Manual Therapy xxx (2009) 1–4

Contents lists available at ScienceDirect

Manual Therapy

journal homepage: www.elsevier.com/math

Case Report

Treatment of myofascial pain in the shoulder with Kinesio Taping. A case report

Francisco García-Muro [1], Ángel L. Rodríguez-Fernández*, Ángel Herrero-de-Lucas

Department of Physiotherapy, Faculty of Medicine, CEU-San Pablo University, C/Tutor, 35, 28008 Madrid, Spain

ARTICLE INFO

Article history:
Received 22 July 2009
Received in revised form
3 September 2009
Accepted 16 September 2009

Keywords:
Myofascial pain syndromes
Shoulder
Kinesio tape

1. Introduction

Kinesio Taping was a technique developed by Dr. Kenzo Kase in the 70s. The adhesive pliable material, directly applied to the skin, differs from classical tape in its physical characteristics. Furthermore, its clinical application departs from the usual restriction of mobility. This technique claims four effects: to normalize muscular function, to increase lymphatic and vascular flow, to diminish pain and aid in the correction of possible articular malalignments (Kase et al., 1996). This taping technique is frequently applied for pathologies in the musculoskeletal system, especially in the field of sports injuries (Yasukawa et al., 2006; Zajt-Kwiatkowska et al., 2007).

Myofascial pain has been studied by several authors (Simons, 1996; Hong and Simons, 1998; Travell and Simons, 1999; Niddam et al., 2007) and among the manual therapy techniques applied are massage (Gam et al., 1998; Travell and Simons, 1999), compression techniques (Hanten et al., 2000), stretching (Travell and Simons, 1999; Hanten et al., 2000), injection of different substances (De Andrés et al., 2003; Kamanli et al., 2005) and dry needling (Edwards and Knowles, 2003). Notwithstanding the above, there is an absence of references documenting the application of Kinesio Taping in the treatment of pain arising from myofascial trigger points (MTPs).

This case report documents the results achieved with Kinesio Taping as the exclusive therapeutic procedure for the treatment of a patient with shoulder pain of myofascial origin.

2. Case report

2.1. History

A 20-year-old female patient was seen due to pain of two days duration in her right shoulder (Fig. 1). The pain, extremely intense from the beginning, intensified 48 h after awakening, and had not diminished. The intensity of the pain did not wake the patient and although she usually adopted a supine position, the pain was not related to any specific posture during sleeping.

Previous clinical history included a diagnosis of rotator cuff pathology in the same shoulder induced by her activity as a swimmer. Subsequently, the patient had not been training for one year and this had completely resolved the complaint. The current pain episode was treated from the beginning with NSAIDs (ibuprofen 1-1-1) and gastric protector (magaldrate anhydrous), short wave and transcutaneous electrical nerve stimulation (TENS), with no improvement. The patient did not endure the TENS and this treatment was discontinued.

2.2. Examination

The clinical examination findings are as listed below:

- Restricted shoulder mobility caused by pain, assessed by goniometry and Apley's scratch test (McFarland, 2006) for the most representative movements, in order to avoid the

* Corresponding author. Tel.: +34917580310.
E-mail addresses: fgarciamuro@ceu.es (F. García-Muro), alrodfer@ceu.es (Á.L. Rodríguez-Fernández), aherrero@ceu.es (Á. Herrero-de-Lucas).
[1] Tel.: +34917580310.

