Scrambler Therapy: A Novel Approach for Alleviating Immunotherapy-Induced Peripheral Neuropathy – A Case Report

Tyler Murphy, MD; Shiri Etzioni, MD
[1]Division of Palliative Medicine, Mayo Clinic Arizona

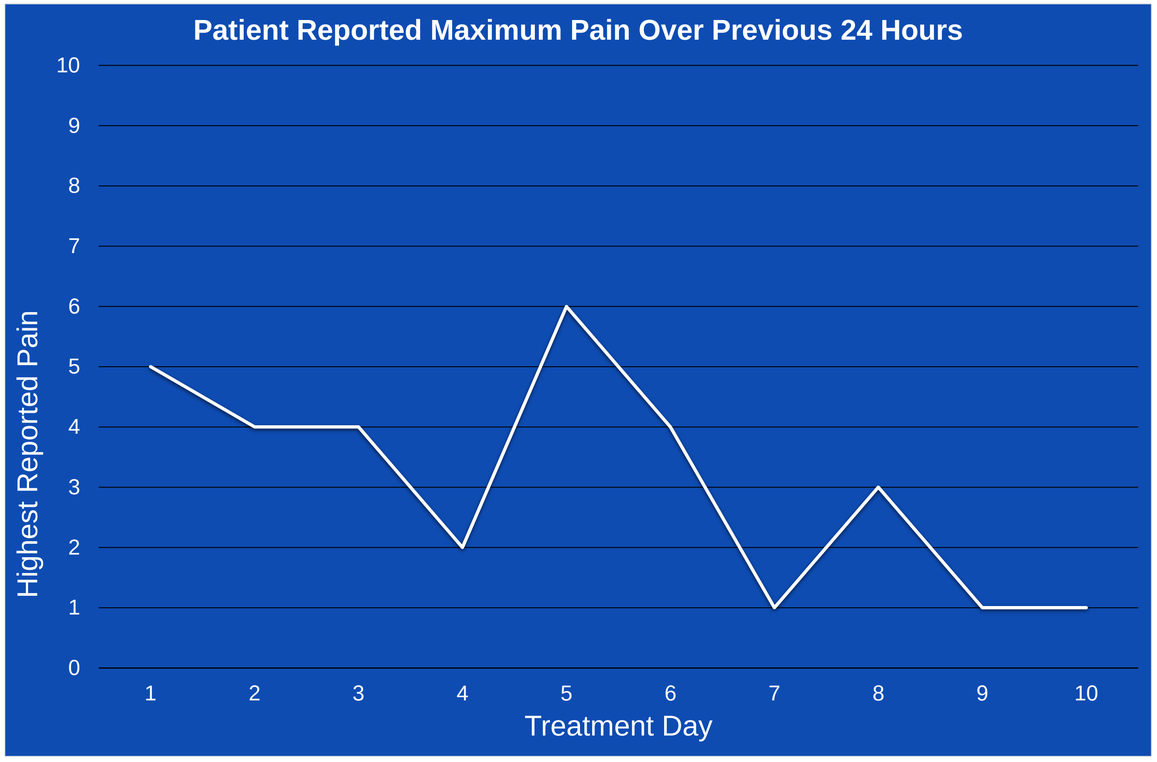
BACKGROUND AND PURPOSE

Immunotherapy has transformed the treatment landscape of many cancers, often leading to significant improvements in survival. Unfortunately, some patients face long term sequelae as a result of immunotherapy, including peripheral sensory neuropathies. Scrambler therapy is a novel, non-invasive form of neuromodulation that uses electrical stimulation to reprogram the central nervous system into interpreting chronic neuropathic "pain" signals as "non-pain" signals. It has been shown to be a helpful intervention for peripheral sensory neuropathies of various etiologies and can provide symptomatic relief for months to years. This case report highlights the potential use of Scrambler Therapy in the treatment of Immunotherapy-Induced Peripheral Neuropathy, a yet uninvestigated indication.

CASE DESCRIPTION

The patient is a 62-year-old woman with past medical history of malignant melanoma with metastasis to the brain, liver, and lymph nodes. She underwent treatment with chemotherapy which was discontinued due to toxicity (pyrexia and rash) and disease progression. She was then treated with dual immunotherapy nivolumab and ipilimumab followed by single agent nivolumab. She had an excellent response to treatment and remained under surveillance without the need for further active cancer directed therapies since.

The patient developed neuropathic pain while receiving immunotherapy. This neuropathic pain persisted for four years after treatment completion, negatively impacting her quality of life. She had constant burning pain in the soles of her bilateral feet, as well as intermittent pain radiating up her right upper extremity. The pain was often worse at night, as well as with heat, closed toe shoes, and walking on carpet. Pain improved with compression stockings and cooler temperatures. Although the pain did not limit her ability to ambulate independently; it did limit her ability to enjoy activities, such as hiking that required specific foot wear. She reported disrupted sleep and fatigue.



RESULTS

The patient was treated with scrambler therapy using the scrambler therapy device. Electrode pairs of standard EKG electrode stickers were placed directly on the skin surface across the L4 and L5 dermatomes proximal to her described area of neuropathic pain. During each of her 30 minute sessions, scrambler therapy electrical impulse was increased gradually to tolerance. Treatment was given daily for 10 consecutive weekday sessions, with a weekend break given between session 5 and 6. Symptoms were assessed daily prior to treatment, and a survey with patient reported outcomes was administered during sessions one, five, six, and 10. She noticed symptom improvement after the first session and continued to have progressive improvement daily. Interestingly, she experienced an acute spike in her nightly neuropathic pain on day 4, which she attributed to feeling so well that she over exerted herself with activity that day. This acute increase in pain quickly subsided with ongoing scrambler therapy. By the end of treatment, she reported significant improvement in ease of ambulation, day and nighttime pain severity. Treatment team to follow in the coming months to assess durable response to treatment.

DISCUSSION

Treatment with immunotherapy has led to survival times significantly exceeding traditional estimates and better tolerated treatment courses. Unfortunately, Immunotherapy does have treatment related adverse effects including sensory neuropathy which can manifest within weeks to months of initiating treatment or can develop at any time in the treatment course. It is important for palliative care physicians to have awareness of the potential adverse effects of immunotherapy and to collaborate with multidisciplinary services to explore durable and safe options for long-term management.

Scrambler therapy may be a particularly ideal option for patients who have an extended prognosis after immunotherapy but struggle with residual chronic neuropathic pain. Treatment is painless and no serious adverse effects have been reported. Unlike TENS therapy which typically provides pain relief for the duration of electrostimulation only, the analgesic effect of scrambler therapy has been shown to be more sustained. Additionally, randomized control trials have shown that patients who received scrambler therapy had significantly reduced need for analgesic medications including opioids. Scrambler therapy has been shown to have a positive impact on quality of life for patients with sensory neuropathies. The use of this modality for immunotherapy related neuropathy shows promise and warrants further investigations.

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