Residents' Day Symposium
Friday, May 10, 2013
7:30am – 9:15am
Farrell Learning and Teaching Center ~ Atrium

Poster presentations will begin at 7:30am

Awards will be presented at 9:00am

I encourage everyone to attend this important event.

Bhar, Avinesh and Mesfin Mitike

Outcomes of Inpatient Obstructive Sleep Apnea Evaluation

Authors: Avinesh Bhar, MD; Mesfin Mitike, MD; Jill Massena, RPSGT; Christina Toedebusch, RPSGT; Jennifer McLeland, RPSGT; Stephen P Duntley, MD; Brendan Lucey, MD.

Division: Sleep Medicine, Department of Neurology, Washington University in St Louis.

Background: There is a lack of data regarding inpatient obstructive sleep apnea (OSA) evaluations. Many co-morbid diseases lead to multiple hospital admissions.

Objectives: To evaluate compliance to treatment and follow up for sleep disordered breathing. We also hypothesized that early recognition of sleep disordered breathing (SDB) may reduce 90 day readmission rates.

Method: Retrospective cohort study of consecutive inpatient OSA polysomnography (PSG), from Aug 1 2012 – Feb 1 2013.

Results: Total of 50 inpatient PSGs were screened with 18 included in this study. Exclusion reasons were: non-diagnostic, lost to follow up, refusal to participate and deceased. Mean age 59.4 years; mean BMI 38.1kgm2; male 9 (50%); predominant co-morbidities were heart failure (11), diabetes mellitus (11), hyperlipidemia (9), hypertension (11) and COPD (8). Predominant reason for hospital admission is respiratory failure (12). Patients with prior admission for similar reasons: 13 (72%). Only 8 patients (44%) had a sleep medicine follow up scheduled upon discharge. While 2 patients (11%) did not have positive airway pressure (PAP) set up after discharge. Verbal compliance (>50% usage) to PAP was 75% for patients set up with PAP. 3 patients (17%) were readmitted for similar reasons, with 2 of them non-compliant to therapy.

Conclusions: Majority of patients have had multiple admissions for similar reasons. Verbal compliance to PAP treatment is encouraging. Lack of follow up with a sleep physician needs improvement. Low readmission rates for patients compliant to PAP treatment were noted. We are limited by a small number of patients in our cohort.

Dietzmann, Shannon and Nisha Ramamoorthy

Rehabilitation of Huntington's Disease

Abstract: Huntington's disease is a progressive neurodegenerative disease resulting in cumulative disability over time. Rehabilitation programs for Huntington's Disease should have a multidisciplinary approach addressing behavior changes, deficits in executive function, and physical impairments.

Dosenbach, Nico

Prediction of individual brain maturity using fMRI

Abstract: Group functional connectivity magnetic resonance imaging (fcMRI) studies have documented changes in human functional brain maturity over development. Here we show that support vector machine-based multivariate pattern analysis extracts sufficient information from fcMRI data to make predictions about individuals' brain maturity across development. The use of 5 minutes of resting-state fcMRI data from 238 scans of typically developing volunteers (ages 7 to 30 years) allowed prediction of individual brain maturity as a functional connectivity maturation index. The resultant functional maturation curve accounted for 55% of the sample variance and followed a nonlinear asymptotic growth curve shape. The greatest relative contribution to predicting individual brain maturity was made by the weakening of short-range functional connections between the adult brain's major functional networks.

Geisler, Stefanie

Rapid redistribution in a mouse nerve crush model of SCG10, a marker of human and mouse peripheral axons

Stefanie Geisler[1], Jung Eun Shin[2], Amir Dori[1], Alan Pestronk[1], Aaron DiAntonio[2]
[1]Department of Neurology and [2]Department of Developmental Biology
Washington University Saint Louis

