

ORIGINAL ARTICLE



Converging Healthcare & Technology

INTERNATIONAL JOURNAL OF CONVERGENCE IN HEALTHCARE

Published by
IJCIH & Pratyaksh Medicare LLP

www.ijcih.com

Comparison Between Subjective and Objective Assessment of Tumour Induced Foot drop post-surgical removal of common peroneal nerve sheath tumour: A Case Study

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Abstract

Tumour Induced Foot drop post-surgical removal of common peroneal nerve sheath tumour affects people of any age, schwannomas are more common in those between the ages of 30 and 60years. It is generally assessed subjectively using patient self-report or clinician-reported questionnaires. The goal of this study was to use TNS to objectively measure peroneal neuropathy symptoms in patients, as well as to investigate the concordance between TNS and subjective EORTC QLQ – C30 assessments. We measured neuropathic symptoms using subjective and objective methods, namely the EORTC QLQ – C30 and the total neuropathy score. The prevalence of patients with abnormal sensation was observed on TNS and EORTC QLQ – C30 grading. The level of concordance between quantitative and subjective measures was poor. Schwannomas Symptoms should be evaluated objectively as well as subjectively.

Keywords: Foot drop, common peroneal nerve, nerve sheath tumour, tumour-induced peripheral neuropathy, tuning fork.

Introduction

Schwannomas, also known as neurinomas or neurilemmomas, are the most common benign tumours that develop from peripheral nerves. Schwannomas in the peroneal nerves can go undetected for a long time before causing symptoms like dysesthesia, pain, and muscle weakness. ⁽¹⁾

Peroneal neuropathy is the most prevalent compressive neuropathy affecting the lower extremities. It is the third most frequent focal neuropathy, following median and ulnar neuropathies. Individuals who underwent high tibial

and fibular osteotomies saw a 2-27% increase in peroneal neuropathy. ⁽²⁾

Schwannomas originate from differentiated Schwann cells and are benign tumours of the nerve sheath. It is gender-neutral and occurs intermittently in over 90% of cases. Schwannomatosis occurs in a limited percentage of people and Neurofibromatosis (NF) Type 2 accounts for 3% of schwannomas. Five percent of cases include several meningiomas in different sites along with schwannomas, either with or without NF Type 2. Schwannomas of the common peroneal nerve are uncommon and so appear infrequently in literature. The patient with common peroneal nerve schwannoma experienced pain due to mechanical compression, despite often being asymptomatic. ⁽³⁾⁽⁶⁾

Common peroneal nerve neuropathy is characterised by weakness in ankle dorsiflexion, considerable toe

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extension, foot eversion, and sensory loss on the foot's dorsum. Foot drop refers to a severe lack of dorsiflexion and everting of the foot. This can cause a steppage gait, where the afflicted hip flexes more during the swing phase. Foot drop can occur suddenly or gradually over a few weeks, with varied severity. Patients with sensory abnormalities may experience burning, tingling, numbness, and discomfort from the anterolateral leg to the foot.⁽²⁾⁽⁵⁾⁽⁶⁾

Although minimally invasive methods like percutaneous cryoablation have been described, open surgery remains the preferred therapeutic option. Excision of the mass decompresses the afflicted nerve, whether intracapsular or extracapsular. In most situations, even marginal excision can alleviate symptoms. However, intracapsular excision is recommended to maintain nerve function.⁽¹⁾

Due to differences in evaluation, it might be difficult to characterize and follow cancer survivors. The best way to evaluate this serious illness that lowers the quality of life for many cancer survivors is up for debate.⁽⁴⁾

The European Organisation of Research and Treatment of Cancer Quality of Life Questionnaire core thirty-item scale (EORTC QLQ – C30) and patient reported outcomes are used to measure symptoms of neuropathy such as pain, numbness, and quality of life (Subjective Methods). However, pain evaluation might vary widely depending on the patient's mental and physical state. As a contrary, objective assessment methods such as total neuropathy score (TNS) are required. The goal of this study was to evaluate Schwannomas Symptoms objectively as well as subjectively.

