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Case Report

Physiotherapy Section

Approach-oriented Physiotherapeutic Management of a Patient with Right Thalamic Bleed: A Case Report

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ABSTRACT

Rehabilitation is essential for stroke recovery. Professionals with experience in stroke rehabilitation from the different fields should make up a basic multidisciplinary stroke rehabilitation team. A stroke is the sudden loss of blood supply to the brain followed by a neurological deficit for more than 24 hours. A 42-year-old male patient presented with chief complaints of sudden weakness over one side of the body, slurred speech and blurred vision. The patient showed typical features of stroke-like tonal abnormalities, altered sensorium, diminished reflexes, reduced range of motion and strength. Magnetic Resonance Imaging (MRI) showed bleeding in the right lenticular capsular, basal ganglia and intraparenchymal part of the thalamus. The physiotherapy treatment started from the Intensive Care Unit (ICU) itself for better results with the collaboration of neurosurgeons and nurses, after the surgery. The Proprioceptive Neuromuscular Facilitation (PNF) approach and Rood's approach were used to generate neuroplasticity as early as possible. The motor relearning program helped to regain the movements. Various outcome measures like the National Institute of Health Stroke Scale (NIHSS), Brunstorm grading, and Barthel index showed many crucial changes in tone, strength, balance, and coordination that improved the patient's Quality of Life (QoL). Also, speech therapists and neuro-optometrist play an important role during rehabilitation.

Keywords: Brunstorm grading, Stroke, Tonal abnormalities

CASE REPORT

A 42-year-old male patient, driver by profession, right-handed, presented with the complaints of weakness in the left-side of the body since the last two days. The patient suddenly fell from the bed at night and was unable to move the left half of his body. He was unable to walk and severe headaches with vomiting were noted. The MRI showed a haemorrhage in the right lenticular capsular, basal ganglia and intraparenchymal thalamic area. Decompressive craniotomy and tracheostomy were done. He was unable to speak because of increased secretions. The patient's bowel and bladder were affected so, the patient was on intermittent catheterisation. Manual muscle strength and deep tendon reflex findings are mentioned according to Modified Ashworth Scale [Table/Fig-1,2] [1]. The postoperative thalamic bleed patient was referred for physiotherapy to normalise the muscle tone, increase strength and improve his functional independence.

Joints	Muscles	Day 1	Day 7	Day 18	Day 25
Shoulder	Flexor	0	¼	1/4	¼
	Extensor	0	1+	¼	¼
	abductors	0	1+	1/4	1+
Elbow	Flexors	0	¼	1/4	¼
	Extensors	0	¼	¼	¼
Wrist	Flexor	0	1/4	¼	¼
	Extensor	0	¼	1/4	¼
Hip	Flexor	0	1+	1/4	Normal
	Abductors	0	¼	1/4	Normal
Knee	Flexors	0	¼	1/4	Normal
	Extensors	0	¼	1/4	Normal
Ankle	Plantar flexors	0	¼	1/4	Normal
	Dorsiflexion	0	¼	1/4	Normal

[Table/Fig-1]: Muscle tone according to Modified Ashworth Scale [1].

Physiotherapeutic Intervention

The tailor-made physiotherapeutic protocol is discussed below in [Table/Fig-3,4].

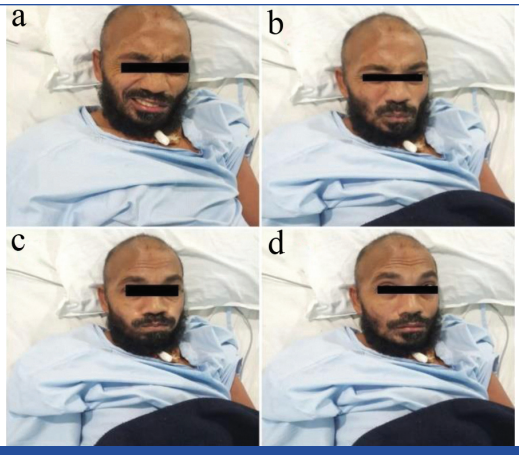
DTR	Day1	Day 7	Day 18	Day 25
Biceps jerk	0	1+	3+	1+
Triceps jerk	0	1+	3+	2+
Supinator jerk	0	1+	4+	2+
Knee jerk	0	1+	4+	2+
Ankle jerk	0	1+	4+	2+

[Table/Fig-2]: Deep Tendon Reflexes (DTR).