SCG10 (superior cervical ganglion clone 10) was initially identified as a neuronal marker of the neural crest and is highly expressed in the developing nervous system. It is up-regulated during axonal regeneration and lost from distal axons soon after nerve injury, before Wallerian degeneration. These data suggest that SCG10 may be an early and specific marker of both regenerating axons and axons that appear morphologically intact, but are destined to degenerate. In this mouse study we evaluated the distribution of SCG10 at early times after nerve crush and compared its expression to that of Growth Associated Protein 43 (GAP43), a marker of regenerating axons. We found that SCG10 is more rapidly re-distributed than GAP 43 after nerve injury. Following crush injury of the sciatic nerve in C57B/6 mice, SCG10 was increased proximal to the injury site after 4 hours (3.3 ± 1.0 fold increase [mean $\pm$ SEM]; $P<0.01$) and 8 hours (3.2 ± 0.6 fold increase [mean $\pm$ SEM]; n=3, $P<0.01$) and lost distally. In contrast, GAP43 levels proximal and distal to the nerve injury site were unchanged at these time points (1.2 ± 0.1 and 1.1 ± 0.1 fold increase [mean $\pm$ SEM]; after 4 and 8 hours, respectively; n=3; $P>0.05$). Given the potential of SCG10 as an early selective marker for regenerating and degenerating axons, we examined SCG10 expression in normal human nerve. Fresh frozen human nerve was stained for SCG10 and axon markers SMI31 or Peripherin. We found that SCG10 is abundantly expressed in normal human nerve large (SMI31) and small (Peripherin) axons. In further studies, we will investigate whether SCG10 is differentially expressed in selected neuropathies and, thus, might have use as a diagnostic tool.

Goli, M, G. Giganti, and H. O. Setzer

A Quality Improvement Study in an Inpatient Rehabilitation Setting to Identify Patients at High-Risk for Readmission to an Acute Care Hospital

Washington University School of Medicine and The Rehabilitation Institute of St. Louis

M. Goli, L G. Giganti, H. O. Setzer, A. Valleck, and D.B. Carr

Background: Acute care transfers (ACT's) are common in inpatient rehabilitation settings; especially in facilities affiliated with tertiary care referral hospitals that sub serve patients with high co-morbidities. The literature is inconsistent in identifying risk factors for transfer back to the hospital and no decision trees or algorithms have been created and/or adopted in this setting to identify high-risk patients who are either not candidates for inpatient admission or who might benefit by more intensive oversight with hospitalist consultation.

Objective: We created a subcommittee, the Falls and Acute Care Transfer (FACT) Committee within our Quality Improvement Committee that was directed to a) review our ACT rate, compare it to regional and national data, and set goals and a timeline for rate reduction, b) review ACT risk factors from the literature c) review ACT rates across our own service lines to determine if certain admission medical diagnoses were associated with higher rates d) create a QI project that would identify risk factors for transfer back to the hospital and e) develop a plan to disseminate the findings with WU clinicians and TRISL staff to make changes in practices in an attempt to reduce ACT rates

Methods: We reviewed data from our own institution and compared it to regional and national ACT rates. We reviewed ACT rates based on specific admission diagnoses to our facilities. We reviewed the literature on ACT rates using Ovid and PubMed Mesh terms "acute care transfers" and "inpatient rehabilitation." We recently completed a chart review of almost 200 TRISL patients to determine risk factors for acute care transfers.

Results: In 2012 our average ACT rate for our facility was 16%. The average for other Health South facilities (N=121) and the nation for inpatient rehabilitation facilities (IRF's) is 12%. Our FACT committee set as a goal, a reduction in our ACT rate to 12%. A review of the literature noted that high number of co-morbidities, impaired admission functional status as measured by the FIM, prior history of surgery or pneumonia, elevated WBC, low Hgb, low albumin, foley cather, elevated Cr and an admission diagnoses of brain injury or cancer were identified as risk factors for transfer back to the hospital. Based on admission diagnoses to our facility, we found that either non-traumatic brain injury admissions (e.g. primary or secondary brain neoplasms, seizures, encephalitis, etc.) or cardiac patients were associated with ACT rates of 25%. Thus, the FACT committee directed a QI project to focus on almost 200 non-traumatic brain injury admissions in 2012 to identify risk factors for transfer back to the hospital. We also noted that service lines that had a high use of hospitalists following patients (>90%) were associated with lower rates of ACT's (12%), when compared to service lines where involvement of the hospitalists was lower (<30%, 18% ACT rate).

Conclusions: Our facility has a higher rate of ACT's compared to other facilities in the region and nation. This probably reflects the complexity of patients with multiple co-morbidities that are admitted from our major referral source (a tertiary referral hospital), possible underutilization of hospitalist services, and a lack of decision-tree or an algorithms to guide physicians when admitting patients. We have created a process to identify risk factors that should aid clinicians in their decisions to admit patients and provide a safety net to those patients who are at high risk for transfer back to the hospital setting.

