Chapter XXII

ACUTE TRAUMATIC INJURIES IN VOLLEYBALL

by Andrea Ferretti

Acute injuries which occur the most frequently in Volleyball are: sprains (ankle, knee, fingers); muscle strains (quadiceps, hamstring, calf); contusions.

Sprains

A sprain is a stretching or a tearing of a ligament following an injury that forces the joint in a wrong direction. The tear may be complete, partial or only minimal. Most sprains are partial tears which heal satisfactorily in a few weeks. A complete tear of a ligament is a serious injury and sometimes requires surgical repair. The stretching of a small number of fibers in a ligament usually causes only minimal damage.

Ankle Sprains

In Volleyball, ankle sprains usually occur when the athlete falls after a jump, due to a loss of balance during the flying time or to an unexpected fall onto the foot of another player. In these instances the player can land on the outside of the foot, turning his foot inward and thus injuring the ligament of the lateral side of the ankle. This is the most common ankle injury.
In mild sprains, pain and swelling are usually moderate and the player, with appropriate taping, is often able to resume immediate sports activity. In more serious sprains, the player can feel a “crack” in his ankle, together with violent pain and noticeable swelling. In such a case he is totally unable to continue the game.

The treatment of such a type of injury, during the first 24/48 hours, is the following:

- **Rest** (not weight bearing)
- **Ice**
- **Compression** (with elastic bandage)
- **Elevation** (keep the leg elevated on two pillows)

An **X-ray examination** in both frontal and lateral views should be carried out in all cases of ankle sprain in order to exclude bone injuries (fractures of malleoli or others) which require appropriate treatment. Other tests can be recommended to define exactly the extent of ligament involvement. Stress radiograms seem to be very useful for this purpose.

The treatment of complete ruptures of the ligament of the lateral side of the ankle is still controversial. There are three forms of treatment:

### Functional treatment

This consists in the active and passive mobilization of the ankle as soon as possible, early weight bearing with appropriate taping, physiotherapy, and an early return to the sport with the protection of taping.

This kind of treatment allows the athlete to resume sport activity early. The main disadvantage is the risk of recurrence and subsequent chronic instability of the ankle. **Functional treatment should be used only if the injured athlete can be continuously assisted by an experienced doctor or trainer** during each phase of the treatment. In fact, protective, well-constructed taping, must be changed frequently during the treatment.

### Plaster

This is the most popular treatment because it is easy and safe. It gives good results in more than 80% of all cases of complete (III degree) ankle ligament tears. The return to sport is delayed longer than with the functional treatment.

### Surgery

The surgical repair of complete rupture of the ligaments of the lateral side of the ankle seems not to be indicated in all cases of acute tears, because of satisfactory results obtained with conservative treatment. **Surgery should be performed only in very selected cases** of acute injury and in chronic instabilities. All ankle sprains, whether mild, moderate or severe, must go through a process of rehabilitation to strengthen the damaged ligaments and condition them for further play.
Moreover, following a sprain, the ankle should be taped for practice and playing. Taping helps prevent the stretching of a ligament until it is completely healed and thus prevents recurrent sprains. There are many methods of taping an ankle. Every coach and trainer has his or her own method within the frame of a correct method and technique.

**Knee Sprains**

Unlike ankle joints, the knee stability is assured not only by collateral ligaments but also by cruciate ligaments. Collateral ligaments (medial and lateral) hold the knee together and prevent it from bending sideways. Inside the knee, cruciate ligaments (anterior and posterior) assure rotatory stability to the joint, and this is essential for many sports activities.

Whereas tears of collateral ligaments can be treated conservatively, heal satisfactorily and seldom compromise joint stability, the tears of the anterior cruciate ligament produce a rotatory instability of the knee which usually makes the athlete unable to continue strenuous sports activities. Tears of anterior cruciate ligaments must be recognized early and treated operatively.

In Volleyball injuries of anterior cruciate ligaments usually occur in falling from a jump in the attack area for a forced valgus external rotation or varus internal rotation movement of the knee. This kind of injury is more frequent in female than in male players. Tears of anterior cruciate ligaments usually produce a feeling that the knee is giving way or cracking, or a sensation of the knee being subluxated or something breaking inside the joint. Blood swelling (haemarthrosis) usually appears in a few hours.

Injuries of posterior cruciate ligaments are very unusual in Volleyball players.

Immediate treatment of a sprained ligament of the knee is much the same as that for a sprained ankle. - Ice and compression followed by elevation of the leg and rest. Any player with an injured knee must consult a physician as soon as possible and should use crutches until released by the doctor.

During a forced movement of the knee, the menisci can be also torn. Menisci are cartilages, semilunar shaped, one medial and one lateral in each knee, which, like cushions, help to distribute the weight evenly over the joint. Meniscal tears can be isolated or associated to ligament tears.

In Volleyball, isolated meniscal tears usually occur during a defense action, due to a forced valgus external rotation or varus internal rotation movement of the knee, with the feet fixed on the ground and the knee bent 90° or more. Meniscal tears can produce locking episodes of the knee; in these instances the athlete is unable to extend fully his knee. Meniscal tears must be treated operatively. Arthroscopy, by examining inside the joint, represents a true revolution in the treatment of meniscal tears. A tube with a light on the end is inserted into the knee through a tiny incision. The doctor looks through the tube, can see the entire joint and makes the necessary surgical procedures. A few days after an arthroscopic treatment of a meniscal tear, the athlete can resume his sports activity.

Meniscal tears associated with major ligament damage should be surgically treated together with the reconstruction of the ligament.
Finger Sprains

Volleyball players often sprain their fingers. Usually this injury occurs during a blocking action. The impact of the ball on the hand forces the joint to move in a wrong direction, resulting in a ligament being either torn or stretched. In more serious injuries, the joint can even be dislocated. The dislocation can be reduced by pulling on the finger and bringing it back into its proper position.

Sprains and dislocations can usually be treated with ice, and by taping the finger to its neighbours. This treatment allows the athlete to continue his activity. Taping should be continued for two or three weeks to prevent recurrence.

Muscle Strains

There are three degrees of muscle strains: mild, moderate and severe. Mild muscle strains are simply an overstretched of a muscle. The muscle stretched will have minimal bleeding between the fibers and subsequent pain and tenderness. Ice will control the bleeding. Slowly resuming full practice within a day or two after the strain should result in no time loss from competition.

A moderate strain is a tear of some of the muscle fibers. This results in more bleeding, more swelling, more pain and tenderness. Such injuries need treatment with ice and compression until the bleeding stops (usually in 24/48 hours). The gradual resumption of activities can be allowed as the pain subsides.

Severe muscle strain represents a complete separation of the muscle. Some muscle tears may need surgical repair, but most will heal with rest alone.

Correct warming-up and some stretching exercises are the most effective measures to prevent muscle strains.

Contusions

Contusions are the effect of a direct blow on soft tissues of the locomotor system. In superficial contusions also muscle and deep structures may be involved.

In Volleyball contusions are rare and usually superficial in comparison with those occurring in contact sports. Contusions should be treated only by ice package; any form of massage is absolutely contra-indicated.
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