

Accumulation of phosphorylated tau (p-tau) is accepted by many as a long-term consequence of repetitive mild neurotrauma based largely on brain findings in boxers (dementia pugilistica) and, more recently, former professional athletes, military service members, and others exposed to repetitive head trauma. The term “chronic traumatic encephalopathy” has been in the literature for decades, although the term has been applied more liberally to sporting activities since 2005. The most specific pathology according to a recent consensus group is the presence of phosphorylated tau in perivascular areas and in depths of sulci. Some caution before accepting chronic traumatic encephalopathy as an entity is warranted, however. Concussions and subconcussive head trauma exposure are poorly defined in available cases, the clinical features reported in chronic traumatic encephalopathy are not at present distinguishable from other disorders, and adequate control groups as well as prevalence data are virtually non-existent. Moreover, dementia pugilistica, which has widespread acceptance, has had autopsy correlation in a surprisingly small number of cases, which are further complicated by numerous co-morbidities, including substance abuse, vascular disease, infection, and genuine neurodegenerative disease. With respect to the modern iteration of chronic traumatic encephalopathy, the association of sparse immunohistochemical reactivity with psychiatric signs such as impulse control issues and suicide is also problematic. Predicting complex behaviors on the basis of such changes is beyond the reach of neuropathological interpretation. In general, because the definition of neurodegenerative disease requires a defined clinical phenotype, invariable disease progress, and a defined pathological phenotype, chronic traumatic encephalopathy falls short of neurodegenerative disease. Indeed, the clinical phenotype varies from normal to advanced dementia, disease progress is lacking in the majority of reported cases, and the pathological phenotype varies from absence of pathology to widespread pathology and co-morbidities. As such, chronic traumatic encephalopathy is more a hypothetical construct or concept than a neurodegenerative disease entity.