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Physiotherapy Influence on a Knee Cap with a Toe

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Abstract

Due to skin lesions and overstretched periarticular tissues, hammertoe, one of the most common toe deformities, is painful. In addition, it causes difficulty selecting footwear, an unsightly foot appearance, and a decline in personal satisfaction. The most common treatment for rigid and advanced deformities is surgery, which is extensively covered in the literature. Moderate therapy ought to be considered if the progressions in the interphalangeal and metatarsophalangeal joints are adaptable—that is, they undergo revision without causing pain—or if medical intervention is impossible. In any case, this treatment strategy has not been concentrated on exhaustively. Part of the conservative treatment is the Kinesiology Taping (KT) method, which uses tape to correct deformities. The impacts of KT treatment on a female patient with hammertoes are examined in this report. Materials and Methods: Prior to KT application, immediately following tape application, and after tape removal after a month of use, foot loadings (baropodometric platform) and anthropometric foot measurements (three-dimensional scanner) are presented. Following the use of KT, parameters such as: There were changes in foot length, maximum foot load, and load under the metatarsal II-III area. Conclusion: Kinesiology tape is a great alternative for patients who do not wish to or are unable to undergo surgery because it appears to be a symptomatic method of treating the effects of a lesser toe deformity.

Keywords: Foot; Hammer toe; Lesser toe deformity; Toe; Anthropometry of foot

Introduction

The proximal interphalangeal (PIP) joint bends when the hammertoe is bent, and the MTP joint and DIP joint hyperextend in response (dorsiflexion). Toe deformities can initially be completely corrected; nonetheless, as the condition deteriorates, contracture of the periarticular designs might happen, bringing about unbending, unfixable disfigurements [**1**].

The study looked at 2662 adult Turks and found that 8.9% of them had smaller toe deformations. Adults in the United States have hammertoe and claw toe at rates of 18% and 2%, respectively, according to 2445 studies. Deformities are five times more common in women than in men, and they become more common as people get older (up to 50% in elderly patients). A family history of hallux valgus, joint inflammation in the MTP joint, rheumatoid joint inflammation, removal of the hallux, and neurological conditions that cause spasticity in the toes are additional risk factors. Unlucky footwear (shoes that are excessively short, free, or high-behaved) However, the majority of authors concur that the issue is multifactorial [**2,3**].

Pain, typically in the vicinity of the MTP joints, skin lesions like corns and nail problems, difficulty locating appropriate footwear, and an unsightly foot appearance that makes people feel embarrassed whenever their feet are exposed are the most common symptoms of deformities in the smaller toes. One of the additional symptoms is plantar plate injury, which is caused by peri articular tissue overloading. According to López-López's research, the condition of the foot, including hammer toe deformation, has an impact on quality of life. His research also demonstrates that, regardless of gender, older adults with fewer toe deformities have lower quality of life scores related to foot health. As a result, proper foot health management and care may be necessary to prevent lower toe deformity from appearing or developing. PIP Joint Arthoplasty, Arthrodesis of the Proximal Interphalangeal Joint, Flexor to Extensor Tendon Transfer, and Metatarsal Shortening (Weil) Osteotomy are among the numerous surgical options [**4,5**].

The Kinesiology Taping (KT) technique is a method for treating torment, further develop dissemination, and change the place of different body parts by applying adaptable tapes to explicit region of the body. The fact that the tape works continuously throughout the day and adheres to the skin for several days is a benefit. The patient and the musculoskeletal system should be examined before any tape is applied. Hip, knee, foot, and HV deformity-related pain syndromes may benefit from the KT method. KT can be used as part of a treatment plan or as a stand-alone strategy [**6**].

In hammer toe deformation, KT shortens the stretched joint capsule and supports the weak flexor digitorum brevis muscle. The application moves the toe mechanically into the right position when standing, walking, or taking a break.

