

CASE REPORT

ANESTHESIA & CONCURRENT DISEASE

Anesthetic management of a post Guillain-Barre syndrome patient undergoing oncological breast surgery

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Abstract

Guillain-Barre syndrome (GBS) is one of the leading causes of non-trauma induced paralysis in the world. We present the anesthetic management of a 43-year-old breast cancer female patient who recently suffered from GBS. The patient had complete motor loss with power of 3/5 in all four limbs and she fully recovered after successful treatment with intravenous immunoglobulin. Keeping in view the nature of surgery and her clinical condition, her breast surgery was planned with para-vertebral block and sedation with target controlled infusion (TCI) plus entropy monitoring. The literature search for the anesthetic management for such type of cases revealed no common agreement regarding management, which prompted us to report this case.

Key words: Breast cancer; Guillain-Barre syndrome; Regional anesthesia; Target controlled infusion; Entropy monitoring

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1. Introduction

Guillain-Barre syndrome (GBS) is one of the leading causes of non-trauma related muscular paralysis in the world. It is an acute, immune mediated, inflammatory, demyelinating polyradiculoneuropathy. It is characterized by progressive motor weakness, areflexia and symmetrical ascending paralysis. The incidence is approximately 0.75 to 2% per 100,000.^{1,2} Patients either have a history of upper respiratory tract infection or gastroenteritis a couple of weeks prior to the onset of disease. Usual presentation is, rapidly developing ascending weakness that typically begins in the lower extremities. Other clinical features, include sensory symptoms, like cranial nerve deficits and autonomic dysfunction, documented mortality is

4-15%, and 12-20% of patients may require ventilatory support.³ It is a self-limiting and fully curable disease. The mainstay of the treatment is supportive care which includes thromboprophylaxis, adequate nutrition and physiotherapy.⁴ Aside from the supportive management, plasmapheresis and gamma-globulins are also used to modify the disease progression.⁵ It is fundamental to keep in mind that recovered patients may display unfavorable response not only to surgery but anesthesia as well.⁶ Hence, when planning anesthesia for such patients, the anesthetist must have complete understanding of GBS and its impact on altered physiology of the various body systems.

2. Case report

A 43 y old female patient presented to our pre-operative anesthesia clinic in August 2020 for her anesthesia evaluation for breast surgery. She had undergone chemotherapy. Her airway assessment showed large multi nodular goiter with radiological evidence of compression and right sided deviation of trachea. Her other co-morbidities included hypertension and diabetes mellitus type 2. She had previous uneventful anesthesia for hysterectomy and oophorectomy. Her past history was significant with GBS and ICU admission for pneumocystis jirovecii pneumonia. She had non-invasive ventilation for respiratory failure type 1 during her ICU stay at Peshawar center of Shaukat Khanum. She developed quadriplegia with power of 3/5 in all limbs. She was treated with immunoglobulins and broad-spectrum antibiotics. She was diagnosed and treated at Peshawar center of Shaukat Khanum Memorial Cancer Hospital and Research Centre. She was initially scheduled to have two procedures during one operation that is for breast surgery and thyroid surgery. But only breast surgery was performed considering cancer as an emergency.

At our pre-operative anesthesia clinic, risk of anesthesia due to her co morbidities was explained to the patient. Anesthesia plan was discussed with patient that included paravertebral block and sedation. A consent for anesthesia plan and postoperative mechanical ventilation was also obtained.

On the day of surgery, the patient was transferred to the operating room without any premedication. Inside the operating room, standard monitoring i.e., pulse oximeter, electrocardiogram and non-invasive blood pressure were attached. Electrodes for entropy were applied on the forehead using GE entropy module and sensor (GE Healthcare Finland Oy Kuortaneenkatu 2 FI-00510 Helsinki, Finland) to monitor the depth of anesthesia. Left paravertebral block was performed in awake patient. Patient was placed in right lateral position and identified T4-T5 level using linear probe (12 L) of GE machine (LOGIQ e, GE Medical Systems, Jiangsu, P.R. China 214028). A 22G 85mm high resolution Visioplex™ needle (VYGON, 5 rue Adeline 95440 Ecoen, France) was used to perform the block. The thoracic left paravertebral block was done with 10 ml of 0.5% Bupivacaine and 10ml of 2% Lidocaine with epinephrine 1: 100,000. This dose was enough to provide surgical anesthesia for the entire duration of the surgery without any hemodynamic

instability. Deep sedation was maintained with propofol TCI and entropy monitoring. Supplemental oxygen (5 L/min) by Hudson facemask was given during the surgery. No other airway device was used to support her breathing. The duration of the procedure was 1 hour and 7 minutes. The patient remained hemodynamically stable throughout the procedure. After the procedure, patient was transferred to Post Anesthesia Care Unit (PACU), spontaneously breathing with 99% saturation on room air.

3. Discussion

The relationship between GBS and cancer is controversial and the existence of paraneoplastic GBS in cancer patients is still an ongoing debate.⁷ The occurrence of GBS in cancer patients has been reported, but this association is considered as a mere coincidence by many around the globe.^{8,9}

Patients with GBS or history of GBS who are scheduled for any surgery, tends to present with a wide range of clinical challenges for the anesthetists. Hence, a careful preoperative evaluation and preparation helps to avoid any anesthetic complications.^{8,9}

Literature search regarding anesthetic techniques for anesthesia in the patients with history of GBS revealed lack of consensus. Both the general and regional anesthesia techniques have been used by anesthetists worldwide depending upon the type of surgical intervention and the clinical condition of the patients. After reviewing the available data and the clinical condition of our patient, we tailored our anesthesia technique and opted for regional anesthesia with deep sedation.

It is an established fact that for breast cancer surgeries thoracic paravertebral block is gold standard analgesic modality, as it not only provides surgical anesthesia but also reduces postoperative surgical pain and opioid requirements. This is achieved due to combined somatic and sympathetic blockade of innervations to the breast. This was evident in our patient as we did not use any other analgesia during the perioperative period for any break through pain.^{10, 11, 12, 13}

Propofol (2, 6-Diisopropylphenol) is a popular anesthetic agent with rapid onset and short duration of action, which can either be used as an induction agent or as a continuous IV infusion for anesthesia maintenance. It has context sensitive half-life which is the main mechanism of TCI. Propofol is bi-phasic with its initial half-life being relatively quick, around 40

minutes, and its terminal half-life usually being 4 to 7 hours.

In our case, we used it as TCI to provide deep sedation with entropy monitoring. The entropy is a known to be a reliable objective monitor in determining the adequate depth of sedation and maintenance hence avoiding adverse outcomes from under- or over-sedation.^{14, 15} TCI helped us avoid any airway management maneuvers in this difficult airway situation. We avoided manipulation of deviated difficult airway. Spontaneous breathing also helped us to avoid artificial ventilation effecting on lung mucociliary function.

Patient remained admitted postoperatively for 2 days and remained pain free. She was discharged on third postop day with only oral paracetamol by the primary team.

The above-mentioned management helped us in not only time saving and financial burden on the patient/hospital by avoiding ICU admission but also avoided the probable post-op ventilation, which could have led to other potential complications.

4. Conclusion

Guillain-Barre syndrome is a serious disease with musculoskeletal involvement, thus impairing the patients capacity to maintain adequate oxygenation in moments of stress, e.g., during anesthesia and surgery. A meticulously tailored anesthesia protocol for any such patient with judicious use of monitoring and the available options, will lead to successful outcome.

5. Conflict of interest

None declared by the authors

6. Authors' contribution

AR: Conducted the case, literature review, manuscript writing

SRM: Supervision of the case, review of the manuscript

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