Kinesio Taping in Dysphonic Patients

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Summary: Objective. Kinesio taping (KT) is a method of elastic bandaging that produces a biomechanical effect on the organism. This study aims to evaluate its use in dysphonic patients tratment, as integrated part of speech therapy.
Study Design. Randomized controlled
Materials and Methods. Fifteen dysphonic patients were given the option to complement the speech therapy treatment with KT (DG1). 15 dysphonic patients suffering from similar conditions (DG2) who underwent traditional speech therapy were the control group.
Results. After treatment, both DG1 and DG2 obtained a statistically significant improvement for jitter and noise-to-harmonic ratio ($P > 0.05$) and showed an improvement in Voice Handicap Index (VHI) total (VHIt), VHI functional (VHIf), VHI emotional (VHIe), and VHI physical (VHIp). However, the improvement was statistically significant for VHIt ($P = 0.0102$), VHIe ($P = 0.0349$), and VHIp ($P = 0.0366$) in DG1, and only in VHIt ($P = 0.0466$) in DG2. In DG1, P had a lower value than in DG2 for VHIt, VHIe, and VHIp. In DG2, there were a few patients who after therapy had a VHIt higher than before therapy, whereas this did not occur in DG1.
Conclusions. As expected, this study confirms the benefits of speech therapy. Although KT is not a substitute for speech therapy, our preliminary results and patients' favorable response to KT encouraged us to continue with our studies on a larger scale. Further studies are required to better define the role of KT in speech therapy and evaluate its real effect over its placebo effect.
Key Words: Kinesio taping–Taping–Speech therapy–Muscle tension dysphonia–Dysphonia.

INTRODUCTION

Kinesio taping (KT) is an elastic tape that has become popular during the last 10 years, owing to its use by high-profile athletes including volleyball, soccer, and tennis players. This tape does not limit movement but supports it and activates the healing process.[1] The scientific basis of KT is still to be understood. In scientific literature, an evidence-based KT efficacy is given for pain reduction, range of motion improvement, better recruitment of muscle motor units, and increased lymphatic activity.[2]

This technique was developed by the Japanese chiropractor Kenzo Kase in the 1970s,[3] following the trail of another Japanese chiropractor, Murai, who was working in America over the possibility to facilitate tissue recovery and movements with a normal tape. KT got an international visibility during the Seoul Olympics in 1988, when it was used by the Japanese volleyball team.

In recent years, KT has revolutionized physiotherapy and sports medicine. This method of elastic bandaging, thanks to its limited thickness and its particular characteristics of elasticity and adhesiveness, produces a biomechanical effect on the organism. Currently, KT is not only used in sports medicine and physiotherapy but also in gynecology, pediatrics, preventative medicine, osteopathy, neurology, and speech therapy.

Human voice production is a complex mechanism that requires a perfect synchronization of laryngeal muscles and a proper glottis positioning. When this mechanism is not correctly performed, we have a vocal disorder (dysphonia) that can be classified as organic or functional. A functional voice disorder occurs when vocal quality deteriorates in absence of anatomic and/or neurological factors. Today, the preferred term for functional dysphonia has become *muscle tension dysphonia* (MTD), because altered laryngeal muscle tension is believed to result in altered laryngeal performance despite normal anatomy.[4]

Individuals with MTD may have changes in cervical and perilaryngeal muscles,[5,6] muscle pain at rest or during function,[5,7] hyperactivity of extrinsic laryngeal muscles, limitation in the amplitude of the cervical movement,[5,7] and even postural changes.[8,9]

Traditionally, the treatment of dysphonia related to muscle change uses body techniques, laryngeal massage and massage on the shoulder girdle, and postural changes in the neck and shoulder, besides techniques to balance the vocal production and the stabilization of voice emission.[10]

The objective of this study was to verify the effect of KT in the treatment of functional dysphonia, as an integrated part of speech therapy.

MATERIALS AND METHODS

Between September 2015 and March 2016, we enrolled consecutive patients suffering from MTD who came to the ENT Department of Policlinico S.M. alle Scotte, University Hospital Siena, and offered to them the possibility to associate KT to traditional speech therapy.

We decided to exclude the following from our analysis: individuals with neurological dysphonia or who had presented with any general neurological alteration; people who underwent surgery of the larynx; individuals with reported thyroid changes (hypo- or hyperthyroidism); and people reporting any sort of heart condition or gastroesophageal reflux disease, and those who smoke.

Dysphonic group 1 (DG1) was composed of 15 individuals (12 women, with mean age of 27.6 years; and 3 men, with mean age of 26.6 years) who met those criteria and underwent traditional speech therapy and KT. All individuals signed the informed consent form.

