

GENERAL ANESTHESIA IN A PATIENT WITH CHARCOT-MARIE-TOOTH DISEASE

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Abstract: *General anesthesia organization in patients with Charcot-Marie-Tooth Sickness (CMTD) presents novel moves and contemplations because of the hidden neuromuscular and fringe sensory system association. The main objective of the case report is to establish a safe general anesthesia protocol without triggering malignant hyperthermia in a patient with Charcot-Marie-Tooth disease. A 22-year-old female student presented to the plastic surgery department with a history of progressive bilateral foot drop (more on the left than right). She had been diagnosed with CMTD 10 years previously. No surgical procedure was done previously. There was no problem other than the foot drop. The patient was NKDA and NKFA allergic, and there was no medication previously. This case underscores the complexities of managing CMTD-related symptoms, particularly foot drop, in a young female patient. The multidisciplinary collaboration between plastic surgery, orthopedics, and Anesthesiology offers a holistic approach to improving mobility and enhancing the patient's quality of life through muscle-strengthening exercises and potential surgical interventions.*

Keywords: Iron Deficiency Anemia, Acute Morbidity, Pregnant Women, Oxidative Stress

Introduction

General anesthesia organization in patients with Charcot-Marie-Tooth Sickness (CMTD) presents novel moves and contemplations because of the hidden neuromuscular and fringe sensory system association. CMTD envelops a gathering of genetic neuropathies portrayed by moderate muscle shortcomings and tangible shortfalls. Patients with CMTD are defenseless to inconveniences connected with anesthesia because of their modified nerve conduction, expected respiratory weakness, and expanded aversion to specific sedative specialists. General anesthesia is a foundation of present-day careful work empowering patients to go through strategies serenely and without torment (Ohshita et al., 2016).

In any case, its organization to patients with complex ailments requests cautious thought, transformation, and skill. One condition) presents particular difficulties regarding general anesthesia is Charcot-Marie-Tooth Illness (CMTD), a gathering of innate neuropathies influencing the fringe sensory system (Schmitt and Münster, 2006). This presentation dives into the complexities encompassing the organization of general anesthesia in patients with CMTD, featuring the special physiological and clinical elements that require a custom-made way to guarantee patient security and ideal careful results (Ursino et al., 2013).

CMTD, named after the three doctors who initially depicted it, is a heterogeneous gathering of acquired messes portrayed by moderate muscle shortcomings, tangible shortages, and muscle squandering, influencing the fringe nerves. With different subtypes due to hereditary changes, CMTD has an expansive clinical range. The condition fundamentally influences the myelination and construction of fringe nerves, prompting changed nerve conduction speeds and engine neuron dysfunction. Subsequently, patients with CMTD frequently show engine and tactile

shortages, foot distortions, and an uplifted gamble of falls (Kapoor et al., 2021).

Controlling general anesthesia to patients with CMTD presents extraordinary difficulties because of the fundamental neuromuscular contribution. Impeded nerve conduction can impact drug metabolism, drug distribution, and patient reaction to sedatives. Besides, likely respiratory disability and aversion to explicit sedative specialists further confound sedative administration (Kumar et al., 2019). A few people with CMTD might encounter respiratory muscle shortcomings, prompting compromised lung function and diminished crucial limit. In that capacity, fastidious preoperative evaluation of respiratory function is vital for measuring a patient's capacity to endure general anesthesia. Sedative specialists that could additionally stifle respiratory function, for example, muscle relaxants, should be utilized with alert. CMT is all the more frequently an autosomal prevailing infection (yet there is hereditary heterogeneity and more than 30 pathogenic qualities have been embroiled, X-connected and autosomal passive structures, and even mitochondrial DNA changes showing a CMT-like aggregate have been accounted for). The most widely recognized disorder is CMT1A, which represents 55 % of all CMT cases and 66.8 % of CMT1 cases, and which is normally brought about by duplication of or change in the quality encoding fringe myelin protein-22 on chromosome 17p12, containing the PMP22 quality (causing extreme quality measurement, and overproduction of PMP22 and gathering in Schwann cells is a proposed system bringing about customized cell demise, a definitive component of CMT development staying obscure). Yet, the rates can fluctuate per different series detailed and geographic beginning. The 1970s grouping from Dyck is legitimate, yet molecular hereditary qualities have changed the nosology (Kaur et al., 2021; Pasha and Knowles, 2013).

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The main objective of this case report is to establish a safe General Anesthesia protocol without triggering malignant hyperthermia or respiratory failure in a patient with Charcot-Marie-Tooth disease.

