# "Comprehensive Anesthetic Approach in Myasthenia Gravis for Mastectomy: Successful Use of TIVA Without Neuromuscular Blockade"

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**Abstract:**

Managing Anesthesia in patients with Myasthenia Gravis (MG) poses significant challenges due to their sensitivity to neuromuscular agents. Here, we report the anesthetic management of a 45-year-old female with Myasthenia Gravis who successfully underwent excision of a large breast tumor under general Anesthesia.

**Keywords:** Myasthenia Gravis, Breast tumor excision, Neuromuscular blockade, Anesthesia, Dexmedetomidine, T otal intravenous Anesthesia.

**DOI Number: 10.48047/nq.2024.22.5.nq25021** **NeuroQuantology 2024; 22(5):207-209**



## INTRODUCTION

Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by fluctuating muscle weakness, which occurs due to the presence of antibodies against acetylcholine receptors (AChR) at the neuromuscular junction. The prevalence of MG is estimated to be approximately 20 per 100,000 individuals, with a higher incidence in women. The hallmark feature of MG is its sensitivity to neuromuscular blocking agents (NMBAs), particularly non-depolarizing agents, making perioperative management in these patients highly complex .[1]

Patients with MG may experience a myasthenic crisis—a severe exacerbation of muscle weakness—either during or after surgery, particularly in those who have undergone thymectomy. In fact, myasthenic crises have been reported in 17.5% of patients after thymectomy . Due to this, Anesthesia management in MG patients must be approached with great caution to avoid complications related to neuromuscular blockade and respiratory compromise.[2,3]

The anesthetic management of Myasthenia Gravis (MG) patients is not well-documented, presenting unique challenges in surgical care. This case highlights the anesthetic considerations and perioperative management of a patient with MG undergoing a breast tumor excision.

**Case Presentation:**

A 45-year-old female, with a known diagnosis of Myasthenia Gravis, was scheduled for a

large breast tumor excision at Ghandhi Surgical Hospital, Tagore Road, Gandhidam, Gujarat, India. Her medical history included a thymectomy five years earlier and a previous myasthenic crisis two years ago. At the time of surgery, she was on a regimen of prednisolone 15 mg once daily, Mycophenolate 1 g once daily, Mestinon (Pyridostigmine) 60 mg three times daily, and Cipralex (Escitalopram) 10 mg once daily. She exhibited no abnormal findings on physical examination, with normal vital signs and muscle strength at baseline.

On the morning of surgery, the patient received 8 mg of intravenous Ondansetron as premedication. Anesthesia was induced with 150 mg of intravenous Propofol and 100 mcg of Fentanyl. Endotracheal intubation was achieved with a 7.0 mm cuffed endotracheal tube without the use of any neuromuscular blocking agents (NMBAs), given the patient's sensitivity to these drugs. Maintenance of Anesthesia was achieved with a continuous infusion of Dexmedetomidine at 0.5 mcg/kg/hr and Remifentanil at 0.2 mcg/kg/hr.

The surgical procedure lasted approximately two hours. The patient's body temperature was carefully monitored and maintained above 36°C throughout the procedure. She remained hemodynamically stable, and there were no intraoperative complications. At the end of surgery, the patient's muscle strength was assessed, and spontaneous respiratory efforts were observed 30 minutes after the cessation of anesthetic agents. Extubation was uneventful, though it required a slightly longer recovery time than typical, reflecting the anticipated delayed emergence due to the patient's MG.

In the immediate postoperative period, the patient remained stable. She experienced no signs of muscle weakness, difficulty swallowing, or respiratory compromise. The patient was discharged the next morning without complications.

**DISCUSSION :**

In our study, we managed a 45-year-old female patient with a known history of myasthenia gravis (MG) undergoing large breast tumor excision. The patient had a history of thymectomy five years prior and experienced a myasthenic crisis two years before the current surgery. Anesthesia was carefully administered, avoiding neuromuscular blocking agents (NMBAs) due to the patient's increased sensitivity to these drugs. We employed a total intravenous Anesthesia (TIVA) approach using propofol, fentanyl, dexmedetomidine, and remifentanil, without the use of muscle relaxants. The surgical procedure was uneventful, with stable hemodynamics and no postoperative complications, reflecting the effectiveness of this technique for patients with MG.



In comparison, other studies have reported similar strategies for anesthetic management in patients with MG. Uchida et al. (2012) [3] managed MG patients undergoing thymectomy using total intravenous Anesthesia (TIVA) and epidural Anesthesia, also minimizing the use of NMBAs due to the risk of hypersensitivity. They noted that patients with MG are highly sensitive to non-depolarizing neuromuscular blocking agents, and even small doses can lead to prolonged muscle weakness postoperatively . In another case report, Marcuse et al. (2021) [5] described anesthetic management for subclinical MG patients with thymoma, emphasizing the importance of monitoring and limiting the use of muscle relaxants due to the risk of prolonged recovery times and potential respiratory compromise.

In contrast to our case, where NMBAs were entirely avoided, Nitahara et al. (2007)[6] reported the use of minimal doses of rocuronium in MG patients, combined with careful TOF monitoring to assess neuromuscular function. They successfully reversed the effects with sugammadex, though there have been reports of sugammadex failure in some MG patients, leading to prolonged neuromuscular blockade.

Our approach aligns with best practices in the literature, avoiding muscle relaxants and opting for a TIVA-based anesthetic plan, which is considered safer for patients with MG. Postoperatively, our patient had a stable recovery without respiratory or muscle weakness, consistent with other studies that suggest TIVA reduces the risk of postoperative complications such as myasthenic crises and respiratory failure.

Overall, the literature supports the use of TIVA and minimal use of NMBAs in MG patients, as demonstrated by both our study and prior research. The key to successful management lies in careful monitoring, should avoid neuromuscular blockade, and ensuring adequate postoperative recovery without respiratory compromise.

**Conclusion:**

This case illustrates the successful anesthetic management of a Myasthenia Gravis patient undergoing breast tumor excision. Avoidance of neuromuscular blocking agents, careful selection of anesthetic drugs, and vigilant perioperative monitoring were critical to minimizing the risk of a myasthenic crisis and other complications. Dexmedetomidine and Remifentanil proved to be effective agents for maintaining Anesthesia in this patient, with a stable intraoperative course and smooth postoperative recovery.

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