**Severe Myoclonus under Desflurane and Propofol TIVA**

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**Introduction and Case Report:** This is a report of two anesthetics performed on a 23 year old man for repair of a pilonidal cyst with a myocutaneous flap. The patient had a history of myalgias which were thought to be due to seronegative ankylosing spondylitis. He also had mild inflammatory bowel disease treated with sulfasalazine. His blood tests were remarkable for an ESR of 30 and a normal HCT. He took no other medications, had no drug or smoking history, and no allergies. He had undergone two prior attempts to repair the cyst with an unknown, uncomplicated anesthetic, most recently in 2007.

For the first anesthetic, the patient was induced with propofol 150 mg and rocuronium 30 mg and lidocaine 50 mg. Following induction and intubation the patient was maintained in desflurane 6% in oxygen. Fentanyl 250 mg was given in divided doses. No additional muscle relaxant was administered. Surgery proceeded for approximately 1 hour and thirty minutes with unremarkable vital signs. The patient abruptly had what appeared to be a grand mal seizure with severe tonic-clonic contractions of all four extremities and his torso. The movement was sufficiently intense that the surgeons had to restrain the patient despite the safety strap. The episode lasted approximately 30 seconds and terminated spontaneously. Approximately 3 minutes the later the patient had a second episode of similar intensity lasting approximately 1 minute, terminated with propofol 100 mg. Approximately 5 minutes later the patient had a third event, again terminated with propofol 100 mg. The desflurane was discontinued and the patient was sedated with propofol 200 micrograms/kg/minute. There were no further events.

The blood pressure was stable throughout, and the oxygen saturation remained at 100%. The patient’s esophageal temperature was 36.8o.During the shaking episodes the patient’s end tidal CO2 increased and his heart rate increased to 110-120 from the 80s for several minutes and returned to baseline. The wound was stapled and an occlusive dressing was applied. The patient was turned supine and examined. His lungs were clear, his pupils where midrange and reactive to light. Laboratory values were checked. All electrolytes were normal, as was his arterial blood gas including co-oximetry. The patient was transported for head CT, which was normal without evidence of bleeding or midline shift. The patient was subsequently transported to the ICU intubated and sedated with propofol 200 micrograms/kg/minute. The propofol was tapered several hours later and the patient was extubated without further sequelae. An EEG the following morning showed left posterior slowing. An MRI of his head was normal.

The patient required completion of surgery for the open flaps in his buttocks the next day. Prior to induction the neurology service placed an 8 channel EEG montage on the patient’s scalp. Anesthesia was induced with 200 mg propofol and 50 mg rocuronium. Anesthesia was maintained with propofol at 200 micrograms/kg/minute with 250 micrograms of fentanyl in divided doses.

During the second anesthetic the patient had several shaking episodes resembling those from his first anesthetic but shorter lasting and less intense. A neurologist was observing the EEG recording remotely and reported that there was movement artifact but no seizure activity at the time of shaking. The EEG was consistent with slow wave sleep. The patient emerged from anesthesia with total body shaking similar to that observed in his first surgery. He regained consciousness and had no further sequelae.

**Methods:** The total propofol blood and brain concentrations were simulated using the Schnider kinetic set (1).

**Results:** The simulation of propofol concentrations with the times of shaking episodes noted are shown in figure 1. There is no association between propofol concentration and the patient’s myoclonus. In the first procedure (A) they occurred with very low propofol concentrations and with 1 MAC desflurane. In the second procedure (B) they occurred in the presence of relatively high estimated propofol concentration (5 ng/ml), and no desflurane.

**Discussion:** Myoclonus and seizure activity have been reported under anesthesia with propofol (2). To our knowledge, neither seizures, nor myoclonus has been reported under desflurane anesthesia. The fact that this patient had severe myoclonus under anesthesia with both desflurane and propofol TIVA suggests that potentiation of gabaergic and or glycinergic inhibition may play a role. The patient’s underlying systemic inflammation may or may not be a contributing factor. It is also unknown why a similar phenomenon did not occur in the patient’s prior anesthetics. He may have been paralyzed and the thus the shaking would not be manifest during the procedure or he may have had metabolic changes in the intervening time.

1. Schnider TW, Minto CF, Gambus PL, Andresen C, Goodale DB, Shafer SL, Youngs EJ.[The influence of method of administration and covariates on the **pharmacokinetics** of **propofol** in adult volunteers.](https://vpn.ucsf.edu/pubmed/,DanaInfo=www.ncbi.nlm.nih.gov+9605675) Anesthesiology. 1998 May;88(5):1170-82.

2. Bernhard Walder, Martin R. Tramèr and Margitta Seeck. Seizure-like phenomena and propofol: A systematic review. *Neurology* 2002;58;1327-1332.

a..

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Shaking

b.