

Case Report

Two case reports of cervical spinal cord injury in football (soccer) players

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Study design: Two case reports of male football players who sustained injury to cervical spinal cord as a direct result of the sport.

Objective: To raise the awareness that playing football (soccer), a very popular sport, may cause injury to the cervical spinal cord with dire consequences, albeit rarely.

Setting: North West Regional Spinal Injuries Centre, Southport, UK.

Case report: We report two male football players, who sustained injury to the cervical spine and developed tetraplegia as a direct result of the sport. Case 1: A 21-year-old football player was tackled from behind while running with the football, he lost his balance and landed on his head resulting in burst fracture dislocation of C5/C6 associated with immediate onset of complete tetraplegia (ASIA-A). Case 2: A 24-year-old football player collided, head first, with his own team goalkeeper, causing a hyperextension of neck. He developed motor complete tetraplegia at C5 level, with some sensation sparing below the level of injury (ASIA-B).

Conclusion: Injury to the cervical spinal cord is known to occur in some team contact sports such as rugby and American football. Over time the laws and the preparation of the athletes for these games have been changed in order to minimize the neck injuries. What might not be appreciated is that playing football (soccer), a very popular sport worldwide, may cause injury to cervical spinal cord with dire consequences.

Spinal Cord (2006) 44, 383–385. doi:10.1038/sj.sc.3101839; published online 20 September 2005

Keywords: cervical spinal cord injury; football; soccer; tetraplegia

Introduction

Sport and recreational activities are the third commonest causes for spinal cord injury among patients admitted to the North West Regional Spinal Injuries Centre, Southport, UK. We report two male football players, who sustained injury to cervical spinal cord and developed tetraplegia as a direct result of the sport.

Case 1

A 21-year-old, fit and healthy football player was tackled from behind while running with the ball. He lost his balance and landed on his head. This resulted in a burst fracture dislocation of C5/C6 associated with immediate onset of complete tetraplegia.

He was originally admitted to the local hospital. In the A&E department, management of his airway and respiratory compromise arising from his level of cord transection necessitated intubation and ventilation support. He had surgical stabilization of the cervical

spine with bone grafting 5 days after injury. As attempted extubation after surgery failed, he required formal tracheostomy 10 days later. Postoperatively he developed chest infection and a Grade 3 pressure sore in the sacral region.

At 4 weeks after his accident, he was transferred to the North West Regional Spinal Injuries Centre (NWR SIC) at Southport, for the overall management of his spinal cord injury. Peripheral neurological examination performed at this time confirmed this to be a complete (ASIA-A) C5 tetraplegia. The need for ventilatory support was short and tracheostomy closed within a few days of the removal of the tracheostomy tube. Once the pressure sore healed completely the patient was mobilized slowly and progressed well through the rehabilitation programme and there were no other medical complications during this period.

At time of discharge (11 months after injury) this patient required, partial to total assistance for all self care activities such as feeding, bathing, dressing and grooming. He was managing his bladder by assisted intermittent catheterization, needing total assistance in all transfers. He was mobilizing independently in a manual wheelchair, only for short distances.

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Case 2

A 24-year-old, fit and healthy football player collided head first, with his own team goalkeeper. The accident happened as he was running full speed back to his net and dived for a cross ball. As he was in full extension, heading the ball away, his forehead collided with the thigh of the goalkeeper, causing hyperextension to the neck. He immediately felt severe pain to the back of his neck, felt pins and needles in his arms, and was unable to move all four limbs.

Cervical spine X-rays taken at the A&E department of the local hospital revealed fracture of spinous process of C3, C4 and C5, but no apparent disturbance of the alignment. He was transferred to the NWR SIC at Southport the day after the injury. Peripheral neurological examination confirmed this to be a motor complete tetraplegia at C5 level, with some sensation sparing below the level of injury (ASIA-B). His cervical spinal injury was managed conservatively and after the appropriate immobilization time the patient commenced a rehabilitation programme with no medical complications during this period. The patient was discharged home 18 months after the injury. He remains dependent for the last 23 years on the help of a third person for most/all activities of daily living and requires an electrical wheelchair for his mobility.

