

ANESTHETIC MANAGEMENT IN A CASE OF POST-SURGICAL GUILLAIN-BARRE SYNDROME

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Abstract

Background and Objectives: Guillain-Barre Syndrome (GBS) is an acute demyelinating polyneuropathy characterized by ascending motor weakness and sensory and autonomic dysfunction. Anesthesia management in patients with GBS, especially post-surgical, poses challenges due to potential neuromuscular impairments and respiratory complications. This case report discusses the anesthetic considerations in a post-surgical GBS patient.

Case Presentation: A 62-year-old female, a known case of hypertension and diabetes mellitus, presented with wound gaping at the surgical site two months after undergoing Open Reduction and Internal Fixation (ORIF) for a right femur fracture. One-month post-surgery, she developed lower limb weakness, followed by upper limb weakness, and was diagnosed with GBS (Acute Inflammatory Demyelinating Polyneuropathy variant) and managed with Intravenous Immunoglobulin (IVIG). The patient underwent wound closure under regional anesthesia.

Conclusion: GBS poses significant anesthetic challenges, particularly concerning respiratory management and sensitivity to local anesthetics. Careful anesthetic planning, including monitoring neuromuscular function and adjusting local anesthetic dosages, is crucial in managing such cases.

Keywords: Guillain-Barre Syndrome, Anesthesia, Post-Surgical Complications, Regional Anesthesia, Neuromuscular Impairment

INTRODUCTION

Guillain-Barre Syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy that presents with ascending motor weakness, sensory deficits, and autonomic dysfunction.¹ The syndrome is a significant concern in anesthetic practice due to potential respiratory complications and the impact on neuromuscular function.² This report presents a case of post-surgical GBS managed with regional anesthesia, discussing the anesthetic challenges and management strategies.

CASE PRESENTATION

A 62-year-old female patient, with a medical history significant for hypertension and diabetes mellitus, presented for evaluation following complications related to a previous orthopedic surgery. The patient had undergone Open Reduction and Internal Fixation (ORIF) for a right femur fracture two months prior. Postoperatively, she experienced wound gaping at the surgical site, prompting further medical evaluation and

management.

Approximately one month after the initial surgery, the patient began experiencing progressive weakness, initially manifesting in the lower limbs. This weakness progressed to involve the upper limbs, raising clinical suspicion for a neurological disorder. Upon admission to a government hospital, the patient underwent a thorough neurological evaluation. The clinical presentation, alongside supportive diagnostic findings, led to a diagnosis of Guillain-Barre Syndrome (GBS), specifically the Acute Inflammatory Demyelinating Polyneuropathy (AIDP) variant.³ She was promptly treated with Intravenous Immunoglobulin (IVIG), which is a standard treatment modality for GBS aimed at reducing disease severity and accelerating recovery.

Preoperative investigations included routine blood work, which revealed a hemoglobin level of 12 g/dL and a total leukocyte count of 16,100 cells/cumm. Her HbA1c was 4.2%, indicating good glycemic control. A CT scan of the brain showed suspicious hypodensity in the left frontal lobe and right capsule ganglionic region, suggestive of a possible infarct. Nerve conduction studies revealed increased distal latency in the bilateral median nerve, decreased compound muscle action potential (CMAP) amplitude in the right ulnar nerve, and absent sensory nerve action potential (SNAP) and F waves, confirming the diagnosis of GBS.

On examination, the patient was found to be conscious, oriented, and afebrile, with stable vital signs. She had a height of 156 cm and a weight of 60 kg. Her cardiovascular and respiratory systems were assessed as normal, and her Glasgow Coma Scale (GCS) score was 15/15. Neurological examination showed diminished deep tendon reflexes in the lower limbs, consistent with the peripheral nerve involvement typical of GBS. Importantly, her pulmonary function test was normal, which supported the decision to proceed with surgery under regional anesthesia with adequate cardiopulmonary monitoring.

The anesthesia technique chosen for the procedure was regional anesthesia. After ensuring aseptic conditions, the patient was placed in a sitting position, and the skin was prepared and draped. The L3-L4 intervertebral space was identified, and after local infiltration, a 25-gauge Quincke spinal needle was used to access the subarachnoid space. Clear cerebrospinal fluid flow was observed, confirming correct placement, and 2.3 mL of 0.5% heavy Bupivacaine with 10 mcg of Fentanyl was administered intrathecally.