1356-689X/$ – see front matter
doi:10.1016/j.math.2009.09.002

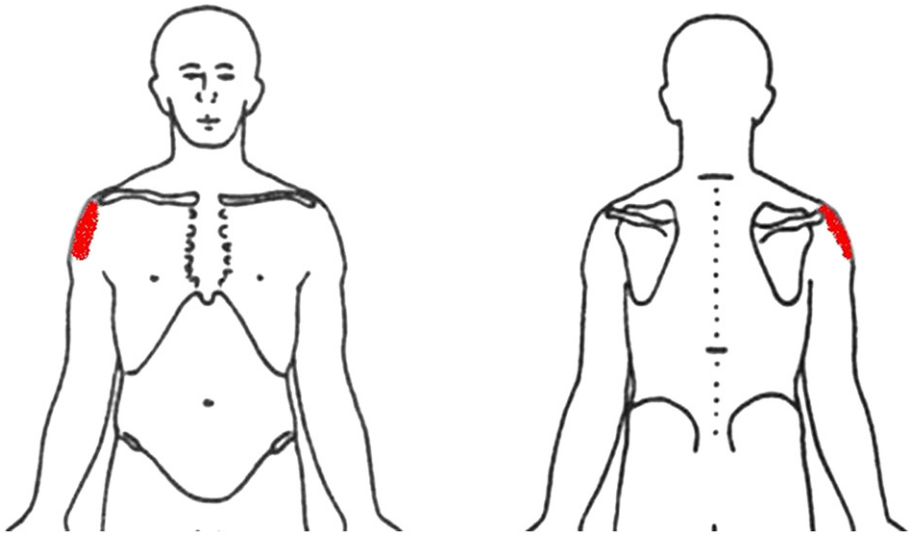

Fig. 1. Body chart showing painful area.

increasing irritation suffered by the patient. The goniometry measurements disclosed a range of movement of 35° and 54° for abduction and flexion respectively. The same movements were painful but almost full range when tested passively. External rotation was measured in the anatomical position with the elbow at a 90° flexion, hence obtaining a result of 90°, both actively and passively. From a more functional point of view, superior and inferior Apley's scratch tests (McFarland, 2006) were examined. In the superior test, pain inhibited the action, and in the inferior test her fingertips reached the inferior angle of the scapula, although the left upper limb fingertips contacted the cervicodorsal junction.

- Visual Analogic Scale (VAS) scored 10 in movement and 5.85 in the resting position.
- No results were obtained for Jobe's test (Buckup, 2008), palm up and specific for positive deltoid, and the test of painful arc. In Jobe's test, the lack of results was due to it not being possible to support the upper limb in the correct position to undertake the test.
- The sub deltoid bursa, rotator cuff tendons and short and long heads of biceps brachialis were painless at palpation. However, several taut bands were felt with active MPTs in anterior and medial deltoid fasciculi. Following the protocol described by Fischer (1988, 1997), pressure pain thresholds (PPT) were measured with an analogic algometer (Wagner Instruments. Greenwich, USA) and scored 0.5 Kg/cm^2 to induce the pain.
- The active and passive physiological movements of the cervical spine were painless and full range. The anterior and posterior cervical quadrant tests (Maitland et al., 2007) were normal.

2.3. Physiotherapeutic diagnosis and treatment

Based on the onset of the pain and the results of the clinical examination, the authors hypothesize an activation of the MTPs in the anterior and medial deltoid fasciculi, although the patient did not relate the pain with any specific activity in the 24 h prior to symptom onset. For this reason the authors followed the essential diagnosis criteria for MTPs described by Simons et al. (2002) (Table 1). The treatment of choice for the myofascial pain of the deltoid muscle was an application of Kinesio Taping for the deltoid, reinforced by a transverse strip over the region where the MTPs are located as shown in Figs. 2 and 3.

Table 1
Diagnostic criteria recommended for the identification of MTPs actives and latents (modified from Simons DG, Travell JG, Simons LS. Dolor y disfunción miofascial. El manual de los puntos gatillo. Mitad superior del cuerpo, 2ª Edición. Madrid: Editorial Médica Panamericana, 2002).

Essential criteria:
1. Palpable taut bands (if muscle accessible).
2. Local pain sensitive to pressure over a nodule on the taut bands (focally).
3. Recognition of usual pain suffered by the patient pressing on the sensitive nodule (identification of active MTPs).
4. Painful restriction of the full range of motion on passive stretching.

Confirmatory observances:
1. Visual or tactile identification to twitch response.
2. Distinction of a twitch response induced by needle puncture of the sensitive nodule.
3. Pain or sensibility alteration (in the predictable distribution of a MTPs in the muscle) by compression of the sensitive nodule.
4. Electromyographic demonstration of spontaneous electrical activity representative of the active *loci* located in the sensitive nodule of the taut bands.

Fig. 2. Kinesio Taping application for deltoid muscle.

