

## Introduction

Arteriovenous malformations (AVMs) carry a significant risk of intracerebral hemorrhage and subsequent neurologic deficits, with post-stroke pain syndromes often complicating recovery. While embolization effectively reduces the likelihood of rebleeding, it can also provoke perilesional ischemia and neuroinflammation. These processes may heighten central sensitization within the thalamocortical pathways, leading to maladaptive pain responses such as hemiparetic or central post-stroke pain.

## Case Description

A 34-year-old male with a history of depression and tobacco use presented with right-sided weakness following embolization for a ruptured arteriovenous malformation (AVM) involving the left thalamus and adjacent basal ganglia. Initial CT imaging showed a left intraventricular hemorrhage with midline shift and hydrocephalus, requiring placement of an external ventricular drain. He subsequently underwent endovascular embolization for hemostasis. The patient was stabilized post-procedure but exhibited persistent right hemiparesis and sensory changes. He was transferred to an acute inpatient rehabilitation facility on post-procedure day 10 for continued neurologic and functional recovery.

## Clinical Course

At community rehab hospital, the patient participated in an intensive interdisciplinary rehabilitation program that included physical therapy, occupational therapy, and speech-language pathology. The primary goals were to improve mobility, independence with activities of daily living (ADLs), balance, coordination, and overall functional endurance. On admission, he required moderate assistance for most self-care activities, maximal assistance for transfers, and was completely dependent for ambulation. Therapy sessions emphasized neuromuscular re-education, task-specific training, and compensatory strategies to enhance motor control and safety during mobility and ADLs. Speech therapy focused on cognitive-communication and swallowing assessment, while occupational therapy targeted right upper extremity function, fine motor control, and adaptive techniques for self-care independence..

## Results

After one week of intensive interdisciplinary rehabilitation, the patient demonstrated significant functional gains. He exhibited improved trunk stability and postural control, allowing greater independence in seated balance and initiation of sit-to-stand transitions. Right upper extremity motor activation increased, enabling partial voluntary grasp and release during task-oriented activities. He progressed to requiring only minimal assistance for dressing, grooming, and bed mobility, reflecting enhanced coordination and endurance. Cognitive and attentional improvements were also observed, with better participation in therapy sessions and increased ability to follow multi-step commands. These advancements indicated early neuroplastic recovery and positive response to comprehensive rehabilitation interventions.

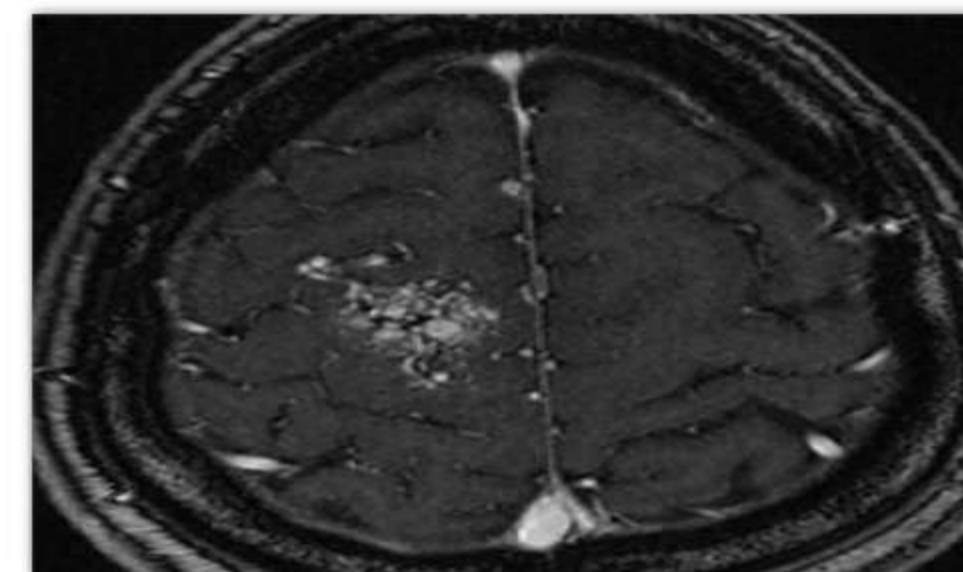
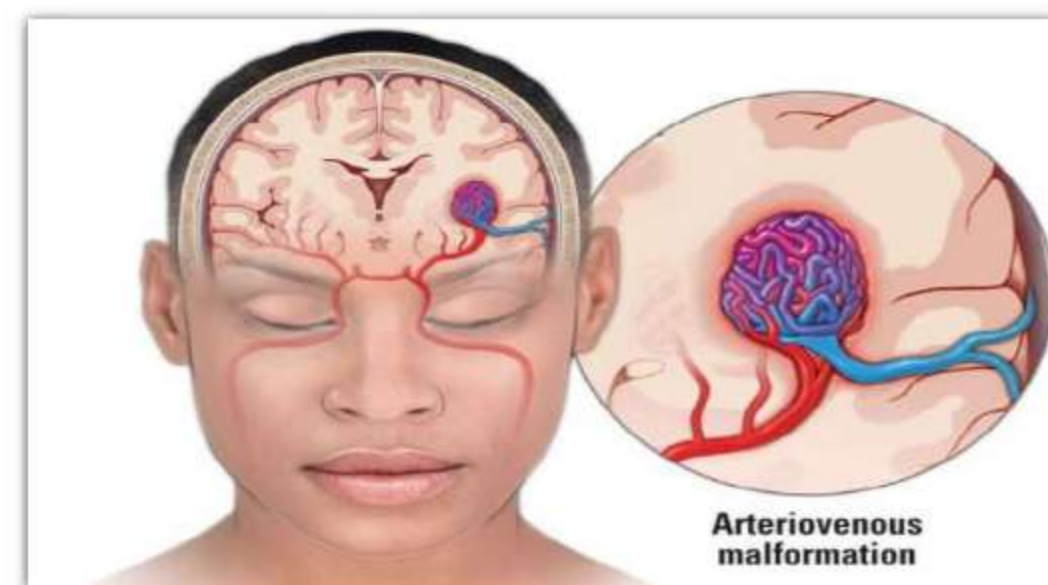
## Conclusion

This case underscores the critical importance of early and intensive interdisciplinary rehabilitation in optimizing functional recovery following hemorrhagic cerebrovascular accident (CVA) secondary to AVM embolization. Comprehensive, goal-directed, and patient-centered therapy facilitated rapid neurological and functional improvements within a short timeframe. Tailored interventions addressing mobility, coordination, and cognitive engagement contributed to meaningful gains in independence and overall recovery trajectory.

## References

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4. Ong, P. L., Lee, Y. S., Chen, G., & Wong, S. H. (2023). Inpatient rehabilitation outcomes after primary severe hemorrhagic stroke. *Frontiers in Neurology*, 14, 1229392. <https://doi.org/10.3389/fneur.2023.1229392>

## Image Demonstration



A visual representation of AV malformation of the intracerebral vasculature  
B MRI: representative imaging of AVM with hemorrhage noted within parietal lobe