

Myoclonic Movement After Mandibular Cyst Enucleation Under General Anesthesia, A rare case report during COVID-19 pandemic

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Abstract

Introduction: Myoclonic movement is not common side effect after general anaesthesia. Since we use various intravenous agents during general anaesthesia recently, it is troublesome to find out the exact cause of this neurologic complication.

Patient concerns: A 28-year-old male patient without any past medical history underwent mandibular cyst enucleation surgery under general anaesthesia.

Diagnoses: Sudden myoclonic movement confined to upper trunk and left upper extremity in recovery room after uneventful GA.

Outcomes: There was no significant abnormality in electroencephalography or blood tests, which were taken after the event.

Keywords: epilepsies, general anaesthesia, myoclonus, nefopam, partial, propofol

Introduction:

A variety of dental and maxillofacial procedures carry the risk of post operative complications. In the post anesthesia care unit (PACU), there are many complications that are observed such as; cardiovascular including hypotension and tachycardia, or the respiratory system includ-

-ing respiratory depression and upper airway obstruction which is very common after maxillofacial surgeries. [1,3]

Also, other complications as pain, postoperative nausea, vomiting, and shivering are frequently observed. Regarding neurologic complications, emerg-

-ence agitation, delirium, or postoperative cognitive disorder are frequently reported. [4] Dystonic movements after general anesthesia are rare. The differential diagnosis of dystonia includes: adverse drug reaction, local anesthetic reaction, emergence delirium, hysterical response, and shivering. There have been some reports that show a relationship between the different agents used as anesthetics (e.g., propofol) or drugs for perioperative management (e.g., ramosetron or nefopam) and neurologic disorders (especially myoclonic movement). [5,6]

Although myoclonic movements is not common findings in the immediate postoperative period, we observed a case of myoclonic movement in the recovery room after the patient received general anesthesia for an mandibular cyst enucleation surgery.

Case presentation

A 28-year-old male patient was scheduled for elective mandibular cyst for enucleation. He was 167 cm tall, 64 kg in weight, and had neither a family medical history or own past medical history of the disease and was not taking any medication routinely before surgery. All results from preoperative routine laboratory tests including an electrocardiogram, a chest x-ray, as well as blood and COVID 19 test were in the normal range. The patient entered the operation room without any premedication after taking written consent.

Routine ASA monitoring such as; noninvasive blood pressure, electrocardiogram activity, oxygen saturation, and capnometry and general anesthesia was conducted for him by three minutes pre-oxygenation, intravenous induction was done by propofol (2 mg/kg) and fentanyl 2 µg/kg administered over one minute. Tracheal intubation was performed after adequate neuromuscular blockade with Rocuronium 0.5 mg/kg. Anesthesia was maintained by sevoflurane 1-1.5 MAC, Rocuronium 0.03 mg/kg given when indicated. Patients were mechanically ventilated to maintain ET_{CO2} between 35-40 mmHg. The inspired oxygen fraction (FIO₂) was 0.5 using oxygen-and-air mixtures then patient positioning was done and surgery was started. Carefully check about patient's position and chest infiltration to confirm proper ventilation till the end of operation. the patient received antibiotic cefazoline 2 gm, Granisetron 1 mg and dexamethazone 8 mg plus paracetamol infusion 1gm intravenous (I.V) over 10 min before starting of surgical incision.

At the end of surgery neuromuscular block was reversed with neostigmine 0.05 mg/kg and glycopyrrolate 0.02 mg/kg and trachea was extubated in the operating room.

After arriving in the recovery room, the patient's vital signs were stable. Oxygen was supplied at a flow rate of 6 L/min via a simple facial mask. His mental status changed from drowsy to alert after 10 minutes of arriving in the recovery room. At this time, he suddenly complained of a myoclonic jerk, which lasted for 45 minutes, involving the upper part of trunk and his left arm. There were no observations of salivation, urination, or biting of the tongue. The patient's orientation remained intact and he was able to obey verbal commands. The patient asserted that he could not control his left arm at the location of the involuntary movement.

