Kinesio Taping Fundamentals for the Equine Athlete

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KEYWORDS

• Kinesio taping • Equine rehabilitation • Musculoskeletal diseases • Posture
• Complementary therapy

KEY POINTS

- Kinesio equine tape is lightweight, breathable, and allows full range of motion. It can be left on 24 hours a day for up to 5 days.
- The application of the tape on the skin can affect all of the layers of tissues and organs because they are all intimately interconnected.
- Kinesio taping application can relieve pain, increase range of motion, assist tissue recovery, optimize muscle function, and promote lymphatic flow.
- Kinesio taping assists rehabilitation of the horse in any phase; its main goal is to help the body's self-healing potential to bring tissues back to their homeostasis.

Absent a correct diagnosis, medicine is poison, surgery is trauma and alternative therapy is witchcraft.

—A. Kent Allen.

INTRODUCTION

Kinesio taping was first introduced in 1979 by Dr Kenzo Kase, a Japanese chiropractor and moxibustion practitioner (**Fig. 1**), as an efficient alternative to other wrapping or bandaging techniques already in use such as McConnell taping, compressive bandaging, and so on.

The idea underlying the invention of Kinesio Tex Tape was to have a tool working on the patients in between treatments. The consideration that all other types of bandages were in some ways restricting the range of motion and could not be worn longer than a few hours led Dr Kase to develop a particular type of elastic tape that could stay on for up to 5 days 24 hours per day.

Kinesio taping has been used for years, but it really broke out with 2008 Olympic Games when it had its first big media attention because it was used by many athletes.

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Fig. 1. Kenzo Kaze, the founder of Kinesio taping.

Since then, it has become usual to see it on athletes in almost all sports, although its main use remains in normal people's everyday life.

At the beginning of this century, the discovery of its potential use in animals and especially in equine athletes led many companies to develop equine taping as a very new and useful technique to be used in horses (Fig. 2).

Kinesio taping has been showing a great potential of application in almost all conditions that can be found in the equine athlete, from the competition ground to rehabilitation facilities. Especially in equine rehabilitation, it can be used to assess and treat muscular conditions, postural imbalances, and fascia restrictions; it has a great effect

Fig. 2. Use of Kinesio taping in horses.

on tendon and ligament injuries and can also be used in lymphatic conditions. The taping assists the rehabilitation of the horse in any phase, because its main goal is to help the body's self-healing potential to bring tissues back to homeostasis.[1] It can be combined with other modalities or treatments, before or after the sessions, to prepare or complete the effect (Fig. 3).

It is important to keep in mind that Kinesio taping is not a substitute for veterinary care, its use needs to be approved by a clinician, and its application must be performed by trained professionals because improper use may be harmful.

MECHANISM OF ACTION

Characteristics of the Tape

The tape is produced with 100% cotton elastic fibers, which allows the skin to breathe and the tape to dry.[2] It stretches along its longitudinal axis only up to 130% to 140% of its resting length in a way that is similar to the flexibility of skin. The tints are all made of hypoallergenic dyes naturally derived from plant extracts; there is no difference in the physical characteristics of the tape depending on the dye used, but some chromotherapy effect is considered to be acting based on the color used for the treatment:

- Green: emotional calm, rebuild muscles, and help injuries;
- Yellow: mental alertness, optimism, aids digestion; and
- Brown: natural, earthy color.

The adhesive of Kinesio equine is 100% medical grade, acrylic, and heat activated; it is specifically designed to fit with the equine movement. The tape is not medicated and eventual feelings of warmth or cooling of the therapeutic zone are related to the direct effect on local circulation.

Embryology Concept

The application of the tape on the skin can affect all of the layers of tissues and organs because all stratums are intimately interconnected (Fig. 4). The relationship is even stronger for tissues that differentiate from the same layer (ie, epidermis and brain). The application of the tape on the skin affects 5 major physiologic systems differently:

- Skin: lifting effect with creation of space between superficial layers.
- Fascia: unwinding effect, redirection of movement.

Fig. 3. Combined use of Kinesio taping and modalities.

