



ANKLE INJURIES IN BASKETBALL - TREATMENT AND ADAPTATION TO THE TRAINING PROCESS

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ABSTRACT

The article analyzes the problems of sports injuries, the main focus is on ankle injuries received during training and basketball competition. Given the growing incidence of ankle pain complaints not only from pupils and students- game lovers, but also from professionals of all ages, ankle injuries are considered significant injuries, with serious consequences for the training of basketball players. The aim of the study is to indicate the most common ankle injuries received during basketball training and competition activities and to explain the options for treatment.

Conclusions: The factors for the occurrence of chronic injuries in the ankles are complex, but most authors determine the lack of proper treatment and subsequent model for gradual adaptation to training after injury as most significant. That is why coaches and doctors combine their knowledge with the task of reducing injuries during training and competitive activities in basketball and effective recovery of the athlete after treatment of injuries.

Key words: injuries, trauma, diagnosis, recovery, competitions, basketball, sports training.

INTRODUCTION

According to official data from the International Basketball Federation (FIBA), more than 450 million people around the world play basketball. In many countries, governmental and non-governmental organizations and sports federations have created an organization that provides opportunities for young people to play basketball in conditions ranging from physical education classes, school and student competitions to state and national championships and not least as part of community sports entertainment programs.

In the United States, basketball is a very popular sport among boys and girls in high school.

Although the exact number varies over the years, it remains stable. In the school year 2003 – 2004, 544 811 boys and 457 986 girls were registered. In 2016 – 2017 the girls were 430 368, in 2018 – 2019 they were 399 067, which is considered a decline, but in a stable range of 430 000 in the last seven years. For boys, the number of registered boys playing basketball in 2018 – 2019 is 540 769 and is also reported as a stable number of people willing to play in school (1).

In Bulgaria, the registered basketball clubs with the Bulgarian Basketball Federation (BSE) by 2021 are 96, but no official reference is available for the exact number of boys and girls playing.

Involving children and young people in the basketball game is a top priority for basketball federations and clubs, but unfortunately, in proportion to the increasing number of practitioners, the number of injuries is also increasing.

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According to the National Electronic Injury Monitoring System (NEISS-AIP) in the United States, basketball was the most common cause of sports and recreation injuries observed in U.S. emergency departments in 2000 – 2001 with 395 251 cases. The share of cases is not evenly distributed among the age groups - in boys between the ages of 5 and 9, basketball accounts for 4.9% of all sports injuries, while in the age of 10 – 14 the percentage increases to 15.2% and reaches a peak in 15 – 19 year olds by 25.9%. In girls between the ages of 10 and 14, basketball caused 14.9% of all sports injuries and 18.1% in the 15 – 19 age group (2).

Many authors have found that sports activities such as basketball, football, handball and volleyball are high-risk activities, especially in the case of lateral injuries of the ankle ligaments (3). In basketball, any other injury that occurs affects the ankle joint (4, 5).

Dr. Taralov, Zd. (2019) in its study specifies that in the Bulgarian football championship ankle injuries account for 24.6% of all injuries, and worldwide this is the most common injury. The same author says: “the variety of ankle injuries is great due to the many structures that make it up, and yet nearly half of the injuries (50%) fall on the lateral ligament complex. The mechanism of their receipt can be both direct impact and indirect ("stepping" crooked) with inversion of the foot. The second most common (10%) are injuries of the medial complex, and the mechanism of receipt is most often direct - a kick to the supporting leg with eversion and external rotation. There are other injuries such as syndesmosis injuries, ruptures and dislocations of tendons, nerve damage, cartilage damage and others, but the main part of injuries in football falls on the lateral and medial ligament complex" (6).

The causes of ankle injuries in the practice of basketball, regardless of gender, age and level of the player are directly related to playing situations on the field. The most common game situations in which an ankle injury can occur are a fight for the ball, a rebound shot and a sudden change of direction. During training, the condition of the terrain (wet floor) increases the risk of injury many times over.

Ankle injuries often lead to a significant recovery time for injured players, usually a week or more (7) or five to six games (8). During this time, players remain inaccessible to their team in important phases of the season, thus causing a serious problem, especially for professional and semi-professional teams (9). Such absence negatively affects not only the injured player, but also the team's ranking.

