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Integrating Matrix Rhythm Therapy in Physiotherapy for Foot Drop Secondary to Rhabdomyolysis: A Case Report

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ABSTRACT

In this case, foot drop after rhabdomyolysis - a rare condition, leading to loss of dorsiflexion occurs in an uncommon way. Effective physiotherapy interventions are necessary for patients with rhabdomyolysis since it can significantly impair their mobility. Serious neuropathy was found in both lower limbs during a clinical evaluation. The common peroneal nerve was affected, and dermatome sensation was diminished at the L5-S1 level. To overcome these obstacles, the patient received a five-week treatment that included Matrix rhythm therapy (MRT), electrical stimulation, and a regimented exercise routine. Post-treatment assessments showed improved balance on the NeuroCom © Balance Master and functional scores on the Foot and Ankle Disability Index (FADI). The results of this study highlight how well the combination treatment restored foot dorsiflexion, mobility, and overall functional outcomes, indicating a potential strategy for instances of this nature.

Keywords:- *Foot Drop Rehabilitation, Neuromuscular Re-education, Rhabdomyolysis Recovery, Balance Training, Matrix Rhythm Therapy*

1. INTRODUCTION

The prevalence of rhabdomyolysis is estimated to be about 0.1% to 0.5% in the general population. Rhabdomyolysis, a severe muscle breakdown, leads to pain, kidney damage, and impaired mobility. When foot drop occurs, nerve damage further restricts foot movement, affects balance, and increases fall risk. This combination limits daily activities and reduces independence. foot drop that occurred after rhabdomyolysis, a complication that is not often reported in the literature. A tailored physiotherapy protocol based on clinical findings is mandatory to manage neurological impairments that develop consequently [(1,2)] Physiotherapy plays a crucial role in the management of foot drop, with an emphasis on functional mobility, joint range of motion improvement, and neuro-muscular strength restoration. Neuromuscular re-education and focused strengthening activities have been shown to improve recovery. Electrical stimulation in conjunction with traditional physiotherapy, for instance, has been demonstrated to enhance motor function in individuals suffering from foot drop [(3).] MRT stimulates the body's matrix, which consists of muscles, connective tissues, and fascia, by providing precise vibrations. This stimulation can enhance blood flow, reduce muscle stiffness, and enhance cellular healing. In case of foot drop, MRT may enhance muscle activation assisting in the return of normal dorsiflexion and gait. [(4)] Studies have demonstrated that FES can help patients with foot drop by enhancing their muscle strength, endurance, and functional performance resulting in improved walking speed, gait symmetry, and general mobility. [(5)] MRT and electrical stimulation have shown benefits; thus, exploring their combined effects on foot drop is essential for improved outcomes.

Patient Information:

An 18-year-old male was admitted with Dengue Fever and had experienced multiple complications, including rhabdomyolysis, acute kidney injury (AKI), perinephric hematoma, hospital-acquired infections, and posterior reversible encephalopathy syndrome (PRES). These complications were medically managed and patient was discharged on October 17, 2023. He was referred to physiotherapy out-patient department for follow up with the complaint of Left lower limb weakness and difficulty in walking due to foot drop and fear of fall due to knee joint instability and overweight.

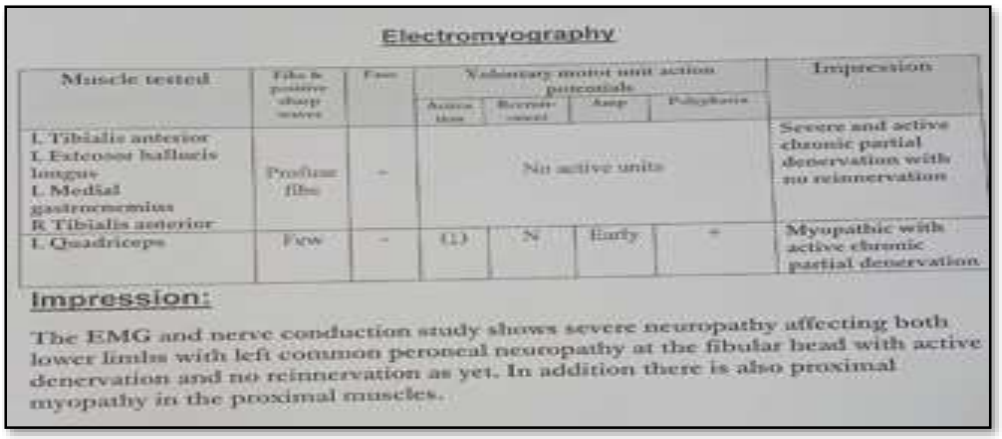
Clinical findings:

The patient's build was Endomorphic with BMI – 37.4. Physical presentation of the Lower extremity showed the attitude of left lower limb - ankle in plantar flexion and hip externally rotated. Sensations at L5-S1 level dermatome were absent. Reduced ankle movements and disuse resulted in a lowered muscle tone. Both upper limbs, trunk, left lower limb were functionally normal.

Investigations:

MRI report dated 12 Oct, 2023 showed mild disc bulges at L4-L5 and L5-S1, indenting the thecal sac and epidural fat, and compromising the neural foramina. Muscles displayed hyperintense signals on STIR images, likely from rhabdomyolysis.

EMG and NCV Reports dated 3 Nov, 2 (figure 1 and 2) showed severe neuropathy affecting both lower limbs with left common peroneal neuropathy at the fibular head with active denervation and no innervation. Evidence of myopathy in proximal muscles.



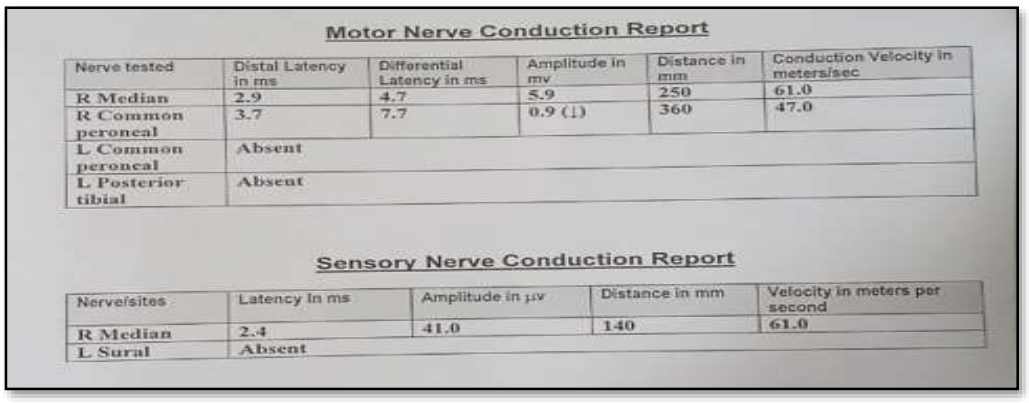
Electromyography

Muscle tested	Fibs & positive sharp waves	Fasc	Voluntary motor unit action potentials: Amplitude	Recruitment	Amp	Polyphasic	Impression
L Tibialis anterior L Extensor hallucis longus L Medial gastrocnemius R Tibialis anterior	Profuse fibs	-	No active units				Severe and active chronic partial denervation with no reinnervation
L Quadriceps	Few	-	(1)	N	Early	+	Myopathic with active chronic partial denervation

Impression:

The EMG and nerve conduction study shows severe neuropathy affecting both lower limbs with left common peroneal neuropathy at the fibular head with active denervation and no reinnervation as yet. In addition there is also proximal myopathy in the proximal muscles.

