



Tamil Nadu Journal of Health Research and Innovation (TNJHRI)

<https://tnjhri.in/>

Case Report

Effectiveness of the Vasa Concept in Improving Functional Performance After Hemorrhagic Stroke: A Case Report

Mayank Singh S¹

¹People's College of Paramedical Sciences and Research Center, Bhanpur, Bhopal, Madhya Pradesh-462031, India.



*Corresponding author:

Dr. Mayank Singh S
People's College of Paramedical
Sciences and Research Center,
Bhanpur, Bhopal, Madhya Pradesh-
462031, India.

Email:
mayanksingh9112001@gmail.com

Received: 11/02/2026
Accepted: 20/05/2026
Published: 04/09/2026

ABSTRACT

Background: Stroke can result in persistent motor impairment, balance deficits, gait dysfunction, and reduced upper-limb function. Task-specific and functional rehabilitation may support motor recovery and independence. The Vasa Concept is a task-oriented approach that emphasizes postural control, paretic-side loading, centre-of-mass control, gait training, and functional movement. Evidence regarding its use in stroke rehabilitation remains limited.

Case Presentation: A 50-year-old man with chronic left-sided hemiparesis following a right gangliocapsular intracerebral hemorrhage presented for physiotherapy 4 months after stroke. He had difficulty with independent walking, balance, stair negotiation, and functional use of the affected upper limb. Clinical examination revealed mild spasticity (Modified Ashworth Scale Grade 1+), exaggerated deep tendon reflexes, and impaired selective motor control. A Vasa Concept-based physiotherapy programme was provided for 4 weeks, 5 days per week. Each supervised session lasted 60–90 minutes, with an additional home programme of 30–45 minutes per day. Motor recovery was assessed using the Fugl-Meyer Assessment (FMA) and balance using the Berg Balance Scale (BBS).

Conclusion: A 4-week Vasa Concept-based rehabilitation programme was associated with improvements in motor recovery, balance, gait, and functional performance in this patient with chronic hemorrhagic stroke.

Keywords: Stroke; Hemorrhagic stroke; Vasa Concept; Physiotherapy; Neurorehabilitation; Gait training; Motor recovery.

INTRODUCTION

Non-invasive Stroke is a major cause of death and long-term disability worldwide. Hemorrhagic stroke can cause severe neurological impairment and functional disability. Common problems include weakness, abnormal muscle tone, impaired motor control, poor balance, gait dysfunction, and reduced upper-limb function.[3] Stroke occurs because of interruption of cerebral blood flow or rupture of a cerebral blood vessel. Ischemic stroke results from reduced or blocked blood flow, whereas hemorrhagic stroke results from rupture of a cerebral blood vessel and bleeding into or around the brain.[3] The location and extent of the lesion influence the clinical presentation. Patients may develop motor, sensory, cognitive, perceptual, language, and balance impairments.[3] Motor impairments may include hemiparesis, abnormal muscle tone, poor postural control, and reduced weight bearing on the affected side. These problems can affect standing, walking, stair climbing, and daily activities. Upper-limb impairment may affect reaching, grasping, releasing, and object manipulation. Rehabilitation is an important component of stroke management. Current neurorehabilitation approaches emphasize repetitive and task-specific practice. Meaningful functional activities may promote motor relearning and improve independence. The Vasa Concept was developed by Dr. Rajul Vasa. It is described as a task-oriented

neurorehabilitation approach.[1,2] The approach emphasizes functional movement, postural control, weight shifting, gait training, and use of the affected side. It also emphasizes centre-of-mass control, paretic-side loading, proprioceptive input, and repeated functional movement. These principles aim to improve movement control and functional independence. However, published evidence specifically evaluating the Vasa Concept remains limited.[1,2] Most available evidence is case-based or descriptive. The aim was to describe changes in motor recovery, balance, mobility, and functional independence following Vasa Concept-based physiotherapy in a patient with chronic hemiparesis after intracerebral hemorrhage. The objectives were to assess motor recovery using the Fugl-Meyer Assessment, improve weight acceptance and weight transfer through the affected lower limb, improve balance, stepping, gait initiation, and walking, improve reaching, gripping, grasp-and-release, and functional hand use, and promote functional mobility and independence in daily activities.

