

Changes in the Volume of the Peripheral Blood Flow by using Kinesio Taping

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Dr. Kase, Chairman/Founder of the Kinesio Taping Association, and Dr. Hashimoto, Educational Director for the Kinesio Taping Association conducted this joint study in 1997-98

Purpose

For the treatment of injuries, increasing the amount of blood flow is one of the mechanisms in the healing process. This is a clinical study based on 9 subjects using a Doppler machine to measure the volume changes of the peripheral blood flow before and after applying Kinesio Taping Methods.

Procedures

The subjects were chosen at random. Five subjects had chronic disorders and poor circulation, and four subjects were relatively healthy. There were different areas chosen where the subject's volume of the peripheral blood flow was measured by Doppler. Based on the area being measured, Kinesio Taping was applied to the areas most likely to affect blood circulation. For example, if the volume was being measured at the radial artery, the pectoralis major muscle had been taped. If the dorsal artery of the foot was measured, mainly the gastrocnemius muscle was taped with the popliteus fossa being taped as well due to the positive results seen. For the superficial temporal artery, the sternocleidomastoid muscle was taped. The volume of the peripheral blood flow was first measured before the Kinesio Tape was applied. After recording the results, Kinesio Taping was applied and the volume was measured immediately (approx. 10 min) to see if changes in the volume flow was occurring.

Before Taping (A-1)

The pectoralis major muscle was chosen for the procedure measuring the volume in the radial artery by observing the following outcome graphs. The first graph (A-1) represents measurements before Kinesio Taping was applied for subject #1, 13.2 cm/s is the peripheral blood flow volume (VPK), the average volume of the peak volume (FPK) and the lowest volume (FMN). The major muscles that are involved in the flow to the radial artery are the pectoralis major, pectoralis minor, and the anterior and medial scalenus. Blood vessels go through the scalene space between the anterior and medial scalenus. By applying Kinesio Tape over the anterior and medial scalenus, it will relieve the tension which will decrease the pressure off of the axillary artery. The pectoralis minor attaches to the upper region of the precordial which applies pressure to the axillary artery. The pectoralis major is a more superficial muscle which inserts to the greater tubercle crest of the humerus and which will also apply pressure to the axillary artery.

By applying Kinesio Tape from the insertion to the origin of these two muscles, it will help avoid the pressure which is placed to the axillary artery that is caused by isometric contraction. Results for effective Kinesio Taping can be observed when there are convulsions on the skin created by the tape.

Pectoralis Major (B-2)

Comparing the results for these three muscles that were involved, the pectoralis major muscle measured 33.6cm/s (B-2), an approximate of 60% increase. The pectoralis minor muscle measured 18.9cm/s (B-3), an approximate of 30% increase. And the anterior and medial scalenus muscle measured 16.7cm/s (B-4), which is approximately 20% increase of the peripheral blood flow volume.

Pectoralis Minor (B-3)

Based on these results, the most effective muscle, the pectoralis major was taped to measure the volume change of the radial artery. This same procedure was applied to the muscles that affected different arteries used for the other subjects, and Kinesio Taping was applied to the most effective muscle to measure the changes of the peripheral blood flow volume for each arteries.

Ant. & Med. Scalenus (B-4)

Results

Subject # 1, was a 38 year old female who complained of constant pain, tingling and swelling in both of her upper extremities. The volume of blood flow at the right radial artery before applying Kinesio Tape was 13.2cm/s. After applying Kinesio Tape to the right pectoralis major(C-1), the volume of blood flow increased to 33.6cm/s. A 60.7% increase change was seen in the volume of the blood flow to the right radial artery.

Subject # 4, a 24-year-old female and subject # 5, a 72-year-old male both suffer from chronic patella tendinitis. Subject # 8, an 87 year old female has deformans osteoarthritis in the knee. All three subjects have difficulty in walking. For subjects #4 and #5 Kinesio Tape was applied to the right gastrocnemius muscle (C-2). For subject #4, the volume changed from 14.9cm/s to 20.9cm/s a 28.7% increase. For subject #5, the volume changed from 38.8cm/s to 46.8cm/s a 20.6% increase. For subject #8, Kinesio Tape was applied to his right popliteus fossa muscle (C-3), and the volume changed from 29.2cm/s to 46.2cm/s, for a 58.2% increase. For subject #9, a 55-year-old male who suffers with hypertension and complains of a constant headache, Kinesio Tape was applied to the sternocleidomastoid (C-4). The volume changed from 13.3cm/s to 19.9cm/s a 45.8% increase at the superficial temporal artery. As one can observe from the

results from the chart (D-1), subjects that suffer with disorders have an extremely high increase in their volume of peripheral blood flow after applying Kinesio Taping. Though as seen in subjects like #2, a 24 year old healthy female that has no complaints of any existing physical disorders, the volume of blood flow at the right radial artery before applying Kinesio Tape was 25.5cm/s.

After applying Kinesio Tape to the right pectoralis major, the volume of blood flow decreases to 24.1cm/s. There is a -5.4% decrease in the volume of blood flow, which means there are hardly any relative changes in the volume of blood flow. The same type of results are seen in every healthy patient, such as subject #3, #6, and #7. There were no significant changes in the peripheral blood flow after Kinesio Tape was applied to healthy subjects

Conclusions

Based on the results, applying Kinesio Tape was effective in changing the volume of the peripheral blood flow for subjects that had physical disorders. The result of this research suggests that Kinesio Taping causes the alternation of the blood flow. By applying Kinesio Taping techniques, an immediate effect is seen since the blood flow has been changed immediately (within 10 min.) after taping. Probably more importantly, the result that we were able to gather from this study was that, since the Doppler indicated no major changes in the healthy subject's blood flow after taping, we can say with some confidence that Kinesio Taping has no major adverse effects.

Clinician's Overview & Case Study: Post Operative Neuroma & RSD

Amy Stahl, MS, PT, CKTI

Stahl, A. (1999). Clinician's Overview & Case Study: Post Operative Neuroma and RSD. 15th Annual Kinesio Taping International Symposium Review. (pp. 99-102) Tokyo, Japan: Kinesio Taping Association.

Part I. Overview and Background

I have been working as a master's level physical therapist for the past 2 ½ years. My story, however, dates back to my birth. I have been raised in a loving and competitive family that includes my father, my mother, two sisters, many horses, dogs, cats, and rabbits. In addition, however, I have grown up the surrogate daughter of five very close family friends as well. Thus in many ways, I have had six fathers, six mothers and numerous brothers and sisters. Our families have collected for games and fun every holiday, and for two weeks each summer, we live in harmony and competition on a sandy beach among beautiful canyons at Lake Powell, which is a spectacular lake, situate in Arizona and Utah. All of "my" six fathers, some of their wives, and all of the kids are athletes. Although now middle aged, the Dads continue to push us to compete in various athletic endeavors ranging from barefoot water-skiing, to cliff jumping, to volleyball, to rigorous hikes. As a result, we have endured some frightening but exhilarating experiences as we grew up. We are all wiser and tougher because of it.

I have spent the time to introduce you to my extended family, because they have become "tape believers!" When I tried to tell "my" six tough fathers about the wonders of Kinesio Taping this summer, the reception was anything but encouraging. These tough men weren't about to be fooled by the hocus pocus of some "miracle" tape that one of the kids - i.e. "me" - said would really help them through the inevitable injuries that I knew would come their way before this year's trip was complete. It was inevitable, when "aging warriors" try to do what was difficult for them twenty-five years earlier, something is going to give. In a nutshell, I was at the lake for one week, and I taped everything from large hematomas, to stone bruises of the feet, sprained ankles and knees, wrenched backs and necks, and strained muscles and ligaments in forearms and hands. In every case, within 24 hours "my" tape and I drew the raves of the "victims," than the manual therapy I also was called upon to provide. My skeptical warriors were won over. Although they kept their anti-inflammatories handy, Kinesio Tape and my taping applications, turned disdainful skeptics into believers. In fact, this beleaguered crew was begging for me to leave some tape and instructions with them when I left the campsite for a return to civilization and "saner" people.

My success at the lake was not a surprise. I knew what the tape could do, because of the remarkable successes I have had using it in my clinical practice. I have taped and helped victims of RSD (reflex sympathetic dystrophy), torn muscles, sprained necks, backs, elbows, knees, and shoulders. I estimate that I use Kinesio Tape on 85% to 90% of my patient population and have very positive responses from my patients and their doctors. I even use it myself to manage a chronic low back pain.