Week	Problems	Goal	Physiotherapeutic Intervention
Week 1	Reduced limb mobility due to being bedridden and in a semi-conscious state due to anaesthesia. Accumulation of secretions.	1. To mobilise the extremities of the upper and lower limbs. 2. To prevent complications and secondary impairments of stroke 3. To improve respiration. 4. To educate the patient.	1. Passive movements to both upper and lower limbs. 2. Vigorous ankle-toe movements for proper veinous circulation. 3. Positioning after every two hours. 4. Postural drainage with percussion and vibrations. Suctioning and nebulisers were used.
Week 2	1. Left-side upper limb and lower limb are flaccid. 2. Reduced respiration due to the accumulation of mucus secretions. 3. Facial asymmetry 4. Cognitive impairments.	1. Normalise the tone of the left-side. 2. To improve ventilation and clear lung fields. 3. To improve facial symmetry. 4. To improve cognition.	1. Rood's facilitatory approach like tapping at the muscle-tendon, joint approximation, and stroking were used. Rolling is facilitated on both sides. 2. Elevation of the head side end of the bed to 30 degrees to improve respiration. 3. Breathing exercises like deep breathing were initiated. 4. Exercises for the face shown in [Table/Fig-4]. 5. Exercises to improve cognition by challenging the brain.

Week 4	1. Spasticity appears to peak in both upper and lower extremity. 2. Muscle tightness and reduced strength.	1. To reduce tone in the muscle. 2. To increase flexibility of the muscles. 3. To increase strength of the muscle. 4. To improve functional independence.	1. Rood's inhibition techniques were used to reduce tone. Pressure in the muscle tendon, tapping on muscle belly and stroking from proximal to distal. 2. PNF was used to break the synergistic patterns. D1 and D2 patterns for upper and lower limbs with rhythmic initiation are used. 3. Initiate the rolling. 4. Stretching to tendo-achilleas, hamstring, adductors and pyriformis muscles. 5. Strengthening of the upper extremity and lower extremity with 1 kg weight cuff. Dynamic quadriceps for lower extremity strength.

[Table/Fig-3]: Physiotherapeutic rehabilitation protocol.
PNF: Proprioceptive neuromuscular facilitation



[Table/Fig-4]: Patient performing facial exercises on day 8. a) Smiling; b) Frowning of eyebrows; c) Filling of air in mouth; d) Raising the eyebrows.

The regimen primarily emphasises approaches like Rood's method, PNF and strengthening combined with stretching. It was critical to maintain the joint integrity and mobility of the patient during the first week since he had no movement as a result of respiratory insufficiency. Therefore, the main objective was to prevent further complications from occurring during this phase.

In week 2, the patient became conscious and the respiratory issues were resolved, but the affected side's muscles remained flaccid. So, the rood strategy was utilised. It causes the tone to increase. The patient was finally more stable in week 3, but it was a rise in tone that was causing the spasticity. To stop the synergistic movement, PNF was applied along with the rood's inhibitory strategy. As the tone subsided, the concentration was on strengthening and stretching strategy.

Outcome Measures

National Institute of Health Stroke Scale (NIHSS): Pretreatment score was 37 (severe stroke) and the post-treatment score was 14 (moderate stroke) on day 24 [2]. Brunstorm Stage of Recovery score for the upper limb on day 24 was 4 and for the lower limb was 6 [3]. Montreal Cognitive Assessment Scale (MoCA) pretreatment score was 12 and postscore was 20 out of 30 total scores. The patient was followed-up to day 25 regularly, after that monthly for four months.