CASE REPORT

A 50-year-old man with chronic hemiparesis following hemorrhagic stroke attended the physiotherapy outpatient department. He presented 4 months after the stroke. Neuroimaging showed an intracerebral hemorrhage involving the right gangliocapsular region. He received acute medical

treatment and was subsequently referred for rehabilitation. The patient had persistent left-sided weakness. He reported difficulty walking independently, poor balance, and difficulty climbing stairs. He also had difficulty gripping household objects with the affected hand. His participation in daily activities was reduced. A Vasa Concept-based physiotherapy programme was initiated. Treatment focused on lower-limb motor control, paretic-side loading, centre-of-mass control, gait training, balance, and functional upper-limb activities. The patient was conscious, alert, and able to participate in the rehabilitation programme. Residual left-sided motor impairment was observed. Functional limitations were more evident during standing, walking, stair negotiation, and use of the affected upper limb. Muscle tone was assessed using the Modified Ashworth Scale. The affected side demonstrated Grade 1+ spasticity, indicating a slight increase in muscle tone with a catch followed by minimal resistance through less than half of the available range. Deep tendon reflexes were exaggerated on the affected side, consistent with an upper motor neuron pattern. Selective motor control was reduced in the affected upper and lower limbs. Lower-limb impairment was particularly evident during weight acceptance, weight transfer, single-limb loading, stepping, gait initiation, reciprocal walking, and stair negotiation. Upper-limb

impairment was observed during reaching, grasping, maintaining a grip, releasing objects, and functional object manipulation. Motor impairment was assessed using the Fugl-Meyer Assessment (FMA).[4] Functional balance was assessed using the Berg Balance Scale (BBS). The upper-extremity FMA score increased from 21/66 at baseline to 48/66 after treatment. The patient demonstrated better isolated joint control, along with improved functional grasp and release. Finger-to-nose performance improved from a delay of more than 6 seconds to less than 2 seconds difference between the affected and unaffected sides. The lower-extremity FMA score increased from 18/34 to 29/34. Voluntary motor control improved. Active ankle dorsiflexion was achieved in sitting and standing. Improvements were also observed in weight transfer, stepping, and gait-related activities. Balance improved during the intervention. Unsupported standing improved from 2/4 to 4/4. Standing with eyes closed improved from 1/4 to 4/4. Tandem or single-leg stance improved from 0/4 to 3/4. The patient was able to maintain single-leg stance for more than 5 seconds.

The treatment programme was provided for 4 weeks at a frequency of 5 days per week. Each supervised physiotherapy session lasted approximately 60–90 minutes. A home programme of approximately 30–45 minutes per day was also provided. Treatment intensity was adjusted according to fatigue, neurological status, cardiovascular response, and

safety. During the first week, treatment focused on basic postural control and loading of the paretic side. The goals were to improve body alignment, increase awareness of the affected side, improve trunk and pelvic control, and reduce excessive reliance on the unaffected side. Supine activities included pelvic tilting, pelvic rotation, trunk rotation, bridging with symmetrical loading, bilateral lower-limb movements, and paretic-side sensory loading. Side-lying activities included trunk and pelvic movements, reaching with the affected arm, active movement of the affected leg, and rolling toward and away from the affected side. Sitting activities included forward and lateral centre-of-mass shifts, movement toward the affected side, reaching outside the base of support, trunk rotation, and functional reaching. Sit-to-stand training emphasized symmetrical foot placement, forward centre-of-mass movement, controlled standing, and controlled sitting. Supported standing included equal weight distribution, weight transfer, paretic-side loading, and controlled anterior, posterior, and lateral movements.

During the second week, the programme progressed to dynamic balance and stepping. The goals were to improve centre-of-mass control, dynamic standing balance, trunk-pelvis coordination, and inter-limb coordination. Standing activities included lateral and diagonal

weight shifts, reaching toward the affected side, reaching at different heights, and controlled return to midline. Paretic-side loading included step initiation with the unaffected limb, controlled loading and unloading of the affected leg, and mini-squats with symmetrical loading. Dynamic reaching was performed in forward, lateral, floor-level, and shoulder-level directions. Stepping activities included forward, backward, lateral, and alternating stepping. Functional transitions included sit-to-stand, stand-to-sit, turning, and bed-to-chair and chair-to-bed transfers.

