



September 13, 2010

Suicide Reveals Signs of a Disease Seen in N.F.L.

By ALAN SCHWARZ

ALLENTOWN, Pa. — A brain autopsy of a University of Pennsylvania football player who killed himself in April has revealed the same trauma-induced disease found in more than 20 deceased National Football League players, raising questions of how young football players may be at risk for the disease.

Owen Thomas, a popular 6-foot-2, 240-pound junior lineman for Penn with no previous history of depression, [hanged himself](#) in his off-campus apartment after what friends and family have described as a sudden and uncharacteristic emotional collapse. Doctors at Boston University subsequently received permission from the family to examine Thomas's brain tissue and discovered early stages of chronic traumatic encephalopathy, [a disease linked to depression and impulse control](#) primarily among N.F.L. players, two of whom also committed suicide in the last 10 years.

Doctors in the Boston University group and outside it cautioned that Thomas's suicide should not be attributed solely or even primarily to the damage in his brain, given the prevalence of suicide among college students in general. But they said that a 21-year-old's having developed the disease so early raised the possibility that it played a role in his death, and provided arresting new evidence that the brain damage found in N.F.L. veterans can afflict younger players.

Thomas never had a diagnosis of a concussion on or off the football field or even complained of a headache, his parents said, although they acknowledged he was the kind of player who might have ignored the symptoms to stay on the field. Because of this, several doctors said, his C.T.E. — whose only known cause is repetitive brain trauma — must have developed from concussions he dismissed or from the thousands of subconcussive collisions he withstood in his dozen years of football, most of them while his brain was developing.

The idea that C.T.E. can stem from hits below the level of concussion — which are endemic to football and all but impossible for doctors to see or manage — is relatively new. Ever since C.T.E. in professional football players began making national headlines in early 2007, it has generally been ascribed to mistreated or at least cumulative concussions, for which awareness and education can be an antidote.

The diagnosis in Thomas's case was independently confirmed by Dr. Daniel Perl, a professor of pathology at Uniformed Services University of the Health Sciences, the medical school for the United States military.

"It's not unreasonable that aspects of his behavior were related to the underlying brain disease that was detected," said Dr. Perl, adding that he was speaking as an experienced neuropathologist and not on behalf of his organization. "This is real."

He added, "This is a call for a broader range of research into this problem that extends beyond the heavy duty N.F.L. level of athletics."

Thomas is the youngest and first amateur football player to be found with clear C.T.E., which is linked with cognitive impairment, depression and ultimately dementia. One 18-year-old former high school player who died two years ago, and whose name has been withheld by the Boston University researchers at his family's request, had only incipient traces of the disease.

Thomas's parents, the Rev. Tom Thomas and the Rev. Kathy Brearley, requested that their son's case be made public to educate other families about the possible and perhaps addressable risks of football at all levels. About 1.4 million children ages 14 to 18 play high school football every fall, and about three million others play in youth leagues at younger ages.

Thomas's parents emphasized that they did not hold responsible the University of Pennsylvania specifically or their son's youth and high school programs in South Whitehall Township, which is outside Allentown. They also said they were not considering legal action.

"This is an issue beneath the N.F.L. level," Mr. Thomas said. "I want people to take this seriously."

Sitting with her husband on the porch that overlooks the yard where Owen once played, Ms. Brearley added, "We have to think of different options that can take a hearty, meaty, great contact sport but minimize the risk to young people."

Owen Thomas was the second Penn player to commit suicide in five years; running back Kyle Ambrogio [killed himself in 2005](#). The university will honor Thomas at a ceremony before Penn's opening home game against Lafayette on Saturday. He had been elected one of the team's captains before he died.

"Obviously this is a contact sport — could this happen? Absolutely," said Penn Coach Al Bagnoli, noting how Penn trainers never clear a player with a concussion to return until he withstands appropriate medical scrutiny. "Do people take as many precautions as we can? Absolutely."

Before Thomas, 21, the youngest player who previously received a diagnosis of C.T.E. was Chris Henry, 26, a Cincinnati Bengals receiver who died in December during a domestic dispute in which he appeared to jump from the back of a moving pickup truck. The only previous non-N.F.L. player with a clear case of C.T.E. was Mike Borich, a former Western Illinois receiver [who died in February 2009](#) after a drug overdose at 42.

The Thomas case will almost certainly prove more arresting to those assessing the long-term risks of football at all levels, as he had developed the disease before leaving college and, for reasons that remain unknown, developed severe depression and killed himself.

"It's pretty hard to make a jump with one case," said Dr. James Moriarity, the University of Notre Dame's head physician, who oversees the athletic department's medical care. "But if it's true that that happened, it would kill the sport," he said, referring to an amateur player getting C.T.E. "As a parent, it's going to be hard to justify kids going out and doing that."

Owen Thomas was a third generation college football player. His grandfather Frank Thomas played for Millersville (Pa.) University in the 1930s, and his father played four years at the University of Virginia in the late 1960s.

Owen started playing at age 9 and relished football's physicality.

"He loved to hit people," his mother said. "He loved to go into practice and hit really hard. He loved to intimidate. It's kind of sad. We all love football. We all love watching. We all love these great hits."

Thomas played three seasons at Parkland High School, talented enough at linebacker and tight end to often play every down of every game — even blocking on punts and kickoffs, one of his favorite responsibilities. He was bright enough to be admitted to Penn's Wharton School of Business, one of the best undergraduate business programs in the country. He played freshman football and then started the last two seasons on the varsity, earning second-team all-Ivy League honors in 2009 and helping lead the Quakers to the Ivy title.

Dr. Robert Stern, a director of the Boston University group, said the identification of factors like genetics would probably someday explain why some people develop C.T.E. while most do not. Thomas's case, he said, proves that the disease can begin, and perhaps influence behavior, among football players below the N.F.L. level.

"We don't know if it's a specific age, we don't know if it's a cumulative number of years of exposure to head trauma, we don't know what combination of hits to the head set this disease in motion," Dr. Stern said. "These are critical issues that need to be answered in order to help guide any dramatic policy changes and individual decisions down the road."

Dr. Stern and other experts in the field emphasized that C.T.E. could not be blamed solely for a person's suicide. But some of the clues left from Thomas's case, they said, suggested that the damage in his brain might have exacerbated his sudden depression and compromised his ability to think clearly about his actions.

Thomas left no note and still had his cellphone in his pocket — which his mother said indicated that he was acting on impulse, not forethought.

Dr. Perl said that although links were easy to make in hindsight, lack of impulse control is a consistent manifestation of how executive function can be compromised by C.T.E.'s neurofibrillary tangles

and tau protein formations in the frontal lobe of the cerebral cortex. Dr. Perl added that C.T.E. typically impaired a person's short-term memory — which in a college student approaching exams would be harrowing — but that the relatively mild C.T.E. in Thomas's hippocampus did not suggest severe memory problems, though that was possible.

Ms. Brearley said she would never know the root of her son's actions, but the C.T.E. diagnosis gave her solace, if not a solution.

"It gives me some peace in my heart to think this is a missing piece of a jigsaw puzzle," she said.

Thomas's parents said they wanted to share his story to warn other families of young football players that C.T.E. and all of its still-unknown ramifications were no longer confined to the N.F.L. In this respect, Owen Thomas will probably become amateur football's counterpart to Andre Waters, the former hard-hitting Philadelphia Eagle whose suicide in 2006 catalyzed much of the awareness of head injuries in the N.F.L.

Mr. Thomas said he recalled the day he read about Waters's brain damage in a newspaper. He also remembered what he had thought ever since: "Thank goodness that's only the N.F.L. — it can't happen to Owen."