My confidence in Kinesio dates from the very first patient I taped. Her story follows.

Part II. Post Operative Neuroma and RSD - Case Study:

Subject: Patient was an active 20-year-old female who worked as an athletic trainer and enjoyed playing ice hockey, hiking, and horseback riding, and exercised regularly.

Diagnosis: Post-operative Neuroma extraction and RSD Reflex Sympathetic Dystrophy (RSD): RSD is an uncommon and poorly understood condition wherein the autonomic nervous system malfunctions. The initiating factor, may be trauma, surgery, or may result from a remote disease of the viscera. Doctors can't predict who is at risk or why some individuals will fall victim to it and others with similar injuries or exposure do not. It is extremely painful. It can be difficult to diagnose, and treatment is often ineffective. The patient often experiences severe and bizarre pains, which they describe as "burning." They have extreme "hypersensitivity" of the skin. The condition is often associated with excessive sweating, coolness, and edema. The skin becomes glossy and very sensitive to temperature changes. Many of its victims cannot even stand to have a sheet laid across their skin, or to stand under a shower. It is truly a miserable affliction.

Past Medical History: Patient had a soft tissue lesion excised in May 1996 from the dorsal aspect of her left foot, which subsequently became infected. Following the closure of the wound in September 1996 she continued to complain of persistent nerve-like pain of the dorsum of her left foot and first and second toes. In March 1998, she was diagnosed with a neuroma and an entrapment of the deep peroneal nerve and she opted for elective surgery to release the nerve and resect it above the ankle joint in hopes of decreasing her pain. Pain complaints include a deep ache throbbing pain, as well as sharp and stabbing pain. Patient had pain with temperature changes, weight bearing activities, range of motion, had difficulty sleeping, had an analgesic gait pattern, and was often unable to wear a closed toe shoe. As a result of her symptoms, she had to give up her job as an athletic trainer and work as a receptionist in order to be non-weight bearing for the majority of her day. Following her second surgery, she had numbness to the touch of the first and second toe, as well as severe burning pain with palpation, which later was diagnosed as RSD (reflex sympathetic dystrophy).

Treatments: Physical therapy for 6 months from August 1998 to January 1999 which included: joint mobilization of the foot, myofascial release for scar adhesions, trans-friction massage of her extensor tendons, gentle ROM, aquatic therapy, ultrasound 3.3mHz @ 20% 1.0w/cm, interferential electrical stimulation for pain (80-150 mHz), TENS unit trial, moist heat, silicon pads for scar adhesions, walking boot, therapeutic exercise, nerve blocks.

Assessment: Patient did not respond well to palpation or myofascial release. She could not tolerate any of the modalities except for ultrasound and moist heat. Her scars remained immobile and her nerve-like pain did not resolve. Patient was still in a walking boot on occasion and was not able to return to her ice-skating and other athletic activities because she could not tolerate a shoe. At the time of her physical therapy discharge in January 1999, her physician suspected that she had some arthritis in the foot and was at a loss as to what else he could do for her.

Kinesio Taping: Following an incident in January 1999, when the patient had banged her foot on a box and caused a significant flare up, she was back on her walking boot and experiencing increased pain. I asked her permission to let me try this new taping method I had just learned about the previous weekend (three days prior). She agreed, so I applied Kinesio with her foot plantar flexed and inverted to stretch the skin on the dorsum of her foot. The tape was "Y" around her great toe and then "I" across the dorsum of her foot medial to lateral at an angle over her scars to the lateral aspect of her lower leg (superficial peroneal nerve pattern: SEE Pic. A.1 Below). Within 24 hours, the patient called me to report that she was pain free and the hypersensitivity of the skin of her foot is at a minimum and that she wished to learn how to tape her own foot for self management. She was instructed how to tape her foot and she has been able to control her symptoms independently for the past nine months. She has returned to ice-skating, running and working out, rock climbing, taken swing dance lessons, and been able to put her feet in the ocean and tolerate the surf and sand.

Conclusion: Kinesio Taping has been a true compliment to my work as a physical therapist and I support the use of it 100%. As a result of the tremendous results that I have been able to achieve, I have seen a decrease in healing time and increased patient satisfaction following treatments. Since becoming a Certified Kinesio Taping Instructor, I have had the opportunity to host several seminars for physicians, chiropractors, massage therapists, acupuncturists, nurses, athletic trainers, and other physical therapists. There has been a very positive response towards Kinesio Taping. I am looking forward to continuing to educate people about Kinesio Taping and learning more about it as a treatment adjunct.

Kinesio Taping, Muscle Strength and ROM after ACL Repair

Heather M. Murray, PhD, PT, University of New Mexico

Murray, H. (2000). Journal of Orthopedic and Sports Physical Therapy, 30, 1.

Improvement in strength in the anterior and posterior thigh muscles following anterior cruciate ligament (ACL) reconstruction is a major focus for physical therapists, athletic trainers and other rehabilitation specialists. In general, there is a significant decrease in both extensor and hamstring muscle strength, with significant morbidity due to extensor lag. Efforts to increase quadriceps femoris and hamstring muscle strength may be hampered by the pre-surgical muscle atrophy commonly noted in ACL injured individuals, as well as post-surgical pain and swelling. Undesirable outcomes for soft tissue structures surrounding the knee after ACL-reconstruction can be correlated with restricted muscle contraction or limitation of knee motion.

Although the techniques of cutaneous stimulation to enhance muscle contraction are widely used in rehabilitation settings, the effect is not long-lasting, with most overflow continuing only about 15-30 minutes after cessation of treatment. No modalities or externally applied dressings have been described that prolong the treatment effects.

It may be that an elastic tape might cause proprioceptive stimulation while at the same time not limiting the enhancement of improved joint range of motion and thigh muscle function during rehabilitation. One such elastic tape is called Kinesio Tape, long used for rehabilitation and during athletic competition in countries such as Japan, but not introduced into the United States until 1995. Kinesio Tape is a relatively unique tape that is capable of stretching up to 130-140% of its resting state, may either be used as a compressive or non-compressive external adjunct to rehabilitation, is approximately the same weight and thickness of skin, and has no medicinal qualities. In addition, Kinesio Tape is reported to be hypoallergenic and, due to its construction, allows the skin to breathe.

Little is known of the proprioceptive effects of elastic tape, but it may be anticipated that there will be a facilitatory effect of cutaneous mechanoreceptors as has been noted in the case of athletic tape. This mechanism may be an underlying component in the return of muscle function after injury. The purpose of this study is to compare the effects of Kinesio Taping versus athletic tape on muscle strength in the quadriceps femoris, hamstring and anterior tibialis muscles of the lower extremity in individuals with recent ACL reconstruction.

Methods

In this study, 2 healthy adults, volunteered to perform an active knee extension as completely as possible. Each subject was positioned on a chair with an elevated seat such that their involved lower extremity did not touch the floor. Electromyographic (EMG) surface recording electrodes were placed on the skin over the muscles of the anterior and posterior thigh, and anterior leg compartment muscles. Each subject was asked to perform a single full knee extension with the involved side, and measurement of the active joint range of motion was made with a hand goniometer. EMG recordings were taken as the subjects then performed four full knee extensions. The goniometric and electromyographic measurements were made for the following conditions: no tape, athletic tape and Kinesio Tape, with the latter applied to the method of Kase (1994).

Results

In both subjects, no difference was noted in extensor lag between the no tape and the athletic tape conditions. However, under the Kinesio Tape condition, there was a significant improvement in the active joint range of motion. EMG measurements revealed similar results with little to no difference between the no tape and athletic tape conditions, whereas under the Kinesio Tape condition there was an immediate increase of approximately 1½ times in amplitude compared to the prior conditions. In addition, each subject commented that they felt the muscle contraction was stronger when Kinesio Tape was applied compared to either no tape or with athletic tape.

Conclusions

In this preliminary study, it was found that Kinesio Tape applied to the anterior aspect of the thigh could significantly enhance the joint active range of motion and that this increase is correlated with an increase in surface EMG of the muscles of the anterior compartment of the thigh, the quadriceps femoris muscle. It is not known as this time if the effects demonstrated in this study are mediated by skin mechanoreceptors. Nor is it known if the enhanced muscular contraction noted shortly after application of Kinesio Tape would be sustained after a prolonged period. These and other questions need to be addressed in further research efforts.

