Athletic Injuries to the Head, Neck, and Face

JOSEPH S. TORG

SECOND EDITION

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To my wife Barbara, whose organizational skills, editing abilities, and efforts were responsible for making this edition a reality.

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PREFACE

Richard Schneider, former Professor and Chairman of Neurosurgery at the University of Michigan, succinctly noted that "the football fields of our nation have been a vast proving ground or laboratory for the study of tragic neurologic sequelae of head and neck trauma in man." His practical applications of this observation resulted in a series of major contributions that included descriptions of the "acute anterior spinal cord injury syndrome," and the "acute central cervical cord injury syndrome." In addition, his laboratory model for impacting the anesthetized primate resulted in the development of the double-crowned pneumatic football helmet used today. He must also be given credit for having been the first to conclude that "fractured cervical spines with tetraplegia could be avoided by enforcing a rule that outlawed spearing and stick-blocking." His true genius was perhaps best demonstrated by his position in 1972, that in the face of cervical spine fracture with spinal cord injury "the early administration of steroids . . . seems as effective or perhaps even better than surgery." Recently, some 18 years later, *The New England Journal of Medicine* reported a major multi-center study regarding the use of steroids in acute spinal cord injury, with similar conclusions.

Although material in this book takes issue with Dr. Schneider's concept of the role of the helmet in cervical spine injury, i.e., the proposed guillotine mechanism, and questions his concept of the "teardrop fracture," he is acknowledged as *the* pioneer in the academic pursuit of dealing with the problems presented by head and neck injuries in the athlete.

With the exception of the Dr. Schneider and the efforts and contributions of Drs. Joseph Marrone and Robert Cantu in this country and Charles Tator in Canada, the concern of the neurosurgical community with neurologic problems confronting those who participate in recreational and competitive athletics can best be described as underwhelming. As one prominent neurosurgeon admitted, "If it's not a brain tumor, we are not really interested."

With a few exceptions, the performance of the orthopaedic sports medicine community in dealing with these problems has been equally inadequate. Dr. John Albright clearly understood the scope of the problem of cervical spine injury in American football. His article, "Nonfatal Cervical Spine Injuries in Interscholastic Football," published in JAMA in September 1976—although it seems to me to have been neither appreciated nor understood—represented the first scientific attempt to define the problem of cervical spine injuries in this particular group.

More recently, the efforts of Dr. Robert Watkins to address the issue of risk criteria following cervical spine injury are noteworthy, as is the fact that his efforts were motivated by concerns of physicians caring for professional football teams. These physicians have developed significant discomfort due to both a lack of creditable data and workable principles to deal with cervical spine injuries and the demands and pressures brought to bear upon them by team owners, coaches, and players, in what can be best described as litigiously hostile environment.

Why have the orthopaedic sports medicine mavens failed to direct attention to the problems presented by cervical spine injuries in the athlete? Or more pointedly, why has the orthopaedic sports medicine leadership completely failed to recognize the cervical spine as an area demanding recognition, concern, and attention? To this observer, the answer is quite obvious. Just as a neurosurgeon is not "really interested unless the patient has a brain tumor," the sports medicine orthopaedist is not really interested unless the patient has torn his or her anterior cruciate ligament. The anterior cruciate ligament has become the focus of an obsession that has dominated the interest, efforts, and resources of the orthopaedic sports medicine community, a phenomenon dramatically demonstrated by the fact that during the five-year period 1985 through 1989, the *American Journal of Sports Medicine* published 90 articles dealing with the anterior cruciate ligament and only one dealing with the cervical spine.

Although this material represents the latest word regarding these matters, it certainly should not be the last. It is intended that this edition will fill the void that currently exists with regard to available information pertaining to the definition of the problem, prevention, treatment, and rehabilitation of athletic injuries to the head, neck, and face.

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CONTENTS

PART ONE

Problems and Prevention

CHAPTER 1

Anecdotal Observations

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A tremendous increase in active participation in recreational and competitive physical activities has occurred during the past several decades. With more leisure time, affluence, and media attention to sports, Americans by the millions are flocking to the playing fields, courts, and trails. Recent estimates place the number of individuals who run and jog on a regular basis to be in the order of 25 million.[6] Another 110 million Americans swim, 65 million bicycle, 26 million play softball, and 25 million ice-skate. In addition, 1,300,000 youngsters participate in interscholastic football programs each season.

Associated with large numbers participating in many forms of physical activity, many of which involve body contact, has been a variety of injuries and health problems. It has been estimated that about 17 million Americans seek medical care each year because of such athletic- and recreation-related problems.[5] Because of that need, an area of medical interest referred to as sports medicine has developed. Sports medicine is multidisciplinary in nature. The basic goal is to provide total health care for the athlete through a team effort directed toward injury prevention, treatment, and rehabilitation (Fig 1–1).

The majority of sports-related injuries involve the musculoskeletal system, and therefore the orthopaedic surgeon has assumed a visible and prominent role. Sports medicine is an area requiring multidisciplinary input and cooperation, however. It necessarily involves the participation of individuals with medical as well as nonmedical backgrounds. Specifically, sports medicine requires the expertise, knowledge, and cooperation of the physical educator, athletic trainer, exercise physiologist, kinesiologist, biomechanical engineer, and epidemiologist, as well as the pediatrician, family practitioner, radiologist, neurosurgeon, and many other specialists.

Prevention and management of athletic injuries of the head, neck, and face exemplify the interdisciplinary approach to a group of problems confronting the recreational and competitive athlete.

