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# An alternative treatment for notalgia paresthetica: Kinesio taping



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**Abstract**
Aim: This study aimed to examine whether kinesiotaping tape is effective in improving the symptoms of patients diagnosed with notalgia paresthetica.
Materials and Methods: Twenty-three patients with notalgia paresthetica were included in the study. Kinesio taping was applied four times, with 5-day intervals for each patient. The LANSS (Leed Assessment of Neuropathic Symptoms and Signs) pain scale was used to evaluate the pattern of pain, and the VAS (visual analog scale) for pain and itching. Also, an itching symptom was evaluated using by 5-point Likert scale. The diameter of the lesion was measured with a standard measuring tape. The color of the lesions was assessed visually. Lesions were photographed at all follow-ups. All evaluations were made before and after the intervention by the same physician.
Results: After kinesio tape treatment, VAS pain, VAS itch, and LANSS mean and LANSS median values were significantly lower than pre-treatment values, respectively ($p<0.001$, $p<0.001$, $p<0.001$, and $p<0.001$). İn addition, the median values of lesion diameter were found to decrease after treatment, but the difference was not statistically significant ($p=0.058$). Out of the 23 patients, one did not show any color change in lesions, 12 had a 40% color change, 5 had 20%, and 5 had 60% level of color change.
Discussion: It was concluded that kinesio taping may be an alternative treatment option for patients with notalgia paresthetica.

**Keywords**
kinesiotaping, notalgia paresthetica, pain, itching

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This study was approved by the Ethics Committee of the University of Health Sciences Adana City Training and Research Hospital (Date: 2022-04-24, No: 1800)

## Introduction

Notalgia paresthetica (NP) is a common unilateral sensory neuropathy characterized by chronic pruritus, intense focal itching, and occasionally burning pain, paresthesia, hyperesthesia, and sensitivity in the interscapular and paravertebral region. It follows a course with periodic remissions and exacerbations [1]. Lesions are typically located near the scapula on the back, presenting as itchy, sometimes keratotic or atrophic, vaguely defined, pigmented macules that usually do not cross the midline. In some cases, the lumbar region may also be affected [2]. This disorder is typically unilateral, though bilateral distribution of symptoms in the interscapular region has also been reported [3]. NP has been reported predominantly in middle-aged female patients. Managing NP is challenging due to the unclear pathogenesis of NP and the lack of a well-defined treatment protocol. Traditional treatments like antipruritics, antihistamines, and topical corticosteroids are ineffective against the neuropathic component of notalgia. Although the exact etiology of NP is not fully understood, it is thought to be a compression neuropathy of the cutaneous branches of the dorsal primary rami of the thoracic spinal nerves (T2-T6). These nerves travel at a right angle through the multifidus spinae muscle towards the epidermis, making them more susceptible to injury. Therefore, it suggests that the underlying cause may be nerve entrapment [4-6]. Pathologies seen in spinal nerves may result from degenerative changes in the spine (e.g., osteoarthritic changes, vertebral hyperostosis, kyphosis, or entrapment of muscle fibers). Unfortunately, there is not always a strong correlation between spinal pathology shown in imaging and the typical clinical presentation.

Kinesio tape does not contain any medication and is made of elastic polymer fibers wrapped in 100% cotton fibers. It is an elastic tape that does not stretch transversely but can stretch between 40-60% longitudinally [7]. Many theories and hypotheses have been proposed regarding the mechanism of action of kinesio taping. The most widely accepted is the layer theory, according to which the application of kinesio taping on the skin creates wrinkles, lifting the epidermis upwards, leading to an increase in the thickness of the dermis. This change affects proprioception and somatosensory impulses in the dermis [8].

In this study, kinesio taping's effects were considered with the aim of eliminating compression neuropathy. We sought to provide additional treatment benefits by utilizing the widely proven 'kinesio tape' in the physiotherapy clinic for its space-opening and circulation-enhancing properties in this group of patients.

## Materials and Methods

The patients with NP between the ages of 18-65 who applied to the dermatology clinic Adana City Training and Research Hospital were consecutively enrolled in the study. Exclusion criteria were as follows: Pregnant and breastfeeding individuals, those with additional diseases that may cause neuropathic pain, such as diabetes, those with herpes-related shingles, polyneuropathy, and entrapment neuropathy, those with additional skin diseases in the symptomatic area, and those allergic to plaster.

In this prospective study, patients with NP were evaluated by the same dermatologist and physical medicine and rehabilitation physician at each visit. The diameter, color, and localization of the lesion and the duration of symptoms were recorded. The diameter of the lesions was measured with a tape measure at the widest part. The color of the lesions was assessed visually. Lesions were photographed at all follow-ups.

