SAN DIEGO -- Junior Seau, who committed suicide in May, two years after retiring as one of the premier linebackers in NFL history, suffered from the type of chronic brain damage that has also been found in dozens of deceased former players, five brain specialists consulted by the National Institutes of Health concluded.

Seau's ex-wife, Gina, and his oldest son, Tyler, 23, told ABC News and ESPN in an exclusive interview they were informed last week that Seau's brain had tested positive for chronic traumatic encephalopathy, a neurodegenerative disease that can lead to dementia, memory loss and depression.

"I think it's important for everyone to know that Junior did indeed suffer from CTE," Gina Seau said. "It's important that we take steps to help these players. We certainly don't want to see anything like this happen again to any of our athletes."

She said the family was told that Seau's disease resulted from "a lot of head-to-head collisions over the course of 20 years of playing in the NFL. And that it gradually, you know, developed the deterioration of his brain and his ability to think logically."

CTE is a progressive disease associated with repeated head trauma. Although long known to occur in boxers, it was not discovered in football players until 2005. Researchers at Boston University recently confirmed 50 cases of CTE in former football players, including 33 who played in the NFL.

Seau shot himself in the heart on May 2. His death stunned not only the football world but also his hometown, San Diego, where he played the first 13 years of his 20-year career. Seau led the Chargers to their first and only Super Bowl appearance and became a beloved figure in the community.

Within hours of Seau's death, Tyler Seau said he received calls from researchers hoping to secure his father's brain for study. The family ultimately chose the National Institutes of Health in Washington to oversee the research.

Gina Seau said the family chose the NIH because it was a "complete, comprehensive, unbiased scientific institution of the highest level."

In a statement, the NFL said the NIH's finding "underscores the recognized need for additional research to accelerate a fuller understanding of CTE."

The statement also said: "The NFL, both directly and in partnership with the NIH, Centers for Disease Control and other leading organizations, is committed to supporting a wide range of independent medical and scientific research that will both address CTE and promote the long-term health and safety of athletes at all levels. The NFL clubs have already committed a $30 million research grant to the NIH, and we look forward to making decisions soon with the NFL Players Association on the investment of $100 million for medical research that is committed in the collective bargaining agreement. We have work to do, and we're doing it."
The NFLPA, meanwhile, called on Congress to look into player safety in the NFL and noted that it set aside $100 million for medical research when it negotiated the latest CBA.

"The only way we can improve the safety of players, restore the confidence of our fans and secure the future of our game is to insist on the same quality of medical care, informed consent and ethical standards that we expect for ourselves and for our family members. This is why the players have asked for things like independent sideline concussion experts, the certification and credentialing of all professional football medical staff and a fairer workers compensation system in professional football," the players' union said.

"Given their keen interest in Health and Safety issues in football, we call on Congressman Cummings, Congressman Issa and the Congressional Committee on Oversight and Government Reform to review this issue as well.

"Our players deserve the best care, and we will fight to hold the NFL and the Clubs accountable for providing it."

Dr. Russell Lonser, the former chief of surgical neurology at the NIH, helped coordinate the study. In an interview, Lonser, who was recently named chairman of the department of neurological surgery at Ohio State University, said that because of the publicity surrounding the case, the study of Seau's brain was "blinded" to ensure its independence.

Three independent neuropathologists from outside the NIH were given unidentified tissue from three different brains; one belonged to Seau, another to a person who had suffered from Alzheimer's disease, and a third to a person with no history of traumatic brain injury or neurodegenerative disease.

Lonser said the three experts independently arrived at the same conclusion as two other government researchers: that Seau's brain showed definitive signs of CTE. Those signs included the presence of an abnormal protein called "tau," which forms neurofibrillary tangles, effectively strangling brain cells.

A statement released by the NIH said the tangles were found "within multiple regions of Mr. Seau's brain." In addition, the statement said, a small region of the left frontal lobe showed "evidence of scarring that is consistent with a small, old traumatic brain injury."

Lonser declined to name the neuropathologists who examined Seau's brain.

In addition to his previous role at NIH and now at Ohio State, Lonser serves as chairman of the NFL's research subcommittee, part of the league's Head, Neck & Spine Committee, which helps set policy related to concussions. Lonser said the league "was not involved in anything regarding how this brain was handled or managed at any step of the process, to be absolutely crystal clear about that."

"The NFL had no influence whatsoever," he said.

The study of CTE and football is still in its infancy. The prevalence of the disease has not been established. It cannot be diagnosed in living people, only by examining brains that are removed during autopsy.
More than 4,000 former players are suing the NFL in the federal court, alleging the league ignored and denied the link between football and brain damage, even after CTE was discovered in former players. The Seau family said it has not yet decided whether to join the lawsuits.

Over the past five years, under pressure from Congress, dissenting researchers and, more recently, the lawsuits, the NFL disbanded a controversial committee on concussions that was established in 1994 under former commissioner Paul Tagliabue. The league made several rule changes and overhauled its policies to focus on head trauma and long-term cognitive problems.

Asked if she believed the NFL was slow to address the issue, Gina Seau said, "Too slow for us, yeah."

Tyler, whose mother was Junior Seau's high school sweetheart, and Gina both described drastic changes they noticed in Seau during the final years of his life, including mood swings, depression, forgetfulness, insomnia and detachment.

"He would sometimes lose his temper," Tyler said. "He would get irritable over very small things. And he would take it out on not just myself but also other people that he was close to. And I didn't understand why."

Seau, who also played for Miami and New England, was never listed by his teams as having had a concussion.

Gina was married to Seau for 11 years and had three children with him. They divorced in 2002, but she said they remained close friends until his death. Seau sent a group text to his four children and Gina the night before he took his life.

"I love you," he wrote.

"The difference with Junior ... from an emotional standpoint [was] how detached he became emotionally," Gina said. "It was so obvious to me because early, many, many years ago, he used to be such a phenomenal communicator. If there was a problem in any relationship, whether it was between us or a relationship with one of his coaches or teammates or somewhere in the business world, he would sit down and talk about it."

Gina recalled that Seau frequently said, "Let's sit down and break bread and figure this out." She added, "He didn't run from conflict."

Tyler, Gina and her two oldest children, 19-year-old Sydney and 17-year-old Jake, all said they found some solace in the CTE diagnosis because it helped explain some of Seau's uncharacteristic behavior.

Still, it also left them conflicted that a sport so much a part of their lives had altered him so terribly.

"It definitely hurts a little bit because football was part of our lives, our childhood, for such a long time," said Sydney, a freshman at USC. "And to hear that his passion for the sport inflicted and impacted our lives, it does hurt. And I wish it didn't, because we loved it just as much as he did. And to see that this was the final outcome is really bittersweet and really sad."
Jake, a high school junior who quit football to focus on lacrosse, added: "He lived for those games, Sunday and Monday nights, you know? And to find out that that's possibly what could've killed him or caused his death is really hard."

Tyler said he was holding tightly to his memories of getting up at 5 in the morning to lift weights with his father before heading to the beach for a workout and surfing. And while the diagnosis helps, he said, it can't compensate for his loss.

"I guess it makes it more real," he said. "It makes me realize that he wasn't invincible, because I always thought of him as being that guy. Like a lot of sons do when they look up to their dad. You know? You try to be like that man in your life. You try to mimic the things that he does. Play the game the way he did. Work the way he did. And, you know, now you look at it in a little bit different view."

Tyler added: "Is it worth it? I'm not sure. But it's not worth it for me to not have a dad. So to me, it's not worth it."

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