



Case Study

Effects of ankle eversion taping using kinesiology tape in a patient with ankle inversion sprain

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Abstract. [Purpose] The aim of this study was to report the effects of ankle eversion taping using kinesiology tape on ankle inversion sprain. [Subject] The subject was a 21-year-old woman with Grade 2 ankle inversion sprain. [Methods] Ankle eversion taping was applied to the sprained left ankle using kinesiology tape for 4 weeks (average, 15 h/day). [Results] Ankle instability and pain were reduced, and functional dynamic balance was improved after ankle eversion taping for 4 weeks. The Cumberland Ankle Instability Tool score and reach distances in the Y-Balance and lunge tests were increased. [Conclusion] Repeated ankle eversion taping may be an effective treatment intervention for ankle inversion sprain.

Key words: Ankle instability, Cumberland Ankle Instability Tool, Lunge test

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INTRODUCTION

Ankle inversion sprain often occurs during sports-related activity, landing on an inverted and plantar flexed foot after jumping, and running on uneven surfaces¹). Approximately 85% of ankle sprain injuries are related to the lateral ligament²). It involves pain, lateral ligamentous injury, excessive ankle inversion, swelling, and limitations in ankle range of motion³). Some patients with ankle inversion sprain experience continuous pain and ankle instability at long-term follow-up⁴). Additionally, the reinjury rate of ankle inversion sprain may be as high as 80%⁵). Therefore, utilizing the most effective intervention for ankle inversion sprain is important.

Here, we report the effects of repeated application of ankle eversion taping (AET) using kinesiology tape in a patient with ankle inversion sprain.

SUBJECTS AND METHODS

A 21 year-old woman complained of lateral left ankle pain after experiencing a Grade 2 ankle inversion sprain during walking one week prior to treatment. She had been diagnosed with left ankle inversion sprain 2 years prior, for which she had received manual physical therapy for 3 weeks. However, she continued to experience occasional ankle sprain. She complained of painful ankle inversion and instability when descending stairs, ascending an oblique surface, and standing on unstable ground and severe pain during running, jumping, and squatting. Full weight bearing on the sprained leg was especially difficult. Prior to study participation, she provided a written informed consent document that was approved by the Ethics Committee of Dong-Eui University. This study was conducted in accordance with the ethical standards of the

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Fig. 1. Ankle eversion taping using kinesiology tape

Declaration of Helsinki.

AET using kinesiology tape (BB Tape, WETAPE Inc, Seoul, Republic of Korea) was applied daily to the left ankle for 4 weeks (average, 15 h/day). First, an I-shaped tape was applied from the talus to the calcaneus in a mild dorsiflexion position for posterior talar glide (Fig. 1A). Second, an I-shaped tape was applied from 5 cm above the lateral malleolus, over the medial calcaneus, to the inside of the instep of the foot in an eversion position to prevent painful inversion (Fig. 1B–C). Third, an I-shaped tape was applied using the same method as that used for the second tape to reinforce prevention of painful inversion and allow ankle eversion (Fig. 1D–E). Fourth, an I-shaped tape was applied using the same method as that used for the first tape to reinforce posterior talar glide and provide ankle support (Fig. 1F). We applied AET to the sprained left ankle daily after removal of the AET applied the previous day, even though the patient did not complain of itchiness. Additionally, the start and end points of the tape (approximately 2–3 cm) were applied without stretching to prevent skin problems⁶. No other treatment intervention for ankle inversion sprain was used.

RESULTS

In the initial assessment, the Numeric Pain Rating Scale (NPRS) score (0, no pain, and 10, the worst pain) of the lateral ankle at rest was 4 and that on application of 3 kg pressure on the most tender area of the lateral ankle using an algometer (Pain Test Model FPK; Wagner Instruments, Greenwich, CT, USA) was 7. Her left ankle score on the Cumberland Ankle Instability Tool (CAIT) questionnaire (9 items scored on a 30-point scale for measurement of functional ankle instability⁷) was 2/30. The Y-Balance test was used to assess functional dynamic balance with ankle instability⁸. The maximal reach distances of the opposite leg in 3 directions (anterior, posteromedial, and posterolateral) while in a sprained left leg stance were 35 cm, 55 cm, and 54 cm, respectively. The lunge test (distance from the wall to the big toe in ankle dorsiflexion without lifting the heel and with knee flexion) was used to assess ankle flexibility⁹. The initial distance of the left toe was 5 cm.

Following AET application for 4 weeks, the NPRS score for the lateral ankle at rest decreased from 4 to 0 and that after application of 3 kg pressure to the most tender lateral ankle area using an algometer decreased from 6 to 1; the CAIT score increased from 2/30 to 29/30. The reach distances in the anterior, posteromedial, and posterolateral directions increased from 35 cm to 46 cm, from 55 cm to 69 cm, and from 54 cm to 63 cm, respectively. The lunge test distance increased from 5 cm to 9.5 cm. She no longer experienced ankle pain and instability when descending stairs, ascending an oblique surface, standing on unstable ground, or when jumping, running, or squatting. She was able to fully bear weight on the left leg without pain.

DISCUSSION

This case study showed that repeated AET application for 4 weeks reduced lateral ankle pain and improved ankle flexibility and functional dynamic balance. Painful plantar flexion and inversion of the sprained ankle were prevented through a more everted ankle with AET application. In addition, the sprained ankle was protected from reinjury through the mechanical effects of AET application. Previous studies have reported that kinesiology tape application to an ankle with instability¹⁰ and eversion sprain¹¹ reduced pain and improved stability. Therefore, healing of ankle inversion sprain was possible.

Kinesiology tape may provide support to the joint structure¹² and improve joint position sense¹³. Activation of proprioceptors through kinesiology tape application may increase the ankle joint position sense. Therefore, maintaining the neutral ankle position using repeated AET application may increase ankle stability, the reach distances in the Y-Balance and lunge tests, and the CAIT score. Future studies on the clinical effects of AET in a larger number of patients with ankle inversion sprain are required.

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