References

Kase K. 1994. Illustrated Kinesio Taping®, 3rd Ed., Ken'I Kai, Tokyo, pp.90-91.

Use of Kinesio Tape in Pediatrics to Improve Oral Motor Control

Trish Martin, PT, CKTI with Audrey Yasukawa, MOT, OTR/L, CKTI

Martin, P. (2003). 18th Annual Kinesio Taping International Symposium Review. Tokyo, Japan: Kinesio Taping Association.

The use of Kinesio Tape in pediatrics has become more widespread over the past year. As a result of input from several therapists, we have begun taping trials with a few select children at Cleveland Clinic Children's Hospital for Rehabilitation. As a result of these trials, we hope to initiate research or case studies in this area.

Dr. Kase in the Kinesio Taping Perfect Manual has outlined taping techniques for TMJ pain. These include techniques for pain with chewing and difficulty opening the mouth due to pain. Children with neurological disorders, developmental delay and dysarthria often present with difficulty with mouth closure, resulting in increased drooling, poor articulation, and hypermobility in the TMJ.

Trials of Kinesio Tape have been used with children who present with decreased oral motor control using the following techniques for TMJ stabilization, jaw stability to decrease drooling, and jaw stabilization for better lip closure.

About one year ago, I began working with a few therapists, including a speech therapist at City Kids, in Chicago, taping TMJ (temporomandibular joints) for stability. On one child with asymmetrical TMJ mobility, the hypermobile joint was taped to limit hypermobility and more symmetrical jaw movement was observed. Two 1" pieces were cut and used in an "X" as a corrective technique over the TMJ.

Another child was taped to provide jaw stability in the hope of decreasing drooling. His mouth was held open at rest and drooling was excessive and continuous, often causing wetness down the front of his shirt. Tape was applied over the TMJ joint and extended in a "Y" to the upper and lower jaw. A 2" piece of tape was cut in a "Y", anchored at the TMJ with one tail laid down toward the mouth and the other toward the lower jaw. After four months, this therapist noted an improvement in mouth position at rest and a significant decrease in drooling. Per therapist, clothes no longer became moist from saliva.

The orbicularis oris is the major muscle responsible for lip closure. This is generally a weakened muscle, due to overstretch from poor closure, head and neck position and poor alignment, and muscle imbalances. Children with varying diagnoses, including cerebral palsy, developmental delay, and dysarthria have been taped. Two 1" strips of tape, about three to four inches long are cut. The child is asked to open the mouth all the way. Tape is applied from the center of the upper lip (tearing the center of the tape) with paper-off tension only, above and outlining the upper lip. The same is done below the lower lip.

Examples of taping for lip closure:

One four-year-old boy with cerebral palsy drooled a great deal, requiring wiping of his mouth a minimum of 12 times a session. With tape applied to the orbicularis oris, drooling during the session decreased, with minimal drooling, requiring wiping of his mouth only once a session. After 45 to 60 minutes, he seemed to tire and tolerance of tape decreased. Time in tape was gradually increased to a few hours, to include mealtimes at home. Awareness of drool also improved in a four-year-old girl with cerebral palsy and increased lip closure to capture drool was observed.

Taping for lip closure may not only decrease drooling, but may improve tongue lateralization as evidenced by the production of bilabial sounds. A nine-year-old girl with cerebral palsy and dysarthria had a significant decrease in drooling at rest, and during eating she showed improved tongue lateralization as well. She was also able to produce bilabial sounds, including "b", "m", and "t" much more accurately. A four-year-old boy with developmental delay with a tongue thrust was able to keep his lips closed for two minutes without a tongue thrust, much longer than without tape.

In general, the use of Kinesio Taping to improve lip closure needs to be further explored. The mechanism of impact may be primarily sensory, or may involve facilitation of the orbicularis oris. I believe Kinesio Tape provides another tool for use in the therapeutic treatment of children with oral motor concerns. I would like to thank the staff at Cleveland Clinic Children's rehab, as well as the staff at City Kids, Inc. in Chicago, for their input, interest and support. Cleveland Clinic children's Rehab therapists involved in this informal study include: Stefanie Orkin, MACCC-SLP, Tracy Biller, MACCC-SLP, Carolyn Leitch, OTR/L, Laurie Williams, OTR/L, and Kathy Chippi, PT.

Kinesio Taping for Lymphedema

By the Kinesio Taping Association

Lymphedema is basically caused by a back up or congestion of lymphatic fluid. This is caused either when the lymphatic system is unable to transport large proteins and other molecules to be reabsorbed by the

venous system, or when surgical procedures require the removal of lymph nodes and in turn lymph fluid can not drain and process normally.

How Does Kinesio Taping Help?

When the Kinesio Tex Tape is applied, small convolutions in the tape cause the skin to be lifted and this helps to give more space and take pressure off the interstitial fluid. This allows for greater drain of the lymph, and as the body moves, the tape acts as a pump continually stimulating the lymph circulation on a 24hr/day basis.

NOTE: The Kinesio Tex Tape is designed to the same thickness of the epidermis of the skin.

Technique Development

*** Correction techniques for lymphatic drainage were developed from traditional Kinesio Taping applications for acute clinical conditions. These techniques have been developed and tested in clinical trails and patient case studies. Additional research is currently underway.

By spreading the application to cover a larger area, it was discovered that the overall effectiveness in reducing edema was greater than with traditional techniques for acute rehab. In development, it was also discovered that not only area coverage was important, but also the placement of the tape. By positioning the tape, the tape was able to help facilitate and channel the lymph in a specific direction. To cover this larger area, and to help channel the lymph drainage more effectively, a cut known as a "fan" shape cut of tape was adopted. Then, other considerations in treating lymphatic disorders were taken into account. As is often recognized, in order to drain specific areas of the body, it is necessary to first open up areas that the lymph will be draining towards. In other words, clear out one section to be able to clear out another. Therefore, applications for lymph drainage often include applications to facilitate circulation of other areas of lymph as well.

Taping Procedure

First, the length of tape will vary depending on how large the area of edema, and how far away the closest and next closest (secondary) lymph nodes are, but in general, a 6 to 8 inch strip is used. Then, a fan cut (left top picture) is performed. Next, with the skin or area of edema in a stretched position, the base of the Kinesio Tape is placed towards the closest lymph nodes and the fingers of the fan cut are applied with little to no stretch around and over the edema area. The next application is placed from a different angle and direction to draw the lymph towards the secondary lymph nodes or the heart using the same technique as the first application. Lastly, an additional strip is placed to draw lymph away from the secondary lymph nodes, in order to open up and facilitate lymphatic flow in the general region as a whole. The same technique is used to channel the flow of lymph away and towards the heart.

Notice: The following techniques have been developed by trained medical and lymphatic practitioners. This is a lymph correction technique that evolved from traditional Kinesio Taping applications in which facilitation of circulatory and lymphatic flow was the result. It is recommended that only practitioners trained in treating lymphatic disorders and application of the Kinesio Taping Method apply this technique as a treatment. It is also recommended that any use of the techniques be in cooperation with your physician and/or with patient consent. In addition, the Kinesio Taping Association and individuals involved in comprising this information assume no responsibility for implementation of the techniques discussed.

Kinesio Taping® with Aqua-Therapy for Pediatric Disability involving Neurological Impairment

Kayoko Maruko, Director of Potential Development Support Center, Hokkaido Japan
Maruko, K. (1999). Kinesio Taping® with Aqua Therapy for Pediatric Disability Involving Neurological Impairment. *15th Annual Kinesio Taping International Symposium Review*. (pp. 70-73) Tokyo, Japan: Kinesio Taping Association.

<http://www.kinesiotaping.com/kinesio-taping-with-aqua-therapy-for-pediatric-disability-involving-neurological-impairment.php>

Kinesio Taping in Pediatrics

<http://www.kinesiotaping.com/kinesio-taping-in-pediatrics.php>

The Functional Effects of Kinesio Taping in an Acute Pediatric Rehabilitation Setting

<http://www.kinesiotaping.com/functional-effects-of-kt-in-an-acute-ped-rehab-setting.php>

The Effect of Kinesio Taping on Muscular Micro-Damage Following Eccentric Exercises

Nosaka, K. (1999). The Effect of Kinesio Taping on Muscular Micro-Damage Following Eccentric Exercises. 15th Annual Kinesio Taping International Symposium Review. (pp. 70-73) Tokyo, Japan: Kinesio Taping Association.

