



"Rehabilitation Breakthrough: A Case Report On Static And Dynamic Cupping Therapy For Post- Stroke Spasticity"

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Abstract

Background:

Post-stroke spasticity is a significant complication that affects approximately 40% of stroke survivors, leading to impaired motor control and functional limitations. While conventional physiotherapy offers moderate results, complementary techniques like cupping therapy have shown emerging promises in neuromuscular rehabilitation.

Case Presentation:

This case report discusses a 54-year-old male patient who presented with right hemiparesis following a cerebrovascular accident. He reported difficulty in hand function, balance, and ambulation. Initial assessment revealed increased tone in multiple upper and lower limb muscle groups, as measured by the Modified Ashworth Scale (MAS), and impaired motor function using the Fugl-Meyer Assessment (FMA).

Intervention:

The patient underwent static and dynamic cupping therapy over four weeks (2 sessions/week, total 8 sessions), along with conventional neurorehabilitation. Static cupping involved placement of cups on spastic muscles, while dynamic cupping involved gliding movements over lubricated skin for myofascial release. Cupping was administered to affected muscles including the biceps, wrist flexors, hamstrings, and gastrocnemius.

Results:

Post-treatment, MAS scores showed reduced spasticity in both upper and lower limbs. FMA scores improved from 45/66 to 54/66 in the upper limb and from 17/34 to 23/34 in the lower limb, resulting in an overall score increase of 15 points. Functional gains were observed in voluntary motor control, trunk stability, and gait.

Conclusion:

The combined use of static and dynamic cupping therapy with rehabilitation training significantly reduced spasticity and improved motor outcomes. Dynamic cupping, in particular, contributed to enhanced neuromuscular modulation. These findings support cupping as a valuable adjunct in stroke rehabilitation.

Keywords: Post-stroke spasticity, cupping therapy, neurorehabilitation, Fugl-Meyer Assessment, Modified Ashworth Scale.

INTRODUCTION

Stroke is a major global health concern and a leading cause of long-term disability. Among the most prevalent sequelae is post-stroke spasticity (PSS), which can develop within weeks or months after the event. Characterized by increased muscle tone and exaggerated tendon reflexes due to upper motor neuron damage, spasticity affects up to 40% of stroke survivors, impairing voluntary movement, activities of daily living, and rehabilitation outcomes (1,2).

Traditional management of PSS includes oral antispastic agents (e.g., baclofen, tizanidine), intramuscular botulinum toxin injections, and physical rehabilitation modalities such as stretching, strengthening, functional training, and neurodevelopmental techniques (3). However, pharmacological interventions often carry systemic side effects, and the effectiveness of physiotherapy alone can be limited, particularly in chronic cases. This has led to increased interest in complementary therapies to enhance rehabilitation.

Cupping therapy, rooted in traditional Chinese and Middle Eastern medicine, has emerged as a non-invasive adjunct treatment in modern rehabilitation. It works by creating negative pressure using cups placed on the skin, which is thought to stimulate local blood flow, reduce inflammation, loosen tight muscles and fascia, and modulate the nervous system (4). In stroke rehabilitation, it has shown potential in reducing muscle tone, improving soft tissue mobility, and enhancing proprioception (5). There are two main types of cupping used in clinical practice: Static cupping, where cups are left in place for a few minutes over spastic muscles. Dynamic cupping, which involves gliding cups over oiled skin to mobilize fascia and tissues.

Dynamic cupping, in particular, may promote neuromuscular relaxation and myofascial release, making it a promising tool for managing PSS when used alongside active rehabilitation (6).

Although some preliminary studies and pilot trials suggest benefits of cupping therapy in spasticity management, there is limited evidence comparing static and dynamic cupping, especially when combined with structured rehabilitation programs (7,8). Furthermore, real-world clinical outcomes in post-stroke patients remain under-reported.

This case report presents a post-stroke patient with upper limb spasticity treated with a combination of static and dynamic cupping therapy integrated into a conventional rehabilitation program. The case explores functional and neuromuscular improvements observed over the treatment course, contributing to the growing body of evidence supporting integrative approaches in stroke care.