During the operation, the patient experienced a blood loss of approximately 80 mL. She was catheterized, and her urine output was measured at 120 mL. The entire procedure lasted 1 hour and 30 minutes and was uneventful. Postoperatively, the patient remained stable with no significant changes in her neurological condition, allowing for a smooth recovery phase.

DISCUSSION

Guillain-Barre Syndrome (GBS) is an acute inflammatory demyelinating polyneuropathy characterized by progressive motor weakness, sensory disturbances, and autonomic dysfunction.³ The incidence of GBS is approximately 1.7 per 100,000 per year in the general population and remains consistent in pregnant populations.⁴ Despite its rarity, GBS poses significant challenges in perioperative management due to the potential for neuromuscular impairment and respiratory complications, particularly in the postoperative period.⁵

In the presented case, the patient developed GBS following a surgical procedure for right femur fracture repair. This post-surgical GBS occurred without a preceding viral infection, which differentiates it from the typical epidemiological pattern where GBS follows a viral illness.⁶ Post-surgical GBS, defined as the occurrence of symptoms within six weeks of surgery, accounts for approximately 4.5% to 9.1% of all GBS cases.⁷ This emphasizes the need for heightened vigilance in patients presenting with neurological symptoms postoperatively, especially in the absence of other major triggers.

The management of GBS in this case involved the administration of Intravenous Immunoglobulin (IVIG), a primary therapeutic intervention known to accelerate recovery in both pregnant and non-pregnant patients.⁸ Plasmapheresis is another effective treatment option, though its use specifically during pregnancy requires careful consideration due to the lack of extensive studies. Clinical decisions should be tailored to the patient's

overall condition, weighing the potential benefits and risks of each therapeutic approach.⁹

Anesthetic management in patients with GBS is particularly challenging due to the potential for exacerbated neuromuscular symptoms and respiratory complications. Regional anesthesia, including neuraxial blocks, is generally considered safe for these patients.¹⁰ However, they often exhibit increased sensitivity to local anesthetics, necessitating careful dose adjustments to prevent prolonged sympathetic blockade and associated hemodynamic effects such as hypotension and bradycardia. In this case, regional anesthesia was selected for our patient due to her stable respiratory status and normal pulmonary function tests.

The literature reports mixed outcomes regarding the use of regional anesthesia in GBS patients, with some cases suggesting a possible link between epidural anesthesia and the onset or worsening of GBS.¹¹ However, this association remains inconclusive, and our experience aligns with findings where regional anesthesia, when carefully administered, did not exacerbate the patient's condition. The administration of a reduced dose of 0.5% heavy Bupivacaine with Fentanyl intrathecally was uneventful, and the patient tolerated the procedure well without any postoperative complications.

In contrast, general anesthesia is often preferred in GBS patients with significant respiratory involvement due to the ability to maintain controlled ventilation and secure airway management.¹² Neuromuscular blockers, such as succinylcholine, are generally avoided in GBS due to the risk of hyperkalemia and prolonged neuromuscular blockade.¹³ Instead, non-depolarizing neuromuscular blocking agents may be used cautiously, with careful monitoring for prolonged effects. Inhaled anesthetics, which do not interact with GBS pathophysiology, can be safely used, but attention must be paid to potential autonomic instability in these patients.¹⁴

Patients with post-surgical GBS are at a higher risk of developing acute respiratory failure and may require mechanical ventilation more frequently than those with non-surgical GBS.¹⁵ Consequently, a thorough preoperative evaluation of pulmonary function is critical to anticipate and manage potential respiratory complications.¹⁶ This case illustrates the importance of tailoring anesthetic management to the patient's clinical condition, ensuring adequate monitoring and dose adjustments to account for her increased sensitivity to local anesthetics.

In conclusion, the anesthetic management of GBS requires a comprehensive understanding of the disease's pathophysiology and its implications for anesthesia. Anesthesiologists must carefully assess the risks and benefits of each anesthetic approach, taking into account the patient's clinical condition, the nature of the surgical procedure, and the potential impact on neuromuscular and respiratory function. With careful planning and monitoring, successful surgical outcomes can be achieved in patients with GBS, minimizing the risk of exacerbating neurological symptoms and ensuring safe recovery.

CONCLUSION

The anesthetic approach for patients with post-surgical GBS requires careful assessment and monitoring to address potential neuromuscular and respiratory challenges. Regional anesthesia can be safely employed with appropriate dose adjustments and vigilant intraoperative monitoring.

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