

Postpartum Guillain-Barré Syndrome Rehabilitation: A Case Report on Multidisciplinary Management and Functional Outcomes

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Abstract: Guillain-Barré syndrome (GBS), a serious acute neurological disorder that can occur during pregnancy and the postpartum period, poses significant risks to maternal health. Severe cases may rapidly progress to generalized paralysis or life-threatening complications, underscoring the urgency of early rehabilitation interventions to mitigate acute sequelae. This report details the rehabilitation journey of a 27-year-old female diagnosed with GBS following cesarean delivery at 36 weeks of gestation. Initially presenting with limb paralysis, respiratory failure, and dysphagia, she received immunoglobulin therapy and mechanical ventilation; however, persistent deficits necessitated transfer to specialized rehabilitation. A multidisciplinary program integrated respiratory training (sputum clearance, high-flow oxygen, speaking valve use), swallowing rehabilitation (oral motor exercises, laryngeal elevation training), physical therapy (joint mobility, electrical stimulation), and psychological support. Following this regimen, she achieved ventilator independence, extended phonation duration from 10 minutes to 1 hour, and demonstrated safer swallowing with reduced aspiration risk. Despite these gains, residual challenges included incomplete limb motor recovery, food spillage due to weak oral musculature, and persistent sensory disturbances. Her progress highlights the role of early multidisciplinary rehabilitation in restoring critical functions in postpartum GBS, while persisting deficits emphasize the need for long-term adaptive care. This case provides actionable insights for optimizing maternal GBS management, advocating integrated care models addressing physical and psychological recovery to advance global maternal health priorities.

Keywords: Guillain-Barré syndrome, postpartum, rehabilitation, maternal health

Introduction

Guillain-Barré syndrome (GBS), an acute autoimmune polyneuropathy characterized by inflammatory demyelination of peripheral nerves and nerve roots, represents the leading cause of acute flaccid paralysis worldwide.^{1,2} Pathologically, lymphocyte and macrophage infiltration around peripheral nerve vasculature drives progressive myelin damage, resulting in symmetrical limb weakness, respiratory failure, and autonomic dysfunction.^{3,4} Despite advances in immunotherapy and critical care, mortality rates remain at 3–7%, with approximately 20% of survivors experiencing long-term neurological sequelae, including muscle atrophy, foot drop, and impaired mobility.^{5,6} Early rehabilitation interventions are critical to mitigate complications such as pulmonary infections, pressure ulcers, and joint contractures. Despite its rarity in perinatal periods (incidence: 1.2–1.9/100,000 pregnancies),⁷ postpartum GBS carries heightened risks due to physiological vulnerability after cesarean delivery, and it poses unique challenges due to the dual demands of maternal and neonatal recovery. However, there are relatively few reports on postpartum GBS, mainly focusing on the



pharmacological treatment or the rehabilitation of single-system dysfunctions.^{8–10} There is still a lack of literature regarding the multisystem rehabilitation of complex early-stage cases. This case report details the multidisciplinary rehabilitation of a 27-year-old female diagnosed with severe GBS at 36 weeks of gestation, highlighting strategies to address respiratory failure, dysphagia, and motor deficits while navigating postpartum recovery. By documenting her functional improvements and persistent challenges, this report provides a pragmatic framework for optimizing rehabilitation protocols in maternal GBS, emphasizing the integration of respiratory, physical, and swallowing therapies to bridge acute care and long-term functional restoration.

Case Presentation

A 27-year-old female was admitted to our rehabilitation department with motor dysfunction, respiratory difficulties, and swallowing impairment. At 36 weeks of pregnancy (May 9, 2024), she developed a fever (max 38.2°C) and limb weakness, prompting hospitalization. During her stay, she experienced progressive weakness in her upper limbs, neck pain, and an inability to move her right fingers. Quantitative assessment using the Medical Research Council Sum Score (MRC-SS) revealed symmetric weakness: upper limbs proximal (deltoid/biceps) 3/5, distal (wrist extensors/finger flexors) 2/5; lower limbs proximal (iliopsoas/quadriceps) 2/5, distal (tibialis anterior/gastrocnemius) 1/5. On May 11, she underwent a cesarean section under general anesthesia. Obstetric history: Gravida 1 Para 1 (G1P1). Neonatal outcome: Male infant, birth weight 3200 g, Apgar 9/10 (1-min/5-min), with weekly developmental monitoring showing appropriate weight gain (3500 g at 2 weeks) and normal neurological reflexes. Postoperatively, she developed respiratory distress, requiring reintubation and ventilatory support. The muscle strength of her limbs significantly declined but improved after the first intravenous immunoglobulin (IVIg) course (0.4 g/kg/day for 5 days, May 14–19, 2024).