During the third week, the focus shifted to gait, turning, and environmental adaptation. Level-surface walking and progressive walking distances were practiced. Symmetrical stance loading and controlled weight transfer were emphasized. Walking speed was gradually varied from slow to comfortable and faster speeds as safely tolerated. Walking with horizontal and vertical head movements was introduced to improve balance during visual orientation. Turning practice included 90°, 180°, and 360° turns. Obstacle training included stepping over and around low obstacles and changing direction around cones. Stair preparation included step taps, alternating foot placement, and controlled weight transfer.

During the fourth week, treatment focused on functional integration and independence. Functional gait training included changes in walking speed, turning, head movements, obstacle negotiation, and

variable environmental conditions. Stair training included step-up and step-down practice, with progression toward alternating steps. Rail use was reduced only when safe. Functional reaching was performed in standing, including carrying lightweight objects and bilateral tasks. Paretic-side participation was encouraged during daily activities. Advanced balance exercises included narrow-base standing, tandem stance, step initiation, single-limb loading, and dynamic reaching. Functional activities included chair transfers, bed mobility, toilet-transfer simulation, household walking, and turning and reaching in confined spaces. The home programme included whole-body movement, sitting and standing centre-of-mass activities, controlled weight shifting, walking practice, and functional use of the affected side.

RESULTS

The patient demonstrated improvement following 4 weeks of Vasa Concept-based physiotherapy. The most noticeable gains were observed in lower-limb function. Improvements were seen in weight acceptance, weight transfer, stepping, gait initiation, reciprocal walking, and stair-related activities. Upper-limb function also improved. The patient demonstrated better reaching, gripping, grasp-and-release, and object manipulation. The upper-extremity FMA score increased from 21/66 to 48/66. The lower-

extremity FMA score increased from 18/34 to 29/34. Balance also improved. Unsupported standing increased from 2/4 to 4/4. Standing with eyes closed improved from 1/4 to 4/4. Tandem or single-leg stance improved from 0/4 to 3/4. Functional independence also improved according to the FIM. Overall, the patient showed improvements in motor function, balance, gait, mobility, and upper-limb use. However, the improvement cannot be attributed solely to the Vasa Concept. This was a single case without a control group. Repetitive practice, home exercises, physical activity, and other factors may also have contributed to recovery (Table-1).

Outcome Measure	Baseline	Week 1	Week 2	Week 3	Week 4
FMA-UE (Motor)	21/66	25/66	30/66	35/66	48/66
FMA-UE (Sensory)	10/12	10/12	10/12	11/12	11/12
FMA-UE (PROM)	14/24	16/24	18/24	20/24	22/24
FMA-UE (Joint Pain)	20/24	21/24	22/24	23/24	24/24
FMA-LE (Motor)	18/34	20/34	22/34	26/34	29/34
FMA-LE (Sensory)	10/10	10/10	10/10	10/10	10/10
FMA-LE (PROM)	14/20	15/20	17/20	18/20	19/20
FMA-LE (Joint Pain)	20/20	20/20	20/20	20/20	20/20
Berg Balance Scale	27/56	33/56	38/56	43/56	48/56

Table 1. Weekly changes in clinical outcome measures following Vasa Concept-based rehabilitation

DISCUSSION

This case demonstrates the potential use of the Vasa Concept in chronic stroke rehabilitation. The programme emphasized functional movement rather than isolated muscle strengthening. Paretic-side loading was an important component. Stroke can reduce weight acceptance on the affected side. This may contribute to asymmetrical standing and gait. The programme therefore included repeated weight shifting, stepping, and functional loading. The lower-extremity FMA score increased from 18/34 to 29/34. Improvements were also observed in gait initiation, stepping, reciprocal walking, and stair-related activities. These findings suggest improved voluntary motor control and functional mobility. Balance also improved during the intervention. Unsupported standing improved from 2/4 to 4/4. Standing with eyes closed improved from 1/4 to 4/4. Tandem or single-leg stance improved from 0/4 to 3/4. These changes may indicate better postural control. Upper-limb function also improved. The upper-extremity FMA score increased from 21/66 to 48/66. Reaching, gripping, grasp-and-release, and object manipulation also improved. Repeated task-specific practice may have contributed to these functional gains. The programme progressed gradually over 4 weeks. Initial treatment focused on postural control and paretic-side loading. Dynamic balance and stepping were introduced during the second week.