METHODOLOGY

The **aim** of the study is to indicate the most common ankle injuries received during basketball training and competition activities and to explain the options for treatment.

The **object** of the study are ankle injuries in basketball.

The **subject** of study is establishment of the types of injuries in the ankle joint in basketball athletes, diagnosis and types of treatment.

Methods: literature analysis, pedagogical observation, conceptual analysis.

DISCUSSION

The types of ankle injuries, depending on the structure that is damaged, can be divided mainly into those affection soft tissue and bone. Soft tissue injuries in turn include bruise (contusion), sprain (distorsion), rupture, dislocation (luxatio). Bone traumatic injuries include fractures.

Muscle injuries are traumatic blunt force injuries to muscular bodies mainly in the lower limb. They create temporary weakness and pain in the affected area.

The most common cause of ankle sprains is related to the transfer of all body weight, in which there is an inversion moment of the ankle in plantar flexion (for example, when a player steps on another player's foot (7, 10). The result is distortion or tearing of the anterior talo-fibular ligament, most often followed by the calcaneo-fibular.

Eversion injuries are less common: they occur secondary to dorsiflexion with foot eversion or external rotation. These injuries, often leading to high ankle distortions, can be more serious due to injuries to the deltoid ligament, anterior tibiofibular ligament, and interosseous

membrane with syndesmosis (connection of bones by connective tissue).

The prevalence of Achilles tendons (AT) ruptures among the various sports is most widespread in basketball, the latter actually accounting for 42.6% of all AT ruptures in people under the age of 60 in the United States (11). As a consequence of these injuries, removal of the injured player from the field is required for a long time and subject him to a physical and psychological test, which can seriously disrupt the work rhythm, especially for the professional basketball player. Frequent dislocations (without associated fractures) of the ankle are extremely rare. They are usually accompanied by concomitant malleolar fractures.

Acute ankle fractures are relatively rare injuries in basketball players, corresponding to 0.5% of injuries in professional players (12). These injuries are serious and often lead to long periods of missed play among athletes.

Treatment is an individual process for the athlete and the specific injury. The classification of Danis-Weber is used as a classification. This classification, in which fractures are defined as Weber A, B, C, directs the severity of the injury and the associated treatment with high interobserver reproducibility.

Boden, B.P., et al (2000, 2001) classify stress fractures as low and high-risk injuries. Low-risk injuries in the ankle area are those of the lateral malleolus. The high-risk ones are those of the medial malleolus (13, 14).

DIAGNOSIS AND TREATMENT

Diagnosis of the injuries

Making the right diagnosis is crucial for a player's speedy recovery. Neglecting the problem leads to chronicity and deterioration of his condition, which in turn prolongs the absence of the athlete from the field with professionals.

For people who play basketball on an amateur level, the whole work process is also disrupted and complicates the daily life of the injured.

The history and the clinical examination are extremely important both for establishing the mechanism of the trauma and for its treatment.

For fast and accurate diagnosis, specialists use the potential of image diagnostics: radiography, and in the case of soft tissue injuries - magnetic resonance imaging (MRI).

MR imaging has established itself as a "non-invasive and non-radiation method, with high soft tissue resolution. The method of choice is both for diagnosis and for determining therapeutic behavior..." (15). „Magnetic resonance imaging is an ideal method for visualization, evaluation and diagnosis“ (16).

Conservative treatment

Muscle injuries are recommended to be treated with ice and compression.

Grade I and II ankle sprains are treated with functional rehabilitation, not immobilization. Grade III patients should be immobilized for at least 10 days in a special boot or cast below the knee and followed by specific functional rehabilitation once the pain and swelling have subsided (17, 18).

In terms of treatment, all stable Weber type A ankle fractures, without displacement or minimally displaced avulsion fracture of the distal fibula and those without medial lesion, in clinical evaluation and radiographic examination, are treated with plaster until healing. Athletes with such injuries can usually return to play within 8 weeks.

Indications for surgical treatment by open reduction and internal fixation (ORIF) of such injuries include the presence of fracture displacement or significant instability of the lateral malleolus. Low-risk stress fractures are usually treated with non-surgical treatment. (Guidelines for the treatment of ankle sprains were published by NATA in 2013 (19)).

