



Management of scaphoid fractures in professional Australian Footballers

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Med Sci Sports Exerc [abstract] 1999, 31(5):S144.

Objective

Review management techniques and present case studies of scaphoid fractures in professional Australian footballers.

Introduction

The AFL is the premier competition of Australia's most popular sport. There are 16 teams in the competition who play 22 weekly matches in the regular season. Each game is played continuously for 4 x 20 minute quarters and involves running, sprinting, jumping, tackling, ball handling and kicking for all players.

Fractures of the scaphoid are the most common fractures of carpal bones and mainly result from sudden stress upon the dorsiflexed wrist, such as a fall on the outstretched hand (Cooney, 1980).

The scaphoid is most often fractured at the waist (70%), followed by the proximal third (20%), with distal third fractures least common (10%). Patients present with wrist pain and swelling. Examination reveals tenderness over the dorsoradial aspect of wrist particularly in the anatomic snuffbox and reduced range of wrist motion compared to the uninjured side (Gaebler, 1996).

The fracture may be difficult to diagnose on initial X-ray due to the shape and position of the scaphoid in the carpus. If no fracture is seen, traditional management dictates the wrist be immobilized for 10-14 days until resorption of any fracture occurs and renders it radiologically visible (Tiel-van Buul, 1997).

Non-operative management of scaphoid fractures (using immobilization in a thumb spica cast for 6-12 weeks) is widely used and high union rates have been reported. It is difficult to assess healing both clinically and radiologically (Dias, 1990).

In circumstances in which a player needs to return to the field as quickly as possible, or in which there is fracture displacement, acute internal fixation is often performed. This is best achieved with a Herbert screw (Herbert, 1984).

In Australian football, the use of a playing cast is not possible due to the demands of the game.

Methods

The AFL has prospectively surveyed all injuries which occurred to players since 1992 (Orchard, 1998). Case histories were retrospectively collected regarding all scaphoid fractures in the Australian Football League between 1992 and 1998, by request to the medical officer of each club. Nine teams had at least one player with a history of fracture and all responded.

Results

Over the study period, there were 15 new fractures in 13 players on AFL lists. This represents an incidence of new injury of 1 per 314 players seasons. Two players had separately occurring fractures in either wrist (cases 7a,b & 9a,b).

One other fracture occurred in a listed player but outside football playing or training (15*). There was a further fracture (for which records were available) that occurred in a lower grade player in AFL competition but who was not on an AFL team list at the time of injury (16*). One AFL player had a documented fibrous non-union from a fracture sustained before he entered the AFL that he was able to play with for many years with minimal symptoms (14*).

Two players had re-fractures after returning to play. Both were treated by revision fixation and bone grafting. Both then fractured again and were treated with further surgery (one costochondral graft and one scaphoid reconstruction with vascularized pedicle graft from distal radius). Both finally returned without further complications. Overall, eight of 18 cases required 10 bone graft procedures for non-union or re-fracture, of which 8 were successful.

There were ten right-sided and eight left-sided fractures equally divided between dominant and non-dominant hands. There were 8 waist fractures, 2 proximal fractures with X-rays unavailable for the remainder.

The players were 21.2 ± 3.4 years old, 187.1 ± 6.7 cm, 87.9 ± 9.6 kg, which was slightly younger, taller and heavier than the average player over that period (22.5, 184.7 and 83.1).

Only eight of the eighteen injuries were correctly diagnosed within a week of injury (seven by X-ray and one by technetium triple-phase bone scan). Of the ten who were not diagnosed acutely, four had negative X-rays and six did not have an acute X-ray. Six players, whose injuries were not diagnosed acutely, elected to continue playing once the diagnosis was made. Of these six players, three required end of season internal fixation and bone grafting due to symptoms of persistent non-union.

The six injuries treated initially with internal fixation returned between 4-12 weeks, while the seven injuries treated initially with plaster returned between 4-22 weeks.

	Diagnosis	Management	Return	Complications
1	acute Xray	Acutrax screw	8	refracture x2
2	subacute XR	kept playing	0	nil
3	initial Xray	Herbert screw	12	nil
4	subacute tbs	Herbert screw	10	nil
5	acute Xray	plaster 3 wks	4	off-seas bone graft
6	Xray 5 wks	kept playing	0	off-seas bone graft
7	acute tbs	plaster 5 wks	6	nil
7b	acute Xray	plaster 5 wks	6	off-seas bone graft
8	acute Xray	Herbert screw	4	refracture x2
9	acute Xray	Herbert screw	seas(4)	nil
9b	subacute XR	kept playing	0	nil
10	Xray 10 wks	kept playing	0	off-seas bone graft
11	subacute XR	kept playing	0	off-seas bone graft
12	subacute tbs	Herbert screw	6	off-seas arthroscope
13	acute Xray	plaster 6 wks	7	nil
14*	Xray 2 years	kept playing	0	stiffness only
15*	Xray 3 wks	plaster 6 wks	season	later perilunate disloc
16*	Xray 3 wks	plaster 8 wks	22	non-union (bone graft)

Table 1. Summary of cases



Fig 1. Typical X-ray of visible fracture



Fig 2. Herbert screw fixation

Discussion

Ideally, a professional footballer with a scaphoid fracture should refrain from sport until the fracture has united. Acute internal fixation with a Herbert screw is in most situations the treatment most likely to result in union in the shortest possible time. Irrespective of the method of treatment, return to play before 8-10 weeks is likely to result in a high rate of non-union or re-fractures.

In this study six players were able to keep playing with ununited fractures. Delayed reconstruction at the end of the season was successful and enabled them to continue playing in subsequent seasons. This delay was not planned but in fact occurred fortuitously, as wrist symptoms were mild (not interfering with continued participation) and therefore not fully investigated initially. Scaphoid reconstruction procedures are not always successful, hence scaphoid fracture can become a career-ending injury in professional footballers (Gibbs, 1993). Despite this series covering 16 teams for 7 seasons, there was not a large enough number of cases to give an accurate estimate of the likelihood of this becoming a career-ending injury.

In highly paid players with critical performance demands, it is an option in some cases to delay scaphoid reconstruction until the end of the season. Earlier reconstruction is advised if the fracture is significantly displaced, significantly painful or there is associated carpal instability. Adequate post-operative rest from play (at least 6-8 weeks) is an important aspect of surgical treatment and if this will not be observed then surgical treatment is likely to fail.

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