Karmarkar, Swati

Infantile Polyarteritis Nodosa: an unusual cause of stroke

Swati Karmarkar, MD, Resident, Division of Pediatric & Developmental Neurology
Soe Mar, MD, Associate Professor, Division of Pediatric & Developmental Neurology

Introduction: Infantile polyarteritis nodosa(IPN) is a rare vasculitis seen in children younger than 2 years. The condition was considered almost uniformly fatal due to development of coronary artery aneurysms and thrombosis leading to myocardial infarction, diagnosis often being at autopsy. CNS manifestations have been very rarely described. We report a case of a 2-month-old boy who presented with stroke and was subsequently diagnosed with IPN.

Case description: He had a history of fever and tachyarrhythmia 5 days prior to admission and a seizure on day of presentation. Head CT revealed right occipital stroke. Initial laboratory tests revealed elevated WBC count, anemia, thrombocytopenia and elevated inflammatory markers. Brain MRI revealed multiple strokes in bilateral cerebral hemispheres. Echocardiogram showed new mitral regurgitation. He was treated with antibiotics and acyclovir for presumed infectious etiology but no improvement was seen. On fifth day, he developed a purpuric rash and discoloration of digits. Vasculitis was suspected and hence CT angiogram of chest and abdomen obtained which revealed fusiform dilations of multiple medium sized arteries. He also developed cardiac failure. Repeat Echocardiogram revealed coronary aneurysms. He was treated with steroids, IVIG and Infliximab and anticoagulation with Heparin. He responded well to these timely interventions.

Conclusion: Infantile polyarteritis nodosa is a rare, potentially fatal cause of stroke in infants. Persistently elevated inflammatory markers, rash and cardiac manifestations could provide clues to this diagnosis. Early recognition and treatment can result in a favorable outcome.

Longbrake, Erin

Susac syndrome in a patient with HIV infection

Abstract: Susac syndrome is the rare clinical triad of encephalopathy, branch retinal artery occlusions, and sensorineural hearing loss. It is thought to be an autoimmune endotheliopathy directed against cells in the brain, retina, and cochlea. We describe a case of Susac syndrome that presented in the context of HIV infection. To our knowledge, this is the first published coincidence of Susac syndrome with HIV.

Ly, Cindy

Small-Fiber Neuropathy: Retrospective Analysis of 431 Patients Receiving Skin Biopsy

Small-fiber neuropathy (SFN) refers to peripheral neuropathy selectively involving small, unmyelinated peripheral nerve fibers that subserve nociceptive, thermal, and autonomic function. The clinical presentation of SFN typically consists of dysesthesias, numbness, and autonomic dysfunction in a length-dependent distribution with selective impairment of pinprick and thermal sensation on examination. Skin biopsy with evaluation of intraepidermal nerve fiber density (IENDF) has the highest diagnostic efficiency (88.4%)[1].

We performed a retrospective analysis of 431 patients who underwent skin biopsy for evaluation of suspected SFN from 2008 to early 2013. Chart review was undertaken to analyze patient symptoms, localization of sensory changes, reported comorbid conditions, and diagnostic evaluations. In addition to sensory symptoms, patients also described myalgias/ cramps and autonomic disturbances without differences between those having normal and abnormal skin biopsies. Nearly 73% of skin biopsies were abnormal due to reduced IENFD at both distal and proximal sites and distal or proximal sites only. Reduced IENFD proximally with distal fiber sparing was observed in ~15% of biopsies and is suggestive of a non-length dependent neuropathy. Patients exhibiting a proximal reduction in IEFND were less likely to have diabetes or involvement of large sensory fibers, and were more likely to have an underlying autoimmune/ inflammatory condition. These findings suggest etiologic differences between length-dependent and non-length dependent neuropathy.

Maiti, Baijayanta

Unusual CSF findings in West Nile Neuroinvasive disease, a diagnostic and therapeutic conundrum

Baijayanta Maiti, M.D., Ph.D., Robert C. Bucelli, M.D., Ph.D.

West Nile Virus (WNV), an arbovirus transmitted by Culex mosquito has long been implicated as the most common cause of epidemic viral encephalitis in the United States.[1] Although a vast majority of WNV infections are clinically asymptomatic, less than 1% can present with any combination of meningitis, encephalitis, myelitis or acute flaccid paralysis (AFP) collectively coined as West Nile neuroinvasive disease (WNND).[1] There was a recent upsurge in WNV infections in 2012, the most severe outbreak since 2003, with 5387 cases being reported of which 2734 (51%) were diagnosed with WNND and was marked by 243 deaths.[2] We report a case of WNND with AFP marked by unique CSF parameters that created a considerable diagnostic and therapeutic dilemma resulting in a thorough search for alternate pathologies while awaiting results of cerebrospinal fluid testing for WNV .

