Case Report

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Needle Knife Treatment of Superficial Peroneal Nerve Entrapment Combined with Lumbar Disc Herniation: A Case Report

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ABSTRACT

This study reports the diagnostic and therapeutic course of a patient with superficial peroneal nerve entrapment combined with lumbar disc herniation. The patient complained of low back pain and numbness of the left lower extremity, and imaging showed a posteriorly protruding lumbar 4/5 intervertebral disc, which was initially diagnosed as a lumbar disc herniation compressing the L5 nerve root. However, the patient's repeated treatment for lumbar disc herniation was ineffective, and further examination revealed that it was actually superficial peroneal nerve compression. In order to avoid diagnostic confusion, Prof. Li Zhanxin innovatively proposed the straight leg raising attenuation test to differentiate whether the radiating numbness and pain in the lower limbs were caused by the lumbar disc herniation. In the end, through the needle knife on the scar tissue stripping and loosening, lifting the superficial peroneal nerve compression, the patient's symptoms were relieved, reflecting the combination of modern medicine and Chinese medicine holistic concept of treatment ideas.

Keywords: Needle Knife; Lower Extremity Numbness; Lumbar Disc Herniation; Straight Leg Raise Test; Straight Leg Raise Reduction Test; Superficial Peroneal Nerve Entrapment

Introduction

Lumbar disc herniation [1] is a clinical disease in which the fibrous annulus of lumbar intervertebral disc ruptures and the nucleus pulposus protrudes due to various reasons, thus compressing or irritating the nerve root or dural sac, and triggering lumbar pain and radiating pain in the lower limbs as the main manifestation. An epidemiological study showed [2] that the prevalence of lumbar disc herniation is closely related to age and occupation, especially in the working population between the ages of 25 and 39, with a detection rate of about 13.93%, posing a serious threat to people's health and quality of life. Straight Leg Raise Test (SLR) [3] is one of the most commonly used clinical tests for lumbar disc herniation, and it has significant advantages in the diagnosis of lumbar disc herniation: firstly, SLR can effectively stimulate the sciatic nerve, and it can help to determine the nerve root compression by observing whether the patient has radiating pain in the lower limbs and the degree of the pain; secondly, it does not require special equipment and is easy to be used at all levels of medical institutions.

Secondly, the method does not require special equipment, which makes it easy to promote its use in medical institutions at all levels. However, the SLR test also has some drawbacks [4]: its high sensitivity and low specificity may lead to false-positive results. In this article, we developed a new physical examination method (straight leg raising attenuation test) based on the existing physical examination to better identify whether lower extremity numbness is caused by lumbar disc herniation and applied it to a patient with lumbar disc herniation combined with superficial peroneal nerve entrapment, as reported below.

Case Presentation

The patient is a 58-year-old male who presented to the clinic on October 3, 2024, complaining of numbness of the left lower extremity for 4 years and low back pain for 1 month. History of present illness: The patient complained of numbness of the left lower limb without obvious triggers 4 years ago, the numbness was mainly concentrated in the left dorsum of the foot lateral 3-5 toes, and the symptom was aggravated by prolonged walking and standing, and the patient was diagnosed with lumbar intervertebral disc herniation with a higher probability during the consultation with a number of tertiary hospitals, and the symptom did not see significant improvement after treatment with acupuncture and tui-na.1 month ago, no obvious cause of lumbar pain, accompanied by numbness of the left lower limb, self-applied ointment did not see any improvement, now in order to seek further treatment in our hospital outpatient consultation.

Current symptoms include lumbar pain, numbness of the left lower extremity, especially in the left dorsum of the foot lateral 3-5 toes, numbness of the dorsum of the foot aggravated by prolonged walking and standing, no limitation of backward leaning and bending, no intermittent claudication, no weakness of the lower extremities, and normal bowel movements. Physical examination showed no obvious scoliosis of the lumbar spine, lumbar paraspinal muscle tension and tenderness (+), 10mm×50mm scar on the lateral side of the left ankle joint (Figure 1), Tinel's sign on the superficial peroneal nerve course on the lateral side of the left ankle (+), straight-leg raising test (+), Straight Leg Raise Strengthening Test ±, "4" test (-), pelvic squeeze test (-), patellar tendon test (-), and patellar tendon test (-), patellar tendon reflex was present, Achilles tendon reflex was present, muscle strength, muscle tone, skin sensation of both lower limbs did not show obvious abnormalities, and pathological reflexes were not elicited. Auxiliary examination showed lumbar CT (Figure 2): 1. lumbar degeneration 2. lumbar 4/5disc herniation toward the back. Diagnosis: superficial peroneal nerve entrapment. Treatment plan: needle knife treatment. Needle knife specification: disposable 0.8*50mm Hanzhang brand needle knife.