Please cite this article in press as: García-Muro F, et al., Treatment of myofascial pain in the shoulder with Kinesio Taping. A case report, Manual Therapy (2009), doi:10.1016/j.math.2009.09.002

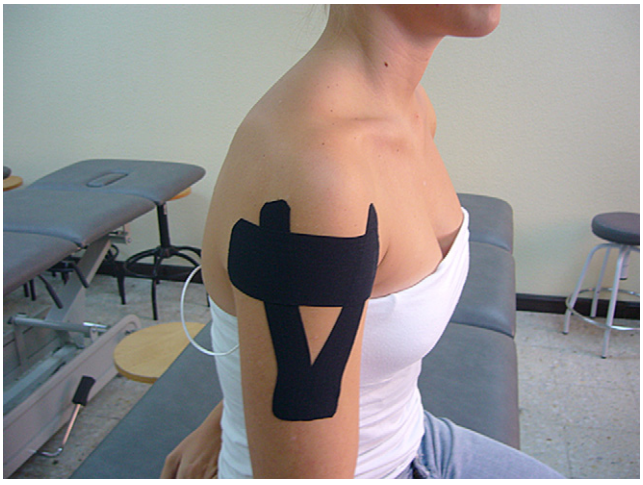

Fig. 3. Corrective application of Kinesio Taping in the region of MTPs.

Apart from the initial assessment, two more evaluations were performed, one just after the application of the taping and another two days after the start of the treatment when the taping was removed.

3. Results

An objective improvement in the range of motion was observed after treatment. Nevertheless, there was no change in the VAS or in the algometry. Active abduction scored 107°, and active flexion 50°. Passive values and external rotation exhibited no change. Inferior Apley's scratch test (McFarland, 2006) was unchanged, but there was an improvement in the superior test reaching the cervicodorsal joint, while the left side attained the mid dorsal region. The specific tests matched the previous findings, except for Jobe′s test (Buckup, 2008), where the patient was now capable of maintaining the upper limb in the study position.

Two days after treatment and from a subjective point of view, the patient felt there had been a noticeable improvement. After tape removal, the patient was re-evaluated. Mobility in active abduction and flexion reached 160° and 165° respectively. The same movements were painless and full range in passive range of motion. In superior Apley's scratch test (McFarland, 2006), the hand reached the mid dorsal region, the same as the contralateral side; whereas in the inferior test the affected limb reached the inferior angle of the scapula, while the left hand achieved the higher position of the cervicodorsal junction. Specific tests were positive for Jobe's test (Buckup, 2008) (offering resistance to the physiotherapist opposition) and medial deltoid; being negative for the anterior deltoid test, painful arc test and the palm up test. PPT scored 0.7 Kg/cm^2 and VAS was 0.6 at rest and 2.7 during motion (Table 2).

After 9 days, a telephone follow up was conducted. The patient reported she was in no pain and her shoulder movement was almost normal.

4. Discussion

The patient exhibited an important pain-restriction related to shoulder function ability, caused by the MTPs. In view of the results, the treatment with Kinesio Taping modified the inhibition of the deltoid muscle caused by the pain. It is highly significant that intensity values of pain, either subjective (VAS) or objective (algometry), did not change between the two first measurements, although a significant improvement was perceived in the functional tests and active shoulder range of motion. Just after the treatment, the improvement in abduction was much greater than in flexion. This can be explained by the application of KT where the corrective strip was on the middle deltoid.

Between the second and third assessments, the functional tests and articular range of motion kept improving, but never normalized completely. There was a greater improvement in the VAS scores than in the algometry. This was possibly due to an inactivation of the active MTPs in the deltoid muscle. The overall enhancement might be the result of the normalization of muscular function and not merely an analgesic effect. The effect of taping on muscular activity has been studied by several authors (Słupik et al., 2007), who showed that in healthy subjects performing an isometric contraction of the quadriceps muscle, Kinesio Taping modifies the bioelectrical activity of the vastus medialis by an increase in motor unit recruitment. Chen et al. (2007) found a significant increase in the activating velocity of the vastus medialis in patients with femoropatelar syndrome versus control and placebo subjects after applying Kinesio Taping. Whereas Fu et al. (2008) did not observe any improvement in isokinetic measurements or inhibition of muscular torque in knee flexors or extensors when a Kinesio Taping was applied in healthy athletes' quadriceps muscle. Neither electromyographic change have been observed in the McConnell taping technique in those muscle groups implied in scapular rotation (Cools et al., 2002). However, Liu et al. (2007) showed an improvement in epicondylear muscles sliding during wrist movements in two patients with epicondylalgia after application of the Kinesio Taping technique. In this study, they used a diagnostic ultrasound image of the epicondylear muscles.

Table 2
Summary of the patient assessment results.

