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FRICTIONAL FORCES AND ANKLE FRACTURES IN SPORT

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ABSTRACT

The frictional forces between the sports footwear and the ground can induce distortion trauma to the lower extremity.

Two cases are reported in which fractures about the ankle are related to this friction. An adjustment and reduction of the frictional forces are recommendable.

Key words: Sports, Shoes, Fractures, Ankle, Accident prevention.

INTRODUCTION

In recent years the elucidation of the number and the aetiology of sports injuries has attracted increased attention in medicine. An important factor in the appearance of injuries is the development of sport shoes (Renström, 1977). Two cases are presented in which the friction between the sole of the sport shoe and the ground was the main factor responsible for ankle fractures.

CASE REPORTS

Case 1

A 35-year old female handball player was brought to the emergency ward after having twisted her right ankle. The accident occurred after 10 minutes of play which was preceded by careful warming up.

The player received the ball with her back to the goal. During a 90 degree right turn in the following scoring attempt the shoe stuck to the floor, causing a twist of the ankle. The radiograph showed an ankle fracture of the supination fracture stage II type (Lauge-Hansen, 1949). The fracture was treated with osteosynthesis. It was clinically and radiographically healed after six weeks.

The patient had used a pair of sport shoes with a soft sole profile including circular cups. The playing ground was a rough linoleum floor.

Case 2

Playing indoor football a 14-year old boy sustained a twist of his left ankle. After a shot at goal in the second half of the match concerned (playing time 7 + 7 minutes) the player turned left on his left foot. However, as his sport shoe was stuck to the floor he twisted his left ankle. The radiograph showed a distal tibial epiphyseal fracture, type I (Salter and Harris,

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1963). Treated with closed reduction and fixed in a cast the patient recovered in five weeks. The sport shoe had a soft sole with a profile consisting of small studs and circular cups under the heel and the forefoot. The playing ground was a lacquered wooden floor.

DISCUSSION

The soles of shoes used for indoor sports should provide the player with stability and a safe send-off when accelerating or changing direction or position. Torsion to bones and joints can take place when forces are generated between the friction of the sole against the floor surface during rapid movement, as described by Renström in 1977. The sportsman's weight is another important factor in forces generated.

Both patients reported that the weight bearing shoe appeared to stick to the floor while executing a quick turn, and as the rest of the body continued to revolve this resulted in a twist of the ankle leading to a fracture.

It is essential, therefore, for all participants to ensure that the shoes worn are appropriate for the playing surface used, and for the activities performed. Friction is an important factor in the causation of trauma, but often neglected, according to Torg in 1982. Twisting injuries to the ankle are very common in indoor sports, reported by Andrén-Sandberg and his colleagues in 1982, and are recorded as comprising a fifth of all injuries in European Handball (Jørgensen, 1983 and von Biemer et al, 1980), 5%-10% of these injuries being fractures.

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