McGill, Bryan

Evidence implicating cohesins in peripheral nerve function in mice

Bryan McGill, Amy Strickland, and Jeffrey Milbrandt

Cohesins CTCF and Smc3 are proteins that enable sister chromatid synapsis during mitosis and regulate gene expression in terminally differentiated cells. To determine the role of cohesins in peripheral nerve function we selectively deleted the genes *Ctcf* and *Smc3* in Schwann cells under the control of the myelin protein zero (*Mpz*) promoter. We find that these mice are less massive than control littermates and that they develop paraparesis. Results of neurophysiologic and neuropathologic studies on these animals will be presented and discussed.

Morgan, Michael

A slide is worth a thousand scans: Diplopia with a cavernous sinus metastasis of a remote endometrial stromal tumor

Introduction: Structural lesions involving the visual pathways often require tissue diagnosis to guide therapy. However, pathology is not always definitive, and a biopsy showing poorly differentiated cells poses significant difficulty in identifying the primary tumor. We report a case of metastatic disease causing cavernous sinus syndrome in which biopsy yielded poorly differentiated tissue. The patient reported a remote uterine tumor, and only after obtaining slides from 7 years prior was the diagnosis made.

Methods: Single Case Report

Results: A 54 year old woman presented with right ear pressure and hearing loss for 14 months with right temporal headaches and diplopia for 2 weeks. Previous imaging had detected a mass in the right cavernous sinus. Medical history was unremarkable aside from hypertension and a remote history of uterine tumor, resected 7 years prior.
Head CT and brain MRI both showed a right sphenoid sinus mass with bony erosion. Trans- sphenoidal biopsy revealed a spindle cell sarcoma with staining positive for vimentin, CD34, SMA and negative for HMB-45, S-100, p63, EMA, PGR, desmin, CAM5.2, MSA and pan-keratin consistent with mesenchymal origin including fibrosarcoma, leiomyosarcoma and malignant glomangiopericytoma. Subsequently, pathology slides from the patient's prior uterine tumor were obtained from an outside hospital. They showed a spindle cell tumor with staining positive for DC10 and BCL2 and negative for desmin, WT-1, s-100 and cytokeratins including AE1/AE3, CAM 5.2, EMA, CK7 and CK19 with less than 5% positive staining for ER and PR with the pathologists favoring an endometrial stromal tumor. This prior pathology permitted definitive diagnosis. Clinically, the patient progressed to a complete cavernous sinus syndrome.

Conclusion: The patient presented with a clear sphenoid sinus mass with unusual pathology. The nature of the prior uterine resection was not known initially. Only after obtaining outside slides from 7 years prior permitted a definitive diagnosis of metastatic endometrial stromal tumor to the right sphenoid sinus and cavernous sinus resulting in cavernous sinus syndrome.

Ong, Charlene and Nathan Kung

First Presentation of Unusual Tumefactive Lesions: Differential and Management

Ong, C., M.D.; Kung, N., M.D.; Cai, C., M.D.

Abstract:
Acute and severe isolated presentations of demyelinating disease can be initially difficult to diagnose, manage and predict long-term outcome. We present a case of a 27 year old with no past medical history who presented with acute onset of dense left sided hemiplegia and dysarthria, initially refractory to steroid treatment, with biopsy proven demyelinating disease. Her clinical presentation, radiographic and pathological characteristics were ultimately most consistent with a clinically isolated syndrome of tumefactive demyelinating type. In this presentation we review the characteristics and differential of this uncommon diagnosis.

Ostendorf, Adam

Epilepsy in Individuals with Neurofibromatosis Type 1

Objective: To describe the clinical characteristics and outcomes of individuals with neurofibromatosis type 1 (NF1) and seizures in the largest cohort reported to date.

Methods: A retrospective cross-sectional review of 536 individuals with NF1 was performed and clinical data from 51 individuals with a history of at least one seizure were analyzed.

