Unusual presentation of more common disease/injury

A Wii virtual activity severe thumb metacarpal injury

Ilias Galanopoulos, Anand Kumar Garlapati, Neil Ashwood, Christos Kitsis

Department of Trauma and Orthopaedics, Queen's Hospital, Burton-on-Trent, UK

Correspondence to Ilias Galanopoulos, galanop.ilias@gmail.com

Summary

In this paper we present a case of a severe thumb bone injury sustained during simulated sporting activity using a Wii games console. Although several types of injury related to this form of physical activity have been encountered during the last few years with increasing frequency, this particular basal thumb fracture has not been reported in the literature yet. This was a complex Rolando type of fracture similar to those obtained doing the actual activity mimicked by the game. Ensuring a safe environment and adequate preparation before undertaking sport is key to prevent injury and the same principles are needed when undertaking virtual sport.

BACKGROUND

Nintendo Wii has become a must-have household item for both its gaming experience and more recently in assessing and enhancing a person's fitness. It has a unique user interface and enables multiple players to compete in a multitude of activities within the home.

However, with the increasing popularity of the Wii there has come a multitude of game-related injuries.¹ Wii-related injuries appear more common than reported in the literature judging from the cases that have presented to our institution. A large number of soft tissue injuries^{1 2} have been reported previously and problems related to excessive gaming causing repetitive stress type of injuries.^{3 4} Recently specific fractures have been identified⁵ and certain areas of the body are noted to be more prone to injury depending on the activity undertaken.⁶⁻⁸

The authors present a serious trauma case sustained from undertaking gaming activities without preparation either of the individual or the gaming environment

leading to an isolated severe injuring event. Injury by others swinging the gaming console has been noted previously.⁹ We outline the mechanism of injury, summarise the current worldwide literature and highlight a series of preventive recommendations.

CASE PRESENTATION

A 54-year-old right-hand dominant male patient was ten-pin bowling on the Wii at home. Caught up in the excitement of trying to clear all the pins this teacher stepped forward and bowled, vigorously hitting his hand on a nearby glass coffee table. He developed immediately pain and swelling along with restriction of movements in his right thumb. Plain film radiography revealed a complex Rolando's fracture of the right thumb metacarpal (figure 1). The patient underwent surgical treatment with the fracture being openly reduced and internally fixed with a condylar buttress plate (figure 2). He was discharged

Figure 1 Anteroposterior (A) and lateral (B) radiographs of the right thumb metacarpal demonstrating a Rolando fracture with displacement.

Figure 2 Anteroposterior (A) and lateral (B) radiographs of the right thumb metacarpal following a surgical stabilisation of the Rolando fracture.

from hospital with an uneventful recovery and had regained full function and return to employment within 7 months of injury.

DISCUSSION

As pointed out by Nett *et al*⁴, virtual sports and physically interactive video-games represent a new era of recreational technology. A variety of injuries have been reported ranging from mild soft-tissue injuries, fractures or overuse combined injuries. The same authors identified that hand lacerations or bruising was the most common injury accounting for almost half of the injuries sustained.

The Rolando fracture appears to have occurred following an impact injury sustained by the individual not clearing enough space to undertake the game safely.

Considering this case, 'Ten pin' bowlers are often exposed particularly to wrist, back, shoulder, hip and knee injuries. In order to bowl properly, the muscles, tendons, joints and ligaments in these areas must function in concert so as to remain injury-free. Although pin bowling is not a rough sport or even a contact sport, those players who are engaged in that can potentially sustain a certain number of painful injuries.

Overuse injuries are also common.³ Those who bowl multiple times per week and rapidly paced bowlers are most likely to suffer overuse injuries in the joints of the aforementioned regions. Many injuries have been reported with ten-pin bowling including adductor muscle strain, adductor tendinopathy, carpal tunnel syndrome, de Quervain's tenosynovitis, finger sprains, knee ligamentous injury, lumbar disc injuries, quadriceps muscle strain, thumb sprain and bowlers thumb.¹⁰

The mechanism of Rolando fracture is usually an axial blow to a partially flexed metacarpal, such as in a fistfight.⁷ The fracture line is typically T-shaped or Y-shaped. The volar fragment remains attached to the carpometacarpal joint, while the main dorsal fragment subluxes or dislocates dorsally and radially due to the unopposed pull of abductor pollicis longus.⁷ A similar

axial load may have been transmitted to this patient's thumb while hitting the coffee table during bowling. Subsequently the patient had to undergo surgical treatment to regain function. This appears to be the most severe orthopaedic injury that has been reported so far regarding virtual sports injuries as it is more frequently seen in real contact sports. However, during these console games activities there is always the possibility of even more severe injuries not necessarily involving the musculoskeletal system. We have found in the literature a case report of a patient who sustained a traumatic haemothorax while playing Nintendo Wii,¹¹ highlighting the likelihood of any type or grade/severity of injury and the importance of always taking the necessary precautions before starting the game.

In order to prevent injury, the area around the gamer must be free of objects to reduce the risk of impact or fall. Being 'in shape' or having a baseline of fitness may also prevent a serious injury. Usually when undertaking sports there are coaches or team mates that help us regulate our activity and prevent us from excessive activity that can potentially lead to injury.

Learning points

- ▶ A Rolando-type fracture of the thumb metacarpal is a serious injury which can lead to significant functional disability even after appropriate surgical treatment.
- ▶ Injury associated with video game play is not unique to the Wii, nor is it a new phenomenon.
- ▶ Injury is more likely to occur when the gamer underestimates the space required to undertake the Wii activity and not prepares the surrounding environment appropriately.
- ▶ Not being used to sports or not being fit enough may also lead to people injuring themselves.

Competing interests None.

Patient consent Obtained.

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