The contextual investigation's objective was to evaluate and investigate the impact of the Kinesiology Taping application on the likelihood of moderate treatment to correct hammer toe deformation. Even though this is only demonstrated in one instance, foot professionals like physical therapists and orthopedic surgeons may find it particularly significant. This objective is one component of the search for efficient conservative treatment options that can assist individuals who are unable to undergo surgery for various reasons [**7-10**].

There hasn't been any research done on how kinesiology tape affects hammer toe deformation. Using a 3D scanner, the purpose of this study is to document the impact of patch application on the position of the flexed toe and the way the individual parts of the feet are loaded while standing and walking.

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Hammer toe

A 75-year-old woman had bilateral hammertoe deformities on her second and third toes. She had a BMI of 21 kg/m2. The patient said that the aggravation between the forefoot and the toes had been there for a really long time and continued to deteriorate. The patient's right foot second toe disfigurement (RF) was joined by day to day torment that deliberate 4 focuses on the Visual Simple Scale. The majority of the time, the patient experienced pain while walking in shoes. Abrasions and redness were present on the dorsal side of the toes, at the level of the PIP joints. The resultant toe (Greek foot) was longer in both feet. The MTP and DIP joints were found to be fully mobile during a manual examination, while the PIP joints had full range of motion despite being slightly stiff in dorsiflexion. There was a slight sensation of tenderness when the plantar plate's vicinity was touched. The Dorsal Drawer Test, the Digital Plantarflexion Test, and the Plantar Plate Provocation Test were all negative for pain. The musculoskeletal system examination had no effect on the biomechanics of the lower limb axis.

The patient's deformities were flexible enough to allow for conservative treatment with manual therapy and Kinesiology Taping (the interphalangeal and metatarsophalangeal joints' range of motion makes it possible to correct the toe position without pain).

The patient was examined prior to the application of the tape (T0), immediately following its application (T1), and 32 days later (T2) following the application of Kinesiology Taping. Prior to the assessment, the patient was instructed to discontinue the tape application.

Discussion

A novel therapeutic approach that demonstrates the efficacy of using KT to alter the foot and toe positions of a person with hammertoes as well as the load placed on various plantar areas of the foot in both static and dynamic conditions is presented here. A hammertoe misshapening can be brought about by various things, for example, being singled out some unacceptable foot, wearing shoes that are excessively close, having a hereditary inclination, being overweight, or having hallux valgus, which comes down on the two toes together. One of the factors that contributes to the formation of the hammertoe in the second toe is the increased length of metatarsal II, which is characteristic of the so-called Greek foot. Fleischer claims that a longer metatarsal II puts additional strain on the MTP joint and metatarsal head. As a result, plantar plate injuries, particularly MTP joint hyperextension, which prevent excessive bone-to-bone movement, may be more likely. Weber confirms that a longer metatarsal II is linked to increased surface pressure. Hulstaert make the connection between a deformity in the smaller toes and damage to the plantar plate, which typically occurs in conjunction with damage to the collateral ligaments. At first, this causes oedema and metatarsalgia. Later, the toe's biomechanics are disrupted, resulting in the toe's incorrect positioning (hammer, claw, crossover, or mallet toe). The authors of the aforementioned studies found that the Greek foot had a higher load under the metatarsals II and III, which may have contributed to the deformity. In order to alleviate metatarsalgia, soft tissue overload, calluses, and skin corns, the hammertoe position was corrected with KT. Additionally, less strain was placed on this region. At T1 and T2, the load on the metatarsals II–III decreased, but it continued to be higher than that on the metatarsals I–IV–V, which may be due to the length of the bone.

Conclusions

In patients with hammertoe, kinesiology tape appears to temporarily alter the position of the small toes. The patient is shown that the correction in the position of the toes has a positive effect on the foot's everyday functioning and reduces pain when the tape is applied to the patient's lesser toes. Consequently, patients who are unable or unwilling to undergo corrective surgery can benefit from this conservative treatment option and improve their quality of life. However, additional research on a group of patients that is followed over time is required in order to evaluate the efficacy of the Kinesiology Taping method for treating patients with hammer toe deformities.

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