Title	Prolonged Neuromuscular Blockade in a Patient with Polymyositis
Authors	May Thai, MD
Affiliation	Stanford University, Department of Anesthesiology

INTRODUCTION: Polymyositis is a rare idiopathic disease involving weakness and wasting of proximal muscles and myalgia. Only a few reports exist on the anesthetic management of neuromuscular blockade in polymyositis patients. Theoretically, these patients can have an increased sensitivity to neuromuscular relaxants. However, the very few publications on the sensitivity of neuromuscular relaxants in polymyositis patients have been conflicting.

CASE REPORT: A 57 years old 95kg male with PMH of polymyositis, hypothyroidism, and GERD underwent right knee arthroscopy for meniscal shaving. The patient's medical regimen included levothyroxine, ranitidine, and azathioprine. His pre-op labs (chem 7, CBC, LFTs, CPK, TSH) and studies (EKG, CXR) were within normal limits. Routine lines and monitors were placed. The patient was premedicated with midazolam 2mg and fentanyl 150mcg, followed by preoxygenation and rapid sequence induction with cricoid pressure using propofol 200mg and rocuronium 85mg. The patient was intubated and anesthesia was maintained with desflurane 4%, N20 65%, O2 30%, and intermittent boluses of morphine. Vital signs remained stable throughout the case and the patient was kept normothermic with a Bair hugger. Train of four (TOF) twitches from the left orbicularis showed 0 of 4 twitches 30 min and 1 hr after the initial rocuronium bolus. TOF was rechecked in other locations, including the right orbicularis, bilateral ulnar nerves, and the left tibial nerve; all sites displayed 0 of 4 twitches. Surgery was completed 1.5 hrs after induction and twitches remained 0 of 4 with no response to tetanus. Anesthesia was maintained while TOF was rechecked every 5-10 mins at multiple sites. Approximately 3 hrs after induction, the patient revealed 1 of 4 twitches. Residual neuromuscular blockade was reversed with neostigmine and glycopyrrolate. Five minutes later, the patient displayed 4 of 4 twitches and exhibited evidence of initiating spontaneous breaths. The patient was extubated when he demonstrated adequate tidal volumes, the ability to sustain a 5s head lift, and responsiveness to commands. The remainder of the case was unremarkable. Post-operative neurologic exam showed no changes from his pre-operative neurologic exam. The patient was observed overnight and was discharged home the following day.

DISCUSSION: Polymyositis is characterized by proximal muscle weakness and muscle biopsy usually shows muscle fiber necrosis and infiltration with inflammatory cells. The problems that polymyositis may present in anesthesiology are neuromuscular dysfunction, swallowing impairment, respiratory compromise including aspiration pneumonia and interstitial pneumonitis, and cardiac problems including cardiomyopathy and conduction defects. While the anesthetic management of various myopathies has been described, little information exists regarding the anesthetic management of polymyositis, especially with regard to the use of muscle relaxants in these patients. To date, there are only a handful of anesthesia case reports involving patients with polymyositis and the use of muscle relaxants. Of these, there are 7 reports of no change in expected duration of neuromuscular blockade and only 2 reported cases of prolonged neuromuscular blockade. We observed a markedly prolonged neuromuscular blockade to rocuronium in our patient with polymyositis. This prolonged response is likely due to the patient's myopathy and concomitant increased sensitivity to muscle relaxants. Other, less likely, causes of this patient's prolonged neuromuscular blockade include hypothyroidism, residual IV/inhalational agent, or interaction of rocuronium with an immunosuppressant. Unlikely, but included in the differential, causes of prolonged paralysis are hypoxemia, hypercapnia, hypothermia, hypotension, liver disease, renal disease, diabetic dysfunction, and CVA. The reported experience of anesthesia for polymyositis patients is very limited and considerable individual patient variation in response to neuromuscular blockade can be anticipated. If prolonged neuromuscular blockade is observed, it is important to maintain at least amnestic anesthesia levels during paralysis and to prepare for possible post-op ventilatory support. In polymyositis patients, consideration should be given to exploring regional techniques, the use of shorter acting nondepolarizing muscle relaxants, titrated dosing, and adequate monitoring of the neuromuscular blockade.