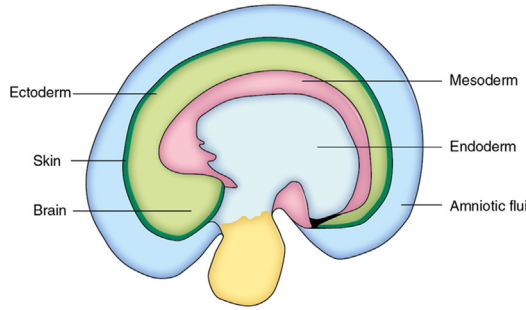

Fig. 4. Embryology concept. All layers are deeply interconnected.

- Muscle: optimization of function.
- Lymphatic: decongestion and fluid redirection.
- Joint: realignment effect through direct proprioceptive action on ligaments or indirect through muscle control.

Inflammation Concept

Inflammation is characterized by 5 fundamental elements: calor, rubor, tumor, dolor, and function lesa (ie, heat, redness, edema, pain, and loss of function). The Kinesio taping method aims to act on all of these components to reduce inflammation. The direct effect of the tape applied to the skin reduces heat, redness, and congestion through a direct action on the local circulation. The reduction of the edema and the decompressive action of this elastic bandage unloads the mechanoreceptors, thus promoting a pain-controlling effect. Finally, reduction of inflammation and the possibility to act on the range of motion through different techniques, which are discussed elsewhere in this article, helps to restore function.

Pressure Concept

Pain perception can be modulated by the tape's effect on the skin and fascia through the activation of the endogenous analgesic system[3,4] and the inhibitory pathways related to the pain-gate theory.[5] Either compressive or decompressive forces obtained by changing the tension of application can modulate pain. With compression, the mechanoreceptors will be stimulated, thereby activating the inhibitory pathways; in contrast, decompression unloads overworked receptors.

MUSCLE APPLICATIONS

Sensory–Motor Cortex Communication

Application of the tape on the skin stimulates sensory receptors, which produces an afferent message to the dorsal horn of the spinal cord and from there to the motor cortex through the ascending fibers where this is integrated with other proprioceptive stimuli to produce a motor response; in this way, the tape applied on the skin can affect the motor control of a muscle (Fig. 5). We can either rest an overused muscle through inhibition application or increase the motor awareness with facilitation.

Action of the Tape

Because of its intrinsic elasticity, after being applied the tape will recoil toward the starting point of application, and this directional pull travels through the tissues from the skin to the underlying muscles, thus stimulating the Golgi tendon organs and the muscle spindles. Proper location of the tape on specific anatomic landmarks, and the direction

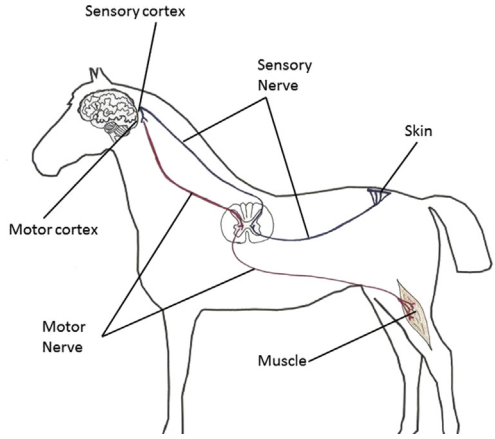

Fig. 5. Sensory–motor cortex communication.

and tension of application will achieve either an inhibiting or facilitating effect. Moreover, depending on the condition diagnosed, the use of the tape will promote the restoration of the appropriate length of the muscle to produce the best contractile force (length–tension curve; Fig. 6), thus optimizing muscle function.

Use of Muscle Taping in Equine Rehabilitation

The effects of the tape on muscles are mainly to improve muscle balance, optimize the range of motion, relieve pain, and promote tissue recovery.[6] Application of the tape should be considered whenever there would be a primary muscle involvement, such as strains or tears, in case of metabolic conditions (ie, tying up), or neurologic pathologies with local muscle effects (ie, radial nerve paralysis). Moreover, muscle applications can be used when the participation of the muscles is needed to address or diagnose postural imbalances or gait abnormalities, to reeducate proper neuromotor control and to prevent injuries or repeat injuries in the rehabilitation process of many conditions (Fig. 7).