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TABLE 1.
Distribution of the Dysphonic Groups According to Phoniatric Examination

Phoniatric Physical Examination	DG1 (%)	DG2 (%)
Bilateral thickening and median-posterior chink	3 (20)	3 (20)
Bilateral nodules	5 (33.3)	5 (33.3)
Median-posterior triangular chink	4 (26.7)	4 (26.7)
Longitudinal chink	3 (20)	3 (20)

Abbreviations: DG1, dysphonic group 1; DG2, dysphonic group 2.

Our sample was composed of adults of both genders, aged between 18 and 45. We therefore decided to exclude individuals aged over 45 to make the case and control group homogeneous and exclude any possible interferences related to aging and presbyphonia.[11]

Dysphonic group 2 (DG2) was composed of 15 individuals (12 women, with mean age of 20.8 years; and 3 men, with mean age of 25.3 years) who met all the criteria and underwent traditional speech therapy only.

All patients had already been submitted to phoniatric examination and showed cleft, thickening, or vocal nodules (Table 1); the groups were paired according to gender and age.

We followed the SIFEL (Società Italiana di Foniatria E Logopedia—Italian Society of Phoniatric and Speech Therapy) protocol,[12] and carried out a complete objective examination, evaluating global posture, respiration, laryngeal palpation (including Aronson's sign), voice perception (G.I.R.B.A.S. scale—General degree of dysphonia, degree of voice Instability, degree of voice Roughness, degree of voice Breathiness, degree of voice Asthenia, degree of voice Strain).[13] We performed a spectroacoustic voice examination, and we evaluated voice quality. Patients underwent a self-evaluation (Voice Handicap Index [VHI]) that observed the impact of vocal problematics over daily activities, the psychological impact, and the perception of voice characteristics.

Acoustic analysis

The computerized voice analysis was conducted using PRAAT software,[14] and the sample chosen for analysis was the emission of the vowel "a," ruling out the beginning and the end of the emission and observing the following: fundamental frequency (f0), disturbance measures (jitter, shimmer), and noise measurement (noise-to-harmonics ratio [NHR]).

All these evaluations were performed before and after the treatment.

Speech therapy

Each subject had 10 voice therapy sessions with an experienced speech therapist for a total period of 2 months, as for standard Italian National Health Care System protocol.

Vocal hygiene counseling was provided as an initial step of speech therapy. Vocal hygiene education included education on how the normal voice is produced, identification of individual vocal abuse patterns, education on how to reduce or eliminate the vocal abuse, emphasis on the importance of hydration, education on the adverse effects of irritants, and the influence of laryngopharyngeal reflux and certain medications. The speech therapy techniques applied varied according to phonatory behavior of the patient and aimed to reduce associated hyperkinetic behavior (anterior-posterior contraction, latero-lateral shortening of vocal tract) and to obtain the best possible vocal fold vibration.[14] Therapy was directed toward progressive development of optimal breathing, abdominal support, and gentle improvement of intrinsic muscle strength and agility, without supraglottic hyperfunctional compensation. Abdominal breathing was practiced to maintain appropriate subglottic air pressure, avoiding shallow, upper chest breathing, and phonation on residual air. Humming, nasal resonance exercises, yawning-sigh technique, and laryngeal manipulation were the techniques more frequently applied.

KT application

During their last week of speech therapy, patients of DG1 underwent KT. KT consists of a thin elastic tape that can be stretched up to 50% of its original length, resulting in lower restriction compared to conventional tapes. KT was applied in "Y" form over the anterior region of the neck (Figures 1 and 2). The literature on KT application in speech therapy is still in its infancy; thus, we found a very limited number of studies to look up while deciding on tape placement and duration of placement.

Voice is the product of the synergic work of internal and external muscles (supra and infrahyoid). The cricothyroid muscle stretches as well as tenses the vocal ligaments, and it is fundamental for the creation of forceful speech. This muscle originates from the anterolateral aspect of the cricoid cartilage and attaches to the inferior margin and inferior horn of the thyroid cartilage.

Because very few studies and guidelines addressed the issue of tape placement, we decided to apply KT in the anterior neck considering both the anatomy and the physiology of the

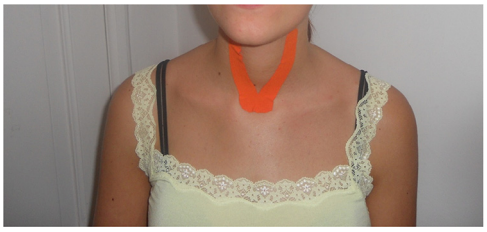

FIGURE 1. Kinesio taping application.

FIGURE 2. Kinesio taping application.