

Sport-Related Structural Brain Injury: A Case Series of Subdural Hemorrhage in American High School Football

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Introduction

The risk of sport-related concussion (SRC) is a major public health concern. Unlike SRCs, sport-related structural brain injury (SRSBI), such as subdural hemorrhage (SDH), is rare and can lead to permanent neurologic deficit or death. Data characterizing SRSBI is limited. In this report, we present three cases of SRSBI from the Fall 2015 football season. Each athlete's long-term outcome is reported in conjunction with implications for future preventative work.

Methods

A retrospective case series was completed for all three patients who suffered a SDH as a result of playing football during the Fall 2015 season. Each patient had a minimum of 1-year follow-up. In-depth descriptive statistics were completed with a focus on the outcomes of return to sport, school, and prior level of cognitive function.

Results

Three high school football players presented with acute SDH following in-game football collisions and were treated at our institution within a span of two months (Table 1). Ages were 13, 15, 16 years-old. Each SDH measured 5mm, 9mm, and 12mm. Two patients required operative intervention. Inpatient hospital stay ranged from 10-25 days. For the two athletes who required surgical intervention, a previous SRC was sustained within four weeks prior to the catastrophic event. One year after injury, two players have returned to school, though with persistent headaches and cognitive deficits. One patient remains nonverbal and wheelchair bound. None of the athletes has returned to sports.

Conclusions

Acute SDH resultant from an in-game football collision is rare but reflects one end of the head injury severity spectrum in sport. The temporal proximity of the reported SRSBIs to recent SRCs emphasizes the importance of return to play protocols and raises questions regarding the possibility of second impact syndrome. These cases provide a unique opportunity to learn about the presentation, management, and long-term outcomes of SRSBI in high school football.

Learning Objectives

In this case series, we describe a series of sport-related structural brain injuries which occurred consecutively during one season of high school football, which helps educate readers on the spectrum of presentation, management, and long-term outcomes of structural brain injuries seen in football.

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