	Pre-treatment	Post-treatment	2 days after treatment at tape removal
Abduction	35°	107°	160°
Flexion	54°	50°	165°
External rotation	90°	90°	90°
Superior Apley's scratch test	Unable to test	Cervicodorsal junction	Mid dorsal region (Normal)
Inferior Apley's scratch test	Inferior angle of scapula	Inferior angle of scapula	Inferior angle of scapula
Visual Analogic Scale (VAS)	10 at motion 5.85 at rest	10 at motion 5.8 at rest	2.7 at motion 0.6 at rest
Algometry	0.5 Kg/cm^2 +	0.5 Kg/cm^2 +	0.7 Kg/cm^2 +
Jobe'stest	Patient unable to support her upper limb	The patient holds her upper limb in absence of opposition	The patient holds her upper limb with opposition but it is painful
Palm up	+	+	−
Anterior deltoid test	+	+	−
Medial deltoid test	+	+	+
Painful arc	−	−	−

Please cite this article in press as: García-Muro F, et al., Treatment of myofascial pain in the shoulder with Kinesio Taping. A case report, Manual Therapy (2009), doi:10.1016/j.math.2009.09.002

The active movement improves after the application of Kinesio Taping. This was demostrated by Yoshida and Kahanov (2007) and Ebbers and Pijnappel (2006) for the active flexion of the lower trunk and for the sit and reach test in the lower limbs respectively. Furthermore, other authors emphasized the functional improvement and focused in the control of upper limb (Jaraczewska and Long, 2006; Yasukawa et al., 2006) and oral and facial motion (Drummond and Fox, 2004). The patient probably obtained benefit from this effect over the motor control by Kinesio Taping.

Simoneau et al. (1997) postulates that a tape consisting of a strip applied longitudinally crossing a joint may have a positive effect, a consequence of the tactile stimuli that increases the feedback and therefore assists the motor control. Furthermore Alexander et al. (2008) hypothesizes that the longitudinal strip may shorten the muscular fibres, producing a decrease in the afferent Ia discharge from the neuromuscular spindle, causing a reduction in the motor neurons of the medullar anterior horn, proved by the diminished amplitude of the *H* reflex observed in the subjects studied (Alexander et al., 2003, 2008). This lower muscular tone might explain the MTPs inhibition and the functional improvement that might influence the decrease of pain.

5. Conclusion

Data on pain, joint motion and shoulder function obtained from this study may suggest that treatment with Kinesio Taping contributed to the resolution of the patient's pathology, producing an immediate improvement and resolving the problem in the following days. The results therefore suggest that Kinesio Taping might well be a technique highly appropriate in the treatment of MTPs. However, more research is necessary, both clinical and neurophysiological, to clarify the specific mechanisms and effects of the Kinesio Taping technique.

References

Alexander CM, McMullan M, Harrison PJ. What is the effect of taping along or across a muscle on motoneurone excitability? A study using triceps surae. Manual Therapy 2008;13:7–62.

Alexander CM, Stynes S, Thomas A, Lewis J, Harrison PJ. Does tape facilitate or inhibit the lower fibres of trapezius? Manual Therapy 2003;8(1):37–41.

Buckup K. Clinical test for the musculoskeletal system. Examination, sings, phenomena. 2nd ed. New York: Thieme; 2008. Ch 2, p. 70.

Chen W, Hong W, Huang T, Hsu H. Effects of kinesio taping on the timing and ratio of vastus medialis obliquus and vastus lateralis muscle for person with patellofemoral pain. Journal of Biomechanics 2007;40(S2):318.

Cools AM, Witvrow EE, Danneels LA, Cambier DC. Does taping influence electromyographic muscle activity in the scapular rotators in healthy shoulders? Manual Therapy 2002;7(3):154–62.

De Andrés J, Cerda-Olmedo G, Valía JC, Monsalve V, Lopez-Alarcón, Minguez A. Use of botulinum toxin in the treatment of chronic myofascial pain. The Clinical Journal of Pain 2003;19(4):269–75.

Drummond S, Fox K. Feasibility of kinesiotape application for treatment of dysarthria. Philadelphia: ASHA Convention; November 2004. pp. 18–20.

Ebbers J, Pijnappel H. De involved van curetape op de sit-and-reach-test. Sportmassage International 2006;8:232–8.