TENDONS AND LIGAMENTS

Corrective Techniques and Proprioceptive Awareness

Within the Kinesio taping method, different corrective techniques exist; one technique is designed for ligaments and tendons. The mechanism of action is based on the proprioceptive information given by the application of the tape to the skin in the area corresponding with the tissue that needs treatment, the effect will be to support the ligament or tendon through the motor response elicited by the proprioceptive input.[7] The combination with techniques such as lymphatic or space correction will help to reduce the edema and to promote pain relief.

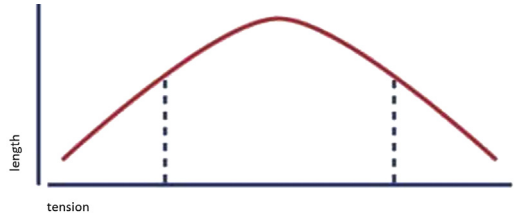

Fig. 6. Length–tension curve.

Fig. 7. Taping for biceps femoris facilitation.

Use of Ligament or Tendon Correction in Equine Rehabilitation

Depending on the stage of the injury or rehabilitation program, different options are possible. Most of the time, a combination of different applications is used. As a general indication, although the decision of the treatment protocol remains case dependent, the application of the tendon or ligament correction should be avoided in the early stages of inflammation or injury during which phase a lymphatic or space correction is more appropriate considering their effect on local circulation and pain. Once the inflammatory phase is achieved, the use of ligament or tendon correction (**Fig. 8**) is very useful to prevent overstretch of the tissue and to reeducate appropriate joint mobility; tendon correction can be combined with a muscle taping either in facilitation or inhibition depending on the stage of rehabilitation.

KINESIO TAPING AND FASCIA

The myofascial compartment is one of the actual rolling topics in both human and equine medicine and physical therapy. It is being demonstrated that especially superficial fascia is responsible for a majority of pathologic conditions in different areas of the body, and that it has the capacity to adapt to movement and to self-contract similarly to smooth muscles,[8,9] consequently influencing biomechanics. Many orthopedic

Fig. 8. Tendon correction.

conditions leave major gait or postural abnormalities, even after the primary problem is corrected, and it is considered that fascia is responsible for the maintenance of these anomalies.[10] This is why the treatment of fascia gains greater importance especially in the rehabilitation programs. The fascia is best treated manually through different techniques including myofascial release at first, but also osteopathy or chiropractic, the use of taping within fascia treatment is of great value[11] because it can either prepare very hard tissues for manipulation or continue the action of the manual therapy in between visits.

Use of Kinesio Taping in the Treatment of Fascia

The use of tape for fascial treatment falls into the corrective technique and is known as fascia correction. The aim of this therapeutic application is to release, unwind, and redirect the movement of the fascia in the physiologic direction and it is achieved by using the typical recoil of the tape thus creating micromovements in the underlying tissues that unbound the adhesions and act as a continuous micromassage. Unwinding the fascia allows the restoration of the mobility of the skin over the muscles or joints thus promoting the return to the appropriate range of motion of the area treated[12] (**Fig. 9**).

LYMPHATIC TAPING

Channeling Concept

The application of the tape to the skin, because of recoil, creates a form of wrinkles called convolutions, which may be immediately apparent or become visible later on