All patients were evaluated by the visual analog scale for pain and itch intensity, the 5-D Itch Scale, Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) score, and global treatment efficacy at each visit. Patients were kinesio taping four times every five days, and after the taping ended (on the 20th day), the tape was removed, and they were called for a follow-up after one week. During the study, no exercises or other additional treatments were recommended.

The pain and itch intensity of the patients were evaluated by VAS (Visual Analog Scale). On the 10-centimeter-long VAS scale, 0 indicates no pain or no itch, while 10 represents the most severe pain or itch [9]. The patients were asked to mark the point on the scale that best represented their pain or itch level.

Neuropathic pain was assessed by LANSS. The instrument consists of two sections. One of them is a pain questionnaire, the other is a sensory test. A score of 12 or higher on the LANSS scale indicates neuropathic pain [10]. The validity and reliability of the Turkish version of the LANSS scale have been previously established [11].

The 5-Dimensional Itch Scale evaluates the duration, degree, course, and distribution of itch experienced in the last two weeks, and the disability caused by itching. The total score of the scale varies between a minimum of 5 points (no itching) and a maximum of 25 points (maximum intensity). The duration, degree, direction, and disability of itching are scored between 1 and 5 points. The disability dimension score is obtained from the average of the total score of the four subsections (sleep, social/leisure, housework/errands, work/school). The distribution score was obtained by examining 16 body parts according to the number of affected body parts, with a maximum of 5 points, 0–2: 1 point, 3–5: 2 points, 6–10: 3 points, 11–13: 4 points, and 14–16: 5 points. The Turkish validity and reliability study of the scale was conducted by Ersoy et al. [12].

Kinesio® Tex Gold™ (Kinesio Holding Corp., Albuquerque, USA) was used as the taping material. Before the application, the skin was cleaned to remove oils, lotions, and moisture that could limit the adhesive's ability to stick. The kinesio tape procedure was applied using the technique described by Kase and colleagues and was performed by a certified physician. The space correction technique was used for the kinesio tape method [8]. Patients were applied four I strips of tape, 5 cm in width and 0.5 mm in thickness, with 25% stretch so that the lesion would be covered in a star shape with kinesio tape (figure 1).

This study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from the patients, and detailed information about the study was included in the consent form.

### *Statistical Analysis*

Continuous variables were expressed as mean ± standard deviation and/or median (min-max), while categorical data were

presented in numbers and percentages. The normality analyses of continuous variables were performed using the Kolmogorov-Smirnov Goodness of Fit Test. Pre- and post-treatment comparisons for continuous variables that followed a normal distribution were made using the Paired Samples T-test, and for those that did not follow a normal distribution, the Wilcoxon Signed Ranks Test was used. Analyses were conducted using IBM SPSS Statistics Software version 27.0 (IBM Corporation, Armonk, NY, USA). The level of statistical significance was set at $p<0.05$.

*Ethical Approval*

This study was approved by the Ethics Committee of the University of Health Sciences Adana City Training and Research Hospital (Date: 2022-04-24, No: 1800).

**Table 1.** Some clinical and demographic characteristics of patients

| | Mean±SD / n (%) (n= 23) |
|---|---|
| Age (years) | 47.9±8.9 |
| Symptom duration (years) | 7.4±4.7 |
| Educational status (n,%) | |
| Primary school | 7 (30.4%) |
| High school | 9 (39.1%) |
| University | 7 (30.4%) |
| Lesion location (n,%) | |
| Upper thoracic | 14 (60.9%) |
| Lower thoracic | 9 (39.1%) |
| Lesion distribution (n,%) | |
| Unilateral | 16 (69.6%) |
| Bilateral | 7 (30.4%) |
| Hypoesthesia (n,%) | |
| Absent | 7 (30.4%) |
| Present | 16 (69.6%) |
| Hyperesthesia (n,%) | |
| Absent | 14 (60.9%) |
| Present | 9 (39.1%) |
| Pain (n,%) | |
| Absent | 0 (0.0%) |
| Present | 23 (100.0%) |
| Itching (n,%) | |
| Absent | 2 (8.7%) |
| Present | 21 (91.3%) |

SD: standart deviation

**Table 2.** Comparison of pre-and post-kinesio tape treatment average/median values of VAS pain, VAS itch, LANSS, lesion diamete

| | Pre-treatment (n=23) | Post-treatment (n=23) | p |
|---|---|---|---|
| VAS pain (Mean±SD) | 7.04±1.52 | 2.86±2.15 | <0.001* |
| VAS itch (Mean±SD) | 6.56±2.57 | 4.26±2.37 | <0.001* |
| LANSS (Mean±SD) | 15.82±4.03 | 11.08±3.84 | <0.001* |
| LANSS [median (min-max)] | 24.0 (8-24) | 8.0 (0-24) | <0.001** |
| Lesion diameter (cm) [median (min- max)] | 63.0 (9-220) | 60.0 (9-220) | 0.058** |

