING REMITTING AND SECONDARY PROGRESSIVE MULTIPLE SCLEROSIS**

F Tona1, L De Giglio1, N Petfas1, C Gianni1, M C Piattella1, L Prosperini1, C Pozzilli1, P Pantano1,2

1Department of Neurology and Psychiatry, University Sapienza, Rome, ITALY, 2IRCCS Neuromed, Pozzilli, ITALY

**Purpose:** In Multiple Sclerosis (MS) the severity of cognitive impairment increases with disease progression, but the underlying pathophysiological mechanisms are still unclear. Abnormalities in thalamo-cortical functional connectivity (FC) have been proved to correlate with Paced Auditory Serial Addition Test (PASAT) scores in relapsing-remitting (RR) MS. The aim of this work was to evaluate thalamo-cortical FC changes in patients with secondary progressive (SP) MS, as compared to both RR and healthy subjects (HS), and to investigate correlations with cognitive impairment.

**Methods:** Forty MS patients (20 RR and 20 SP) and 20 HS underwent a 3 Tesla fMRI at rest; they were also scored with PASAT. Data were analysed with tools from FMRI Library. The seed-based method was used to identify the thalamo-rS network (rSN).

**Result:** Thalamic rSN was altered in both SP and RR with respect to HS, with greatest FC abnormalities in SP. In particular, thalamo-cortical FC was lower in RR than in HS in left temporo-occipital, frontal and parietal cortices, bilaterally and in the cerebellum; SP showed decreased FC in the same brain areas, which were even more extensively affected, and, in addition, in the medial thalamus. Thalamo-cortical FC was higher in RR than in HS in the right frontal and in the occipital and cingulate cortices, bilaterally; SP showed increased FC also in the right temporo-occipital cortex, hippocampus and posterior thalamus, in addition to the aforementioned areas. PASAT scores were significantly lower in patients than HS and in SP than in RR. In RR, PASAT scores significantly correlated with thalamo-cortical FC in the frontal cortex bilaterally, thalamus and left anterior insula, indicating that the performance greater the FC. In SP widespread hyperconnectivity, including the cerebellum, thalamus, posterior cingulate, anterior insula and multiple foci in the whole cerebral cortex, inversely correlated with PASAT scores.

**Conclusion:** Our data indicate that thalamic rSN is progressively altered in the two MS subtypes; SP showed more extensive patterns of both decreased and increased FC than RR. Moreover, the correlation between cognitive impairment and increased thalamo-cortical FC suggests that the recruitment of additional areas within the thalamic rSN is unable to prevent the cognitive decline.

**Keywords:** MULTIPLE SCLEROSIS, FUNCTIONAL CONNECTIVITY, FMRI

**ECO:09:02**

**DIFFUSION TENOR IMAGING AS A POTENTIAL BIOMARKER IN NEUROPSYCHOLOGICAL OUTCOME OF MILD BRAIN TRAUMA INJURY**

N Ramli1, V Veenmanvu1, V Narayananan1, L K Tan1, L Delano-Wood1,4, M W Bood1,4, K Chin12, V M Waran12, D Ganesan12

1University Malaya Research Imaging Centre, University of Malaya, Kuala Lumpur, MALAYSIA, 2Division of Neurosurgery, Department of Surgery, University of Malaya, Kuala Lumpur, MALAYSIA, 3VA San Diego Healthcare System, San Diego, USA, 4Department of Psychiatry, University of California, San Diego, USA, 5Julius Centre University Malaya, Department of Social and Preventive Medicine, University of Malaya, Kuala Lumpur, MALAYSIA

**Purpose:** The aim of the study was to explore the prognostic value of diffusion tensor imaging (DTI) parameters of selected white matter (WM) tracts in predicting neuropsychological outcome both at baseline and 6 months later among well-characterized patients diagnosed with mild traumatic brain injury (mTBI).

**Methods:** Sixty-one patients with mTBI (mean age= 27.08, SD 8.55) underwent scanning at an average of 10 hours (SD 4.26) post trauma along with assessment of their neuropsychological performance at an average of 4.35 hours (SD 7.08) upon full Glasgow Coma Scale recovery. Results were then compared to 19 healthy control participants (mean age= 29.05, SD 5.84) both in the acute stage and 6 months post trauma. Both ICBM-81 Atlas Based Region of Interest (ROI) and Tract Based Spatial Statistics (TBSS) methods were used.

**Result:** The DTI and neuropsychological measures between acute and chronic phases were compared and significant differences emerged. Specifically, chronic phase FA and RD values showed significant group differences in the corona radiata, anterior limb of internal capsule, cingulum, superior longitudinal fasciculus, optic radiation, and genu of corpus callosum. Findings also demonstrated associations between DTI indices and neuropsychological outcome across two time points.

**Conclusion:** Our results provides new evidence for the use of DTI as an imaging biomarker and indicator of white matter damage occurring in the context of mTBI, and they underscore the dynamic nature of brain injury and possible biologic basis of chronic neurocognitive alterations. Besides that, our current results also offers better characterisation of the pathogenic cellular processes occurring both in acute and chronic phase.

**Keywords:** Mild Traumatic Brain Injury, Diffusion Tensor Imaging, Biomarker

**ECO:09:03**

**CEREBELLAR FUNCTIONAL CONNECTIVITY ALTERATIONS AND THEIR ASSOCIATION WITH BALANCE DEFICIT IN MULTIPLE SCLEROSIS**

F Tona1, E Sbandella1, L Prosperi1, N Petfas1, N Upadhyaya1, C Gianni1, M C Piattella1, C Pozzilli1, P Pantano1,2

1Department of Neurology and Psychiatry, University Sapienza, Rome, ITALY, 2IRCCS Neuromed, Pozzilli, ITALY

**Purpose:** Although the relationship between cerebellar function and balance capability is well known, only few study explored cerebellar