



## OLGU SUNUMU/CASE REPORT

# Kinesio taping application in a pediatric patient with spinal muscular atrophy

## Spinal musküler atrofi bir çocuk hastada kinezyoband uygulanması

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### Abstract

Kinesio taping is one of the elastic bandage methods which has been quite popular in the last 20 years and has been applied in various musculoskeletal conditions. Although the mechanism of action is not clear, many theories have been suggested so far. In this case report, we aimed to present the results of kinesiotope application for back pain of the patient with spinal muscular atrophy which is one of the progressive muscular disorders. It was performed for three times with four days interval. Fascial technique B (Space technique) was applied. Reduce of pain was also observed during the subsequent applications. The application of kinesio taping could be beneficial on reducing the pain in patients with progressive muscle diseases.

**Key words:** Kinesio taping, spinal muscular atrophy, back pain

### Öz

Kinezyoband son 20 yıldır oldukça popüler olan ve çeşitli kas iskelet sistemi hastalıklarında kullanılan elastik bandajlama metodlarından biridir. Mekanizması tam açık değildir fakat bazı teoriler öne sürülmüştür. Bu olgu sunumunda progresif kas hastalıklarından olan spinal musküler atrofi bir hastada gelişen sırt ağrısına uygulanan kinezyoband sonuçlarını sunmayı amaçladık. Kinezyoband dört gün ara ile üç defa olmak üzere fasyal B tekniğiyle uygulandı. Uygulama sonrası ağrı azalma sağlandı. Kinezyoband uygulaması progresif kas hastalığı olanlarda ağrı azaltılmasında faydalı olabilir.

**Anahtar kelimeler:** Kinezyoband, spinal musküler atrofi, sırt ağrısı

## INTRODUCTION

Kinesio taping (KT) is one of the elastic bandage methods. It was developed by Dr Kase in the 1980s and became popular all over the world in the following years. This bandage is quite different from the other kinds of conventional banding techniques. It is produced from a special material which allows aeration, it is waterproof but non degradable in water<sup>1</sup>.

KT has been theorized to be an effective treatment to restore muscle function and decrease pain. Although the mechanism of action is not clear, there are some suggestions such as: KT application lifts up the skin, enlarges the space between the skin and muscle resulting the reduction of localized

pressure with better circulation and lymphatic drainage<sup>2,3</sup>. In summary, KT method decreases the pain, swelling and spasm in the muscle<sup>4</sup>.

Although KT research is limited and the results are inconsistent, several studies have supported the efficacy of this treatment technique for the inflammation resulting from acute injuries. It is also enhances the activity, helps proprioception training and post-injury neurological function as well as improves the pain and muscle imbalance.

Here, we present a case of 12-year-old boy with spinal muscular atrophy (SMA) who developed back pain and treated with KT application. To our knowledge, this is the first report consisting the application of KT to the patient with SMA.

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## CASE

A twelve year old boy attended to our department with a complaint of back pain which had started nearly ten days. Patient has reported that pain was exacerbating by movement and was getting better at night. He was unable to walk since one year and came in a wheelchair. Medical history reveals that there was no trauma or infection. Patient was on the follow-up of the Pediatric Neurology department with the diagnosis of SMA-Type 3.

On the physical examination; patient seemed to be in good general health. He had a marked thoracolumbar scoliosis. Proximal group muscles of upper extremities (m. biceps brachii, m. deltoideus, m. triceps) were with prominent weakness of 2/5. When palpating the back muscles, marked spasm was present particularly on the left side. Patient was reporting pain by palpation. Scoliosis was present on the thoracolumbar radiographic evaluation. No other pathological finding was present belonging to the bony structure on the physical examination. Routine blood tests revealed normal findings. Level of pain was assessed using the 11- point numeric rating scale. Pain intensity was measured on an 11- point numeric rating scale, where 0= no pain and 10= worst possible pain. Patient's score was found as 8/10 before the treatment .

As a result of these above mentioned findings, patient was supposed to have back pain due to the lumbar paravertebral muscular imbalance which has occurred secondary to scoliosis. Kinesio taping was applied after consulting and informing the patient and his family. It was performed for three times with four days interval. Fascial technique B (Space technique) was applied. Fifteen cm long 4 I bands were used.