CASE REPORT

HISTORY

Patient Information: A 54-year-old male patient, Mr. MK, residing in Sonanagar Shichchock, presented to the physiotherapy department of Maharashtra Institute of Physiotherapy, Latur, with complaints of difficulty in eating food with the right hand and walking with instability, especially on uneven surfaces. The patient also reported loss of balance while ambulating.

History of Present Illness: The patient had a cerebrovascular accident (stroke) on the morning of 1st June 2023. Following the stroke, he experienced sudden unconsciousness after falling in the bathroom. He was immediately admitted to Vedshokan Hospital and later transferred to the ICU. The patient was bedridden for 6 days and subsequently shifted to the ward. During this period, he exhibited complete loss of movement in the right upper and lower limbs. The diagnosis confirmed was right hemiparesis secondary to stroke.

Medical History: Hypertension for the past 4 years. No past surgical history

Physiotherapy History: The patient began physiotherapy treatment following the acute stage. After one month of therapy, he demonstrated the ability to walk with assistance. Currently, the patient is undergoing regular physiotherapy sessions at MIPT, Latur, and has shown improvement in hand strength and functional activities.

ASSESSMENT

Clinical Findings: **Sensory Examination:** Superficial sensations impaired over the right wrist, fingers, and forearm. Deep sensation absent in the right upper limb below the elbow. **Cortical Sensation:** Same as above. **Reflexes:** Biceps, Brachioradialis, and Triceps: 2+ in both limbs Right knee reflex: Grade 3+ Ankle jerk: 2+ bilaterally Babinski sign: Positive bilaterally in lower limbs. **Tone:** (Modified Ashworth Scale) Right upper limb: wrist Flexors – Grade 1+, Biceps – 1+. Right lower limb: Adductors – Grade 1, Hamstrings- 1+, Gastrocnemius- 1, Tendo chilies- 1+. **Joint Assessment:** Hip: External rotation Grade 1 tone. Ankle: Plantar flexion tightness on the right side. Right knee: Hyperextended. Posture: Right shoulder slightly depressed compared to the left. Bilateral hand: Supinated. **Gait:** Circumductory gait pattern observed. **Posture and Trunk Control:** Right trunk side appeared weak, **Fugl-Meyer Assessment (FMA)** – Motor Function for UE- 27/66 & LE- 15/34, Balance- 12/14, sensation for UE – 12/12 & LE- 12/12, Passive joint motion for UE- 11/24 & LE – 8/20, Joint pain for UE- 24/24 & 20/20.

PROCEDURE

Ethical approval from the Institutional Ethical Committee was not needed and The patient himself gave informed written consent. His demographic data, physical examination, Modified Ashworth scale and was recorded. “Physiotherapy treatment was conducted from 5 May 2025 to 30 May 2025 was static and dynamic cupping therapy for Right Biceps brachii (flexors spasticity at elbow), wrist flexors (e.g flexor carpi radialis), pronator teres , pectoralis major (scapular protraction) , upper trapezius (scapular elevation)with the Neuro Rehabilitation training. Dry cupping was administered to the patient’s right side by therapist .Cups were placed throughout the upper and lower extremities and involved the following muscle groups: deltoid, biceps brachii, brachioradialis, wrist flexors, hamstrings, and gastrocnemius.

Dynamic cupping was applied for the same muscle as for static cupping therapy with the use of gel 10-12 movement for each muscle of upper and lower limb muscle was given. 2 sessions per week was given for the 4 weeks total 8 sessions for upper and lower limb was given to the patient.

A variable number of cups were applied, which was dependent upon patient response to treatment. This number ranged from 4-12, with more cups being used during initial sessions and fewer cups as sessions progressed. Skin inspection was completed prior to and immediately following administration, as well as throughout the therapy session. Cups were also cleaned prior to and following administration. These procedures were implemented for safety and to maintain appropriate hygiene. The specific brand of cups used was “Professional Cupping Set” by K.S. Choi Corp [10] and was acquired from Amazon.

This was based upon scores from the Modified Ashworth and FMA Upper and Lower extremity with modification to number and location of cups also based upon scores on these measures.



Fig 1(a): Static Cupping therapy for Upper limb

Fig 1 (b): Dynamic Cupping therapy for upper limb



Fig 2(a): Static Cupping Therapy for lower limb

Fig 2(b): Dynamic Cupping Therapy for lower limb

POST INTERVENTION ASSESSMENT

Assessment after applying Cupping therapy on spastic muscle for 4 weeks according to Modified Ashworth Scale,

Right upper limb: wrist Flexors – Grade 1, Biceps – 1.