Introduction

Recently, Kinesio Taping has been used for reducing pain related to musculo-skeletal injuries, this has led to its frequent use in many exercises and sport related scenes. It has also been thought that Kinesio Taping could improve sports performance based on muscular functions.

If you do an inexperienced or unpracticed exercise, a few hours after doing that exercise you will experience a severe muscular pain (Delay Onset of Muscle Soreness = DOMS) and lowering of the muscle function. If Kinesio Taping were effective, it would prevent and efficiently improve pain relief, strength loss, and enzymatic activities.

The purpose of this study was to apply an eccentric exercise to the brachium flexor group in order to cause a delay onset of muscle soreness (DOMS). The study would compare the difference of the DOMS effect, with and without Kinesio Tape applied to the skin.

Subjects

Twelve male students who had never been involved in any resistance training program were used as subjects (The mean age, height and weight were 20 ± 1.8 years old, 169.9 ± 6.0 cm, 58.8 ± 6.3 kg.)

Procedure

The subjects performed an eccentric resistance exercise on a modified arm curl machine. Subjects had their elbow joint in a 90 degree angle where they could maximally resist. From there, the subject's elbow was forcibly extended to a position where the elbow joint angle was approximately 180 degrees. Each eccentric resistant exercise lasted 3 seconds in duration, and was repeated every 15 seconds with a total of 24 maximal eccentric resistant exercises being performed. The study was divided into two sessions of testing with each session lasting five consecutive days and with two weeks in-between each session. In the first session, the subjects were randomly selected in equal numbers to be tested with Kinesio Tape applied to the biceps and the brachium during the exercise, and without Kinesio Tape applied during the exercise. In the second session, the group of subjects that had Kinesio Tape applied during the first session, were tested without tape, and vice-versa for the non-taped subjects during the first session. During both session the subjects same arm was tested and no information on what Kinesio Tape would do as an effect was given to the subjects.

The difference of the maximal isometric force (MIF) for the elbow in a 90 degree angle, range of motion (ROM) of the elbow joint, the pain scale (during extension, flexion, and pressure), circumference of the brachium (4 areas in length from the elbow joint 5, 7, 9, & 11cm were measured), plasma levels of creatin kinase (CK) from the blood, and an ultrasound diagnoses (using a B mode ultrasound device to measure muscle thickness and signal intensity of the brachium flexor group) was compared between the two groups.

The changes of measurement based on time (in days) were recorded onto a dual disperse graph with the tape on (T = Treatment with tape) and without the tape (C = Control). An acceptable standard for each measurement was based on a variance of 5% or less.

Results

All the measurements had an acceptable variance between the exercises (graph 1 to 5). However, the only measurement that met the acceptable standard was the muscle strength test (graph 1). However, all the measurements demonstrated a tendency that T (Treatment with tape) controlled the muscle damage and assisted in the recovery.

Discussion

Based on this study, why there was an improvement only to MIF is still unclear. Also for the measurements that did not achieve an acceptable standard, one of the largest cause of error may be based on the

individuality of the subjects. Therefore, we will still need to do further research based on this topic using a larger amount of subjects in order to conclude further effects.

Effect of Kinesio Taping on Proprioception in the Ankle

Heather M. Murray, PhD, PT and Laura J. Husk, PT

Murray, H. (2001). The Effects of Kinesio Taping on Proprioception in the Ankle and in the Knee. *Journal of Orthopedic and Sports Physical Therapy*, 31, 1.

Determine if strips of elastic tape across the ankle enhance proprioception compared to no tape or white athletic tape.

A decrease in ankle proprioception has been linked to injury such as ankle sprain. Previous research has produced mixed results concerning effect of tape/braces on proprioception. White athletic tape is used primarily for mechanical support/stability, but may enhance proprioception via mechanoreceptors (Simoneau et al., 1997)

Twenty-six subjects, 11 female and 8 male, ages 20-49 participated. Normal ligamentous stability of dormant ankle. Exclusion criteria: current ankle injury, significant foot deformity.

Methods

Single group, repeated measures design; random presentation of conditions and target angles. Tape application according to the Kinesio Taping Method for ankle sprain; 2" wide strip of Kinesio Tex Tape applied to skin over anterior and lateral leg compartments. Testing apparatus: Lido Active isokinetic machine with electrogoniometer as part of equipment, dynamometer set at 300°/sec, axis of rotation just inferior to lateral malleolus. Target joint angle replication: 260 and 100 of plantar flexion, and 80 of dorsiflexion. Three minute rest interval between each test condition to reduce possibility of carry-over and practice effect. Condition: No tape, Athletic tape, Kinesio Tex Tape. Data Analysis: Absolute differences between target/reference angle and each replication for each condition. Values added to form deviation scores for each condition at each of the test angles. Scores compared using repeated measures ANOVA for each of the 3 angles.

Results

No significant differences in ankle joint replication at 260 plantar flexion or 80 dorsiflexion. Kinesio Tex Tape condition significantly different at 100 plantar flexion, $p < 0.05$. No significant differences between tape conditions, previous dominant lower extremity injury or current activity level for any joint position tested, $p > 0.05$.

The use of Kinesio Tape in patients diagnosed with Patellofemoral pain

Rob Brandon, MPT, ATC, CKTI and Lisa Paradiso, PT (2005)

Patellofemoral pain (PFP) is a common clinical finding in a wide variety of individuals. (1, 2, 3) Treatment guidelines and underlying rationales remain vague and controversial. (4) Understanding this information, the purpose of this case study presentation is to present how the Kinesio Taping Method was utilized to address patients diagnosed with PFP.

Case Descriptions

Patient 1:

91 year old female who presented to physical therapy post- op Left Hip ORIF and a secondary diagnosis of PFP. Her onset of knee pain was two weeks prior to the Kinesio Taping treatment. Significant physical therapy findings included: 1. 5 degree lag with a straight leg raise (SLR); 2. MMT of Rectus femoris = 3/5, Hip Abductors and Adductors = 3/5; 3. Positive excessive knee valgus with single leg squat; 4. VMO atrophy.

Patient 2:

56 year old female who presented to physical therapy for PFP. Her onset of knee pain was 3-4 years prior to the Kinesio Taping treatment. Significant physical therapy findings included: 1. MMT Rectus femoris = 4-/5, Quads = 4/5, Hip Adductors/ Abductors = 4/5; Pain with ascending and descending stairs.

Patient 3:

12 year old female who presented to physical therapy for PFP. Her onset of knee pain was 1 year prior to the Kinesio Taping treatment. Significant physical therapy findings included: 1. MMT Rectus Femoris = 3+/5, Quads = 3+/5, Hip Abductors = 4/5, SLR with 5 degree lag; 2. Pain with walking, running, snowboarding, and sitting.

Kinesio Taping Method Technique

We used a 2 inch "I" strip with a split to a "Y" proximal to the superior patellar boarder. The strip started at the origin of the Rectus Femoris with a 2" base which had zero tension; 50% of available tension was used through the "I" strip. The lateral tail of the "Y" portion was applied as a Mechanical Correction with 75% of available tension used over the lateral patellar border with the final 2" with zero tension. The medial tail was applied with 10% (paper off tension) along the medial patellar border and then zero tension for the last 2". (see figure 1,2, and 3)

Outcomes

Patient 1 = no pain with gait; no night pain, knee pain was immediately resolved following the application.

Patient 2 = no pain with normal walking, no pain with ascend or descend stairs, patient reported less pain at the end of her day.

Patient 3 = no pain with running or during ADL's

Conclusion

This case study simply demonstrates that the Kinesio Taping Method has been used in cases of patellofemoral pain with positive effects on pain and function. Clearly, further research is necessary to show the benefits of the Kinesio Taping Method.

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[Ortop Traumatol Rehabil. 2007 Nov-Dec;9\(6\):634-43.](#)

Effect of Kinesio Taping on bioelectrical activity of vastus medialis muscle Preliminary report.

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Introduction. Kinesio Taping is currently regarded by physiotherapists as a method supporting rehabilitation and modulating some physiological processes. It is employed e.g. in orthopaedics and sport medicine. This sensory method supports joint function by exerting an effect on muscle function, enhancing activity of the lymphatic system and endogenous analgesic mechanisms as well as improving microcirculation. The aim of the study was to determine the effect of Kinesio Taping on changes in the tone of the vastus medialis muscle during isometric contractions.