The dysarthria interventions provided by a speech therapist resulted in significant improvement in speech of the patient. Approximately, 20% of the visual field was affected, and proper glasses were prescribed by optometrist [4].

DISCUSSION

The present case report mainly focuses on early physiotherapy rehabilitation for better results. According to Krutulyte G et al., in their research, task-oriented strategies such as motor relearning program are preferable to facilitation/inhibition strategies, such as the Bobath program, in the rehabilitation of stroke patients. Additionally, she emphasised on the patient's body being guided by the physical therapist at key moments, activating natural postural reactions, and training natural movement patterns [5].

Research by Shimura K and Kasai T concluded that the PNF position increases the joint's mobility by altering the order in which the muscle groups contract [6]. According to Bordoloi K and Deka RS, a home exercise program that incorporates conventional physical therapy with Rood's method is more effective than conventional physical therapy alone at enhancing patients' capacity for independent self-care following intracranial haemorrhage [7].

Rehabilitation is essential for stroke recovery. Stroke patients commonly have reduced mobility, which limits their ability to participate in social events and Activities of Daily Living (ADL) and lowers their likelihood of returning to their prior level of work [8]. The motor function may contribute to the low overall QoL, together with other factors (such as social or personal issues) [9]. A high-intensity, early physical therapy program improves poststroke motor performance and functional capacity for performing ADLs, according to research [10].

Rood's method was used in this case report, practical including both caregivers and patients since it is reasonably simple to use and places no cognitive demands on the patient. The study by Chaturvedi P and Kalani A suggested that rolling and light joint compressions are used to suppress aberrant hypertonia while exteroception and proprioception are promoted to produce muscle tone [11]. According to Ankar P et al., methods of the Brunnstrom approach, Rood's approach and NDT will aid the patient's recovery of their motor skills. Therefore, if the entire treatment protocol is adhered to correctly and regularly, the patient will demonstrate a good recovery [12].

According to Sheikh S et al., haemorrhagic stroke patients who receive early therapy have a better chance of recovering quickly after their stroke. Basic bed mobility exercises enhance joint integrity and mobility. Active assisted range of motion exercises, bilateral training, and the Rood's method are examples of joint integrity and tone facilitation techniques which were also used in this case report [13].

According to Rodrigues A et al., respiratory complications like atelectasis, sputum retention, facilitation of ventilatory weaning, and/or prevention of reintubation were historically the mainstay of physiotherapy treatment. Active mobilisation and rehabilitation may enhance muscle strength, functional independence and decrease delirium, according to mounting evidence, especially if started within the first few days of an ICU admission. Regular physical treatment and PNF were more efficient in enhancing static and dynamic balance in poststroke patients [14].

Interdisciplinary strategy is a major factor in the quality of care provided by stroke services. Professionals with experience in stroke rehabilitation from the following fields should make up a basic multidisciplinary stroke rehabilitation team including consultant physicians, nurses, physiotherapists, occupational therapists, speech therapists, clinical psychologists, rehabilitation aides and social workers [15,16].

CONCLUSION(S)

The thoroughly monitored rehabilitation after decompressive craniotomy with tracheostomy reduces the symptoms and

enhances the QoL of the patient. Early intervention in neurosurgery, physiotherapy, speech therapy and optometrist can improve the development of neuroplasticity and enable a person to resume most of the activities of a normal day. An ICU based physical therapy rehabilitation protocol was initiated in order to reduce the risk of complications and improve tone. In order to improve early independent movements, Rood's approach may be used to facilitate and inhibit tonal input at appropriate times. PNF is used to break synergistic patterns to be more effective in daily activities. Professionals with experience in stroke rehabilitation from the different fields should make up a basic multidisciplinary stroke rehabilitation team. The consultant neurosurgeon, nurses, speech therapist and optometrist plays an important role in neurorehabilitation.

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