Just after the myoclonic movement was observed, 200 mg of sugammadex and 20 mg Pethedine were administered via intravenous injection as to exclude incomplete neuromuscular blockade and shivering respectively with partially improvement. Two mg of intravenous midazolam administered 10 minutes later and he recovered immediately. 15 minutes later, when he awoke from a sedative state, the same myoclonic movement recurred. Propofol 40 mg was administered which again stopped the myoclonic movement. A third and the last attack (in the same manner as the previous two) occurred 30 minutes after her arrival to the recovery room.

At 45 minutes from arrival to PACU, a neurologist physically examined the patient, which did not reveal any abnormal findings except for the involuntary movement of his left shoulder and upper arm. According to the neurologist, the condition could be diagnosed as a partial seizure. As such, he ordered to EEG, complete laboratory investigation and urine analysis. The patient was transferred to the general ward and administered oxygen 6 L/min via simple face mask. The myoclonic movement was stopped thereafter and there were no significant abnormalities. The myoclonus did not recur during hospitalization and the patient was discharged on the second day after operation without sequelae. No other medications except analgesics were given.

Discussion

Myoclonic movement after general anesthesia is rare event. However, there were several case reports that presented myoclonus either in postanesthetic care unit during recovery phase or delayed onset in ward or even after discharge. [7-9] Propofol, fentanyl, ramonsetron, and nefopam were drugs that were suspicious of the cause of postoperative myoclonic

movement in those previous cases. They are linked to seizure-like phenomena including generalized clonic-tonic seizures, focal motor seizures, muscle twitching, opisthoclonus, and myoclonus in the intraoperative period or shortly after anesthesia. In contrast to the perioperative seizure-like phenomena, the neurologic symptom in this case was refractory to treatment and only stopped shortly without any interventions. [10-11]

The pathophysiology of the seizure-like phenomena linked to these drugs still remains unknown. Carbon dioxide poisoning is also associated with delayed movement disorders ranging from Parkinsonism to myoclonus; however, these symptoms are seen in patients with encephalopathy and/or brain ischemia. In this patient, the negative EEG and brain MRI further support the diagnosis of propofol-induced myoclonus. [12-13]

The mechanisms of the seizure-like movements after administration of IV anesthetics are still relatively unknown. However, there is a possible relationship between myoclonic movements and the effect of propofol on the gamma aminobutyric acid (GABA) pathway. In GABA pathway, a balance is lost between the activity of excitatory and inhibitory neurons at high tissue concentrations of propofol (in the manner of a drug-induced delayed elimination). [14]

However, in this particular case, we need to examine the effects of the other anesthetic agents involved. There are also a few case reports that describe grand mal seizures after fentanyl administration in humans. For example, a 79-year-old woman without an unusual medical history developed grand mal seizures when 200 mic of fentanyl was administered in divided doses during the induction of general anesthesia. [15-16]

Granisetron is a serotonin (5-hydroxytryptamine type 3 receptor [5-HT₃ R]) antagonist used for its antiemetic effect. Recently, physicians prefer the use of 5-HT₃ R antagonists because, among the antiemetic agents, they do not have side effects such as sedation or extrapyramidal symptoms. Seizure is a rare side effect of 5-HT₃ R antagonists but there have been some reported cases. [17]

In conclusion, myoclonic movement can occur in the PACU, even following uneventful general anesthesia in patients without risk factors. From the review of previous reports about postoperative myoclonus, drugs that are commonly used in routine anesthetic procedures such as propofol, fentanyl and Granisetron and anesthesiologists should carefully consider the pharmacologic characteristics and neurologic adverse effects of all administered agents

List of abbreviations:

EEG = electroencephalography,
GABA = gamma aminobutyric acid,
GA = General anesthesia
LA = Local anesthesia
ASA = American society of anesthesia

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