Material and method. The study group included 27 healthy persons. A Kinesio Tape was placed to support the function of the medial head of the quadriceps muscle of thigh. Transdermal EMG was used to assess bioelectrical activity of the muscle. A standardised protocol was employed for measurement of muscle tone, recorded as the peak torque of the muscle.

Results. An examination performed 24 hours after the placement of the Kinesio Tape revealed significantly increased recruitment of the muscle's motor units, as expressed by peak torque. An examination performed after 72 hours of kinesio taping showed a statistically significant increase in bioelectrical activity of the muscle. However, this was lower than the effect at 24 hours. In the group where the tapes were removed after 24 hours, high torque was still maintained.

Conclusions. 1. Clinically significant effects of Kinesio Taping in this study included an increase in the bioelectrical activity of the muscle after 24 hours of kinesio taping and the maintenance of this effect for another 48 hours following removal of the tape. 2. The decrease in muscle tone to the baseline value, which was observed during the fourth day of Kinesio Taping use, may have resulted from the time of effective use of the KT tape being shorter than previously believed and may restrict Kinesio Taping use. 3. Kinesio Taping used shortly before the motor activity it is supposed to support may fail to fulfil its function.

[Conf Proc IEEE Eng Med Biol Soc.](#) 2007;2007:95-8.

Motion tracking on elbow tissue from ultrasonic image sequence for patients with lateral epicondylitis.

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In this study, Kinesio Tape(R) is used in patients with lateral epicondylitis. The ultrasonic image sequences of elbow are recorded dynamically, and then motion tracking is applied to assist in understanding the effect of the therapy. Motion tracking, based on optical flow method, is used to track certain landmark on the ultrasound image, which is very ambiguous, for estimating the motion of muscle. Hierarchical block tracking technique is proposed to perform this task. The motions with and without Kinesio Taping are compared and can be used as quantitative indicators for the treatment. The experimental results show that Kinesio Taping makes the motion of muscle on the ultrasonic images enlarge. It means that the performance of muscle motion gets improve.

PMID: 18001897 [PubMed - indexed for MEDLINE]

[J Sci Med Sport.](#) 2008 Apr;11(2):198-201. Epub 2007 Jun 27.

Effect of Kinesio taping on muscle strength in athletes-a pilot study.

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Muscle strength is a key component of an athlete's performance and may be influenced by taping. This study examined the possible immediate and delayed effects of Kinesio taping on muscle strength in quadriceps and hamstring when taping is applied to the anterior thigh of healthy young athletes. Fourteen healthy young athletes (seven males and seven females) free of knee problems were enrolled in this study. Muscle strength of the subject was assessed by the isokinetic dynamometer under three conditions: (1) without taping; (2) immediately after taping; (3) 12h after taping with the tape remaining in situ.

The result revealed no significant difference in muscle power among the three conditions. Kinesio taping on the anterior thigh neither decreased nor increased muscle strength in healthy non-injured young athletes.

PMID: 17588814 [PubMed - in process]

[Res Sports Med.](#) 2007 Apr-Jun;15(2):103-12.

The effect of kinesio taping on lower trunk range of motions.

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The purpose of the study was to determine the effects of kinesio taping (KT) on trunk flexion, extension, and lateral flexion. Thirty healthy subjects with no history of lower trunk or back issues participated in the study. Subjects performed two experimental measurements of range of motion (with and without the application of KT) in trunk flexion, extension, and right lateral flexion. A dependent t test was used to compare the range of motion measurements before and after the application of KT.

Through evaluation of the sum of all scores, KT in flexion produced a gain of 17.8 cm compared with the non-kinesiotape group ($t(29)=2.51$, $p<0.05$). No significant difference was identified for extension (-2.9 cm; $t(29)=-0.55$, $p>0.05$) or lateral flexion (3 cm; $t(29)=-1.25$, $p>0.05$). Based on the findings, we determined that KT applied over the lower trunk may increase active lower trunk flexion range of motion. Further investigation on the effects of KT is warranted.

PMID: 17578750 [PubMed - indexed for MEDLINE]

[Top Stroke Rehabil.](#) 2006 Summer;13(3):31-42.

Kinesio taping in stroke: improving functional use of the upper extremity in hemiplegia.

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The purpose of this article is to present the Kinesio taping method used to improve the upper extremity function in the adult with hemiplegia. The article discusses various therapeutic methods used in the treatment of stroke patients to achieve a functional upper extremity. The only taping technique for various upper extremity conditions that has been described in the literature is the athletic taping technique. In this article, some interpretation is offered on proper assessment of the nonfunctional upper extremity, including the emphasis on postural alignment, trunk control, and scapula alignment.

The Kinesio taping method in conjunction with other therapeutic interventions may facilitate or inhibit muscle function, support joint structure, reduce pain, and provide proprioceptive feedback to achieve and maintain preferred body alignment. Restoring trunk and scapula alignment after the stroke is critical in an effective treatment program for the upper extremity in hemiplegia.

PMID: 16987790 [PubMed - indexed for MEDLINE]

[Am J Occup Ther.](#) 2006 Jan-Feb;60(1):104-10.

Pilot study: investigating the effects of Kinesio Taping in an acute pediatric rehabilitation setting.

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OBJECTIVES: The purpose of this pilot study is to describe the use of the Kinesio Taping method for the upper extremity in enhancing functional motor skills in children admitted into an acute rehabilitation program.

METHOD: Fifteen children (10 females and 5 males; 4 to 16 years of age), who were receiving rehabilitation services at the Rehabilitation Institute of Chicago participated in this study. For 13 of the inpatients, this was the initial rehabilitation following an acquired disability, which included encephalitis, brain tumor, cerebral vascular accident, traumatic brain injury, and spinal cord injury. The Melbourne Assessment of Unilateral Upper Limb Function (Melbourne Assessment) was used to measure upper-limb functional change prior to use of Kinesio Tape, immediately after application of the tape, and 3 days after wearing tape. Children's upper-limb function was compared over the three assessments using analysis of variance.

RESULTS: The improvement from pre- to posttaping was statistically significant, $F(1, 14) = 18.9$; $p < .02$.

CONCLUSION: These results suggest that Kinesio Tape may be associated with improvement in upper-extremity control and function in the acute pediatric rehabilitation setting. The use of Kinesio Tape as an adjunct to treatment may assist with the goal-focused occupational therapy treatment during the child's inpatient stay. Further study is recommended to test the effectiveness of this method and to determine the lasting effects on motor skills and functional performance once the tape is removed.

PMID: 16541989 [PubMed - indexed for MEDLINE]

The influence of kinesiointaping applications on lymphoedema of an upper limb in women after mastectomy

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[FP](#) 2007; 7(3):258-269

Background. Doctor Kenzo Kase is a creator of the method Kinesio Taping. In the course of years-lasting experiences he worked out a plaster called Kinesio Tex, which applied during therapy in the form of application affects a patient not only during a visit, but also after its finishing supporting auto-therapy of an organism. The usage of the method of kinesiointaping at women after mastectomy influences on the decrease of oedema lymphatic and normalization of muscular tension.

Material and methods. Researches were conducted in Rehabilitation Ward of Świętokrzyskie Oncology Centre in the period from November 2006 to February 2007. The group consisted of 25 women at the age of 40 to 70 years old (the average of their age 55,16 years) treated because of breast cancer with oedema lymphatic. Every woman taking part in the experiment was subjected to kinesiointaping therapy. The research of measurement of oedema lymphatic, the muscular strength of indicated muscular structures as well as the range of movement in a humeral joint, elbow joint, wrist-radial joint were carried out in four series: before the first application (research I), before every next (research II, III) and after the last application (research IV). In the break between researches a patient was obliged to follow rules referring to behaviour after mastectomy.

Results. Assessment of the efficiency of an upper limb at women after mastectomy shows that a 20 - day cycle of improving with the use of lymphatic applications of the kinesiotaping method considerably reduced oedema lymphatic which 24%, increases range of motion 20 % and normalization of muscular tension brings satisfactory therapeutic effects.

Conclusions. Lymphatic applications accelerate lymphatic and venous microcirculation, reduces the stasis of lymph in intercellular spaces. Decrease of oedema contributes to the improvement of movement range in all joints of an upper limb and normalization of muscular tension contributing to the increase of muscular strength.

