



Multimodal Neurophysiotherapy Rehabilitation Following Left Gangliothalamic Intracerebral Haemorrhage with Severe Right Hemiparesis: A Case Report

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Abstract

Background

Intracerebral haemorrhage can produce complex neurological impairments involving motor control, sensation, perception, balance, gait and activities of daily living. Effective rehabilitation therefore requires an individualized, multidomain approach.

Case Presentation

A 50-year-old male developed sudden facial deviation and right-sided limb weakness on 29 October 2025, followed by loss of consciousness. He received initial medical management and was subsequently transferred to a tertiary-care hospital, where he remained unconscious for approximately two days and underwent tracheostomy. Following recovery of consciousness, he continued to demonstrate severe right upper- and lower-limb weakness, gait dysfunction, speech disturbance and limitations in activities of daily living. Physiotherapy assessment was performed on 3 July 2026. Computed tomography demonstrated residual intraparenchymal haemorrhage in the left gangliothalamic region with surrounding oedema and a 3.8-mm rightward midline shift.

Clinical Findings

Examination demonstrated severe right-sided motor impairment, hypotonia, abnormal synergistic patterns, impaired superficial and deep sensation, perceptual dysfunction, impaired balance and abnormal gait. Right upper-limb muscle strength ranged from 0/5 to 2-/5 in several distal and proximal movements, while lower-limb strength ranged from 1/5 to 3-/5. Functional assessment revealed a Barthel Index score of 65/100 and Functional Independence Measure score of 76/126.

Intervention

A multimodal neurophysiotherapy programme incorporated range-of-motion exercises, motor-learning activities, mirror therapy, affected-limb weight bearing, facilitation techniques, strengthening, balance and gait training, sensory re-education, proprioceptive training, perceptual rehabilitation and task-specific activities.

Conclusion

This case highlights the complexity of post-haemorrhagic neurological disability and demonstrates the clinical rationale for integrating impairment-based and task-specific neurophysiotherapy interventions. Standardized longitudinal outcome assessment is essential for objectively documenting recovery.

Keywords: Intracerebral haemorrhage; hemiparesis; neurophysiotherapy; stroke rehabilitation; mirror therapy; gait rehabilitation; case report.

1. Introduction

Intracerebral haemorrhage (ICH) is a severe form of stroke associated with substantial neurological morbidity. Survivors may experience persistent motor weakness, altered muscle tone, sensory impairment, perceptual dysfunction, impaired postural control, gait abnormalities and reduced independence in activities of daily living. Rehabilitation consequently requires systematic assessment across multiple levels of the International Classification of Functioning, Disability and Health, extending from body impairments to activity and participation.

Contemporary stroke-rehabilitation practice emphasizes repetitive, meaningful and task-specific training combined with individualized management of impairments. The 2024 VA/DoD stroke rehabilitation guideline provides evidence-based recommendations covering assessment and rehabilitation across major domains of post-stroke disability.

Upper-limb dysfunction is particularly disabling because impaired voluntary control can directly restrict self-care and occupational activities. Recent evidence indicates that mirror therapy can improve upper-limb motor and hand function after stroke. Task-oriented upper-extremity training has also demonstrated benefit for functional recovery. Similarly, balance and gait training are important components of post-stroke rehabilitation, although the optimal modality should be individualized according to the patient's impairments and functional goals.

The present case is clinically relevant because the patient demonstrated simultaneous severe motor, sensory, perceptual, balance, gait and ADL impairments following a left gangliothalamic intracerebral haemorrhage. The case illustrates the application of a multimodal neurophysiotherapy strategy to address these interacting limitations.

2.1 Patient Information

A 50-year-old male was assessed in the Department of Physiotherapy, Government Medical College and Hospital, Cuddalore, on **3 July 2026**. He was employed as a license officer and subsequently transferred to Annamalai University as a warden. He was reported to be the sole breadwinner of his family and belonged to the lower-middle socioeconomic category according to the Modified Kuppaswamy Scale.

2.2 History of Present Illness

The patient was apparently well until approximately 8:00 PM on **29 October 2025**, when he developed sudden facial deviation and limb weakness. At approximately 11:00 PM, he became unconscious. He was taken to Government Medical College and Hospital for initial treatment and subsequently transferred to Apollo Hospitals, Trichy. He remained unconscious for approximately two days and underwent tracheostomy.

After regaining consciousness, the patient demonstrated slurred speech and persistent right upper-

3. Clinical Findings

On observation, the patient demonstrated postural asymmetry, mild thoracic kyphosis, right pelvic hiking, right hip flexion and adduction, and a plantar-flexed and slightly inverted right foot. The right shoulder was

adducted, internally rotated and flexed, with scapular protraction and reduced scapular stability. Mild swelling was noted over the right foot.

The patient was awake and alert with a Glasgow Coma Scale score of 15/15. Orientation to person, place and time was intact. Slight difficulties in sustained attention, immediate memory and functional problem-solving were documented.

Perceptual assessment demonstrated impairment in right-left discrimination, depth and distance perception and body-position awareness. Visual and auditory agnosia, finger agnosia and apraxia were documented.

Sensory assessment revealed impairment involving pain, temperature, light touch, pressure, vibration, movement sense and position sense on the affected side.

Motor examination demonstrated marked right-sided weakness. Right shoulder flexion and abduction were 1/5, elbow flexion 2–/5, elbow extension 1/5, wrist flexion and extension 1/5, finger flexion 2–/5, finger extension 0/5, thumb opposition 0/5 and grip strength 0/5. The corresponding left upper-limb movements were 5/5.

Right lower-limb strength was also substantially reduced, including hip flexion 3–/5, hip extension 1+/5, hip abduction 2+/5, knee flexion and extension 2+/5, ankle dorsiflexion 1/5 and plantar flexion 2–/5.