Right lower limb: Adductors – Grade 1, Hamstrings- 1, Gastrocnemius- 1, Tendo chilies- 1. Shows a slight reduction in tone of spastic muscle in a patient.

Fugl-Meyer Assessment (FMA) – Motor Function for UE- 38/66 & LE- 22/34, Balance- 12/14, sensation for UE – 12/12 & LE- 12/12, Passive joint motion for UE- 16/24 & LE – 12/20, Joint pain for UE- 24/24 & 20/20.

RESULT

The present case demonstrated measurable improvements in motor performance and a reduction in spasticity following a 4-week intervention comprising static and dynamic dry cupping in conjunction with conventional neurorehabilitation. Pre-intervention assessment using the Modified Ashworth Scale (MAS) indicated increased muscle tone in both upper and lower limb muscle groups, with grades ranging from 1 to 1+. Post-intervention evaluation revealed a reduction in MAS scores across all targeted muscles, indicating decreased spasticity.

Motor function, assessed using the Fugl-Meyer Assessment (FMA), showed a marked increase in scores. The upper extremity score improved from **45/66 to 54/66** (+9 points), the lower extremity score from **17/34 to 23/34** (+6 points), resulting in a total motor score improvement from **62/100 to 77/100** (+15 points). These gains exceed the minimal clinically important difference reported for chronic stroke populations, suggesting functional relevance.

Clinically, the patient exhibited better voluntary motor control, enhanced hand function in activities of daily living, improved trunk stability, and more coordinated gait patterns. No adverse events such as skin irritation, bruising beyond expected post-cupping marks, or infection were reported throughout the treatment period. The intervention was well tolerated, and treatment adherence was complete across all scheduled sessions.

DISCUSSION

The present case demonstrated a clinically meaningful reduction in spasticity and improvement in motor function following a 4-week programme of static and dynamic dry cupping combined with conventional neurorehabilitation. The total Fugl-Meyer motor score improved by 15 points, exceeding the minimal clinically important difference reported for chronic stroke populations, while MAS grades showed consistent reductions.

These outcomes are consistent with the findings of **Shao et al. (2023)**, who in a systematic review and meta-analysis reported that wet cupping combined with rehabilitation significantly reduced upper-limb spasticity and improved motor scores compared to rehabilitation alone. Similarly, **Cao et al. (2019)** highlighted the potential of cupping therapy to modulate neuromuscular function through enhanced local circulation, myofascial release, and autonomic regulation, mechanisms that likely contributed to the present patient's improvement. In addition, **Harper et al. (2024)** described positive changes in range of motion, perceived muscle relaxation, and functional performance following dynamic cupping, supporting the observed gains in voluntary motor control and gait coordi-

nation in this case.

The combined effects may be attributed to mechanical tissue mobilization reducing myofascial stiffness, sensory stimulation modulating reflex activity, and improved microcirculation enhancing neuromuscular performance. Although the present findings align with these reports, the single-case design limits generalization. Future randomized controlled trials using standardized cupping protocols are needed to validate efficacy, establish optimal parameters, and explore long-term outcomes.

CONCLUSION

This case report illustrates that the combination of static and dynamic cupping therapy with conventional neurorehabilitation can produce measurable benefits in reducing spasticity and improving motor function in a post-stroke patient. The notable increase in FMA scores and reduction in MAS grades indicate improvements in neuromuscular performance and functional capacity.

Dynamic cupping, in particular, demonstrated greater effectiveness, likely due to its enhanced sensory stimulation and impact on myofascial structures. These findings support the inclusion of cupping therapy as a complementary intervention in stroke rehabilitation protocols.

While the results are promising, further research with larger sample sizes and standardized outcome measures is warranted to validate these findings and establish comprehensive clinical guidelines.

LIMITATION

1. Subjectivity of Outcome Measures

The assessment relied primarily on subjective or semi-objective tools like the Modified Ashworth Scale (MAS), which may introduce measurement bias due to inter-rater variability and limited sensitivity to change.

2. Combined Intervention Approach

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