On May 30, a lumbar puncture revealed elevated cerebrospinal fluid (CSF) pressure (initial: 250 mmH₂O, final: 150 mmH₂O), with CSF WBC counts of 32x10⁶/L and protein levels of 2664.1 mg/L (albuminocytologic dissociation). Serum anti-GT1a IgG was positive, and both serum and CSF tested positive for TBA. Electromyography (EMG) indicated peripheral nerve motor fiber damage in the upper limbs, abnormal F waves (prolonged latency), and neurogenic damage to anterior muscles. Lumbar puncture wound management: 22G needle at L3-L4 interspace; sterile dressing with 5-minute pressure. Healing progression: Mild tenderness (Day 1) → scab formation (Day 3) → faint scar (Day 7) without CSF leakage/infection. Based on Brighton Level 1 diagnostic criteria (progressive bilateral limb weakness, areflexia, CSF albuminocytologic dissociation, and electrophysiological demyelination evidence), she was diagnosed with GBS. Treatment included respiratory support, sedation, analgesia, blood pressure management, immunotherapy, spasticity relief, and rehabilitation therapies, including Traditional Chinese Medicine. Due to persistent deficits, a second IVIg cycle was administered (0.4 g/kg/day for 5 days, June 26–30, 2024).

Despite treatment, she continued to exhibit limb dyskinesia, respiratory difficulties, and swallowing dysfunction, leading to her transfer to our rehabilitation department. On admission, her upper and lower limb muscle strength was grade 3+, with limited movement except for shrugging. She displayed muscle atrophy, skin breakdown, and reduced flexibility and coordination. Swallowing muscle strength and endurance were impaired, confirmed by a positive swallowing dye test, necessitating nasogastric feeding and ventilator support. Her superficial and deep sensations were abnormal. She was fully dependent for activities of daily living (ADL), with malnutrition and weight loss. Lactation status: Breastfeeding discontinued due to bilateral upper limb weakness (MRC 2/5 distally), preventing infant holding and milk expression. Bottle-feeding initiated by family members. No IVIg-related adverse effects observed in infant during biweekly pediatric assessments.

Rehabilitation focused on preventing complications and maximizing functional recovery. Respiratory rehabilitation aimed to prevent pulmonary infections and improve respiratory function through sputum expectoration techniques, oral hygiene, and tracheal balloon pressure monitoring. High-flow oxygen therapy and speaking valve use facilitated diaphragmatic breathing and phonation exercises. Swallowing training included oral motor exercises (lip/tongue movements, cheek puffing, cold stimulation) and throat muscle training (larynx lifting, food trials, electrical stimulation). Physical therapy targeted joint mobility, muscle strength, and sensory recovery. Structured psychosocial rehabilitation was implemented, comprising: (1) Cognitive Behavioral Therapy (CBT, 60min sessions twice weekly) targeting illness perception (eg, correcting misconceptions linking GBS to untreatable “postpartum disease”) and maternal role adaptation; and (2) Individualized counseling (45min sessions twice weekly) addressing anxiety about prognosis using empathetic listening and refocusing techniques.

Table 1 Key Interventions and Functional Outcomes During Clinical Course

Time Period	Major Interventions	Key Functional Outcomes
May 11–16, 2024	<ul style="list-style-type: none"> Respiratory support (non-invasive ventilation) Diagnostic workup (CSF/serology) Analgesia (tramadol) 	<ul style="list-style-type: none"> SpO₂ maintained >95% GBS confirmed (CSF albuminocytologic dissociation, anti-GT1a IgG+) Pain VAS: 7 → 5
May 17–Jun 30, 2024	<ul style="list-style-type: none"> Second IVIg cycle (0.4 g/kg/day ×5 days) Passive ROM exercises Initial CBT/counseling 	<ul style="list-style-type: none"> No IVIg adverse events No progression of muscle atrophy HADS-Anxiety: 12 → 9
Jul 4–Aug 14, 2024	<ul style="list-style-type: none"> Active-assisted exercises (upper/lower limbs) Acupuncture Intensive CBT/counseling 	<ul style="list-style-type: none"> MRC-SS improvement: <ul style="list-style-type: none"> Upper limbs: proximal 3→4, distal 2→2+ Lower limbs: proximal 2→3 HADS: Anxiety 7, Depression 5
Aug 14–Sep 18, 2024	<ul style="list-style-type: none"> Resistance training (1-kg weights) Bridge balance training CBT maintenance 	<ul style="list-style-type: none"> MRC-SS (3-month follow-up): <ul style="list-style-type: none"> Upper limbs: proximal 4/5, distal 3/5 Lower limbs: proximal 3/5, distal 2/5 HADS both dimensions <7

Hospital Anxiety and Depression Scale (HADS) scores improved from baseline (anxiety: 12 [moderate], depression: 8 [mild]) to post-intervention (anxiety: 7 [mild], depression: 5 [normal]) within two weeks. Psychological support from family and medical staff encouraged active participation in rehabilitation.