Figure 1: Drawing of the patient's foot and ankle scars.

Figure 2: Patient's lumbar spine CT.

The operation steps are as follows: the patient and the doctor prepare, the doctor instructs the patient to take the supine position, mark the position of the needle knife into the needle, wear a good hat, gloves, routine disinfection, select the left ankle lateral scar as the entry point, oblique needle, the needle knife into the scar tissue, the scar tissue fibrous adhesion direction of the vertical loosening, the depth of the needle for the depth of about for 5-40mm.When entering the needle, the operator can feel a sense of stagnation and obstruction under the needle, which is the scar tissue fibrous adhesion, after the completion of the relaxation, the operator can feel a sense of loosening under the needle, and then the ankle in all directions to eliminate the superficial peroneal nerve residual tissue compression, the patient felt numbness and discomfort symptoms subsided or disappeared, after the relaxation of pulling out the completion of the entire operation, the end of disinfection again, bandage, and the patient is asked to avoid water for 24h, preventing infection. Follow-up on November 3, 2024, the patient had no lower limb numbness, and was advised to avoid prolonged walking and standing, and to follow up for discomfort.

Discussion

Superficial peroneal nerve entrapment [5] is a condition in which the superficial peroneal nerve is mechanically compressed at the site where it exits the deep fascia, leading to nerve conduction dysfunction and triggering symptoms such as pain, numbness, and abnormal sensory function in the anterolateral calf and dorsum of the foot. Its pathogenesis may be related to factors such as high pressure in the fascial compartment, local soft tissue injury, and anatomical narrowing at the fibular tuberosity. The symptoms of this disease and lumbar disc herniation have similarities, a single occurrence is not difficult to identify, but if the two diseases occur at the same time, inexperienced people are prone to miss the diagnosis, misdiagnosis of the situation, the clinical should pay attention to the identification [6].The treatment concept of this case is based on diagnosis and anatomical foundation [7,8], focusing on diagnosis. The patient came to the clinic with the complaint of "lumbar pain and numbness of the left lower extremity", and the numbness of the left lower extremity of the patient was mainly concentrated in the dorsum of the left foot on the lateral side and in the 3-5 toes, which, combined with the patient's symptoms, physical examination (positive straight leg raising test) and imaging (lumbar 4/5), was consistent with the diagnosis of clinical lumbar disc herniation and compression of the L5 nerve root.

In this case, the diagnosis has basically been confirmed, but the patient repeatedly for lumbar disc herniation treatment efficacy is not significant, the reason for this is superficial peroneal nerve entrapment, and the patient's straight leg raising enhancement test (±), on behalf of the lumbar intervertebral disc herniation may be the result of the compression of the L5 nerve root, or it may be the lumbar or gluteal muscle strains to form the muscle along the direction of the alignment of the tensor fasciae latae caused by the clinic is easy to confuse. Prof. Li Zhanxin believes that the straight leg raising strengthening test is prone to false-negative, due to the straight leg raising strengthening test is lowered by about 5° when the straight leg raising causes pain, and then suddenly foot dorsiflexion causes lower limb symptom aggravation as a positive sign, but it is more difficult to control about 5°, in order to solve the problem of this kind of false-negative, Prof. Li Zhanxin innovatively put forward the straight leg raising weakening test. The operation process is as follows: patients lie on their backs, legs stretched out flat on the bed, the operator keeps one hand on the dorsal side of the knee to keep the knee straight, and the other hand dorsiflexes the ankle, respectively, to elevate the single leg, when the leg in the process of elevation of the lower limb numbness or pain and other discomforts, and then release the dorsiflexed ankle, so that the ankle is in a natural state of relaxation, if the patient's lower limb radiating pain symptoms are relieved or disappeared, suggesting that straight-leg elevation If the patient's lower limb radiating pain symptom is relieved or disappears, it is suggested that the straight leg elevation test is negative, which indicates that it is very likely to be caused by the muscles related to dorsiflexion of the foot below the knee joint (such as tibialis anterior muscle and extensor digitorum longus muscle) being pulled along the direction of travel; if the lower limb radiating pain symptom still exists after the dorsiflexed ankle joint is put down, it is suggested that the straight leg elevation test is positive, which is indicated that it is caused by the lumbar disc herniation compressing nerve root.