* Paired Samples T-test, ** Wilcoxon Signed Ranks Test, VAS: visual analog scale, LANSS: leeds assessment of neuropathic symptoms and signs

**Figure 1.** Kinesiotaping with the space correction technique

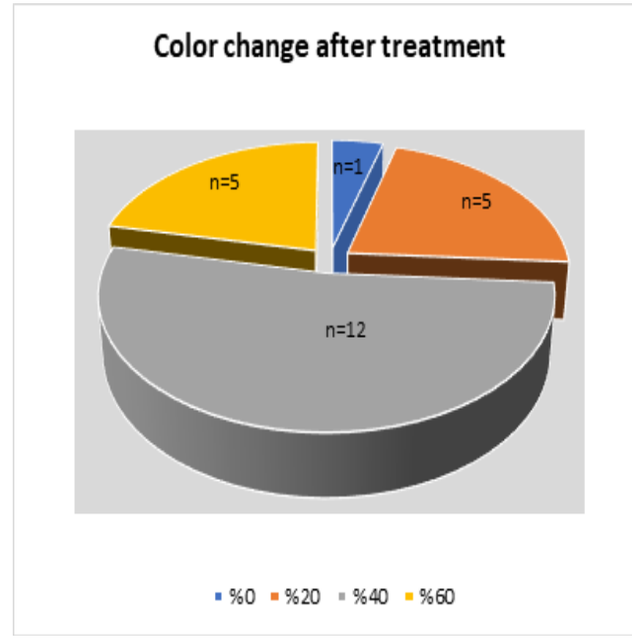


**Figure 2.** Distribution of color change in lessions after treatment

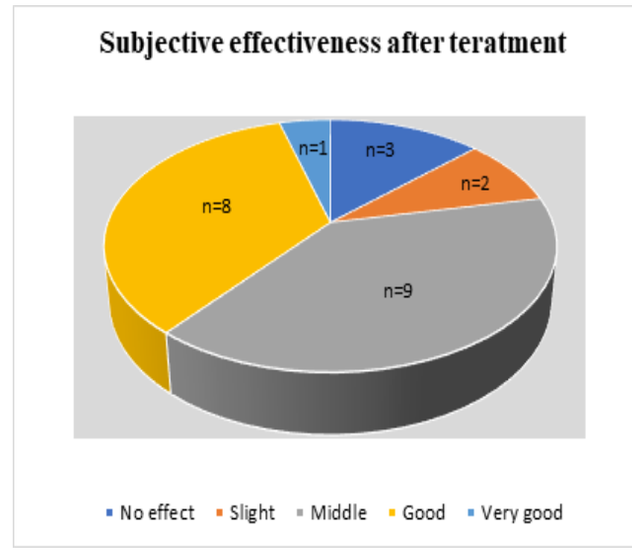


**Figure 3.** Subjective effectiveness after treatment

## Results

Twenty-three female patients with NP and treated with the kinesio tape technique in the study. Table 1 shows some clinical and demographic characteristics of patients.

After kinesio tape treatment, VAS pain, VAS itch, and S-LANSS mean and S-LANSS median values were significantly lower than pre-treatment values, respectively ($p<0.001$, $p<0.001$, $p<0.001$, and $p<0.001$). In addition, the median values of lesion diameter were found to decrease after treatment, but the difference was not statistically significant ($p=0.058$) (Table 2).

Out of the 23 patients, one did not show any color change in lesions, 12 had a 40% color change, 5 had 20%, and 5 had 60% level of color change (Figure 2).

Among the 23 patients, 3 showed no subjective effect of the treatment, 1 had a very good, 8 had a good, 9 had a moderate, and 2 had a slight level of subjective effectiveness (Figure 3).

## Discussion

This study investigated whether kinesio taping was effective in improving the symptoms of patients with NP. After kinesio taping treatment, significant improvements were found in pain, pruritus, and LANNS values compared to pretreatment. It was also observed that the median values of the lesion diameter decreased after treatment, but the difference was not statistically significant. No similar study was found in the literature.

NP is a sensory neuropathy characterized by pain, paresthesia, pruritus, and numbness localized to the back [13]. The exact cause of NP is not yet fully understood, but it is suspected to be multifactorial in origin. This may include factors such as muscle compression, increased nerve density in the skin, and underlying spinal pathologies. These elements are thought to contribute to the development of the condition by affecting the posterior cutaneous branches of the T2-T6 spinal nerves [4]. Constant rubbing and scratching to relieve discomfort can lead to characteristic skin changes, including hyperpigmented patches and thickening of the skin (lichenification) in the affected area of the back. The chronic nature of NP, consisting of remissions and exacerbations, can negatively affect the patient's quality of life. Therefore, it is important to correctly recognize and treat NP, especially since it has been reported to be underdiagnosed in a few cases [3].