Figure- 1



Motor Nerve Conduction Report

Nerve tested	Distal Latency in ms	Differential Latency in ms	Amplitude in mv	Distance in mm	Conduction Velocity in meters/sec
R Median	2.9	4.7	5.9	250	61.0
R Common peroneal	3.7	7.7	0.9 (↓)	360	47.0
L Common peroneal	Absent				
L Posterior tibial	Absent				

Sensory Nerve Conduction Report

Nerve/sites	Latency in ms	Amplitude in μv	Distance in mm	Velocity in meters per second
R Median	2.4	41.0	140	61.0
L Sural	Absent			

Figure- 2

Physiotherapy Intervention:

A five-week protocol was implemented that included MRT, surged faradic current stimulation (low voltage), and targeted exercises. (Table 1)

Table 1

Electrotherapy	MRT – 8-12 Hz frequency, delivered between 8 to 10 Hz to Peroneus Longus, Brevis, Tibialis anterior, Gastro-soleus muscles Duration-40 minutes using Matrix Mobile, three days a week, for five weeks. Electrical stimulation – Surged faradic current to the above-mentioned muscles. No of contractions- 60 No of session- 20 sessions	Rationale – MRT enhances muscle activation, circulation, and reduces stiffness. It stimulates neuromuscular function, aiding in the restoration of dorsiflexion, balance, and mobility. Targeting specific muscles related to foot drop promotes recovery and lowers fall risk. (Fig-3) Electrical stimulation enhances muscle strength and motor function by activating affected muscles, improving dorsiflexion and mobility. It also reduces atrophy and supports functional recovery, enabling patients to perform daily activities more effectively. (Fig-4)
Exercise Therapy	1st and 2nd week- Upper and lower limb mobility exercises Ankle ROM Exercises (10 repetition) Prone Knee bending (10 repetition) (Fig-5) Hamstring curls (10 repetition) Side walking (10 repetition) Squats (10 repetition) Cycling -10 mins (fig-6) Lunges (10 repetition) (Fig-7) 3rd - 5th week- Resistance Training – Flexion-extension, Abduction-Adduction Frequency- 3rd week-3 days/week 4th week- 4 days/week 5th week-5 days/week Intensity- 30-50% of 1 RM Duration- 15-20 mins Type- Strengthening with 2 Kg weight cuff -Hams curls, side walking, squats, Lunges. (8- 12 reps x 2 sets)	Rationale – Functional movement patterns are supported, joint mobility is restored, and muscle activation is enhanced by these workouts. They also aid in promoting general recovery and lowering the danger of atrophy, which eventually helps patients function and move more freely on a regular basis. Through increased joint stability and neuromuscular control, this training improves muscle strength and functional ability. These elements are necessary for minimizing muscular atrophy, promoting successful rehabilitation for everyday activities, and regaining dorsiflexion and mobility.