Edwards J, Knowles N. Superficial dry needling and active stretching in the treatment of myofascial pain. A randomised controlled trial. Acupuncture in Medicine 2003;21(3):80–6.

Fischer AA. Documentation of myofascial trigger points. Archives of Physical Therapy and Rehabilitation 1988;69:286–91.

Fischer AA. Algometry in the daily practice of pain management. Journal of Back and Musculoskeletal Rehabilitation 1997;8:151–63.

Fu TC, Wong AM, Pei YC, Wu KP, Chou SW, Lin YC. Effect of kinesio taping on muscle strength in athletes-A pilot study. Journal of Science and Medicine in Sport 2008;1(2):198–201.

Gam AN, Warming S, Larsen LH, Jensen B, Høydalsmo O, Allon I, et al. Treatment of myofascial trigger-points with ultrasound combined with massage and exercise. A randomised controlled trial. Pain 1998;77(1):73–9.

Hanten WP, Olson SL, Butts NL, Nowicki AL. Effectiveness of a home program of ischemic pressure followed by sustained stretch for treatment of myofascial trigger points. Physical Therapy 2000;80(10):997–1003.

Hong CZ, Simons DG. Pathophysiologic and electrophysiologic mechanisms of myofascial trigger points. Archives of Physical Medicine and Rehabilitation 1998;79:863–71.

Jaraczewska E, Long C. Kinesio taping in stroke: improving functional use of the upper extremity in hemiplegia. Topics in Stroke Rehabilitation 2006;13(3):31–42.

Kamanli A, Kaya A, Ardicoglu O, Ozgocmen S, Zengin FO, Bayik Y. Comparison of lidocaine injection, botulinum toxin injection, and dry needling to trigger points in myofascial pain syndrome. Rheumatology International 2005;25(8):604–11.

Kase K, Tatsuyuki H, Tomoko O. Development of kinesio tape. Kinesio taping perfect manual. Kinesio Taping Association 1996;6-10:p117–118.

Liu YH, Chen SM, Lin CY, Huang CI, Sun YN. Motion tracking on elbow tissue from ultrasonic image sequence for patients with lateral epicondylitis. Conf Proc IEEE Eng Med Biol Soc. 2007;2007:95–8.

Maitland G, Hengeveld E, Banks K, English K. Maitland. Manipulación vertebral. 7th ed. Madrid: Elsevier; 2007. Ch 10, p. 241.

McFarland EG. Examination of the shoulder. The complete guide. New York: Thieme; 2006. Ch 2, p. 72.

Niddam DM, Chan RC, Lee SH, Yeh TC, Hsieh JC. Central modulation of pain evoked from myofascial trigger point. Clinical Journal of Pain 2007;23(5):440–8.

Simoneau G, Degner R, Kramper C, Kittleson K. Changes in ankle joint proprioception resulting from strips of athletic tape applied over the skin. Journal of Athletic Training 1997;32(2):141–7.

Simons DG. Clinical and etiological update of myofascial pain from trigger points. Journal of Musculoskeletal Pain 1996;4:93–121.

Simons DG, Travell JG, Simons LS. Dolor y disfunción miofascial. El manual de los puntos gatillo. Mitad superior del cuerpo. 2ª Edición. Madrid: Editorial Médica Panamericana; 2002.

Słupik A, Dwornik M, Białoszewski D, Zych E. Effect of kinesio taping on bioelectrical activity of vastus medialis muscle. Preliminary report. Ortopedia, Traumatologia, Rehabilitacja 2007;9(6):634–43.

Travell JG, Simons DG. Myofascial pain and dysfunction. The trigger point manual, vol. I. Baltimore: Williams and Wilkins; 1999.

Yasukawa A, Patel P, Sisung C. Pilot study: investigating the effects of kinesio taping in an acute paediatric rehabilitation setting. American Journal of Occupational Therapy 2006;60(1):104–10.

Yoshida A, Kahanov L. The effect of kinesio taping on lower trunk range of motions. Research in Sports Medicine 2007;15(2):103–12.

Zajt-Kwiatkowska J, Rajkowska-Labon E, Skrobot W, Bakula S, Szamotulska J. Application of kinesio taping® for treatment of sport injuries. Research Yearbook 2007;13(1):130–4.

Please cite this article in press as: García-Muro F, et al., Treatment of myofascial pain in the shoulder with Kinesio Taping. A case report, Manual Therapy (2009), doi:10.1016/j.math.2009.09.002