Currently, there are no specific treatment guidelines for NP. Treatment approaches are largely derived from those used for other neuropathic pain conditions [14]. Current therapeutic options range from topical and systemic medications to various procedural interventions that may or may not include pharmacological components. However, the effectiveness of these different treatment strategies in NP has not yet been fully defined.

For the treatment of NP, topical treatments such as capsaicin, as well as oral treatments such as gabapentin, oxcarbazepine, amitriptyline, intralesional corticosteroids, lidocaine injections, and even cutaneous botulinum toxin type A injections have been suggested [15]. Most of these therapeutic options have been described in a limited number of patients with variable treatment outcomes [4].

In one study, eleven patients received different physical therapy modalities, including hot packs, transcutaneous electrical nerve stimulation (TENS), and ultrasound therapy; seven of the cases received dry needling therapy; four patients received a home exercise therapy program (stretching and resistance exercises); and three of the patients received kinesiotherapy. This study showed a significant decrease in VAS and douleur neuropathique 4 (DN4) scores after treatment [13]. Another study, including 15 patients, found a significant decrease in the mean pruritus score after conventional TENS therapy [16]. Stretching and strengthening of the neck and shoulder girdle muscles and posture exercises were recommended as exercise therapy. Manual therapy and many physical therapy modalities, especially TENS, were reported to be successful in treatment [17].

Additionally, a case report published a significant decrease in DN4 and 5-D itch scale scores in an NP patient following three sessions of dry needling treatment [18].

In another study conducted with 80 patients, lidocaine injection around the lesion was evaluated, and it was reported that the underlying cause was cervical degenerative pathologies due to herniated nucleus pulposus, especially at C6-C7, and local lidocaine injection could be a good treatment option for itching and pain. In the literature, it was emphasized that especially C4-C6 spinal pathologies play a role in the etiology, and therefore, the cervical region should be focused on, and patients' neck pain should be questioned in the dermatology clinic [6].

Another study investigating the effectiveness of neural therapy in NP showed that, similar to our study, neural therapy is a promising complementary treatment method in reducing pain, neuropathic pain, and pruritus in patients with NP, and also improves quality of life [19].

A study examining the clinical experiences of NP patients revealed that there is still a need for an effective treatment option, especially for pruritus [20]. In our study, significant improvements were found in pain and itch scores.

In the literature, there is only one case-level publication evaluating the effectiveness of kinesiology taping for NP, and similar to our study, it found that kinesiology taping was effective [21]. In our study, kinesiology taping treatment was applied to 23 patients, and the results were evaluated, which makes our study valuable in terms of contributing to the literature.

Kinesiotaping is proposed to have physiological effects on the blood, lymphatic circulation, muscles, joints, and fascia. Kinesio taping increases the thickness of the dermis, providing more space for free nerve endings that are sensitive to pain, touch, pressure, and temperature. Kinesio taping is applied in various diseases in physiotherapy clinics and has been reported to yield successful results [22-24]. Studies have shown significant improvements in VAS and DN4 scores and dynamometric grip strength measurements with kinesio taping in patients diagnosed with carpal tunnel syndrome [25].

Although notalgia paresthetica is known to be a rare dermatologic disorder, we believe that this study will increase the awareness of clinicians by questioning the symptoms of pain, pruritus, and paresthesia in patients with chronic neck and back pain and performing skin assessments in physical therapy clinics, and that kinesio taping will be an alternative option in

the treatment of patients.

*Limitations*

Neuropathic pain and itching levels were documented through questionnaires, lesion diameter measurements were taken with a measuring tape, and color change was assessed visually by a specialist dermatologist. A parametric evaluation is needed in this regard. Patients were evaluated one week after the completion of treatment, and the results depend on this period; new studies evaluating a larger number of patients and observing long-term effects are needed.

*Conclusion*

Kinesio taping is a treatment method that is subjectively found to be effective and well-tolerated by patients with NP.

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***Scientific Responsibility Statement***

*The authors declare that they are responsible for the article's scientific content, including study design, data collection, analysis and interpretation, writing, and some of the main line, or all of the preparation and scientific review of the contents, and approval of the final version of the article.*

***Animal and Human Rights Statement***

*All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.*

***Data Availability Statement***

*The datasets used and/or analyzed during the current study are not publicly available due to patient privacy reasons but are available from the corresponding author on reasonable request.*

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***Conflict of Interest***

*The authors declare that there is no conflict of interest.*

***Ethics Declarations***

*This study was approved by the Ethics Committee of the University of Health Sciences Adana City Training and Research Hospital (Date: 2022-04-24, No: 1800)*

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