Figure 3 Patient Receiving MRT

Figure 4 Patient Receiving EMS

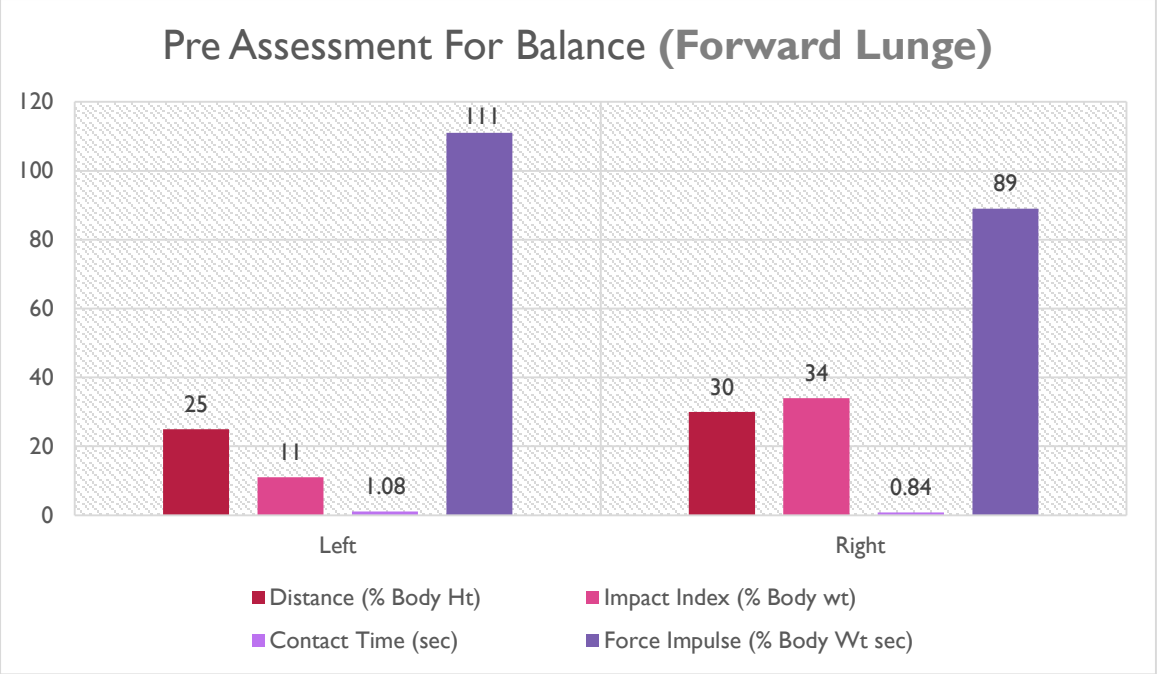
Figure 5 - Prone Knee Bending

Figure 6 –Cycling

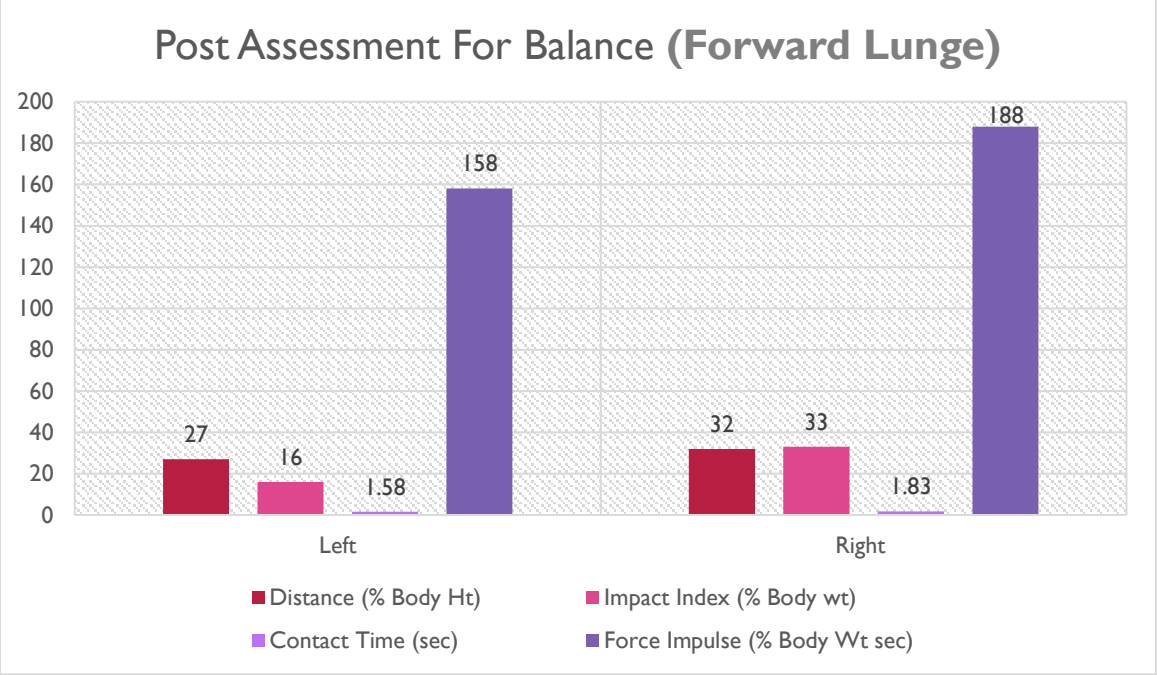
Figure 7 Lunges

Outcome measures: Outcome measures included balance assessment with the NeuroCom Balance Master (Fig -8) and FADI scale. The pre-treatment FADI score was 43/104 (45%), indicating moderate left-side disability, which improved to 73/104 (70%) post-treatment, reflecting minimal disability. (Graph 1 and 2).