After four weeks, she weaned off the ventilator and extended speaking valve use from 10 minutes to 1 hour. She could pronounce monosyllables and phrases, though with effort. Her oral and pharyngeal sensations improved. Fiberoptic bronchoscopy showed reduced saliva aspiration, and the markers of pulmonary infections tended to be normal. She progressed to pureed food trials but exhibited inadequate chewing and orbicularis oris strength, leading to food spillage. Her shoulder and hip joint mobility improved, but limb motor and sensory deficits persisted. At 3-month follow-up, Infant demonstrated normal developmental milestones. MRC-SS showed significant improvement: upper limbs proximal 4/5, distal 3/5; lower limbs proximal 3/5, distal 2/5. The key interventions and functional outcomes during clinical course see [Table 1](#).

Discussion

GBS during the postpartum period represents a critical intersection of autoimmune neuropathology and maternal physiological vulnerability.^{11,12} Notably, postpartum-specific GBS literature remains scarce, amplifying this case's value in documenting acute-to-rehab continuum. While the precise pathogenesis of GBS remains complex, hormonal shifts—particularly rapid declines in estrogen and progesterone post-cesarean delivery—may exacerbate immune dysregulation, potentially amplifying antigen recognition errors and accelerating neurological deterioration.^{7,13} This case illustrates how such mechanisms culminate in life-threatening complications: acute respiratory failure, near-total limb paralysis, and profound dysphagia. Similar to Aabdi et al's case,¹⁰ our patient required emergent ventilatory support within 72 hours postpartum, contrasting with slower progression in non-urgent deliveries.⁷ Early rehabilitation interventions, however, demonstrated their pivotal role in mitigating cascading sequelae. By integrating respiratory therapy (ventilator weaning strategies, speaking valve training), targeted swallowing rehabilitation (oral motor exercises, laryngeal elevation drills), and neuromuscular electrical stimulation, the patient achieved measurable functional gains despite severe axonal involvement. Notably, her 4-week ventilator weaning aligned with Pradhan et al,⁸ but exceeded resource-limited settings where dependence averaged >8 weeks.⁹

Crucially, this experience underscores two underprioritized aspects of postpartum GBS management. First, rehabilitation must address the dual burden of neurological recovery and postpartum physiological adaptation. For instance, lactation demands and delayed mobilization post-cesarean section complicate nutritional and musculoskeletal rehabilitation, necessitating protocols that harmonize maternal-infant bonding with therapeutic rigor. Gupta et al reported identical challenges in postpartum GBS cases, with breast engorgement directly impeding rehabilitation adherence.¹⁴ Second,

psychological resilience is not merely supportive but foundational to functional outcomes. Bhusal et al quantified CBT's efficacy, showing 42% HADS-anxiety reduction within 2 weeks—directly supporting our cognitive-behavioral approach.⁷ The patient's gradual engagement in self-directed exercises and tolerance for prolonged speaking valve use reflected the synergy between neuromotor retraining and confidence-building—a dynamic often overlooked in traditional neuromuscular rehabilitation paradigms.

Nevertheless, persistent deficits in limb coordination, chewing efficiency, and sensory integration remind us that even optimized short-term rehabilitation cannot fully counteract severe GBS-related axonal damage. Chen et al observed this “incomplete recovery paradox” in 70% of postpartum GBS patients despite MRC-SS improvements.¹⁵ This gap calls for a “stepped-care” model, where acute-phase multidisciplinary efforts transition seamlessly into community-based adaptive strategies, such as assistive devices for feeding or mobility. Furthermore, this case challenges the conventional focus on neurological scales (eg, muscle strength grading) by advocating patient-centered metrics—phonation duration, safe oral intake volume—as more meaningful indicators of maternal functional recovery.

By bridging acute critical care and long-term rehabilitation, this report reframes postpartum GBS management as a continuum demanding tailored integration of medical, functional, and psychosocial expertise. It urges clinicians to view maternal recovery not through isolated neuromuscular improvements but through the lens of holistic health restoration—a perspective vital to advancing global maternal care standards.

Conclusion

In conclusion, this case illustrates the critical role of early, multidisciplinary rehabilitation in restoring essential functions in postpartum Guillain-Barré syndrome, including ventilation, speech, and swallowing. While short-term outcomes were encouraging, persistent deficits underscore the need for long-term, individualized care strategies. The case advocates for integrating neurorehabilitation into postpartum care protocols and supports the use of patient-centered functional outcomes to guide maternal recovery. Moving forward, we recommend establishing standardized rehabilitation protocols for postpartum GBS through multicenter studies, particularly focusing on optimal intervention timing and duration to address residual impairments. We aspire for this case to serve as a critical reference for optimizing postpartum GBS rehabilitation strategies, while contributing to the global efforts in safeguarding maternal health.

Data Sharing Statement

All data supporting the findings of this case report are included within the manuscript.

Ethics Statement

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable data included in this article; additional institutional approval for the publication of case details was granted by Guangdong Province Work Injury Rehabilitation Hospital.

Disclosure

The authors report no conflicts of interest in this work.

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