TAPING

Skin preparation

Several different methods of skin preparation are used in today's athletic training rooms. The most common is simply to clean and dry the lower leg, ankle, and foot. A layer of prewrap (a thin foamlike material) is applied to the area to be taped. Some athletes prefer to shave the hair from around the area and have the tape applied directly to the skin. A quick drying adherent is recommended and may be sprayed onto the skin to allow for better tape adhesion. Often, heel and lace pads (foam squares with petroleum jelly or other lubricant) are applied to areas of high friction (ie, the dorsum of the ankle and the distal Achilles tendon) to prevent blisters.

General principles of ankle taping

- Learn how to tear the tape. It can be difficult and frustrating at first, but, with practice, tearing tape becomes quite simple. Hold the tape between the thumb and index finger of each hand with little to no gap between the thumbs. Quickly pull the hands in opposite directions to complete the tear.

- Avoid tape wrinkles as these can lead to blisters and discomfort. First, smooth the tape while it is being applied, as you do not get a second chance. Second, learn to use the angles naturally supplied by the body part. Forcing tape in a direction it does not want to go only serves to increase wrinkles and is less effective.

- In general, tape strips should overlay each other by about one half the width of the tape. Each area should be covered by 2 layers of tape. Uncovered areas within the taped ankle lead to blisters.

- Do not use excessive force when applying tape. Constriction of blood flow is possible when tape is applied too tightly.

Types of tape

Many different types of athletic tape are manufactured. For standard ankle application, the tape of choice is 1.5- or 2-in (3.8- or 5.1-cm) white porous athletic tape or nonelastic tape.

TAPE APLICATION

Position

The ankle should be in the neutral position (90°). The athlete should be seated comfortably with the knee at full extension and only the distal half of the lower leg off the table (see Images 1-2).

Preparation

See Skin preparation.

Realizing that some steps are optional, prepare for taping as follows: (1) clean and dry the skin, (2) apply tape adherent, (3) apply heel and lace pads, and (4) prewrap from midfoot to one third of the way up the lower leg.

Procedure

There are several variations on a standard tape application for the ankle. The following is one of the more commonly used techniques taught to student athletic trainers.

1. Place anchor strips (2 or 3) approximately one third of the way up the lower leg below the bellies of the distal aspect of the gastrocnemius. This is the proximal tape anchor. Place a distal anchor around the midfoot. These anchors may be partially taped directly to the skin to provide increased adherence (see Image 3).

2. Now apply the first stirrup (see Image 4). Start this strip at the medial side of the upper anchors, go down over the medial malleolus, cross under the foot, come up over the lateral malleolus, and end on the lateral side of the anchors. The theory behind this is to tape the foot more in eversion than inversion so that one does not predispose an athlete to injury.

3. Next apply a horseshoe by taping from the inside of the midfoot anchor, back across the Achilles tendon, and ending on the outside of the anchor (see Image 5).

4. Repeat the stirrup and horseshoe 2 more times each, moving the position of each one by one half the width of the tape; this should produce a basket-weave appearance. The first stirrup covers the posterior half of the malleoli, the second covers the middle of the malleoli, and the third covers the anterior half.

5. Place closure strips (usually 5 or 6). Start at the malleoli and work up. An additional 1 or 2 strips may be needed to enclose the midfoot. After this step, no areas within the body of the tape job should be uncovered except for the posterior portion of the heel, which is not to be taped.

6. Figure of 8: Start at the dorsum of the ankle. Go medially around the bottom of the foot and back up to the dorsum. Proceed around the back of the leg and finish at the starting point. Imagine a figure 8 bent about 60^{o} in the middle (see Image 6).

7. Lateral heel lock: Start with the tape anterior to the lateral malleolus. Go medially across the dorsum of the foot aiming for the longitudinal arch. Proceed across the plantar aspect of the foot to just posterior to the base of the 5th metatarsal. Now go up and posterior on the lateral side of the calcaneus, across the Achilles tendon and its insertion on the calcaneus. Go around to the medial side of the ankle, partially overlapping the malleolus. Finish on the anterior aspect of the ankle and tear (see Images 7-9).

