Effectiveness of functional ankle taping for judo athletes: a comparison between judo bandaging and taping

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This study was conducted to compare the effectiveness of the traditional method of ankle bandaging and the new method of ankle taping for judo athletes in Japan, and to introduce a functionally effective taping method for judo players. Four university judo athletes with ankle instability were selected to undertake radiography of the ankles before and after exercise, with bandaging at one time and taping at the other. Talar tilt (TT) angles were measured in order to compare the ankle-supporting effects. The results showed that the old ankle bandaging method had no role in eliminating the talar tilt during judo practice. In contrast, the new taping method was more effective in eliminating the talar tilt and supporting the involved ankles both mechanically and functionally.

Keywords: Judo, bandaging, taping, TT angle

Ankle injuries occur commonly among athletes – over 70% are ankle sprains that include the lateral ligament complex¹⁻⁵. Over 50% of judo athletes injure an ankle each season (results of an investigation of judo athletes in International Budo University in 1989). This has become of major concern to the professionals who are responsible for the prevention of injury, treatment, and safe return of the athletes to participation. Traditionally in Japan, ankle bandaging has been used widely in judo to prevent ankle injury. In fact, although the method has been shown not to provide effective support it may provide psychological comfort. This study compares the physiological effectiveness of ankle bandaging and taping methods and introduces a taping method which is functionally effective during the ankle techniques of judo athletes.

Materials and methods

Twenty-eight International Budo University judo athletes volunteered to participate in the study.

Radiography was carried out using a Rotanode (DRX-T603B) apparatus (Toshiba, Kawasaki, Japan). In each subject both ankles were radiographed in an ankle inversion, bodyweight-bearing stance without

support (barefoot position). The talar tilt (TT) angles were measured⁶⁻⁸.

Four male athletes who complained of ankle instability were selected for our study. They undertook a 90-min daily judo practising programme with ankle bandaging on one experiment day and ankle taping on the other day. The TT angle of the ankles was measured by radiography in each subject before and after training to compare the effectiveness of the two methods of support. Ankle taping was performed by one athletic trainer skilled in the technique and the traditional bandaging was put on by the athletes themselves as usual. The bandaging and taping methods are shown in Figure 1. We have used

Figure 1. a Bandaging method, and b functional taping method

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Table 1. Results of TT angles (in degrees) from radiograph

Case	Barefoot	Bandaging		Taping	
		Before	After	Before	After
1	8	2	4	0	0
2	7	6	7	0	0
3	11	8	10	0	3
4	18	9	14	0	5

an improved taping method based on our studies of judo practice, ankle function (e.g. ashiwaza) and of the sliding friction on the special surface of the judo practising area – Tatami.

Results

The results of TT angle measurement are shown in *Table 1*. The TT angles were measured on radiographs in the barefoot position, before and after training with bandaging at one time and taping at the other. It can be seen that the TT angles of all the ankles tested of the four subjects are comparatively larger in the ankle inversional body-weight bearing stance. Before training, the TT angles were somewhat improved (1–9°) by bandaging, but after 90 min of judo training, the TT angles were again the same as that without support. By contrast, the TT angles were 0° with taping in place before training and remained below 5° after 90 min of competitive judo training.

Figure 2. Functional judo taping method. **a** Non-elastic tape is used to apply the anchor strips, stirrups and horseshoe strips over the underwrap. **b,c** Elastic tape is used to apply the figure-of-eight. **d–f** Elastic tape is used to apply the heel lock

Discussion

TT angles measured in a body-weight bearing inversion stress stance give the exact objective data for evaluating ankle support. The taping method has been shown to eliminate talar tilt and reinforce the structures of the ankle during judo practice.

The majority of judo players were asked about the new taping methods. They said that the method using non-elastic tape imposed obvious limitations on ankle techniques during judo practice (i.e. they were too stiff and ankle dorsiplantar flexion movement was reduced). To resolve this problem, we introduced elastic tape – 'figure eight' and 'heel-lock' – for ankle taping (Figure 2) to release the ankle sagittal plane of motion while still preventing ankle instability as we had previously demonstrated.

The range of ankle sagittal plane motion when using different taping methods, i.e. with non-elastic or elastic tape, during judo practice was also investigated in order to compare the advantages and disadvantages of the two methods. The functional elastic taping gave sufficient ankle support and was less limiting to the judo ankle techniques⁹.

This method has been well received by judo athletes and is now widely accepted.

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