Gait training, turning, obstacle negotiation, and environmental adaptation were emphasized during the third week. Functional activities and independence were emphasized during the fourth week. The principles used in the programme are consistent with important components of contemporary neurorehabilitation, including task-specific practice, repetition, functional movement, and progressive challenge. However, evidence specifically evaluating the Vasa Concept remains limited.[1,2] Therefore, the present findings should be interpreted cautiously. This case has several limitations. The follow-up period was also short. Therefore, the observed improvements cannot be attributed specifically to the Vasa Concept. Natural recovery, repeated practice, home exercises, and other rehabilitation activities may have contributed to the outcome. Future studies should include larger samples and controlled study designs. Standardized intervention protocols and validated outcome measures should be used. Longer follow-up is also required to determine whether improvements are maintained.

CONCLUSION

A 4-week Vasa Concept-based physiotherapy programme was associated with improvements in motor function, balance, gait, mobility, and upper-limb function in this patient with chronic hemiparesis following hemorrhagic stroke. Improvements were

observed in Fugl-Meyer scores and selected Berg Balance Scale components. Functional mobility and upper-limb use also improved. The findings suggest that functional movement, paretic-side loading, centre-of-mass control, gait training, balance activities, and task-specific upper-limb practice may support stroke rehabilitation. However, this was a single case, and the observed improvements cannot be attributed specifically to the Vasa Concept. Further controlled studies with larger samples and longer follow-up are needed.

Author contributions:

MS: Conceptualization, methodology, investigation, resources, writing—original draft preparation, writing—review and editing, visualization, supervision, and project administration. All authors contributed to the review and editing of the manuscript and approved the final version.

Ethical approval: Not applicable

Declaration of patient consent: Written informed consent was obtained from the patient for publication of the case report and any accompanying clinical information and images. The patient was informed that identifying information would be omitted to maintain confidentiality.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation: The authors confirm that there was no use of AI-assisted technology for assisting in the writing of the manuscript and no images were manipulated using AI.

REFERENCES

1. O'Dwyer NJ, Ada L, Neilson PD. Spasticity and muscle contracture following stroke. *Brain*. 1996 Oct;119 (Pt 5):1737-49.
2. Beyaert C, Pierret J, Vasa R, Paysant J, Caudron S. Toe walking in children with cerebral palsy: a possible functional role for the plantar flexors. *J Neurophysiol*. 2020 Oct 1;124(4):1257-1269.
3. Pierret J, Beyaert C, Vasa R, Rumilly E, Paysant J, Caudron S. Rehabilitation of Postural Control and Gait in Children with Cerebral Palsy: the Beneficial Effects of Trunk-Focused Postural Activities. *Dev Neurorehabil*. 2023 Apr;26(3):180-192.
4. Fugl-Meyer AR, Jääskö L, Leyman I, Olsson S, Steglind S. The post-stroke hemiplegic patient. 1. A method for evaluation of physical performance. *Scand J Rehabil Med*. 1975;7:13-31.

© With Author(s). This work is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), provided appropriate credit is given to the original author(s) and source.

Disclaimer: The scholarly papers reviewed and published by TNJHRI Publications, Tamil Nadu, India, represent the views and opinions of their respective authors and do not necessarily reflect the official views or opinions of the Tamil Nadu Journal of Health Research and Innovation (TNJHRI). TNJHRI disclaims any liability for any harm, loss, or damages arising from the published content to any individual, organization, or other party.

How to cite this article: Mayank Singh S. Effectiveness of the Vasa Concept in Improving Functional Performance After Hemorrhagic Stroke: A Case Report. *Tamil Nadu Journal of Health Research and Innovation (TNJHRI)*. 2026;1(1):19–26.