8. Medial heel lock: Start anterior to the medial malleolus. Go down on the lateral side to where the other strip is coming up to go posteriorly around the calcaneus. Proceed straight across the plantar aspect of the foot to the longitudinal arch. Go up and posterior on the medial side of the calcaneus, across the Achilles tendon and its insertion on the calcaneus. Next, go around the lateral side of the ankle, partially covering the malleolus. Finish on the anterior aspect of the ankle and tear. The heel locks are the most difficult part of the tape job to apply and often take practice to master.

9. Repeat both the lateral and medial heel lock one more time for each. Heel lock application techniques are varied. The above is a commonly accepted example.

10. Final closure strips: Apply final circular strips around the foot and lower leg as needed to tidy up the tape job and ensure that no open spaces or weak spots are present (see Image 10).

Variations

The standard tape job described has many variations. To discuss them all would go beyond the scope of this article; therefore, only a few of the simpler changes are mentioned.

- Elastic tape may be used for the heel locks or may be used to reinforce the normal heel locks. This often is reported as more comfortable for the athlete or is reported to give the athlete a sense of more stability.

- Another variation using 1.5-in (3.8-cm) moleskin strips for stirrups is referred to as "power strapping" and often is used on previously injured ankles.

- Another taping variation that should be mentioned is that of ankle "spatting," which is placing tape on the outside of the sock and shoe. While this may provide minimal external support, it does not have the same efficacy as regular ankle taping or bracing and is, therefore, not recommended for use by itself.

- The most recent variation in ankle taping is to replace prewrap with "flex" tape. This is more durable than prewrap and resembles elastic tape but is adherent only to itself and not to skin. In some training rooms, this type of tape is being incorporated more and more into the ankle application with less use of white athletic tape.

ANKLE BRACING

The concept of ankle bracing evolved from ankle taping. Braces currently are being used instead of traditional taping by many athletes at all levels of competition. They offer several advantages in that they are self-applied, reusable, and readjustable. In the long run, they are likely more cost-effective than taping.

Braces generally come in 2 types, although small variations exist depending on the manufacturer. The first is nonrigid and resembles a thick canvas or nylon lace-up sock. Some nonrigid braces also are made of neoprene. The nonrigid style imparts some compression to the ankle and may help in injury prophylaxis but provides little medial or lateral stability to the ankle.

The second type of ankle brace is the semirigid. Its construction is similar to the nonrigid but with the added feature of molded plastic struts or air cushions. These are incorporated into the medial and lateral sides of the brace, similar in orientation to the stirrups used in ankle taping. These braces provide more stability and often are chosen during the rehabilitation and return to play phases of ankle injury.

Most nonrigid and semirigid braces also use fabric straps to simulate heel locks. These are usually on the outside of the brace and fastened with Velcro.

Many athletes do not feel as comfortable or as stable wearing braces, which can be a disadvantage to treatment. Braces also can become torn or lost and require replacement.

Many studies have been completed comparing taping versus bracing of the ankle to try and determine which is the better method. Prospective studies have met with difficulty in controlling all of the variables associated with ankle injuries (eg, playing surface, shoe wear, individual inherent stability, intensity of competition on both a team and individual level). Most have shown that braces are slightly more effective than taping but that both are better than no support. One interesting study found that simply wearing high-top instead of low-top shoes prevented some ankle injuries and that high tops plus taping had more than 50% fewer injuries than low tops plus taping.

SUMMARY

Ankle taping and bracing are fixtures of both athletic training and sports medicine. Although studies regarding effectiveness and technique are not all in agreement, it seems clear that bracing or taping of the ankle will continue to be a mainstay in the prepractice and precompetition routine.

The sports medicine physician should understand the concepts and techniques of ankle bracing and taping so that advice and guidance can be offered to athletes and athletic training staff. Ankle bracing and taping should not be used in place of aggressive rehabilitation including strengthening and proprioceptive exercises. Rather, both should be used in conjunction with rehabilitation in terms of injury prevention.

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