The Clinical Efficacy of Kinesio Tape for Shoulder Pain: A Randomized, Double-Blinded, Clinical Trial

Mark D. Thelen, James A. Dauber, Paul D. Stoneman

DOI: 10.2519/jospt.2008.2791

STUDY DESIGN: Prospective, randomized, double-blinded, clinical trial using a repeated-measures design.

OBJECTIVES: To determine the short-term clinical efficacy of Kinesio Tape (KT) when applied to college students with shoulder pain, as compared to a sham tape application.

BACKGROUND: Tape is commonly used as an adjunct for treatment and prevention of musculoskeletal injuries. A majority of tape applications that are reported in the literature involve nonstretch tape. The KT method has gained significant popularity in recent years, but there is a paucity of evidence on its use.

METHODS AND MEASURES: Forty-two subjects clinically diagnosed with rotator cuff tendonitis/impingement were randomly assigned to 1 of 2 groups: therapeutic KT group or sham KT group. Subjects wore the tape for 2 consecutive 3-day intervals. Self-reported pain and disability and pain-free active ranges of motion (ROM) were measured at multiple intervals to assess for differences between groups.

RESULTS: The therapeutic KT group showed immediate improvement in pain-free shoulder abduction (mean \pm SD increase, $16.9^\circ \pm 23.2^\circ$; $P = .005$) after tape application. No other differences between groups regarding ROM, pain, or disability scores at any time interval were found.

CONCLUSION: KT may be of some assistance to clinicians in improving pain-free active ROM immediately after tape application for patients with shoulder pain. Utilization of KT for decreasing pain intensity or disability for young patients with suspected shoulder tendonitis/impingement is not supported.

LEVEL OF EVIDENCE: Therapy, level 1b-.

J Orthop Sports Phys Ther. 2008;38(7):389-395, published online 29 May 2008. doi:10.2519/jospt.2008.2791

KINESIOTAPING APPLICATION IN CHILDREN WITH SCOLIOSIS

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FP 2007; 7(3):370-375

ICID: 511052 Article type: Short communicationIC™ Value: 3.53

Background. Scoliosis is still a serious problem, despite numerous therapeutic methods. Kinesiotapping (KT) is one of the methods, which can prove helpful in scoliosis treatment. Using proper applications, we can affect alteration of stability line and achieve balance of the spine.

Material and methods. The studies were conducted in Zgorzelec Rehabilitation Centre. The participants were 18 children, who stayed there for rehabilitation, including 16 girls and 2 boys. The mean age was 12 years in this group. Changes in the waist angle were evaluated before and after KT application.

Results. The obtained results indicate that application of KT in the examined group results in waist angle change, on average by 4 degrees. For left waist angle this mean value is 5.27 degrees, while for the right

waist angle it is 2.58 degrees. The highest value for correction was 11.2 degrees.

Conclusions. Selected KT techniques result in changes in stability line course, which is also manifested by waist angle change. Due to muscular and fascial tone normalization, the posture of a child with scoliosis changes in the frontal and sagittal plane. KT as a new method, using multiple forms and techniques, seems helpful in carrying out rehabilitation programme for children with scoliosis.

THE USE OF KINESIO TAPING IN IMPROVEMENT OF FACE MOBILITY IN PATIENT AFTER FACIAL NERVE RECONSTRUCTION

Ireneusz Hałas, Tomasz Senderek, Lucyna Krupa

FP 2005; 5(2):272-276

ICID: 443616 Article type: Case reportIC™ Value: 3.38

Background. The purpose of this study was to present the possibility of using Kinesio Taping method as a complementary therapy in patients with peripheral nervous system damage.

Material and methods. The paper presents a case study of female patient who was treated in the Rehabilitation Centre of Neuropsychiatric Hospital in Lublin. In addition to various kinds of physiotherapy procedures, the Kinesio® Tex tape and Kinesio Taping methods were implemented in treatment.

Results. We noted improvement in face symmetry, tongue muscles movements and in some elements determining quality of life of the patient.

Conclusions. The use of Kinesio Taping method in physiotherapy of peripheral nervous system damage is new and effective therapeutic option.

THE USE OF KINESIO TAPING IN PATIENTS WITH ACUTE STAGES OF BRONCHIAL ASTHMA

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Polish Journal of Sports Medicine 2007; 23(6):337-341

ICID: 846709 Article type: Short communicationIC™ Value: 3.40

Background. Bronchial asthma is a chronic inflammatory condition of the airways with periods of shortness of breath, coughing and chest tightness. An infection in pulmonary tracts, caused by atopy and allergic reaction to pollen allergens, leads to bronchial spasm and bronchial mucosa swelling, excessive secretion, and remodeling of bronchial wall. The topic of this research is the influence of Kinesio Taping application on particular lung volume and dynamic capacity parameters, as well as quality of life of patients with acute stage of asthma.

Material and methods. 10 patients (6 women, 4 men) with acute stages of asthma were tested during research carried out in Public Hospital in Kup. The average age of patients researched was 56.5 years. Apart from pharmacological treatment in Pulmonology Department of the hospital, the patients were also subjected to standard pulmonary physiotherapy, which included: breathing exercises, chest percussion and efficient coughing training. Additionally, Kinesio Tex tape was used for all patients to increase efficiency, normalize additional breathing muscles' tone, and correct inspiratory chest positioning. Applications were preceded by spirometry carried out with the use of Lungtest 1000 apparatus, produced by MES, which meets programming requirements set at European Respiratory Society (ERS) Conference in Copenhagen in 2005. FVC, FEV1, MEF25, MEF50, MEF75 and PEF parameters were used to assess lung activity. Tests were carried out 1 hour after Kinesio Taping application, 24 hours after, and on the day following the application. Modified Borg scale was used to assess dyspnea. Patients' ability to climb levels of staircase was used to assess functional efficiency.

Results. Cough reflex and secretion increased 1 hour of Kinesio Tex application, which caused difficulty in carrying out spirometry. 24 hours after applications, an improvement in patients' condition was observed. All

spirometric parameters improved in relation to initial values. The ability to cover even surface distance increased, and 3 out of 10 patients were able to climb one level of staircase. The value of the parameters slightly decreased the following day, and the MEF25 parameter fell to the initial value. Patients' feeling of dyspnea decreased, on average, from 9 to 5.5 on modified Borg scale 24 hours after Kinesio Tex application and on the following day.

Conclusions. The results, therefore, suggest the usefulness of Kinesio Taping in physiotherapy for patients with acute stages of Asthma.

KINESIOTAPING - NEW OPPORTUNITIES IN PHYSIOTHERAPEUTIC TREATMENT OF PREGNANT WOMEN

Tomasz Senderek, Siegfried Breitenbach, Ireneusz Hałas
FP 2005; 5(2):266-271
ICID: 443615 Article type: Original articleIC™ Value: 5.63

Background. The purpose of this study was to present the possibility of using Kinesio Taping as the most appropriate therapeutic method in treatment of pregnant woman.

Material and methods. The paper presents common problems experienced during pregnancy and some possible uses of kinesiotaping in this group of women. Forty eight pregnant woman between 5th and 9th month of pregnancy were examined. The most common complaints were oedema of legs, low back pain and sacroiliac joint problems. Effectiveness of kinesiotaping in relieving pain was assessed with subjective pain scale and degree of oedema was estimated by measurements of leg circumference.

Results. We noted that kinesiotaping is very safe and efficient treatment. We observed an improvement in low back pain problems, but unfortunately it is difficult to record this in an objective manner. Oedema is easy to assess but its intensity and frequency are subject to personal variability and are increasing in course of pregnancy.

Conclusions. Kinesio Taping is new, effective and easily accepted therapeutic option in physiotherapy of pregnant woman.

[J Electromyogr Kinesiol.](#) 2009 Dec;19(6):1092-9. Epub 2009 Jan 14.

The effects of taping on scapular kinematics and muscle performance in baseball players with shoulder impingement syndrome.

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PURPOSE: This study aimed to investigate the effect of elastic taping on kinematics, muscle activity and strength of the scapular region in baseball players with shoulder impingement.

