Regional anesthesia for craniotomy in a patient with inflammatory myopathy

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Abstract

Patients with inflammatory myopathies are sensitive to multiple anesthetic agents, including sedatives, neuromuscular blockers, analgesics, and volatile inhaled anesthetics. Patients with decreased muscular physiological reserve may experience respiratory failure when exposed to these agents. We present a unique case of a patient with inflammatory myopathy, who received a regional anesthesia-based anesthetic for middle fossa craniotomy. Regional anesthetic-based techniques may decrease or obviate the need for provocative general anesthetic agents, allowing preservation of baseline muscular function. Regional anesthesia was used to facilitate the surgical procedure and provided postoperative analgesia in a patient at high risk of respiratory failure. This regional anesthesia technique facilitated an uneventful postoperative recovery.

Keywords: inflammatory, myopathy, regional, anesthesia, craniotomy

Introduction

Inflammatory myopathies are uncommon and poorly understood primary muscular disorders and include polymyositis and dermatomyositis. Dermatomyositis and polymyositis are chronic autoimmune inflammatory diseases resulting in weakness of the core skeletal muscles including flexors of the neck, shoulders and hips. The histological finding includes inflammatory cells infiltrating the skeletal muscles. Dermatomyositis is distinguished from polymyositis by a reddish or purplish skin rash of the eyelids, elbows, knuckles and knees. Extramuscular involvement includes myocardial fibrosis with heart block, left ventricular dysfunction, interstitial lung disease, systemic lupus erythematosus, rheumatoid arthritis and Raynaud’s phenomenon [1]. Standard general anesthetic techniques that include volatile inhalational agents, neuromuscular blockers, sedatives and opioids can precipitate respiratory failure in patients with borderline physiologic muscular reserve.

Case description

A 42-year-old woman (written consent was obtained for writing this case report) with a history of dizziness and motor imbalance was scheduled to undergo a middle fossa craniotomy for repair of a superior semicircular canal dehiscence. Her past anesthetic experience was significant for prolonged weakness and somnolence, requiring postoperative intensive care unit (ICU) admission following minor surgical procedures performed under general anesthesia. A previous spinal anesthetic, performed without sedation, was uneventful. During her preanesthetic clinic visit, she presented a note from her previous anesthesiologist stating that she had “extreme sensitivity to general anesthetics, sedatives, and analgesics; however, propofol, when used alone for minor procedures, appeared to be safe”. Recent neurological investigations, including muscle biopsy, revealed an inflammatory myopathy with type 2 fiber atrophy.

The patient insisted on using anesthetic that avoided agents to which she was sensitive, and she
agreed to an intravenous propofol/regional anesthetic-based technique. The surgeon also required intraoperative monitoring of the facial nerve, which necessitated avoidance of neuromuscular blocking agents.

The patient was not sedated preoperatively. An indwelling arterial catheter was inserted under local anesthesia. Following induction of general anesthesia with 200 mg of intravenous propofol, her trachea was intubated after transtracheal instillation of 160 mg of lidocaine. General anesthesia was maintained with a propofol infusion averaging 150 mcg/kg/min with controlled lung ventilation. She received supraorbital, superficial cervical plexus (greater auricular, lesser occipital), and trigeminal (auriculotemporal, meningeal) nerve blocks, as described by Hahn [2]. The latter two nerve blocks (superficial cervical and trigeminal) were performed proximally, rather than blocking specific terminal nerve branches, so as to assure the blocks were not interfering with the surgical field (Figure 1). A total of 12 mL of 1% ropivacaine with 2.5 µg/mL epinephrine using a 25 g needle injecting 2-2.5 mL per nerve. The dermatomes and osteotomes supplying the skin and calvarium, respectively, are innervated by the same nerves (Figure 2). At the discretion of the attending anesthesiologist a remifentanil infusion of 0.5 mcg/kg/min was added to the propofol infusion.

