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A Paralyzing Case of Myalgias

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
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Patient: Male, 70-year-old
Final Diagnosis: Succinylcholine-induced myalgias
Symptoms: Myalgia
Medication: —
Clinical Procedure: Lymph node biopsy
Specialty: General and Internal Medicine

Objective: Challenging differential diagnosis

Background: Myalgia, which describes muscle pain or soreness, is a common presenting complaint encountered in the Emergency Department, in inpatient settings and in outpatient settings. Its differential diagnosis is broad and includes benign as well as more serious clinical entities. Some of the common causes of myalgias include viral infections, strenuous exercise, and medications. Succinylcholine is a well-known neuromuscular blockade agent that is frequently used for rapid sequence intubation and short surgeries.

Case Report: We present the case of a 70-year-old male who presented to the Emergency Department with a chief complaint of acute, severe onset diffuse myalgia leading to the inability to mobilize. He was being investigated for recent onset generalized lymphadenopathy and had undergone a diagnostic lymph node biopsy under general anesthesia 2 days prior to his presentation. He was diagnosed with presumed succinylcholine-induced myalgias after other etiologies were deemed less likely with thorough history, physical examination, and laboratory investigations. Succinylcholine binds nicotinic acetylcholine receptors of the neuromuscular junction and produces prolonged depolarization during which activation of the muscle is blocked. Initial depolarization of the neuromuscular junction induces hectic fasciculation of the muscle fibers, which in turn may be responsible for the occurrence of post-operative myalgias (POM). This entity can be severe and debilitating and is self-limited.

Conclusions: Succinylcholine remains a commonly used agent in anesthesia and succinylcholine-induced myalgia should remain in the differential diagnosis of acute, non-inflammatory myalgia. Its recognition can help avoid unwarranted, possibly invasive investigations and their associated additional healthcare costs.

MeSH Keywords: Drug-Related Side Effects and Adverse Reactions • Myalgia • Succinylcholine

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/922568>

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Background

Myalgia, which is described as muscle pain and soreness, is a common complaint encountered in both the inpatient and outpatient setting. Its differential diagnosis is broad and encompasses both benign and more serious clinical entities including viral infections, rheumatological disorders, strenuous exercise, and medication-induced myalgias.

Case Report

A 70-year-old Caucasian male presented to the Emergency Department with a chief complaint of acute, severe, and diffuse myalgias that ultimately limited his ability to ambulate. He was undergoing investigations for diffuse lymphadenopathy and underwent a diagnostic excisional biopsy 2 days prior to his presentation. He had received 100 mcg of intravenous fentanyl, 180 mg of intravenous propofol and 80 mg of intravenous succinylcholine for rapid sequence intubation. The procedure lasted 1 hour, and the patient was sent home on the same day. He was known for hyperlipidemia, coronary artery disease, and hypertension and his medications included atorvastatin, which he had been taking for over 10 years at a stable dose, metoprolol, ramipril, and acetylsalicylic acid. Physical examination performed by his internist as an outpatient was remarkable only for palpable cervical lymphadenopathy.

The patient described paralyzing muscle pains associated with diffuse weakness. He was unable to ambulate due to pain, which he described as dull and exacerbated by movement; he presented in a wheelchair. These symptoms had started 24 hours prior to presentation, were symmetric and more severe in the proximal muscle groups. He denied headache, fever, weight loss, mental status change, recent history of trauma, or travel. He denied any recent changes to his medications or having ever had myalgias in the past.

On physical examination, he was afebrile at 36.3°C, had a blood pressure of 127/81 mmHg, heart rate was 78 beats per minute, and oxygen saturation 100% while breathing ambient air. Neurological examination yielded normal sensation in all dermatomes, normal muscle tone and bulk with normal and symmetric reflexes. Motor examination revealed diffuse symmetric weakness in his upper and lower extremities, which may have been confounded by his significant pain. There was no redness, effusion, or swelling of articulations. The surgical incision from the biopsy site appeared to be healing well. The remainder of the examination was unremarkable. Preoperative and postoperative laboratory investigations are shown in Table 1.

The patient's complete medical record, including surgical and anesthesia records from his excisional biopsy, was reviewed.

A diagnosis of succinylcholine-induced myalgia was entertained. Over the next 24 hours, there was dramatic improvement in the patient's symptoms without any intervention and the patient was discharged home. He later reported that he had completely returned to baseline on the day after discharge, with no residual myalgia or weakness.