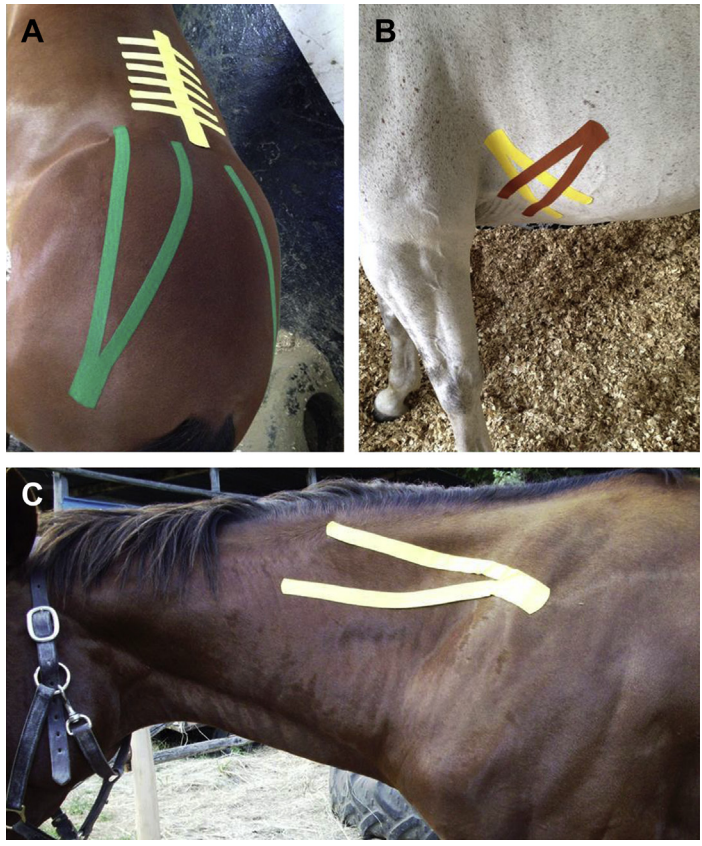

Fig. 9. Fascia correction. (*A*) thoracolumbar and gluteal fascia correction (*B*) fascia correction in girth area (*C*) fascia correction in the neck area.

depending on the elasticity of the underlying tissues; sometimes, they never come out because of the anatomic location (ie, horseback), but microconvolutions are present with movement. The convolutions create a pressure gradient by alternatively compressing and elevating the skin, thus promoting the fluid flow in the interstitial space with consequent improvement of circulation.[13,14]

Taping Application for Lymphatic Conditions

The evaluation of the lymphatic condition is crucial for the effectiveness of the lymphatic taping; the tape should never be applied to an area with active cellulitis and the use of lymphatic taping in patients with cardiac or kidney diseases has to be carefully monitored to avoid system overload. Lymphatic correction is very useful in a large number of circulatory conditions, from acute situations such as bruising or inflammatory edema to more chronic situations like lymphedema. The aim is to allow the fluid to move more freely in the interstitial space while directing it toward the closest healthy patent lymph nodes to be reabsorbed into the general circulation (**Fig. 10**).

USE OF KINESIO TAPING FOR JOINT DISEASES

Joint diseases are a common cause of poor performance in sport horses as described in a large number of papers present in scientific literature. There is a

Fig. 10. Lymphatic taping of the hind limb.

wide range of causes to joint alterations such as diet, type of exercise, genetic predispositions, and so on. A highly contributing factor is malalignment in the joint motion causing overload in some areas of the cartilage or subchondral bone and inflammation of all the structures related to the joint such as capsule or ligaments. Kinesio taping applications can help in addressing the problem in 2 different ways:

- *Directly*, by acting on the ligaments that support the joint using a ligament correction thus giving proprioceptive feedback and consequent muscular action to correct the improper alignment[15]; and
- *Indirectly*, by acting on the muscles through facilitation and/or inhibition techniques thus rebalancing the muscular action and support in the joint area.[6]

A New Perspective: The Epidermis, Dermis, Fascia Taping

A newly introduced concept within the Kinesio taping method is called Epidermis, Dermis, Fascia.[16] Initially designed and tested in human neurologic conditions such as phantom sensations in amputated subjects, it was then brought into more wide range of use for many clinical conditions (ie, multiple sclerosis, local pain, and edema). Because of the very high sensitivity that horses showed to many taping applications, this technique is now starting to be used in the equine patients and showed very good results in the treatment of articular conditions (**Fig. 11**).

Fig. 11. Epidermis, dermis, fascia taping (*A*) hock (*B*) distal interphalangeal joint.

INDICATIONS FOR KINESIO TAPING TREATMENT

Kinesio taping can be used for a very large number of clinical conditions. It is considered that everything that can be treated with the hands can be treated with the tape. Potential applications include the following conditions:

- Tendon and ligament injuries;
- Muscle imbalances;
- Postural adjustments;
- Lymphatic and circulatory conditions;
- Neurologic pathologies;
- Pathologic movement patterns;
- Fascial adhesions;
- Scars; and
- Acute and chronic pain.

When using Kinesio taping applications, it must be kept in mind that there are some important contraindications, such as the use over active cellulitis, skin infection, open wounds, and malignancy sites. Taping should be used carefully in some clinical conditions such as kidney disease, congestive heart failure, and metabolic or endocrine disease.