SCOPE: Seventeen baseball players with shoulder impingement were recruited from three amateur baseball teams. All subjects received both the elastic taping (Kinesio Tex) and the placebo taping (3M Micropore tape) over the lower trapezius muscle. We measured the 3-dimensional scapular motion, electromyographic (EMG) activities of the upper and lower trapezius, and the serratus anterior muscles during arm elevation. Strength of the lower trapezius was tested prior to and after each taping application. The results of the analyses of variance (ANOVA) with repeated measures showed that the elastic taping significantly increased the scapular posterior tilt at 30 degrees and 60 degrees during arm raising and increased the lower trapezius muscle activity in the 60-30 degrees arm lowering phase ($p < 0.05$) in comparison to the placebo taping.

CONCLUSIONS: The elastic taping resulted in positive changes in scapular motion and muscle performance. The results supported its use as a treatment aid in managing shoulder impingement problems.

[J Orthop Sports Phys Ther](#). 2009 Jul;39(7):515-21.

Short-term effects of cervical kinesio taping on pain and cervical range of motion in patients with acute whiplash injury: a randomized clinical trial.

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DESIGN: Randomized clinical trial.

OBJECTIVES: To determine the short-term effects of Kinesio Taping, applied to the cervical spine, on neck pain and cervical range of motion in individuals with acute whiplash-associated disorders (WADs).

BACKGROUND: Researchers have begun to investigate the effects of Kinesio Taping on different musculoskeletal conditions (eg, shoulder and trunk pain). Considering the demonstrated short-term effectiveness of Kinesio Tape for the management of shoulder pain, it is suggested that Kinesio Tape may also be beneficial in reducing pain associated with WAD.

METHODS AND MEASURES: Forty-one patients (21 females) were randomly assigned to 1 of 2 groups: the experimental group received Kinesio Taping to the cervical spine (applied with tension) and the placebo group received a sham Kinesio Taping application (applied without tension). Both neck pain (11-point numerical pain rating scale) and cervical range-of-motion data were collected at baseline, immediately after the Kinesio Tape application, and at a 24-hour follow-up by an assessor blinded to the treatment allocation of the patients. Mixed-model analyses of variance (ANOVAs) were used to examine the effects of the treatment on each outcome variable, with group as the between-subjects variable and time as the within-subjects variable. The primary analysis was the group-by-time interaction.

RESULTS: The group-by-time interaction for the 2-by-3 mixed-model ANOVA was statistically significant for pain as the dependent variable ($F = 64.8$; $P < .001$), indicating that patients receiving Kinesio Taping experienced a greater decrease in pain immediately postapplication and at the 24-hour follow-up (both, $P < .001$). The group-by-time interaction was also significant for all directions of cervical range of motion: flexion ($F = 50.8$; $P < .001$), extension ($F = 50.7$; $P < .001$), right ($F = 39.5$; $P < .001$) and left ($F = 3.8$, $P < .05$) lateral flexion, and right ($F = 33.9$, $P < .001$) and left ($F = 39.5$, $P < .001$) rotation. Patients in the experimental group obtained a greater improvement in range of motion than those in the control group (all, $P < .001$).

CONCLUSIONS: Patients with acute WAD receiving an application of Kinesio Taping, applied with proper tension, exhibited statistically significant improvements immediately following application of the Kinesio Tape and at a 24-hour follow-up. However, the improvements in pain and cervical range of motion were small and may not be clinically meaningful. Future studies should investigate if Kinesio Taping provides enhanced outcomes when added to physical therapy interventions with proven efficacy or when applied over a longer period.

LEVEL OF EVIDENCE: Therapy, level 1b. *J Orthop Sports Phys Ther* 2009;39(7):515-521, Epub 24 February 2009. doi:10.2519/jospt.2009.3072.

[Ortop Traumatol Rehabil](#). 2009 Jan-Feb;11(1):46-54.

Clinical efficacy of kinesiology taping in reducing edema of the lower limbs in patients treated with the ilizarov method--preliminary report.

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INTRODUCTION: Postoperative edema of predominantly lymphatic origin is a significant hindrance to physiotherapy in patients subjected to limb lengthening by the Ilizarov method. New treatment methods are being sought, and Kinesiology Taping is one of them.

MATERIAL AND METHODS: The study involved 24 patients of both sexes subjected to lower limb lengthening using the Ilizarov method who had developed edema of the thigh or crus of the lengthened extremity. The mean age of the patients was 21 years. The patients were randomized into two groups of twelve, which were then subjected to 10 days of standard physiotherapy. The study group was additionally treated with Kinesiology Taping (lymphatic application), while the control group received standard lymphatic drainage. Treatment results were assessed by comparing the linear circumferences of the lower limbs before and after the treatment.

RESULTS: The application of Kinesiology Taping in the study group produced a decrease in the circumference of the thigh and crus statistically more significant than that following lymphatic drainage.

CONCLUSIONS: 1. Both standard edema-reducing treatment in the form of lymphatic massage and Kinesiology Taping significantly reduced lower limb edema in patients treated by the Ilizarov method. 2. The application of Kinesiology Taping in the study group produced a significantly faster reduction of the edema compared to standard lymphatic massage.

Biomechanics Effects of Kinesio Taping for Persons with Patellofemoral Pain Syndrome During Stair Climbing

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Purpose: The purpose of this study was to examine the biomechanical effects of kinesiotaping for persons with patellofemoral pain syndrome during stair climbing.

Methods: Fifteen women diagnosed with PFPS by an experienced musculoskeletal physiotherapist were recruited and exclusion criteria were based on previous studies. Ten normal subjects were recruited as control group in this study. The ground reaction forces (GRFs) and the EMG activity timing and ratio of VMO and VL were calculated for no tape, placebo tape, and kinesio taping conditions for PFPS and control groups during ascending and descending stair.

Result: The results showed there was significant difference between no tape and Kinesco tape conditions for PFP group during descending stair ($p < 0.05$). And there was significant difference between no tape and Kinesco taping conditions for PFP group ($p < 0.05$).

Conclusion: The results showed Kinesio taping can reduce pain and improve the ratio of VMO/VL for the mechanism of patellar stability.

The efficacy of Kinesio taping in patients with a low back pain

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Background: Kinesio taping is a treatment for pain and dysfunction of musculoskeletal system, using tapes which have a similar elasticity to skin. This study was done to find out about the efficacy of kinesio taping on patients with a low back pain.

Methods: This study was performed in patients with a non-specific low back pain who had visited the Incheon International Airport Construction Authority Clinic from January 2000 to April 2000. We performed taping to a randomized case group and a placebo to control group during the first 3 days. After the first 3 days, we assessed the changes of improvement in low back pain with visual-analogue pain scale (VAS). From the second visit on, we also started carrying out kinesio taping in the control group.

Results: The total number of patients participating in this study was 43, but 4 patients did not complete the study stopped. After the first 3 days, control group showed just 0.93 of the VAS score improvement, while randomized case group showed 2.55 ($p = 0.003$). The VAS score of case and control group were 3.18 and 3.03 respectively, which showed improvement at the end point of treatment compared with the first score.

Conclusion: Kinesio taping was more efficacious than placebo in patients with a nonspecific low back pain.

Effects of kinesio taping on the timing and ratio of vastus medialis obliquus and vastus lateralis muscle for person with patellofemoral pain

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INTRODUCTION

Person with patellofemoral pain syndrome (PFPS) may be due to inadequate medial control from the vastus

medialis obliquus muscle (VMO). This inadequate control could be due to a reduction in the tension-producing capacity of the VMO or a problem with the timing of VMO activity in persons with PFPS (Voight and Weider, 1991). The PFPS manifest as anterior knee pain aggravated by activities such as squatting and stair climbing. The patellar taping has been used to treat the PFPS, but there were the inconsistent findings in previous studies (Ng and Cheng, 2002; Salsich et al., 1999). Kinesio taping, created by Kenzo Kase in 1996, is a specialized tape which is thin, elastic and can be stretched up to 120%~140% of its original length, making it quite elastic, compared with the conventional taping. It allows a partial to full range of motion for the applied muscles and joints with different pulling forces to the skin. However, only few researches have measured the effectiveness of Kinesio taping and, however, these revealed inconsistent results (Murray and Husk, 2001; Robbins, 1995), and no study assessed the effects of tape in person with PFPS. Therefore, the purpose of this study was to examine The effects of Kinesio taping on the timing and ratio of VMO and vastus lateralis (VL) for person with PFPS.