Results: In individuals with NF1, 9.5% had a history of at least one unprovoked seizure and 6.5% had documented epilepsy. Individuals with seizures were more likely to have inherited NF1 from their mother (p=0.001). Focal seizures were the most common type, occurring in 57% of individuals, although general seizures, specific electroclinical syndromes, and the presence of multiple seizure types were also noted. Moreover, in 21% of individuals with a previously unremarkable MRI study, neuroimaging at seizure onset revealed a new structural abnormality. In this population, 77% of individuals required multiple antiepileptic drugs (AED), and some required epilepsy surgery, with individuals achieving the best results following temporal glioma resection.

Conclusions: Compared to the general population, seizures are more common in individuals with NF1, where they are often focal and related to an intracranial neoplasm. These observations suggest that all individuals with NF1 and a new seizure should undergo MRI despite previous normal neuroimaging. Individuals with seizures and NF1 typically require more aggressive therapy than those without NF1 and should be considered for epilepsy surgery when appropriate.

Raya, Amanda

Pattern not Volume of Bleeding Predicts Angiographic Vasospasm in Spontaneous Non-aneurysmal Subarachnoid Hemmorhage

Authors: Amanda K. Raya, MD; Gregory J. Zipfel, MD; Michael N. Diringer MD; Ralph G. Dacey, Jr., MD; Colin P. Derdeyn, MD; Keith M. Rich, MD; Michael R. Chicoine, MD; Rajat Dhar, MD

***Background and Purpose*:** Patients with spontaneous non-aneurysmal subarachnoid hemorrhage usually have a benign course, especially those with a perimesencephalic pattern of bleeding; higher risk of vasospasm and disability has been associated with diffuse bleeding. We evaluated whether greater volume of bleeding explains the disparate morbidity in diffuse vs. PM-SAH.

***Methods*:** Bleeding pattern, amount of cisternal/ventricular blood (Hijdra and IVH scores), and ventriculomegaly (bicaudate index) were assessed in 108 angio-negative SAH patients. Neurological outcomes included hydrocephalus, angiographic vasospasm, and delayed cerebral ischemia (based on clinical deterioration). Functional outcome was assessed at 1-year using the modified Rankin Scale.

***Results*:** Bleeding was perimesencephalic in 60, diffuse in 28, convexity in 7 and CT-negative in 13. Patients with diffuse bleeding had higher Hijdra (12[IQR 7-17] vs. 5[3-8]) and IVH scores, and bicaudate indices (0.19[0.14-0.24] vs. 0.14[0.11-0.19]) than those with PM-SAH ($p \leq 0.003$). They required ventriculostomy (54% vs. 18%) and shunting (29% vs. 3%) more often ($p=0.001$). Angiographic vasospasm developed in 29% diffuse vs. 13% PM-SAH ($p=0.08$), but adjustment for blood volume did not explain this disparity; DCI was only seen with diffuse bleeding (14%). Those with diffuse SAH were less likely discharged home (68% vs. 90%, $p=0.01$) or achieve minimal disability (mRS 0-2, 83% vs. 96%, $p=0.14$).

***Conclusion*:** Non-aneurysmal SAH can still result in hydrocephalus, vasospasm, and residual disability, especially with diffuse bleeding; a disparity not accounted for by greater cisternal or intraventricular bleeding. This suggests that the mechanism and/or distribution of bleeding are more important than amount of hemorrhage in angio-negative SAH.

Roberts, Deb

Stroke Patient Characteristics and Risk Factors at Ayder Referral Hospital, Mekelle, Ethiopia: Pilot Data and Study Proposal

DE Roberts, MD, PHD and DB Clifford, MD

Stroke characteristics and opportunities for primary stroke prevention of patients in sub-Saharan Africa have not been well described. As of 2002, stroke in Ethiopia accounted for 100,000 to 200,000 deaths per year and lead to significant productivity loss due to disability. Over 3.5 weeks in winter 2013, pilot data was collected on 13 patients admitted with the diagnosis of 'stroke' to Ayder Referral Hospital in Mekelle, Ethiopia. Upon patient examination and review of history and imaging by a neurologist, 11 were confirmed as stroke, 1 thalamic mass confirmed by MRI, and 1 hemorrhage was suspicious for underlying mass but MRI is still pending. Of the 11 strokes, 8 (73%) were ischemic and 3 (27%) were hemorrhagic. Patients had the following known diagnoses prior to stroke admission: 6 hypertension (55%), 1 atrial fibrillation (9%), 1 hypercholesterolemia (9%) and 3 diabetes mellitus (27%). None of these patients was consistently taking medications to manage their known medical problems, and none were on aspirin. None of the patients were obese or tobacco users. None of the patients received a thrombolytic and only 1 patient arrived to the hospital within 4.5 hours of symptom onset. Stroke work up included HbA1c, LDL, CXR and EKG on all patients. Patients had transthoracic echocardiography if abnormalities were found on EKG or CXR. Blood pressure was measured by manual cuff every 8 hours. The work up revealed elevated LDL cholesterol in an additional 7 patients (64%) and diabetes mellitus in an additional 2 patients (18%). These pilot data lead to many questions and opportunities for further study. What is the incidence of stroke in this population and what is the distribution of hemorrhagic vs. ischemic stroke? Are stroke risk factors similar to those known in the developed world or are there previously undefined risks at work? What impact would primary risk factor management, public stroke education, and the availability/use of thrombolytics have on stroke prevention and recovery? Answers to these questions have the potential to dramatically improve stroke prevention and treatment in this patient population and to advance our understanding of the pathophysiology of stroke in general.

