

A boxer with a prior traumatic subdural hematoma-to fight or not to fight?

Abstract

Professional boxing is a combat sport associated with a substantial risk for both acute and chronic traumatic brain injuries (TBI). Acute traumatic subdural hematoma (SDH) is the most common cause of boxing related mortality. Boxers usually collapse in the ring or in the immediate aftermath of a bout. In case of a large traumatic SDH, an emergency decompressive hemicraniectomy may be a lifesaving procedure but leaves the boxer with significant and permanent neurological deficits. Chronic neurological injuries associated with boxing usually encompass the sequelae of multiple head impact exposures (HIEs) which the boxer sustains over the course of his professional career. These include chronic headaches, chronic dizziness, chronic post-concussion syndrome, Parkinsonism, punch drunk syndrome, dementia pugilistica and chronic traumatic encephalopathy (CTE). Should a boxer who has suffered and survived a traumatic SDH in the ring with no residual neurological deficits, be allowed to box professionally ever again?

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Introduction

Traumatic SDH remains the most common cause of boxing-related mortality. In this case report a boxer who suffered and survived a traumatic SDH with no neurological deficits is presented. The boxer applied for a licensure to fight professionally again. The relevant medical literature was reviewed to answer the question whether this boxer should be licensed to fight again?

Case report

A-32-year-old male boxer applied for his professional boxing license. As part of the medical requirements for licensure, MRI brain without contrast report was submitted. The scan was read as showing normal brain parenchyma and susceptibility artifact in the calvarium of left frontal and parietal convexity. The radiologist had opined that this may be due to post-operative changes from a prior craniotomy. After review of the MRI report, further history and medical records were requested from the boxer. CT scan head was read as showing no acute intracranial pathology, but a left fronto-temporo-parietal craniotomy defect was identified. The radiologist also noted a degree of cerebral atrophy. The boxer's neurologist documented a history of craniotomy two years back for a left subdural hematoma evacuation suffered while boxing. In his office note, he further documented good fusion of craniotomy lines, and that the boxer had boxed professionally once since the head injury. The neurologist cleared him to box with no restrictions. After reviewing the entire medical records, the boxer was denied license to fight professionally. He was counseled to retire from professional boxing.

Discussion

Boxing is a popular combat sports in which the main objective is to win by causing a knockout. Points are scored by hitting the opponent on the head or body (above the belt). As a result, HIEs are common and boxing is associated with a high risk of both acute and chronic neurological injuries.^{1,2} Acute traumatic SDH remains the most common cause of boxing related mortality.^{3,4} Ubayd Haider, Sherif Lawal, Paul Bamba, Hassan Mgya, John Cooney all perished on account of acute TBI suffered during a combat sport bout in the past 9 months. One study documented over 300 deaths between 1950 and 2007.⁵ The statistics are sobering and highlight that boxing-related

fatalities are a serious concern which the boxing community needs to address urgently. Our case raises a few interesting observations.

One is the limitation of various neuroimaging modalities. While MRI brain is generally considered superior to identify the chronic neurological insults associated with boxing, CT scan head is the superior modality for detecting of acute TBI and craniofacial bony injuries such as fractures of the calvarium, nasal bones or orbit. In our reported athlete, if the susceptibility artifact in the calvarium had been missed on MRI brain scan or not reported by the radiologist, the boxer would have been cleared to enter the ring with possible disastrous consequences. Neuroimaging guidelines are not standardized across the various athletic Commissions in the United States and around the world.⁶ Some Commissions request detailed 1.5 T (Tesla) or 3 T MRI neuroimaging sequences, others require only a CT scan head and in some no neuroimaging is needed as a prerequisite for licensure to fight. Ringside physicians need to be aware of the above listed limitations and advantages of MRI brain and CT scan head. Our case report further highlights the urgency to standardize neuroimaging requirements across different Commissions in the United States and abroad.

Should a fighter who has sustained and survived without any neurological deficits a traumatic SDH be allowed to box again? Review of the relevant combat sports medical literature sheds no light on this important question. There are several professional boxers who clinically had begun showing signs of neurological decline but continued to fight. The most famous name that comes to mind is that of Muhammad Ali though it has since been debated whether Ali suffered from young-onset idiopathic Parkinson's disease or post-traumatic Parkinsonism.^{7,8} As stated previously traumatic SDH remains the most common cause of boxing related mortality. Fighters who sustain a large traumatic SDH while boxing either perish in the ring or soon thereafter. Those who survive and are transported to the hospital in a timely fashion usually undergo a decompressive hemicraniectomy as a lifesaving procedure. While the procedure may help the boxer survive the head injury, it invariably leaves the boxer with severe and permanent neurological deficit. Such a boxer is never going to enter the ring. In many cases they are left with lifelong disability, wheelchair bound and with extremely poor quality of life. In the author's professional opinion, traumatic SDH should

be considered a career ending injury in boxing even if it leaves the boxer neurologically intact. The boxer should be counseled to hang up his/her gloves, retire from professional boxing and avoid all HIEs including those that occur in sparing sessions going forward.

In no sport should an athlete die. Boxing should be no different.

Conclusion

Traumatic SDH should be considered a career ending injury in boxing even if it leaves the boxer neurologically intact. The boxer should be counseled to hang up his/her gloves and retire from professional boxing. The boxer should be counseled to avoid further HIEs and not to take part in sparing sessions going forward.

Conflicts of interest

The authors declare no conflicts of interest

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Author contributions

NKS drafted the manuscript.

Disclosures

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Data sharing statement

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