

## AN ELECTROMYOGRAPHICAL STUDY ON THE EFFECTS OF THE ATHLETIC TAPING ON THE SPORTS INJURY

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The using of athletic taping has been rapidly spreaded out in Japan since it was introduced a few years ago from the U.S. People became to notice the important of the taping effects particularly on the field of the sports.

At the same time we found there were a lots of research works that were concerned with its effects on the sports injury. But most of these works were mainly stressed on to see it's effects on the working capacities with or without taping for an injured subject. Only a few of these works dalt with the problem that were to see how could it contribute a person at injury or after it during the recovery period, to have proper information from the injured muscle itself.

In this study we try to know something from EMG of a injured subject during his recovery period, tested with running in taping and without taping.

Same finding obtained could be summarized as follow:

1) The tape could be worked as an artificial muscle fascia and an tendon to support the weakened injured muscle in running with easy speed.

2) Running with speed increased up to 100m per minute, the taping had an effect to prevent the injured muscle from over contracting and lenthening.

3) When the running speed is increased up to 150m per minute, the injured leg could not run without the supporting of taping.

The characteristic and the symptoms of the subject:

1) The subject injured during his training, tumbled in running, over tretched his left foot coused be an adduct movement of the pedis joint at that time.

2) He had a pertinent medical treatment, and ten days completely resting. At that time of this experiment he still feel pain with normal walking.

3) The subject is 1.75m tall and 69kg of weight.

The taping procedure:

1) Taping directly to his skin without under drop.

2) Applicated with the kinds of rehabilitation and medical taping.

3) Have three special tapes on the out side layer to increase the supporting force.

4) Have an hill-lock finally.

Method and procedure;

The subject studied was a young college student who had foot strain at the point of pedis joint ten days ago as described above. The subject was asked to run on a motor driving treadmill with three different running speed that were the speed of 50m per minute, 100m per minute and 150m per minute.

EMG were recorded during his running from both legs (normal and injureid) by surface electrode. The bipolar electrodes were fixed on the belly of M. tibialis anterior and M. gastrocnemius.

Result:

1) In a cycle of running, it was found the muscle of Tibialis anterior had sharply discharged at the time when the runner's leg struck the ground. After it when the runner forceful push of his rear leg down to the ground during the time called driving phase, the muscle Gastrocnemius began to discharge until his rear leg lefted the ground. Two of these muscle worked against each other antagonisted could be found from EMG. (Fig. I. 23).

2) Compared with both normal and injured legs' EMG which recorded from four muscles, Tibialis anterior of the injured leg had no significant change with or without taping as running with the speed of 50m per minute, but in the normal leg the taping had a significant effect to the muscle activity, that is to lower the amplitude of the discharge as compared with no taping applied, running at this intensity. (Fig. I).

3) Running with 50m per minute, the injured leg's Gastrocnemius had altered its pattern of EMG. As running without taping, there was little discharge found in this muscle, on the contrary, muscle worked normally neary the same as the normal leg's muscle did as it was supported with taping. (Fig. I)

4) When the running speed increased up to 100m per minute, the subject had to run with painful, no significant change could be seen in EMG with or without taping in the muscle of Tibialis anterior, but the Gastrocnemius had a quite different pattern and amplitude in its discharge as running with and without taping (fig. 2) running with taping, the time of action potential appeared shorter than without taping could be found. From this effect it means the tape had an effect to limit this muscle's activity, prevented it from over stretching and shortening in doing a quite intensed muscular task.

5) No apprently difference found, with and without the using of taping in running with the speed of 100m per minute. Except for all the four muscles' activity were quite limited by the using of taping. (Fig. 2)

6) As the running speed was increased up to 150m per minute, the subject was unbearable to run with the speed without the supporting of taping. (Fig. 3).

Discussion:

In this study though there was one subject employed, still we did had an evidence to show the effect of taping to sports injury. EMG had shown apperently that he injured leg functioning neary normal situation with the application of taping in doing the same work task. The supporting effect increased linearly with increasing of running speed found in this study.

There were a lots of factors including the mental, the physiological and the pathological limiting factors to inhibit an injured person to use his muscle system. When a muscle lost its function, it may compensate by the other muscle groups to exert a task, such a case was common to most athletes during his injury or in the time of his recovery period. In this study we found by the use of the taping he could improve his motor function considerably in doing a moderate locomotion.

