ABSTRACT

Introduction: Meralgia paresthetica is common but often remains unrecognized. The condition is managed with conservative therapy in most cases. Rarely, surgery is required. If it remains unresolved, it can lead to chronic pain. Research on rehabilitation therapy of meralgia paresthetica is sparse. Mirror therapy is a simple, noninvasive neurorehabilitation technique without side effects. We investigated the role of mirror therapy with brushing of thigh in our patient who has already been treated with various conservative therapies without any improvement. Our patient showed effective pain relief after mirror therapy.

Keywords: Chronic pain, Meralgia paresthetica, Mirror therapy.


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Conflict of interest: None

INTRODUCTION

Meralgia paresthetica is a nerve entrapment that may cause pain, paresthesias, and sensory loss within the distribution of the lateral cutaneous nerve of the thigh. Meralgia paresthetica is not rare, but is often unrecognized or misdiagnosed for other conditions, such as lumbar radiculopathy. Lack of consensus available on recognition and treatment of meralgia paresthetica imposes a challenge to diagnose and manage it correctly. L1 radiculopathy can also mimic meralgia paresthetica. Meralgia paresthetica is treated with conservative therapy in most cases. Various nonsurgical interventions include use of drugs, avoiding compression activities, physical therapy, local infiltration of nerve, and pulsed radiofrequency. Rarely, surgery (neurolysis and resection) is needed. If meralgia paresthetica remains unresolved, it can lead to chronic pain and permanent tingling or numbness of the anterolateral thigh. Central sensitization plays a role in it. The research regarding rehabilitation for meralgia paresthetica is sparse. To date, there is no comprehensive study assessing the efficacy of physical rehabilitation for the treatment of meralgia paresthetica. Mirror therapy is a neurorehabilitation technique designed to remodulate cortical mechanisms of pain and has been used successfully in various conditions, such as in phantom pain, stroke, and complex regional pain syndrome (CRPS). To our knowledge, there is no study available on the use of mirror therapy in meralgia paresthetica. We present a case report where we used mirror visual feedback with brushing therapy to alleviate the pain of patient.

CASE REPORT

A 31-year-old female patient presented with complaints of burning pain, numbness, and tingling sensation in the anterolateral part of the left thigh along the distribution of lateral femoral cutaneous nerve. Her pain started around 2 years back when she underwent myomectomy surgery for fibroid uterus. Initially, she had only numbness and mild tingling sensation, but around 1 year after surgery, she started having severe burning pain which had been worsening after activity. Pain was rated as 8 on numeric pain scale of 0–10. Neurological examination revealed around 50% diminution of sensibility on the left thigh region, motor examination was normal. She was on pregabalin 150 mg and duloxetine 20 mg medications once a day for past 3 months, but there was no pain relief. She had also been treated with various other medications including paracetamol, nonsteroidal anti-inflammatory drugs, opioids, antidepressants, but no complete pain relief was available. She was also doing few stretching exercises, which were also not effective. Her pain was worsening after activity and was improving after rest. She also had complaints of allodynia and stiffness of thigh on touching it. Magnetic resonance imaging of lumbosacral spine was normal. Electromyogram and nerve conduction studies of both legs were also normal, so further confirmation of diagnosis was made. Since pain had become chronic and patient had tried various medications and physical therapies, we advised mirror therapy in the patient as part of neurorehabilitation. She was asked to sit on a flat surface with both legs extended and to keep a long mirror board (70 × 120 cm) positioned between both thighs with shiny side of mirror facing...
normal thigh and affected thigh hidden behind the mirror board. She was asked to do brushing over the normal thigh with soft cosmetic brush while observing its reflection in the mirror, which is superimposed over the unseen affected limb, thereby creating a visual illusion of touching movements of affected thigh. This therapy was advised for at least half an hour twice a day or more time if possible. After 2 weeks of therapy, there was significant reduction in pain and stiffness. Simultaneously, we also tapered the pregabalin and duloxetine within 1 week and asked her to continue mirror therapy. After 1 month, pain was completely relieved with mild tingling only. We advised the patient to continue mirror therapy for another 6 weeks to prevent any recurrence of pain.

