

BENNET OMALU ON HIS INTRODUCTION TO AMERICAN FOOTBALL

BY CHUCK STARESINIC

Mike Webster was dead. Bennet Omalu didn't even know who Webster was when he made a pot of coffee that Saturday morning in 2002 and turned on the television, but the newscasters explained.

Webster was the kind of football player who made Pittsburghers proud. An offensive lineman, he played one of the sport's most punishing positions for 15 years. Strong, silent, and stubborn, he didn't draw attention to himself. He just did his job, which mostly consisted of snapping the football into the hands of quarterback Terry Bradshaw then slamming into defensive players hell-bent on tackling the ball carrier. The Steelers won an unprecedented four Super Bowls with Webster. Now he was dead at age 50.

In a matter of hours after hearing this news, Omalu reported to work as usual at the Allegheny County Coroner's Office, where he was the attending forensic pathologist and neuropathologist. There on the autopsy table was Webster.

An MD educated in Nigeria, Omalu (Fel '02) had completed a pathology residency at Columbia University, then come to the University of Pittsburgh for two successive fellowships, one in forensic pathology and another in neuropathology. He also received a master's degree in epidemiology from Pitt.

All morning, the way people talked about Webster on the news had bothered him. Webster's doctors had attributed some of his health problems to recurrent head trauma he suffered as a football player, yet people described him as an athlete who couldn't handle life after football. (Webster suffered from depression and dementia, rambled incoherently in his Hall of Fame acceptance speech, made bad investments, became homeless for a time, and hocked his Super Bowl rings.)

Omalu looked at Webster's brain, which appeared normal. In a typical autopsy, this naked-eye view would be the extent of the brain examination. Omalu went further. He fixed the brain in formalin and took it to labs of his Pitt mentors Steven DeKosky, professor of neurology, and Ronald Hamilton, professor of pathology.



In the brains of deceased athletes, Omalu discovered injuries invisible to the naked eye.

"I subjected it to highly sophisticated immunohistochemical staining," says Omalu. "A large battery of stains."

Omalu found large accumulations of an abnormal toxic protein called Tau in the intracellular spaces of Webster's brain. This is a sign of chronic traumatic encephalopathy—long known to afflict boxers and sometimes referred to as *dementia pugilistica*.

Since studying Webster's brain, Omalu, who is now the chief medical examiner of San Joaquin County, Calif., has examined the brains of other professional football players who came to tragic ends. Two committed suicide. Another died in a violent and fiery car crash as he fled police after apparently suffering a nervous breakdown. The brains of all of these men showed similar injuries.

Omalu's work has attracted critics, who say that he hasn't examined enough brains to draw conclusions about whether blows to the head suffered in sports created the injuries. He is attempting to examine more brains, but that has proven difficult.

An epidemiological study this year from the University of North Carolina found that a history of recurrent, sports-related concussions in retired football players was linked to increased risk of clinical depression.

In the summer of 2007, a professional wrestler named Chris Benoit apparently murdered his son and his wife, then hanged himself. A few days later, Omalu, having obtained permission from the wrestler's father, Mike Benoit, flew to Atlanta to retrieve his brain. He fixed the brain in formalin and—because he didn't want to declare to airline officials

what he was transporting—drove 13 hours to Pittsburgh.

Benoit's brain showed a large amount of protein tangles in the regions of the brain responsible for controlling emotions. Parts charged with shepherding neurotransmitters like serotonin, noradrenalin, and acetylcholine were all damaged, helping to explain Benoit's major depression and psychotic episodes, says Omalu. Because of the family's privacy concerns, Omalu did not release his results to the press until September 2007.

"This is not about football," says Omalu, though his work has brought a great deal of attention to this aspect of the sport. "This is about concussive brain injury in contact sports. All types of sports."

This year, the National Football League (NFL) instituted baseline neuropsychological testing of all players. (The ImPact test, used by 30 of 32 NFL teams, was developed by Pitt physicians.)

Omalu would like to see the league support research toward a pathognomonic test—one that indicates tissue damage directly and unambiguously. A good example of the sort of test he envisions is Rachel Berger's. That Pitt assistant professor of pediatrics has developed blood tests that detect tiny amounts of certain proteins in the blood that may indicate head trauma in infants.

Before the beginning of the 2007 season, the NFL started a fund for retired players suffering from dementia. At its inception, a handful of former players applied for disability payments. In a few months, more than 100 had applied, with more than 50 approved. ■