Having the lumbar vertebrae flexion to reach the maximum length, the band was stretched to maximum (130-140%), and then the middle part of the band was attached to the site of pain. First band was attached horizontally, the second one placed vertically and the rest two bands were placed diagonally (Fig 1). No other therapy or application including analgesic drugs, lumbosacral supports and physical therapy modalities were performed to the patient. Patient was reported the relief of pain one hour after the first banding. The 11- point numeric rating scale was re-measured and found as 1/10. Patient was also recruited to record the daily scores. Reduce of pain was also observed during the

subsequent applications. Patient was evaluated at 4th, 8th and 12th days.

## DISCUSSION

Spinal muscular atrophy (SMA) is a neurodegenerative disease characterized by the progressive degeneration of alpha motor neurons<sup>5</sup>. It is mostly inherited recessively however, autosomal dominant or X-linked inheritance is also reported<sup>6</sup>. Various types of the disease are present. SMA Type I; (severe type-Werdnig-Hoffman) starts before the age of 6 months, the patient could not be able to sit and generally dies at the age of two years. SMA Type II; (intermediate type) starts at the age of 7-18 months, these patient could be able to sit but can not stand and usually dies before the age of two years. SMA Type III; (mild type-Kugelberg-Welander) starts at the age of 18 months and the patient dies at adulthood. SMA Type IV (adult type) starts at second or third decades of life and death occurs at advanced years<sup>7</sup>. Patients might present with hypotonia, symmetrical proximal weakness, atrophy and absence of deep tendon reflexes<sup>8</sup>. To our knowledge, this is the first report in the literature on kinesio banding method applied for SMA or other progressive muscular diseases. Reduce of pain after one hour of application approves the efficacy of the therapy.

Several hypotheses are suggested on pain reduction after KT method. One of them includes the increase of blood circulation to the application site resulting to the improvement of the muscle and myofascial functions<sup>9</sup>. Another hypothesis consists of the stimulation of cutaneous mechanoreceptors on the application site and subsequent efficacy on range of motion (ROM)<sup>10</sup>. But none of these hypotheses could clearly explain the mechanism of action. Possibly, first hypothesis might have been effective in our patient.

Musculoskeletal disorders have been considered as major indication for KT application. Lee et al.<sup>11</sup> reported that, they have applied scapular elevation taping to a 22-year-old patient with scapular depression syndrome and after taping, reduction in tenderness has been occurred. They have performed this taping for two months, four days a week and for an average of nine hours each day. In their application localized muscle tenderness was present as in our case however the period and style of application was quite different from the current

case. Taping was performed for three times with four days intervals and the bandage have not been removed during this period of time in our case.

In a case report presented by Garcio-Muro and et al.<sup>12</sup>, it has been stated that the tenderness reduced after two applications of KT for myofascial pain in the shoulder region. Castro et al.<sup>13</sup> has applied KT for chronic low back pain. The KT was over the lumbar spine for one week. Authors concluded KT reduced disability and pain in people with chronic non-specific low back pain. In this study, the number of KT application was different from the present case.

In a study presented by Kaya et al.<sup>14</sup> patients with subacromial impingement syndrome were treated with kinesio tape three times by intervals of 3 days or a daily program of local modalities for 2 weeks. KT has been found to be more effective than the local modalities. But there was not any long term follow up in this study. KT applications also take part for the indications other than musculoskeletal disorders. However these data are limited to several case reports in the literature. Chou et al.<sup>15</sup> have suggested that KT methods could be an alternative for the classical lymphedema therapies for the patients with lymphedema occurred secondary to breast cancer.

Aguilar-Ferrández et al.<sup>16</sup> have applied an KT for mild chronic venous insufficiency. They stated that mixed KT-compression therapy produces a slight improvement in overall health status and may have a placebo effect on venous pain. However, despite these reports, the major indication of KT is still directed to the musculoskeletal system.

There are limited data concerning the use of KT in neurological disorders. The application of KT to both ankles of 15 patients with multiple sclerosis, resulted better standing balance in these group of patients.<sup>17</sup> Da Costa et al.<sup>18</sup> used KT for balance and postural control to four children with hemiplegia. Authors concluded neuromuscular taping has been seemed to be beneficial on dynamic activities, but not on predominantly static activities studied. KT application in this study was used for functional status of these four patients. We used KT in the current case for symptomatic improvement of back pain due to scoliosis.

In conclusion, we suggest that the application of KT could be beneficial on reducing the pain in patients with progressive muscle diseases. Besides, KT could

decrease the harmful effects of multiple drug usage in these group of patients as they are mostly in the childhood period and internal organ involvement usually accompanies to the clinical course of disease. In addition, early KT application could slow down the muscle atrophy and could delay the formation of scoliosis as it is one of the major problems in these group of patients. However, controlled trials are needed to approve these suggestions.

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