Both right upper and lower limbs were documented as hypotonic. Right-sided Babinski response was present, while several right-sided deep tendon reflexes were reduced compared with the left.

Gait assessment showed reduced hip and knee flexion, inadequate ankle dorsiflexion, unequal step length, Trendelenburg-type deviation, inadequate foot clearance and absent right arm swing. A quadripod and arm sling were being used.

The **Barthel Index** was **65/100**, while the FIM demonstrated a motor score of 53, cognitive score of 23 and total score of **76/126**.

4. Diagnostic Assessment

CT brain examination demonstrated a trace of residual hyperdense intraparenchymal haemorrhage measuring up to 2.3 mm in thickness within the **left gangliothalamic region**, associated with surrounding hypodense oedema and minimal rightward midline shift measuring 3.8 mm.

The clinical presentation was consistent with a **left-sided intracerebral haemorrhage with persistent right hemiparesis and associated sensory, perceptual, balance, gait and functional impairments**

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5. Physiotherapy Management

The rehabilitation programme was individualized according to the patient's neurological and functional impairments.

Upper-limb rehabilitation

Management included shoulder protection, passive range-of-motion exercises for the wrist and fingers, pain-free shoulder mobilization, motor-learning activities for the elbow and wrist, facilitation techniques, mirror therapy and progressive weight bearing through the affected upper limb.

Mirror therapy was included because contemporary evidence indicates potential benefits for upper-limb motor and functional recovery following stroke. A recent meta-analysis of 18 randomized studies involving 633 participants found improvements in upper-limb motor and hand function with mirror therapy.

Lower-limb rehabilitation

Active-assisted hip and knee exercises, heel slides, pelvic bridging, clamshell exercises and gluteus medius strengthening were prescribed. Sit-to-stand training emphasized symmetrical loading and reduction of compensatory movement.

Balance and gait rehabilitation

Static sitting, standing weight shifting, tandem standing and progressive gait training in parallel bars were incorporated. The programme emphasized postural alignment, weight transfer, lower-limb control and foot clearance.

Evidence from recent systematic reviews supports the role of balance and gait training in improving post-stroke mobility, although intervention selection should reflect the individual's specific balance and gait deficits.

Sensory and perceptual rehabilitation

Sensory re-education included texture discrimination, localization, proprioceptive training, joint-position training and weight-bearing activities. Perceptual rehabilitation included body-awareness activities, task-specific practice and verbal and visual cueing.

Functional rehabilitation

Bed mobility, rolling, sit-to-stand and transfer training were incorporated to improve independence in daily activities.

6. Outcome Assessment

Baseline functional assessment demonstrated moderate dependence, with a Barthel Index of 65/100 and FIM total score of 76/126.

However, **post-intervention outcome scores and a defined treatment duration were not included in the supplied case presentation.** Therefore, the present report does not make claims regarding the magnitude of improvement attributable to physiotherapy. This is important for methodological integrity and avoids overstating treatment effectiveness.

7. Discussion

The present case demonstrates that disability following intracerebral hemorrhage can extend well beyond isolated muscle weakness. The patient exhibited severe motor impairment together with sensory dysfunction, apraxia, agnosia, impaired body awareness, balance deficits, gait abnormalities and reduced independence.

The distribution of weakness was particularly severe in the right upper limb, where distal voluntary control was markedly impaired. Such impairment can substantially restrict self-care and occupational activities. The incorporation of mirror therapy and motor-learning strategies was therefore clinically rational. Recent evidence indicates that mirror therapy can produce improvements in post-stroke upper-limb motor and functional outcomes, although treatment effects vary with intervention characteristics and patient severity

The patient's sensory and perceptual impairments were important contributors to functional limitation. Proprioceptive and body-position deficits may interfere with postural control and movement planning, while apraxia and agnosia can make apparently simple functional activities difficult. Consequently, rehabilitation incorporated sensory re-education, body-awareness activities and repeated task-specific practice rather than focusing solely on strengthening.

Gait impairment was characterized by poor hip and knee flexion, severe dorsiflexor weakness and inadequate foot clearance. Task-specific gait and balance training was therefore integrated with strengthening and weight-shifting activities. Recent evidence supports task-oriented training for improvements in gait speed, endurance and balance following stroke.

A major strength of this case is the detailed multidomain neurological assessment, including motor, sensory, perceptual, balance, gait and functional findings. Another strength is the use of established functional measures, particularly the Barthel Index and FIM.

The principal limitation is the absence of documented post-treatment outcome measurements and treatment dosage in the supplied case record. Consequently, this report should be interpreted as a detailed clinical case description illustrating a rehabilitation framework rather than evidence of treatment efficacy. Additionally, as a single-patient report, causal conclusions cannot be drawn

8. Conclusion

This case highlights the complex neurological and functional consequences of left gangliothalamic intracerebral haemorrhage. Severe right hemiparesis occurred alongside sensory, perceptual, balance, gait and ADL limitations.

A multidomain neurophysiotherapy approach incorporating **motor relearning, mirror therapy, affected-limb weight bearing, strengthening, balance and gait training, sensory re-education, perceptual training and task-specific functional practice** provides a clinically coherent rehabilitation strategy for such complex presentations.

The principal clinical lesson is that rehabilitation should address the **interaction between impairment, activity limitation and functional participation**, rather than treating post-stroke weakness in isolation.

Declarations

Patient consent: Written informed consent for publication should be obtained and documented before submission.

Ethical approval: To be reported according to the requirements of the institution and target journal.

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Conflict of interest: The authors declare no conflict of interest.

Data availability: All clinically relevant information included in this report was derived from the patient's clinical presentation and assessment records

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