FUTURE STUDIES

The effects of Kinesio taping application in various conditions are being largely investigated in human medicine and in the past years many scientific articles have been published and a huge amount of research is being performed as the medical community realized the need to have more answers regarding the mechanism of action and the potential applications in human medicine either to accelerate healing processes or to improve quality of life, especially in patients with cancer and neurologic conditions.[17] In veterinary medicine, the technique is very new and a few studies[18–20] have been already performed; further clinical research is needed to investigate the effects and the potentials of the use of Kinesio taping in equine rehabilitation and sports medicine.

REFERENCES

1. Kase K, Wallis J, Kase T. Clinical therapeutic applications of the Kinesio taping methods. Tokyo: Kinesio Taping Association; 2013.

2. Kase K, Molle S, Collins G. KTE1: fundamental concepts of the Kinesio taping method for horses. Albuquerque (NM): Kinesio Taping Association; 2014.
3. Watkins LR, Mayer DJ. Organization of endogenous opiate and nonopiate pain control systems. Science 1982;216(4551):1185–92.
4. Basbaum AL, Fields HL. Endogenous pain control systems: brainstem spinal pathways and endorphin circuitry. Annu Rev Neurosci 1984;7:309–38.
5. Melzack R, Wall PD. Pain mechanisms a new theory. Science 1965;150(3699): 971–9.
6. Cho HY, Kim EH, Kim J, et al. Kinesio taping improves pain, range of motion and proprioception in older patients with knee osteoarthritis: a randomized controlled trial. Am J Phys Med Rehabil 2015;94(3):192–200.
7. Kase K, Molle S, Collins G. KTE2: Kinesio taping equine concepts and corrective techniques. Albuquerque (NM): Kinesio Taping Association; 2014.
8. Tomasek JJ, Gabbiani G, Hinz B, et al. Myofibroblasts and mechanoregulation of connective tissue remodeling. Nat Rev Mol Cell Biol 2002;3(5):349–63.
9. Schleip R, Klingler W, Lehmann-Horn F. Fascia is able to contract in a smooth muscle-like manner and thereby influence musculoskeletal mechanics. In: Proceedings of the 5th world Congress of Biomechanics. Munich (Germany): Medimond; 2006. p. 51–4.
10. Guimberteau JC, Sentucq-Rigall J, Panconi B, et al. Introduction to the knowledge of subcutaneous sliding system in humans. Ann Chir Plast Esthet 2005; 50(1):19–34.
11. Wei-Ting W, Chang-Zern H, Li-Wei C. The Kinesio taping method for myofascial pain control [Review]. Evid Based Complement Alternat Med 2015;2015:950519.
12. Soo-Yong K, Min-Hyeok K, Ehi-Ryong K, et al. Effects of Kinesio taping on lumbopelvic-hip complex kinematics during forward bending. J Phys Ther Sci 2015;27:925–7.
13. Smith JY, Lee HR, Lee DC. The use of elastic adhesive tape to promote the lymphatic flow in the rabbit hind leg. Yonsei Med J 2003;44(6):1045–52.
14. Kase K. Illustrated Kinesio taping manual. 2nd edition. Tokyo: Kent-Kai; 1997.
15. Simon S, Garcia W, Docherty CL. The effect of Kinesio tape on force sense in people with functional ankle instability. Clin J Sport Med 2014;24(4):289–94.
16. Kase K, Molle S, Collins G. KTE3: Kinesio taping equine advanced and clinical concepts. Albuquerque (NM): Kinesio Taping Association; 2014.
17. Kara OK, Uysal SA, Turker D, et al. The effects of Kinesio taping on body functions and activity in unilateral spastic cerebral palsy: a single-blind randomized controlled trial. Dev Med Child Neurol 2015;57:81–8.
18. Molle S, Ruggeri D, D'Onofrio M. Use of Kinesio taping method in the treatment of sacro-iliac joint dysfunction in the horse: 7 cases. Short Communication, 7th IAVRPT Symposium. Vienna, August 15–18, 2012.
19. Clark L, Nankervis KJ. A pilot study investigating the effects of Kinesio taping on the gait characteristics of three horses. Gloucester (United Kingdom): The Equine Therapy Centre, Hartpury College; 2010.
20. Lima de Mattos LH, Miluzzi Yamada AL, Alves Rodrigues K et al. Application of Kinesio taping on postoperative equine stringhalt syndrome: case report. Poster Presentation, Brazilian Congress of Kinesio Taping. Brazil, 2013.