Figure 8 Assessment on Neuro-Com Balance Master



Graph 1



Graph 2

2. RESULT

The patient demonstrated significant improvements in balance (Balance Master) and FADI scores. The combination of MRT, electrical stimulation, and exercise enhanced foot dorsiflexion, mobility, and balance, highlighting the treatment's effectiveness.

3. DISCUSSION

This case study demonstrates the effectiveness of an integrated physiotherapy approach in managing foot drop resulting from rhabdomyolysis. The patient demonstrated significant improvements in balance (Balance Master) and FADI scores post

rehabilitation. The conventional physiotherapy demonstrated functional improvements, electrical stimulation to increase muscle strength and endurance. The relevant medical literature supports the effectiveness of neuromuscular re-education and electrical stimulation in treating foot drop. MRT is known for stimulating muscle and connective tissue thereby improving muscle activation. [6] Additionally, MRT has been found to reduce muscle atrophy and enhance balance. [7] Thus, MRT was introduced as an adjunct to facilitate the redundant recovery. The findings from this case underscore the value of combining these modalities to address complex rehabilitation needs. The strengths of the approach were the combined use of MRT, electrical stimulation, and structured exercise, which collectively enhanced muscle function, range of motion, and balance. The primary takeaway is that a well-coordinated, advanced combined therapeutic physiotherapy program substantially improves functional outcomes in foot drop, suggesting that similar comprehensive approaches would prove beneficial in other challenging clinical scenarios. However, Class II obesity and non-adherence to follow-up due to patients Academic reasons were the limiting factors for further management.

4. CONCLUSION

This case study demonstrates that thorough interventional physiotherapy protocol promotes improved prognosis in rhabdomyolysis-related foot drop. The patient's functional mobility, strength, and balance were considerably enhanced by the combination of MRT, electrical stimulation, and focused exercises, were seen in post therapy Balance master and FADI scores. These results imply that complicated neuromuscular abnormalities can be effectively treated with a comprehensive and integrated physiotherapeutic strategy.

Sustainable Development Goals by United Nations

The study has a grounding on the Goal 3 of Sustainable Development Goals by United Nations.

Goal 3- Ensure healthy lives and promote well-being for all at all ages. Advocating conservative physiotherapeutic management in rarely occurring medical conditions and their secondary outcomes and provide effective and affordable treatment for all.

REFERENCES

[1] Khan FY. Rhabdomyolysis: A review of the literature. Ned Tijdschr Geneeskd. 2009;67(9):272-83.

[2] O'Malley MJ, DeMaio M, Illingworth KD, Van der Meulen MCH, Drakos MC. Neurologic complications after rhabdomyolysis. Orthopedics. 2012;35(4)

[3] Sheffler LR, Hennessey MT, Naples GG, Chae J. Peroneal nerve stimulation versus an ankle-foot orthosis for correction of foot drop in stroke: Impact on functional ambulation. Neurorehabil Neural Repair. 2006;20(3):355-60.

[4] Bhatikar KK, Rathi A, Shinde A. Effect of Matrix Rhythm Therapy versus Interferential Current Therapy with Laser Therapy on Plantar Heel Pain: A Randomized Clinical Trial. J Rehabil Res Dev. 2022;59(3):435-44.

[5] Wang RY, Hsieh YW, Wu CY. Functional electrical stimulation and gait training for patients with foot drop: A systematic review and meta-analysis. J Rehabil Res Dev. 2015;52(1):11-24.

[6] Makwana MS, Gor K, Kumar A. The effectiveness of Matrix Rhythm Therapy in musculoskeletal disorders: An evidence-based study. Int J Sci Res. 2024;13(4).

[7] Unal A, Altug F, et al. Effectiveness of matrix-rhythm therapy on increased muscle tone, balance, and gait parameters in stroke survivors: a single-blinded, randomized, controlled clinical trial. Acta Neurol Belg. 2021; 121:689–99.

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