The purpose of this test is to distinguish whether the lower limb radiating numbness pain is caused by lumbar disc herniation. When the straight leg raising test (+) and the straight leg raising attenuation test (-), i.e., the lower limb numbness and pain symptom is not caused by lumbar disc herniation, but may be caused by lumbar or gluteal muscle strain to form the muscle pulling pain along the direction of the walkway (easy to be mixed up with the radicular radiculopathic pain), it is This is a good way to distinguish whether the symptoms are radicular or not, and effectively avoid the false-negative straight leg raising test that leads to unclear diagnosis. In this case, under the guidance of modern medical theories, based on anatomical and diagnostic basis, and innovated under the existing physical examination, the use of needle knife on the scar tissue stripping and loosening, lifting the pressure on the superficial peroneal nerve, so as to solve the symptoms, under the guidance of the holistic concept of traditional Chinese medicine, to do the review of the evidence to find the cause, and identification of the cause of the treatment.

Declaration of Interests

I, Li Zhan-Xin, declare that there are no conflicts of interest in relation to the manuscript titled "Needle knife treatment of superficial peroneal nerve entrapment combined with lumbar disc herniation: A case report" submitted to Biomedical Journal of Scientific & Technical Research. I confirm that the results and interpretations reported in the manuscript are original and have not been plagiarized. I certify that I have read and understand the "Biomedical Journal of Scientific & Technical Research"conflict of interest policy, and I understand

that failure to disclose a conflict of interest may result in the manuscript being rejected or retracted. I also certify that I have disclosed any financial or non-financial relationships that may be interpreted as constituting a conflict of interest in relation to this manuscript. I understand that this information will be subject to peer review, and I am willing to provide further information or clarification if required. I confirm that I have no known conflicts of interest that would influence the results or interpretation of the data presented in this manuscript, and I understand that failure to disclose a conflict of interest is unethical and may result in sanctions being imposed on me.

Consent for Publication

Informed consent for publication was obtained from every participant.

Data Availability

Not applicable.

Competing Interests

The authors declare that they have no competing interests.

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Author Contributions

Conceptualization: Hu Zehao. Data curation: Hu Zehao. Formal analysis: Li Zhanxin. Investigation: Li Zhanxin. Methodology: Hu Zehao. Software: Hu Zehao. Validation: Li Zhanxin. Visualization: Li Zhanxin. Writing - original draft: Hu Zehao. Writing - review & editing: Hu Zehao, Li Zhanxin.

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References

1. Kreiner D S, Hwang S W, Easa J E, Daniel K Resnick, Jamie L Baisden, et al. (2014) An evidence-based clinical guideline for the diagnosis and treatment of lumbar disc herniation with radiculopathy. Spine J Off J North Am Spine Soc 14(1): 180-191.
2. Knezevic N N, Candido K D, Vlaeyen J W S, Jan Van Zundert, Steven P Cohen, et al. (2021) Low back pain. Lancet Lond Engl 398(10294): 78-92.
3. Camino Willhuber G O, Piuzzi N S (2024) Straight Leg Raise Test.: StatPearls. Treasure Island (FL): StatPearls Publishing.
4. Pesonen J, Shacklock M, Suomalainen J S, Juha Sampo Suomalainen, Lauri Karttunen, Jussi Mäki, et al. (2021) Extending the straight leg raise test for improved clinical evaluation of sciatica: validity and diagnostic performance with reference to the magnetic resonance imaging. BMC Musculoskelet Disord 22(1): 808.
5. (2022) Progress in diagnosis and treatment of common peroneal nerve entrapment syndrome. International Journal of Osteology 04(43): 242-246.
6. (2023) Visual needle knife treatment of lateral sural cutaneous nerve entrapment syndrome: a case report. Chinese Folk Therapy 19(31): 87-89.
7. (2021) Applied anatomy of cutaneous nerve around ankle joint and its significance. Journal of Local Surgical Surgery 05(30): 376-378.
8. Nee R J, Coppieters M W, Boyd B S (2022) Reliability of the straight leg raise test for suspected lumbar radicular pain: A systematic review with meta-analysis. Musculoskelet Sci Pract 59: 102529.

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