

Seizure following general anesthesia for cystoscopy and urethral dilatation: A case report

ABSTRACT

Seizure and anesthesia is a topic necessitating more studies to understand its mechanism. Some anesthetic agents triggers seizures, while others can control it. We are here reporting a case of apparently healthy young adult patient who underwent diagnostic cystoscopy and urethral dilatation under general anesthesia and who developed seizure immediately after admission to the postanaesthetic care unit.

Key words: Cystoscopy, general anesthesia, seizure

Seizure is one of the most frequent chronic neurological diseases. The perioperative management of such patients is important for the anesthesiologists to identify the seizure type, frequency, severity and the factors triggering the crises, the use of anticonvulsant drugs, and possible interactions. It is essential to understand pro- and anticonvulsant properties of drugs used in anesthesia, minimizing the risk of seizure activity in the perioperative period. It is important to outline the diagnosis and initiate treatment early.^[1] Postoperative seizure is a relatively common occurrence after neurosurgery or in intensive care unit, sometimes in patients without a primary neurologic disease. The incidence has been reported to be as high as 12% in this setting.^[2] We are here reporting a case of an apparently healthy young adult patient who underwent diagnostic cystoscopy and urethral dilatation under general anesthesia (GA) and who developed seizure

immediately after admission to the postanaesthetic care unit (PACU).

Case Report


A 19-year-old previously healthy male presented to the operating room for cystoscopy and urethral dilatation. No previous history of anesthetic exposure with no history of drug allergy. He is a smoker and denied alcohol intake. His physical examination was normal (ASA-I). Basic monitoring before induction of anesthesia showed average normal values. Induction of anesthesia was achieved with IV propofol 2 mg/kgb.w., fentanyl 2 mcg/kgb.w., and rocuronium 0.5 mg/kgb.w., followed by LMA I-gel size 4 insertion. Maintenance of anesthesia was achieved with sevoflurane 1

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MAC in 50% O₂/air mixture. Cystoscopy was eventless, done within 20 min. Sugammadex was given IV 200 mg, after which the patient made a smooth recovery and regaining spontaneous respiration followed by removal of the LMA. The patient then was transferred to PACU. Within 10 min in PACU, he developed seizure attacks, classic generalized tonic clonic contractions lasted for maximum of 1 min, repeated 5 to 6 times, managed with repeated doses of IV midazolam 1 to 2 mg up to 6 mg and propofol 30 to 50 mg. Airway was maintained on O₂ face mask with normal SaO₂ and arterial blood gases (ABGs). Seizure controlled after loading dose of epanutin IV prescribed by the neurologist. Patient became completely calm, relaxed, but still drowsy. The patient was sent to the ward and received oral levetiracetam (Keppra) 500 mg once daily. Computerized tomography scan (CT) of the brain and electroencephalography (EEG) were performed and were normal. Two days later, he was discharged home on oral Keppra 500 mg for further follow-up by the neurologist in the stroke clinic.

Discussion

The causes of postoperative seizure are many. The most common causes seen in the postoperative period are listed in Table 1. Regardless of the cause, seizures need to be treated rapidly as they represent an acute imbalance between cerebral oxygen supply and demand, and if uncorrected can lead to irreversible neuronal damage. Benzodiazepines, barbiturates, and propofol are all acceptable choices for seizure lysis. Adequate oxygenation and ventilation must first be confirmed.^[3]

Differential diagnosis in our case included primary seizure disorder, brain pathology, metabolic or electrolyte imbalance, infection, and a medication-induced seizure. Brain imaging, including CT scan of the brain, ruled out pathologic brain disease. EEG ruled out an epilepsy disorder. Laboratory

workup including ABG were within normal limits ruling out metabolic etiology or drug-induced seizures. As per the neurology team, there was no explanation for what happened in PACU, especially as the patient was completely seizure-free in the next 24 h of observation and till discharge to home after 48 h. A final suspicion was a psychological cause (pseudo-seizure) that couldn't be ruled out due to failure of communication with family. The patient denied any history of psychological disorder.

A similar incidence was reported by Dube *et al.*^[4] where seizures encountered following discectomy in recovery area; it was investigated and assumed to be caused by the hypoglycemia resulted from the prolonged preoperative fasting.

Kerem *et al.*^[5] also reported an unexpected postoperative seizure after mastoid surgery, but in that case, there was a positive temporal cortical finding in CT scan on same side of surgery denoting an iatrogenic cause of seizure.

Eldawlatly^[6,7] reported a rare neurological incidence in the form of a conversion disorder defined as a somatoform disorder involving an unconscious, involuntary process not consistently explained by neurological or medical conditions. The patient recovered well in the end and transferred to the PACU fully awake. Half an hour later, he became unconscious and was not responding to verbal commands. Seizure like activity was one of the differentials that was ruled out after a negative imaging investigation.

Hilty *et al.*^[8] mentioned that there have been several reports of epileptiform EEG activity in adults and children and occasional reports of grand mal convulsions upon emergence from sevoflurane anesthesia. He reported a 19-year-old man with no previous history of seizure activity who, during two consecutive emergences from GA with sevoflurane, experienced tonic-clonic motor activity consistent with grand mal convulsions controlled with midazolam, diazepam, and phenytoin. Investigation of that case revealed a lesion in the left posterior cortex that was suspicious for ganglioneuroma (a benign tumor of mixed neuronal and glial origin). Encephalomalacia, secondary to trauma and cysticercosis, were offered as less likely diagnostic possibilities.

Ramos *et al.*^[9] mentioned that psychogenic non-epileptic seizures (PNES or "pseudo-seizures") remain an obscure topic in the peri-operative setting. A sudden and time-limited motor and cognitive disturbances, which mimic epileptic seizures, are psychogenically mediated. He reported one case of a 48-year female with a history of depression and

Table 1: Causes of seizures in postoperative patient

Physiological factors	Hypoxia, hypercarbia, ischemia
Metabolic disorders	Eclampsia, sodium imbalance, phosphate imbalance, calcium imbalance, renal dysfunction, hepatic dysfunction
Medications	Antibiotics, antipsychotics, local anesthetics, cocaine, amphetamines, phencyclidine
Drug withdrawal	Barbiturates, benzodiazepines, alcohol, opioids
Infection	Febrile seizures, abscess, encephalitis
Traumatic head injury	Hemorrhage or contusion
Surgical injury	Cortical irritation from craniotomy or endovascular cranial intervention

“seizures,” underwent uneventful gynecologic surgery under GA, and recovered neurologically intact. Then, the patient experienced 3 episodes of seizure-like activity. During which she has a stable hemodynamics and adequate ventilation. After investigation, a presumptive diagnosis of PNES was made. He assumed that PNES should be considered early in the differential diagnosis. Autonomic manifestations such as tachycardia, cyanosis, and incontinence are usually absent. Diagnosis of pseudoseizures is of great importance for the anesthesiologists to prevent morbidity and iatrogenic injury such as respiratory arrest caused by anticonvulsants. Psychiatric interventions are the hallmark of treatment.

In conclusion, postoperative seizure following GA can be due to physiologic, pharmacologic, and/or pathologic causes. Regardless of the cause, immediate termination of the seizure should be the priority followed by a rapid assessment of reversible physiologic causes and then a more extensive differential diagnosis to identify the underlying cause. Psychological disorder should be considered if all other leading causes are excluded.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that his name

and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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