Ryman, Davis

Factors influencing age of symptom onset and disease course in autosomal dominant Alzheimer disease (ADAD): a systematic review and meta-analysis

Objective: To characterize the factors influencing age of symptom onset and disease course in autosomal dominant Alzheimer's disease (ADAD) mutations, and develop evidence-based criteria for early prediction of disease onset in ADAD.

Background: ADAD genetics research has been crucial to understanding AD pathogenesis, with investigators discovering over 180 different mutations in three genes (APP, PSEN1, and PSEN2) which are directly involved in production of the amyloid-beta peptide implicated as a primary cause of AD pathology. While these mutations all cause AD with virtually complete penetrance, there are significant differences between mutation types in the onset and course of disease, and the factors influencing disease onset and progression in ADAD remain incompletely understood. Several clinical trials are now preparing to evaluate candidate treatments for presymptomatic AD in ADAD patient populations. If evidence-based criteria can be developed for prospectively estimating disease onset, ADAD treatment trials will have the powerful advantage of enrolling cohorts at well-defined stages of presymptomatic disease.

Methods: We have compiled individual-level data on age of symptom onset and disease course from 362 ADAD pedigrees, gathered from 130 peer-reviewed publications of ADAD families, the Dominantly Inherited Alzheimer Network (DIAN) database, and two large kindreds of Colombian and Volga German ancestry. Our combined dataset includes 3602 individuals, of whom 1266 were affected by ADAD with known age of symptom onset. After adjusting for ascertainment bias, we assessed the relative contributions of several factors in modifying age of onset in individual patients, including ADAD mutation type and amino acid location, age of parental symptom onset, average age of onset within families, and individual ApoE isoform and gender.

Results: We report summary statistics on symptom onset and disease course for 179 pathogenic ADAD mutations, and discover highly significant correlations between age of onset of individual patients and adjusted mean onset values for mutation type and family, which persist after controlling for ApoE allele and gender.

Conclusions: ADAD mutations show substantial variability in the onset and course of disease. Significant proportions of the variance in symptom onset in individual patients can be explained by family history and mutation type, providing empirical support for potential use of these data to estimate onset in clinical research.

Simon, Virginia

Cat scratch disease presenting as encephalopathy with seizures, agitation, and respiratory failure

Authors: Virginia Simon and Arun Varadhachary

Abstract: Cat scratch disease is a self-limited febrile illness caused by *Bartonella Hensalae*, usually associated with a cat scratch or bite. Typically, the disease is characterized by fever and malaise that resolve after 3 weeks. However, up to 2 percent of patients with *Bartonella* infection can develop neurologic complications, with encephalopathy being the most common. We report a case of cat scratch disease (CSD) encephalopathy presenting with nonconvulsive status epilepticus, followed by a prolonged hospital stay due to complications of acute respiratory distress syndrome and agitated delirium.

Zou, Simeon

Riding The Tiger – A Case Report on Fulminant Relapse of MS Associated with Natalizumab Withdrawal

Simeon Zou MD, Alexander Fay MD/PhD, Enrique Alvarez MD, Joseph Black MD, David Clifford MD, Anne Cross MD

Department of Neurology, Washington University

ABSTRACT: With increased use of Natalizumab for the treatment of multiple sclerosis (MS) in selected patients, it is well known there is increased risk of developing PML in this patient population. Recently, there is also emerging evidence showing that these patients can develop immune reconstitute inflammatory syndrome (IRIS) associated with Natalizumab withdrawal. Here we report a case of fulminant MS relapse associated with Natalizumab withdrawal.