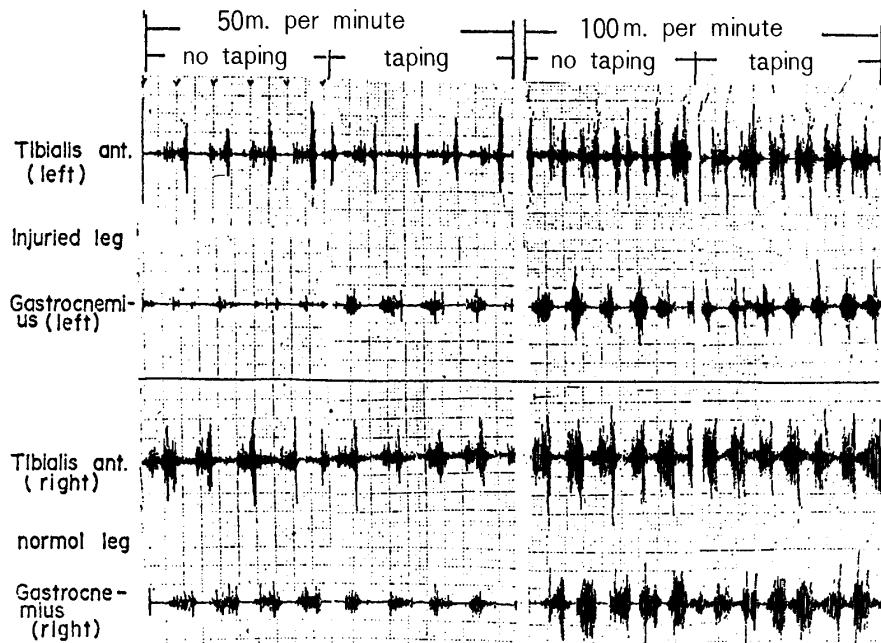


Fig. 1 Comparison of EMGs obtained during running with and without taping at the speed of 50 m/min

Fig. 2 Comparison of EMGs obtained during running with and without taping at the speed of 100m/min

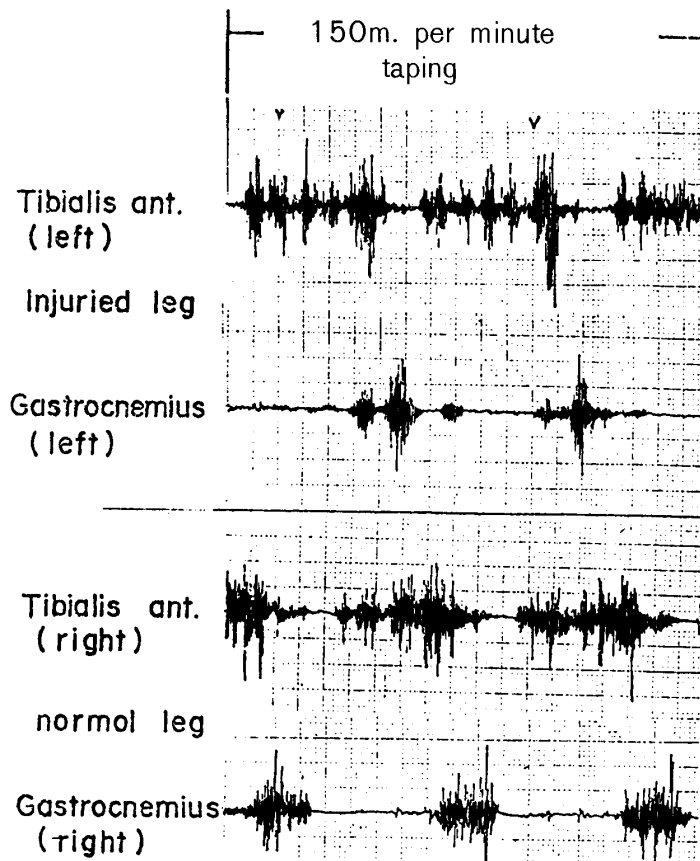


Fig. 3 EMGs during running with taping at the speed of 150 m/min