Case Report

A 49-year-old Asian female having a swelling in the posterolateral aspect of the left knee, firm in consistency. Severe tenderness was present that was aggravated on touch or pressure. No other palpable swellings were present and there was no neurovascular deficit.

She was previously having a history of TB lungs two years back took proper medication for TB, Patient had presented with persistent pain and swelling along the posterior aspect of the left knee, with no increase in size over several months. MRI scans from October 2022 revealed a nodular lesion in the left knee 24x19x18mm in size, osteophytosis, osteochondral defects, sprained ACL, medial patellofemoral ligament, joint effusion, and degenerative changes. A subsequent MRI in May 2023 showed a nodular lesion in the popliteal region, likely of neural origin according to FNAC results. Further investigations included a chest X-ray and ultrasound-

guided trucut biopsy. The biopsy confirmed a spindle cell neoplasm, prompting referral for further evaluation. MRI scans in June 2023 revealed a soft tissue mass in the left thigh along the course of the common peroneal nerve, diagnosed as a nerve sheath tumour. Surgery was performed in June 2023, followed by a post-operative visit in July 2023 with a presentation of foot drop.

Patient presented in the OPD with a left foot drop and burning sensations in the left 1st and 2nd toe dorsal aspect after she underwent wide local excision in her left distal thigh under general anaesthesia for removal of common peroneal nerve sheath tumour. She was recommended for a foot splint, exercises, and NCV testing. NCV testing in August 2023 indicated severe sensorimotor axonal peroneal and sural neuropathy.

Methodology

For self-reported disability (subjective method) patient filled out The European Organisation of Research and Treatment of Cancer Quality of Life Questionnaire-Core thirty-item scale (EORTC QLQ – C30). This consists of six single items, three symptom scales, five functional scales, and a global health status/quality of life scale. No item appears in more than one multi-item scale; instead, each scale has an own set of items. With a 4-point Likert scale (1 = not at all, 2 = a little, Support Care Cancer 3 = quite a bit, and 4 = very much), patient will rate their symptoms during the past week. All items are linearly converted to a 0–100 scale with higher scores indicative of more symptoms.

For objective assessment method total neuropathy score (TNS) was used. It is a 6 -item tool that combines patient report of subjective sensory and motor symptoms, deep tendon reflexes, manual muscle testing of distal muscles, pin sensibility and quantitative vibration thresholds using a 128 Hz tuning fork. 0 -24 points, higher score indicates worse neuropathy.

Result

Substantial deterioration was shown by an objective test, which demonstrated a progressive loss of sensation related to both touch and vibration.

In TNS, the patient received a score of 15. SWM testing considerably enhanced the touch detection thresholds at all three test sites, and the vibration perception time during assessment was significantly shorter than at baseline.

Subjective assessment scores for EORTC QLQ – C30 is 75 out of 100 which represents high level of symptomatology/problems.

Discussion

We measured the degree of congruence between objective and subjective evaluations using the TNS and the EORTC QLQ – C30. The frequency of patients reporting abnormal sensations was about equal in both measurements. Diminished A-beta sensory afferent fibers produce touch and vibration-related sensations, which are sensed by activating cutaneous mechanoreceptors like the Merkel and Meissner corpuscles. Therefore, chemically induced neurotoxicity may be the cause of our patient's sensory deficits. The subjective and objective evaluations do not always agree or correlate. Both of these metrics should be used by clinicians to screen for symptoms in order to better understand the patient's condition.

Conclusion

Correlation coefficients and concordance rates between quantitative and subjective ratings were both poor. As a result, CIPN should be evaluated quantitatively as well as subjectively.

Conflict of Interest: There is no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscripts.

Sources of Funding: The author(s) received no financial support for the research, authorship and /or publication of this article.

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