INTRODUCTION

Neuroimaging of degenerative and traumatic encephalopathies

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Human life expectancy in the past 2000 years has more than doubled, from 28 years to 68 years. We are rapidly moving toward a crisis in terms of morbidity, mortality, health care costs, and societal burden from patients suffering from neurodegenerative diseases. Many neurodegenerative diseases, such as Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis, result in and/or are a result of neuronal death. This may be related in some instances to traumatic brain injury (TBI) or other insults earlier in life. Many neurodegenerative diseases are also related to genetic mutations (apolipoprotein E [APOE]) and protein misfolding (beta amyloid and tau). Neuroimaging, as well as investigating biomarkers, proteins in biofluids such as CSF, blood, and saliva, plays an important role not only in the neurodiagnosis but in understanding the pathophysiology of neurodegenerative diseases and traumatic encephalopathies. We are pleased to present a select collection of papers that review some of the state-of-the-art methods used in the diagnosis and management of neurodegenerative disease. This includes the updated diagnostic criteria, treatment algorithm, and

role of brain biopsy in Creutzfeldt-Jakob disease to the role of APOE genotype as a prognostic marker in TBI and neurodegenerative disease, the central theme in this issue of *Neurosurgical Focus*. Neuroimaging is now playing a critical role in the understanding of brain function, neuroplasticity, and recovery. Ultra-high field 7-T MRI is proving to be the tool of the future for imaging neuroanatomy, physiology, and even micropathology. We include a review of 7-T imaging in patients with Alzheimer's disease. Finally, the hippocampus is a critical structure in memory and aging. There are numerous genetic, environmental, and pathological stressors that may affect the hippocampus. This includes hormonal challenges such as perimenopause and menopause as well as other hormonal changes such as Cushing's disease. We hope that this collection will provide some insight into the neuroimaging of degenerative and traumatic encephalopathies.

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DISCLOSURE

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