Fortunately, serious athletic injuries to the head, neck, and eyes do not occur often. In many activities, however, their occurrence is persistent and demands the attention of those involved with the administration and care of athletes. In some activities the consequences of these injuries require that they be given a high priority, with particular regard to prevention as well as to improvement of methods of medical care. Examples of this group include fatal head injuries resulting from boxing and football; cervical spine injuries with associated neurologic involvement occurring in water sports, use of the trampoline,[2, 9] and football;[13, 14]

FIG 1–1.
A 15-year-old baseball player was impaled on an iron fence spike while attempting to catch a baseball. Although a bizarre injury, it not only emphasizes the multidisciplinary nature of athletic injuries to the neck and face, but also, more importantly, underlines the importance of preventive measures. In this instance such hazardous objects should not have been present in or near the playing environment. (AP/Wide World Photos. Used by permission.)

and disabling face and eye injuries in racquet sports and ice hockey.[7, 8, 16]

Head injuries resulting from athletic participation are not a new problem. Gonzales[3] reported that 104 fatal injuries occurred in competitive sports in New York City during the 32-year period from 1918 to 1950. Head injuries accounted for 27 of the 43 deaths that resulted from baseball. Of the 21 deaths that resulted from boxing, the majority were due to closed head injuries.

BOXING

Unterharnscheidt,[15] in his monograph on injuries occurring in boxing, noted that "this sport deserves special attention because, by its intentional destructiveness, it stands apart from all other athletic activities in which injuries are normally of an accidental nature" (Fig 1–2). The validity of this observation has been emphasized by five boxing deaths that occurred in a 7-month period from November 1979 to June 1980. On Nov 28, 1979, Willie Classen died from head injuries sustained in a professional bout in Madison Square Garden. On Jan 1, 1980, Tony Thomas, a 20-year-old professional, died in Spartanburg, Va, from head injuries sustained in a bout on Dec 22, 1979. On Jan 9, 1980, Charles Newell, a 26-year-old professional fighter, died in Hartford, Conn, from injuries sustained in a fight on Jan 1, 1980. On Jan 18, 1980, Cleveland Denny died as a result of a

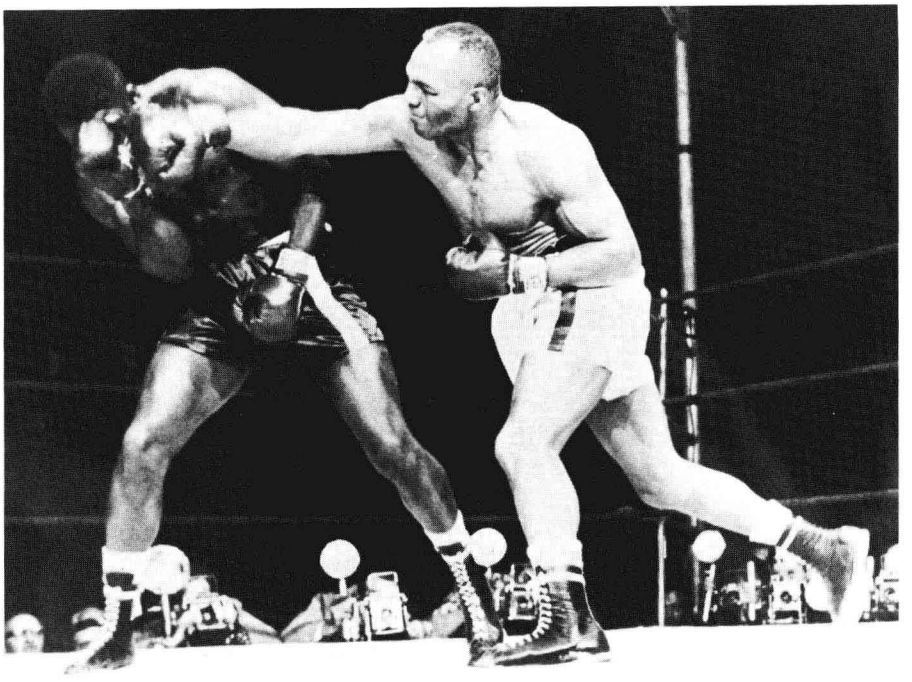

FIG 1–2.
A picture being worth a thousand words, the intentional destructiveness of boxing is vividly demonstrated by such telling blows to the head and, consequently, the brain of the opponent. (Photo by Sam Psoras, *Philadelphia Daily News*. Used by permission.)

"massive brain injury" sustained in a fight on June 20 in Montreal, Canada.

Unterharnscheidt[15] has also described the acute and chronic clinical manifestations of boxing injuries, a description that is simple, lucid, and worthy of consideration:

> Clinically, boxing injuries can be grouped into acute and chronic. The first group includes, for example, cases in which the blow has sufficiently accelerated the head so as to produce cerebral concussion . . . or sudden falls like those in which the boxer is hit much above his center of gravity and is literally knocked off his feet, hitting his occiput in a rapid deceleration trauma.
>
> The chronic brain lesions of boxers produce a condition known as punch-drunkenness, or chronic progressive traumatic encephalopathy of the boxer. This progressive clinical syndrome becomes noticeable only after a number of years. Frequently, this point coincides with the end of a boxer's career, or may occur a little later. Clinically the boxer exhibits a combination of extrapyramidal disturbances and cerebellar signs such as disturbed gait and coordination, tremor of the hands and body, and slurred speech.

Although specific head injury fatality rates have not been determined for boxing, in view of the comparatively few participants and the number of deaths reported in the press, it would appear that they are unacceptably high. Recent published reports indicate that supervision of boxing activities by the state boxing commissions leaves much to be desired.[4] It is necessary to establish and implement criteria as to when a fighter may return after having been rendered unconscious. Also, it is necessary to establish and enforce ringside standards by experienced medical personnel to protect the