Discussion

Sport-related injury account for significant number of traumatic spinal cord injuries.^{1,2} These occur mostly in a young healthy population with most patients spending a long rehabilitation period in hospital and develop life long severe disabilities.³

Injury to cervical spinal cord is known to occur in rugby players. Over a period of three decades and in order to minimize the risk of neck injury in rugby the laws of the rugby game have been changed, standard of refereeing have been improved, standard of fitness in training have been improved as well, study of the cervical spine to look for abnormalities that would predispose the player to tetraplegia, better statistics of injuries and the awareness of the necessity of comprehensive insurance have been accepted.⁴⁻⁶

What is not appreciated is that playing football, a very popular sport worldwide, may cause injury to the cervical spinal cord with dire consequences. The medical literature contains isolated case reports of severe neck injuries in football by various authors. In an analysis of spinal injuries in sports in the UK, Silver⁷ in 1993 reported three broken necks, one resulting from a rugby type tackle, one from a slip driving the head into the ground and one from diving across the goal mouth. Inklaar in 1991 reported a case of player that during an international club game while attempting an overhead kick fell on his occiput causing a hyper flexion injury causing bilateral fracture dislocation at C5/C6 resulting in complete tetraplegia.⁸ Scopetta and Vacario⁹ in 1978 reported a case of central cord syndrome after heading a

football. These anecdotal cases alert us to the possibility of serious cervical spine injury as a result of playing football.

Professional football players are likely to have adequate insurance, which will enable them to get reasonable compensation in case of serious injury with life-long paralysis. However, recreational and semiprofessional football players, as exemplified by case number 2, do not usually have adequate insurance to cover serious and permanent disability. Patient number 2 who was playing in a nonleague match, as we understand, was entitled to a maximum compensation of one thousand pounds only. Patients with C5 tetraplegia require physical assistance for their activities of daily living, for their entire life.

We believe that steps need to be taken to provide adequate insurance cover to semiprofessional and nonprofessional football players. For example, an ordinary citizen, who plays football in a friendly game in the neighbourhood, requires adequate insurance cover. This may be in the form of a single annual payment or a small amount collected every month. Insurance providers should be willing to offer this service. Persons, who indulge in recreational activities, should be advised to take adequate insurance cover before they venture to play even a friendly game in the neighbourhood. This situation is analogous to insurance cover prior to driving a motor vehicle. It is considered foolhardy and illegal to drive a motor vehicle without obtaining a valid driving license and insurance.

Similarly, ordinary citizens should be informed of the potential danger of playing football, which very rarely can cause serious and permanent disability, as indeed happened to these two young men.

These cases raise another question. Should players be discouraged to use their head while playing football? As it is played at present heading is a unique and essential part of the game of football. Several studies indicate that intentional and purposeful heading of the ball, when correctly executed is not a cause for concern of acute head injuries.¹⁰

However in football, head and also cervical injuries have been observed as a result of relatively hard contact impacts with the head, such as in head to head collisions, elbow or contact with the goal post, ground and other objects in a rugby type injury (and in soccer particularly in one of the cases where the man was tripped, this was illegal).

Many people may not be aware of the potential danger of acute neck injury when the players attempt to use their head to hit the ball. We should remember that during evolution, nature did not devise our neck bones for this purpose.

References

- 1 Yeo JD. Prevention of spinal cord injuries in an Australian study (New South Wales). *Paraplegia* 1993; **31**: 759-763.
- 2 DeVivo MJ. Causes and costs of spinal cord injury in the United States. *Spinal Cord* 1997; **35**: 809-813.

- 3 Aito S, D'Andrea M, Werhagen L. Spinal cord injuries due to diving accidents. *Spinal cord* 2005; **43**: 109–116.
- 4 Silver JR. Spinal injuries as a result of sporting accidents. *Paraplegia* 1987; **25**: 16–17.
- 5 Silver JR, Stewart D. The prevention of spinal injuries in rugby football. *Paraplegia* 1994; **32**: 442–453.
- 6 Silver JR. The impact of the twentieth century on rugby injuries. *Spinal Cord* 2002; **40**: 552–559.
- 7 Silver JR. Spinal injuries in the sports in the UK. *Br J Sports Med* 1993; **27**: 115–120.
- 8 Van Akkerveeken PF. Soccer. In: Watkins RG (ed). *The Spine in Sports* 1996, pp 515–521.
- 9 Scopetta C, Vacario ML. Central cervical cord syndrome after heading a football. *Lancet* 1978; **1**: 1269.
- 10 Beusenbergh MC. Biomechanics of head injuries in contact sports: new methods to assess and reduce the risk of concussion. In: The American Orthopedic Society for Sports Medicine (eds). *International football sports medicine* 2005, pp 163–170.