METHODS

Fifteen women diagnosed with PFPS by an experienced musculoskeletal physiotherapist were recruited and exclusion criteria were based on previous studies. Ten normal subjects were recruited as control group in this study. Subjects were taped for pulling VMO up and pulling VL down in accordance to Kinesio taping manual (Kase et al., 1996), and white athletic tapes were in same position as the placebo condition. Taping procedures were applied by the principal investigator (a certified athletic trainer) to ensure consistency throughout this study. A MA-300EMG system (Motion Lab System, LA, USA) was used to record the EMG activity of VMO and VL. The stair included a 60 cm platform with two steps of 25 height and was placed in the center of walkway. Subjects completed a stair stepping task during ascent and descent for five consecutive trials. The timing and EMG activity ratio of VMO and VL were calculated for no tape, placebo tape, and tape conditions for PFPS and control groups. A repeated measures ANOVA were used to compare the effect of taping. The level of significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

The results showed that the onset of VMO activity occurred earlier movement in Kinesio tape compared with no tape condition ($p < 0.05$), but there was no difference between placebo tape and no tape condition. The earlier activation of the VMO should allow for a more optimal positioning of the patella into the trochlea (Fulkerson and Hungerford, 1990). It may help to improve the timing of force distribution and decrease the pressure placed on a particular portion of the articular cartilage. Fig 1 shows the EMG activity ratio (VMO/VL) in the three taping conditions for control and PFPS groups. The results showed there were significant differences Kinesio taping compared to no taping condition in the PFPS group ($p < 0.05$), and no differences between taping conditions in the control group. The Kinesio taping applied to the skin surface apparently provided tactile input, which interact with motor control by altered the excitability of the central neuron system (Simonea et al., 1997). The tactile input generated by Kinesio taping might be strong enough to modulate muscle power.

CONCLUSIONS

The results showed Kinesio tape would change in timing of VMO and improve the ratio of VMO/VL for the mechanism of efficacy.

The Effects of Kinesio Taping on Quadriceps Strength During Isokinetic Exercise in Healthy Non-Athlete Women

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Purpose: The purpose of the study was to investigate the effect of Kinesio Taping on quadriceps strength at maximum concentric and eccentric isokinetic exercise mode in healthy non-athlete women in order to examine the Kinesio Taping effect in increasing or decreasing the muscular quadriceps strength.

Methods: Three different quadriceps taping modes have been used (no taping, placebo taping, Kinesio Taping) for the study and isokinetic concentric and eccentric strength assessments have been done for both knee extensors and flexors.

Results: One-way ANOVA for repeated measures revealed no significant differences in max concentric torque between the three different taping modes but significant differences in max eccentric torque during

both the concentric and eccentric mode of the quadriceps muscle.

Conclusion: The results suggest that application of Kinesio Taping on the anterior surface of the thigh, in the direction of vastus medialis, lateralis and rectus femoris fascia, could increase the eccentric muscle strength (isokinetic eccentric peak torque), in healthy adults.

The Effect of Kinesio Tex Tape on Muscular Strength of the Forearm Extensors on Collegiate Tennis Athletes

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Context: Tennis players, as a group, exhibit a 40% to 50% chance of being diagnosed with lateral epicondylitis at some point in their career. Kinesio Tape (KT) is a popular therapeutic application that is used by athletic trainers, physical therapists and physicians to increase stimulation of mechanoreceptors in order to facilitate muscular power/strength and decrease pain, edema, and inflammation. However, there is minimal research to support the therapeutic benefit of KT.

Objective: To determine if KT used in healthy collegiate tennis athletes is effective at decreasing fatigue by maintaining strength of the forearm extensors, which are commonly associated with lateral epicondylitis.

Design: Repeated-measures, counterbalanced design.

Setting: University Tennis Facility.

Patients or Other Participants: Fourteen (8 females, 6 males) healthy Division I tennis athletes.

Intervention(s): KT using a Y strip and no tape intervention.

Main Outcome Measure(s): The MicroFET2 was used to test the strength of the forearm extensors at pre-test, mid-test, and post-test of 65 slice backhands and 75 forehands performed by each athlete.

Results: RM ANOVA for the interaction of measurement period by group showed that strength in the control condition was significantly decreased when compared to strength in the KT condition ($F=5.79$, $p=.032$). Percent change in strength between groups across measurement periods, using a Bonferonni correction, did not yield statistically significant differences: pre- to mid-test ($p=.094$), mid- to post-test ($p=.210$), or pre- to post-test ($p=.019$).

Conclusion: Our research indicates that KT, when applied to healthy collegiate tennis athletes, is associated with less of a decrease in muscular strength than that seen in a "no tape" condition. More research must be done to test if KT has a therapeutic benefit for athletes with chronic lateral epicondylitis.

Could Kinesio tape replace the bandage in decongestive lymphatic therapy for breast-cancer-related lymphedema? A pilot study

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Goals of work:

The purpose of this study is to compare the treatment and retention effects between standard decongestive lymphatic therapy (DLT) combined with pneumatic compression (PC) and modified DLT, in which the use of a short-stretch bandage is replaced with the use of Kinesio tape (K-tape) combined with PC.

Materials and methods: Forty-one patients with unilateral breast-cancer-related lymphedema for at least 3 months were randomly grouped into the DLT group (bandage group, $N=21$) or the modified DLT group (K-tape group, $N=20$). Skin care, 30-min manual lymphatic drainage, 1-h pneumatic compression therapy, application of a short-stretch bandage or K-tape for each group, and a 20-min physical therapy exercise

were given during every treatment session. Patient evaluation items included physical therapy assessment, limb size, water composition of the upper extremity, lymphedema-related symptoms, quality of life, and patients' acceptance to the bandage or tape.

Main results: There was no significant difference between groups in all outcome variables ($P>0.05$) through the whole study period. Excess limb size (circumference and water displacement) and excess water composition were reduced significantly in the bandage group; excess circumference and excess water composition were reduced significantly in the tape group. The acceptance of K-tape was better than the bandage, and benefits included longer wearing time, less difficulty in usage, and increased comfort and convenience ($P<0.05$).

Conclusions: The study results suggest that K-tape could replace the bandage in DLT, and it could be an alternative choice for the breast-cancer-related lymphedema patient with poor short-stretch bandage compliance after 1-month intervention. If the intervention period was prolonged, we might get different conclusion. Moreover, these two treatment protocols are inefficient and cost time in application. More efficient treatment protocol is needed for clinical practice.

Does Kinesio® Taping of the Abdominal Muscles Improve the Supine-to-Sit Transition in Children with Hypotonia?

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<http://www.kinesiotaping.com/kinesio-taping-for-abdominal-muscles-to-improve-the-supine-to-sit-transition-in-children.php>

Kinesio Taping® with Aqua-Therapy for Pediatric Disability involving Neurological Impairment

Kayoko Maruko, Director of Potential Development Support Center, Hokkaido Japan
Maruko, K. (1999). Kinesio Taping® with Aqua Therapy for Pediatric Disability Involving Neurological Impairment. *15th Annual Kinesio Taping International Symposium Review*. (pp. 70-73) Tokyo, Japan: Kinesio Taping Association.

<http://www.kinesiotaping.com/kinesio-taping-with-aqua-therapy-for-pediatric-disability-involving-neurological-impairment.php>

Kinesio Taping for Erbs Palsy

Pediatric Case using Kinesio Tex® Tape

A 10 year old girl with Erb's Palsy was referred to occupational therapy (OT). Initially, she reported 8 to 9 out of 10 pain level at the left anterior shoulder and left lateral ribcage. She had forward head, rounded shoulder posture. After 4 months of OT 2 times a week for stretching and strengthening, her pain decreased to 6 out of 10. Then, a trial of Kinesio Tex® Tape was started.

One "I" strip of tape was used to relax the left pectoralis major muscle. Another "X" strip of tape was placed on her back to facilitate scapular retraction (left rhomboids). By night time, her pain decreased to 0 out of 10. She remained pain free until the Kinesio Tex® Tape was removed 2 days later. Without the Kinesio Tex® Tape, her pain returned to 6 out of 10. Her mother was trained in applying the Kinesio Tex® Tape and she continues to use it as part of a home exercise program.

Kinesio Tex® Tape has been highly effective in eliminating this patient's pain. She and her mother are very happy!

KT & Hypotonia

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Kinesioiteippauksen käyttö reumalasten hamstring-lihaskireyden hoidossa

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