Case Presentation

A 22-year-old female student presented to the plastic surgery department with a history of progressive bilateral foot drop (more on the left than right). She had been diagnosed with CMTD 10 years previously. No surgical procedure was done previously. There was no problem other than the foot drop. The patient was NKDA and NKFA allergic, and there was no medication previously. There was no history of vomiting, loss of appetite, weight loss, or hospitalization in the previous two months. She has presented for any possible surgical intervention. The doctor has seen the joints and identified possible tendon transfer. Muscle strengthening exercise was recommended. Vital was stable during examination (temp: 36.9 °C, BP: 100/70 mmHg, Pulse: 120 bpm). There was evident muscle wasting in the anterior tibial and peroneal muscle groups. The left side demonstrated more prominent muscle atrophy and weakness than the right. Sensory testing revealed reduced vibratory sensation and proprioception in both lower limbs, predominantly affecting the toes and distal foot regions. The patient also reported occasional tingling sensations in the feet.

Discussion

The case illustrates CMTD's challenges, particularly in the form of bilateral foot drop, significantly impacting the patient's mobility and quality of life. An elective surgical intervention poses additional risks of triggering life-threatening complications like malignant hyperthermia and respiratory failure. The multidisciplinary approach involving plastic surgery, anesthesiology, and orthopedics aims to explore interventions like tendon transfer to restore functional movement without triggering complications (Brock et al., 2009). Regular follow-up and close monitoring are essential to track the condition's progression and evaluate the efficacy of conservative treatments and potential surgical interventions. CMTD is a fringe neuropathy present in youth that generally turns out to be clinically clear by the center teen years. Muscle squandering and shortcomings start in the lower appendages and gradually spread proximally to show up in the hands and forearms (Kim et al., 2019). Autonomic dysfunction is likewise ordinarily present. Myelin dysfunction and axonal degeneration are the fundamental pathophysiologies, giving different clinical qualities. This patient was determined to have poliomyelitis in youth and a vague fringe nerve jumble in his later high school years, despite his dad being associated with CMTD. The personal satisfaction of CMTD patients is impacted by muscle strength (the level of dysfunction in the lower appendages), maturing, and the sickness stage (the length of the disease).

Because personal satisfaction can be decisively affected by actual limits, patients with CMTD seem, by all accounts, to be more vulnerable to modifications in personal satisfaction and present a higher gamble of depression. This patient could ride a bike without help from anyone else and seemed solid (Ortiz-Gómez et al., 2010). In any case, his feet had

The anesthesiologist opted for a balanced general anesthesia approach, incorporating intravenous induction and maintenance. Hence, injections of midazolam 2.5mg Intravenous Injection Fentanyl 100micrograms Intravenous and Injection Propofol 100mg Intravenous on induction were given. Maintenance was done with fentanyl 50 micrograms/hour and Propofol 200mg/hour infusions. Muscle relaxants were completely avoided to minimize potential respiratory complications, and intraoperative monitoring included continuous pulse oximetry, Electrocardiogram, End-tidal carbon dioxide monitoring, and capnography. An i-gel (supraglottic airway device) was inserted to support the airway for the entire procedure (6.5 hours). The patient was administered anesthesia without any immediate adverse reactions. Her vital signs remained stable throughout the procedure, with oxygen saturation levels consistently within the normal range. Anesthetic depth was monitored closely to manage the risk of post-operative respiratory compromise. Intraoperative intravenous infusions were titrated to achieve optimal sedation levels without compromising respiratory function. Following the surgery, the patient was gradually brought out of anesthesia. Her post-operative recovery was uneventful, with no indications of post-anesthetic complications related to her CMTD. The patient's neurological and sensory functions were monitored to ensure no new deficits. The patient was stable at discharge from the Recovery room and her ward on the second post-operative day.

trademark deformation, and the two lower legs were fixed; moreover, his fingers showed squandering, ability development, and tactile problems. He likewise had arthralgia, and the joints of his neck and shoulders would generally be solid and frequently couldn't move fundamentally for a long time. During dental methodology, he frequently mentioned a break to stretch and exercise his neck, arms, and legs, the last option perhaps connected with fretful legs syndrome. Difficulties in overall sedative treatment for CMTD patients are connected with the neurologic issue brought about by myelin or axonal qualities. Significant contemplations for the patients with CMTD are an expanded aversion to nondepolarizing muscle relaxants and the gamble of threatening hyperthermia (Josef Schaller and Fink, 2013)

Conclusion

Managing foot drop and other CMTD-related symptoms in young female patients is complex. Multidisciplinary collaboration is crucial to improve mobility and enhance quality of life. Tailored anesthetic strategies, careful preoperative assessment, and optimized respiratory management ensure patient safety during surgery. This case reinforces the need for individualized care in achieving favorable surgical outcomes in Charcot-Marie-Tooth Disease patients.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned.

Consent for publication

Approved

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Conflict of interest

The authors declared an absence of conflict of interest.

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