DISCUSSION

Meralgia paresthetica is commonly due to focal entrapment of lateral femoral cutaneous nerve as it passes through the inguinal ligament leading to painful neuropathy. It is a pure sensory nerve. The condition is common in middle-aged adults and is often unilateral, but can be bilateral in 20% of patients.7 Symptoms, such as paresthesia, tingling, and burning sensation, range from mild or moderately uncomfortable to painfully disabling. Each patient has their own unique clinical presentation and distribution of symptoms. Some patients reported that these symptoms aggravated on walking and affected sleep.8 Some have described allodynia and vasomotor disturbance also. Our patient had symptoms of burning pain, numbness, tingling sensation, and stiffness for more than 1 year duration, suggesting cortical remodeling of the thigh in the brain. Mirror therapy is a neurorehabilitation technique, i.e., designed to remodulate cortical mechanisms of pain and has been successfully used in conditions, such as phantom limb pain,3 stroke paralysis,4,5 and CRPS.6 Complex regional pain syndrome pain being treated by mirror therapy has many similar characteristics of meralgia paresthetica, such as burning, paresthesia, allodynia, and cramping. Therefore, we investigated the effect of adding mirror therapy in the treatment of meralgia paresthetica.

Earlier thought of pain mechanism as a single hard-wired, dedicated pathway is no longer held.9,10 After peripheral nerve injury, there is remodeling of the cortical representation of tissues innervated by the damaged axon.11 This leads to changes in neural substrates at subcortical and cortical levels within the central nervous system.12 These plastic changes in brain, such as disruption of central cortical processing can lead to generation of feedback-dependent state which produces pain or altered symptoms or sensations experienced by the patients with no evident peripheral damage.13 Harris14 also hypothesized that disorganized cortical representations may lead to the experience of peripheral pain.

In our patient, after starting mirror therapy, there was a significant reduction of burning pain and stiffness within 2 weeks. After 1 month, there was complete pain relief, with significant improvement in numbness and tingling sensation. Mirror creates an illusion or positive feedback to the cortex, which on touching and brushing while looking at the reflected normal thigh image removes the feeling of burning pain and stiffness. This congruent visual feedback of unaffected thigh permits the patient to feel the affected limb without any pain and stiffness, indicating that the maladaptive central sensory processes that were producing pain are not activated.

Pain relief through mirror therapy has been well described in the literature over the past 20 years. Mirror box therapy or mirror visual feedback was originally developed to treat phantom limb pain by Ramachandran and Rogers-Ramachandran.3 They proposed that phantom limb pain results from disruption of the normal interaction between motor intention to move the limb and the absence of appropriate sensory or proprioceptive feedback. They speculated that visual feedback might interrupt this pathological cycle. Studies have shown that the congruent visual feedback of the moving unaffected limb via mirror significantly reduces the perception of pain in early CRPS and stiffness in intermediate stages of disease.6 Decrease in skin temperature of the affected limb in early and intermediate CRPS has also been demonstrated. Mirror therapy has also been used for treatment of paralysis in stroke patients. Mirror visual feedback causes stimulation of mirror neurons in brain and thus provides visual input to revive these motor neurons. This can lead to unlearning of learned paralysis in stroke patients.15 There is maladaptive reorganization of somatosensory pathways in phantom limb pain, and this reorganization is partially reversed by mirror visual feedback with corresponding reduction of pain, suggesting that mirror produces its effect by influencing long-term cortical reorganization of brain maps.16,17 Trigeminal nerve is predominantly sensory. Mirror therapy is effective in producing significant and on occasion complete pain relief in patients of trigeminal neuralgia.18

Along with mirror visual feedback, we combined brushing of normal thigh to reduce tactile defensive- ness. Mirror neurons for motor commands were found in areas of the ventral and inferior premotor cortex, and mirror neurons associated with observation of touch are present in somatosensory cortices.19 These “touch mirror neurons” fire not only when one is being touched but also while watching someone being touched. Patient watched her normal thigh reflection in the mirror being touched with soft cosmetic brush producing no pain, creating an
illusion that touching of affected thigh is not painful. This can lead to unlearning of learned phenomenon in the patient gradually, thus leading to significant decrease in stiffness on touching and decrease in numbness and tingling. Brain assigns different weights to different sensory inputs, and vision dominates touch and proprioception in most cases.\textsuperscript{20,21} Therefore, we combined mirror visual feedback and brushing therapy to augment the effects for alleviating the pain.

Our patient confirmed that her pain had definitely reduced with significant decrease in stiffness, numbness, and tingling. She rated pain score as 0–1 on numeric rating scale, with around 30\% decrease in sensation on the affected thigh. Stiffness was also reduced. During this time, gradually we tapered her medications too. Mirror therapy is a simple noninvasive therapy without any side effects. The result of our study supports the hypothesis that mirror therapy is effective in alleviating the symptoms and pain in meralgia paresthetica.

CONCLUSION

Mirror visual feedback along with brushing is effective in reducing pain and other sensory symptoms of meralgia paresthetica. The congruent use of mirror visual feedback with touch sensation helps in restoring the integrity of cortical mechanism. Creating visual illusion of the affected limb gives positive feedback to sensory and motor cortex, thereby relieving the pain and improving the function of limb.

REFERENCES