Discussion

Myalgia is a common symptom prompting expert medical consultation, whether in the emergency department or in the outpatient setting. Its presentation can be acute, chronic, diffuse, or localized. Acute myalgias suggest an infectious etiology, a drug reaction (e.g. statins, antibiotics), musculoskeletal injury, or an autoimmune process such as polymyositis-dermatomyositis. Chronic causes include rheumatological diseases such as polymyalgia rheumatica, fibromyalgia, and other diseases involving the endocrine or metabolic systems. While most cases are benign and self-limiting, it can be the first manifestation of a serious systemic disease. We present here a case of unusually severe, acute diffuse myalgia.

The patient history, examination, and laboratory investigations helped eliminate many etiologies of acute myalgia. Statin-associated myopathy was initially entertained in our patient case, but the chronicity of use, and the severity and hyperacuity of the presentation argued against this etiology [1]. The absence of infectious symptoms with a normal creatinine kinase (CK) level made the diagnosis of an infection-related myopathy unlikely. Paraneoplastic inflammatory myopathy, such as dermatomyositis, was deemed less likely in the presence of a normal CK. The temporal association with the excisional biopsy was felt to be an important anchor point in establishing our diagnosis. The fact that our patient's symptoms resolved completely within 48 hours, further confirmed our diagnosis.

Succinylcholine is used for neuromuscular blockade for endotracheal intubation and surgery. It stimulates nicotinic cholinergic receptors at the neuromuscular junction, causing their prolonged depolarization and thus blocking further action potential generation and muscle stimulation. One of its most bothersome but also most benign side effects is the occurrence of postoperative myalgia (POM). POM, a phenomenon first described in 1952, has been reported in the literature [2], though the pathophysiology remains incompletely understood. Depolarization of the nicotinic cholinergic receptors happens in a disorganized fashion, which causes fasciculation of the muscles leading to muscle fiber damage and secondary pain [2]. While making mechanistic sense, the degree and extent of muscular fasciculation has not been shown to correlate with the severity or incidence of myalgia [3].

Table 1. Laboratory values.

Laboratory test	Preoperative value	Postoperative value	Normal range
Hemoglobin (g/L)	137	127	140–175
Platelet count ($\times 10^9/L$)	155	146	150–400
White blood cell count ($\times 10^9/L$)	17.5	16.8	4.0–11.0
Neutrophil count ($\times 10^9/L$)	6.6	6.3	1.8–7.5
Lymphocyte count ($\times 10^9/L$)	9.9	9.4	1.2–3.5
Urea (mmol/L)	6.5	8.1	3.2–8.5
Creatinine (umol/L)	86	86	55–120
Sodium (mmol/L)	140	138	134–144
Potassium (mmol/L)	5.0	4.5	3.5–5.5
Chloride (mmol/L)	101	102	98–108
Bicarbonate (mmol/L)	25	24	22–31
Glucose (mmol/L)	4.5	5.1	3.9–11.0
Magnesium (mmol/L)	0.87	0.86	0.70–1.23
Calcium (mmol/L)	2.18	2.15	2.12–2.62
Phosphorus (mmol/L)	1.06	0.83	0.70–1.45
Lactate dehydrogenase (U/L)	203	280	110–220
Creatine-kinase (U/L)	–	63	42–396
Albumin (g/L)	40	37	35–51
C-reactive protein (mg/L)	–	2.7	0.0–10.0
Erythrocyte sedimentation rate (mm/h)	–	26	2–37
Thyroid stimulating hormone (mU/L)	–	1.30	0.40–4.50

A lower incidence of myalgias has been reported in children and in patients over 70 years of age [2]. The severity of myalgia might be influenced by muscle density, with lower density found in children and elderly. POM is more common in women and in the ambulatory surgery setting as opposed to the inpatient setting [4]. Pretreatment with a prostaglandin inhibitor, such as lysine acetylsalicylate [5], as well as pregabalin [4], have been shown to be effective in reducing the incidence of succinylcholine-induced myalgia.

Conclusions

Succinylcholine remains a commonly used agent for rapid sequence intubation and short surgeries and POM is a recognized side effect of this medication in the anesthesia literature. While this entity may be commonly encountered, it is however under recognized by internists and its use should remain in the differential diagnosis of acute non-inflammatory myalgia and can help avoid unwarranted, possibly invasive investigations and their associated additional healthcare costs.

Conflict of interest

None.

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