Surgical treatment

Unlike medial and lateral ankle sprains, surgery is indicated for high ankle sprains if there is a fracture or if the syndesmosis is significantly impaired (20). The stability of syndesmosis is assessed on stress radiographs, taking care to expand the space between the tibia and fibula. Methods of surgical restoration of syndesmosis are screw fixation or suturing, and the results show high success and can lead to less long term chronic pain and instability.

AT ruptures and partial ruptures are almost exclusively indicated for surgical treatment. This is especially true for highly professional athletes who are willing to return to the field due to the ability of the surgical intervention to better restore the volume of movement compared to non-operative treatment.

High-risk stress fractures have an increased risk of progression, delayed union, or nonunion. Therefore, early surgical treatment, by ORIF or with a bone graft (in the presence of nonunion), is associated with a rapid return to sports.

For unstable but otherwise displaced and isolated fractures of the lateral malleolar type Weber B fractures, according to recent literature data, equivalent results can be achieved with both non-operative and operative treatment (21). Of course, in these cases treatment should be tailored to the individual characteristics and goals of the athlete.

Weber type C fractures are lateral fibular fractures that occur above the syndesmosis and are almost always accompanied by complete rupture of the syndesmosis with resulting instability of the ankle (22).

These injuries are usually unstable and almost always require surgical intervention. It is particularly important to set realistic expectations for athletes requiring surgical treatment of these injuries, as according to the latest data, only 25% of athletes return to the same level of play, one year after ORIF of unstable ankle fractures.

PREMEDICAL INSTRUCTIONS FOR TRAINERS, PHYSICAL TEACHERS, ATHLETES AND PARENTS

The actions of the basketball specialist are extremely important, as they must be the first to react in the event of an ankle injury during the training process. Knowledge and skills for cooling and using different types of bandages are useful. Cooling helps reduce pain and reduces swelling.

Physical education and sports teachers must be prepared for such incidents. The use of the R.I.C.E. The method includes **Rest** on the injured area, **Ice**, **Compression**, and **Elevation** (R.I.C.E) of the foot, above the level of the heart. Referral

to a specialist should not only be in case of suspicion of serious trauma, but also in seemingly minor injuries, with proper and timely treatment. During a basketball game, the team's physiotherapist must not only skillfully identify the degree of injury and stabilize the player, but also master the art of first aid. He must be able to intervene in small problems and return the athlete to the field. Of course, the doctor on duty at the basketball game must be aware of the severity of the injury and quickly decide when to refer the athlete to a medical center for proper diagnosis and further medical care.

Adaptation to the training process

Returning to active sports after an injury is a much-discussed issue by athletes, coaches, physiotherapists and doctors. There are many opportunities for the time when the athlete can be actively involved in training after an ankle injury. According to (Anderson 2010), in order to be fully included again in training with other players, the recovering athlete must be able to make 15 single-legged hop off toes, have successfully passed functional tests and to be mentally ready (23).

The time range is very diverse because ankle injuries are different in type and degree. For grade I or II distal tibiofibular injuries, 4 – 6 weeks may be required before returning to unrestricted competition (Mulligan 2011). Others report an average of 45 – 55 days (with a very wide range of 6 – 137 days) twice as long as for grade III lateral sprains Chronic pain, instability, and functional impairment are considered to be common sequelae (24). The doctor or the psychotherapist should continue to monitor for possible complications for a minimum of 6 months (e.g., heterotopic ossification, syndesmotic calcification, anterior impingement syndrome (25).

CONCLUSION

A review of the available world sports medical literature found that ankle injuries affect athletic basketball players from early childhood to longtime professional athletes.

The duration of treatment for an ankle injury is in a very wide time range - between one and nineteen weeks, and it should be used to the maximum so as not to lead to chronic pain in the

athlete. Each treatment is an individual process for the athlete and the specific injury.

Sports professionals must have the skills to provide first aid to the injured on the field and then refer him for a medical consultation, not only in case of suspicion of serious injury, but also with a view to timely and proper treatment. The full return of the athlete to active training and competitive activity is a goal to which everyone aspires.

It is difficult to make an in-depth study and analysis of the frequency and types of ankle injuries in active sports basketball players in Bulgaria, due to the fact that many victims do not seek medical help, and such is provided by physiotherapists or resort to self-medication. For amateur athletes, students and pupils, data on ankle injuries are even scarcer than for professional players.

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