The surgery lasted approximately four hours and was uneventful. The patient’s trachea was extubated in the operating room at the end of the procedure. Apart from a short period (30 min) of confusion requiring observation only, she had an uneventful recovery. Her pain was rated as mild, and she did not require any systemic analgesics during her hospitalization. The patient was discharged home on postoperative day 2 with no complications.

**Discussion**

Inflammatory myopathies are poorly understood autoimmune diseases effecting skeletal muscle [1]. Proximal or generalized muscular weaknesses are the typical presenting features. The principal subtypes are dermatomyositis, inclusion body myositis, and polymyositis [1].

Many patients have syndromes that are not easily classified and are listed as non-specific myositis [2]. There is a paucity of information in the literature as to the special anesthetic considerations and suggested conduct of anesthesia in such patients. Because of the intrinsic muscle abnormalities in patients with inflammatory myopathies, these patients are sensitive to direct acting muscle relaxants, such as benzodiazepines and general anesthetic volatile agents. These patients may also be more sensitive to non-depolarizing neuromuscular blockers [3], making them more susceptible to prolonged neuromuscular block [4].

Cranial surgery is associated with moderate to severe pain [5, 6]. Regional anesthesia, in the form of scalp nerve blocks, have been shown to decrease the severity of pain after craniotomy [7, 8]. Reliance on
Conclusion

A regional anesthetic-based combined technique allowed a patient with inflammatory myopathy to successfully undergo cranial surgery and avoid post-operative ICU admission. The use of regional anesthesia in such patients, whenever possible, is recommended.

References


Implications statement

This is a case report of a 42 year-old female with inflammatory myopathy, who received regional anesthesia as a major component of anesthetic care, during her middle fossa craniotomy. Her recovery was uneventful compared to her previous general anesthetic experiences that required postoperative admission to the intensive care unit. Whenever possible, regional anesthesia should be considered as a component of anesthetic care for patients at risk of general anesthetic-associated morbidity.

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Conflict of interest

Nothing to declare

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Regional anesthetic blocks for postoperative analgesia, rather than administration of systemic (intravenous) opioids, offers an additional advantage by avoiding the potential respiratory depressant effects of these agents.

Our patient was unique in that she required functional nerve blocks for both anesthesia and postoperative analgesia, in accordance with her documented prolonged muscle weakness associated with volatile anesthetics, opioids and benzodiazepines, which necessitated postoperative ICU admission. Although the effectiveness of the blocks was not assessed preoperatively due to the patient’s request that she receive no sedation, postoperative testing of the dermatomes involved confirmed block success. It should be stressed, additionally, that patient selection is very important for a successful procedure. Patient cooperation, his/her thorough understanding of the reasons for using the combined technique, and motivation on the part of the patient will assure an optimal outcome.

Anestezie regională pentru craniotomie la o pacientă cu miopatie inflamatorie

Rezumat

Pacienții cu miopatii inflamatorii sunt cunoscuți pentru sensibilitatea dovedită la numeroși agenți anestezici, incluzând sedative, blocați neuromusculari, analgetice și anestezice volatile. Acești pacienți cu rezervă musculară fiziologică redusă pot dezvolta insuficiență respiratorie atunci când sunt expuși la agenții anestezici menționați. Prezentăm cazul particular al unei pacienți cu miopatie inflamatorie căreia i s-a administrat o anestezie bazată pe anestezie regională în vederea unei craniotomii de fosă mijlocie. Tehnicile anestezice bazate pe anestezie regională pot reduce sau elimina necesarul de anestezice incriminate și pot prezerva astfel funcția musculară bazală. Anestezia regională a fost utilizată pentru a facilita intervenția chirurgicală și pentru a asigura analgezia postoperatorie la un pacient cu risc înalt de a dezvolta insuficiență respiratorie. Această tehnică anestezică regională a determinat o recuperare postoperatorie fără evenimente.

Cuvinte cheie: inflamator, miopatie, anestezie regională, craniotomie