

Case Report

Missed Opportunities for Intervention in a Patient With Prolonged Postoperative Delirium

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ABSTRACT

Purpose: Postoperative delirium is a common and costly state of brain dysfunction that complicates postsurgical management in some patients. The purpose of this report was to describe a case of prolonged postoperative delirium and to review the appropriate identification and management of this condition.

Methods: A 56-year-old female patient who presented with newly diagnosed diabetes mellitus and dry gangrene underwent a vascular bypass procedure while under general anesthesia. After extubation, the patient became disoriented and agitated.

Findings: The delirium continued in a hypoactive form for 10 days before it progressed to severe agitation. During the patient's 2-month hospitalization, she underwent 6 additional surgeries. Eventually, the delirium improved with the use of antipsychotic agents, and the patient was discharged to a skilled nursing facility.

Implications: This patient's history, medications, and anesthetic and surgical exposure placed her at high risk for postoperative delirium. Her exceptionally prolonged course of postoperative delirium was likely perpetuated by a multitude of factors, including the continued use of high-risk medications, the stress of repeated surgeries, urinary issues, and infection.

Conclusion: In this high-risk patient, a proactive approach to the prevention and treatment of delirium

may have avoided or mitigated the prolonged delirium and, potentially, long-term cognitive deficits. (*Clin Ther.* 2015;37:2706–2710) Published by Elsevier HS Journals, Inc.

Key words: anesthesia, benzodiazepines, delirium, postoperative surgery.

INTRODUCTION

Delirium is an acute brain dysfunction characterized by dynamic levels of attention, cognition, and consciousness. It is common among elderly and/or hospitalized patients and places a significant burden on the health care system. Delirium is common in postsurgical patients, with an estimated prevalence of 10% to 80%, depending on the particular population being investigated.¹ Delirium has been associated with a number of adverse outcomes, including prolonged hospital stay and increased risks for mortality and functional decline.^{2,3} The annual costs of hospitalization in delirious patients are more than twice those of nondelirious patients—US \$38 to \$152 billion.⁴ Delirium, particularly the most common subtype, hypoactive delirium, is poorly identified despite its high prevalence among hospitalized patients.⁵ Improvements in the identification and prophylaxis of delirium may both improve clinical care and reduce costs.

Accepted for publication September 29, 2015.

<http://dx.doi.org/10.1016/j.clinthera.2015.09.012>

0149-2918/\$ - see front matter

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Delirium may occur if a susceptible individual experiences a major stressor, such as infection or surgery.⁶ General anesthesia typically involves the administration of several clinical therapeutics that might contribute to delirium, such as anticholinergic, antihistamine, benzodiazepine and/or opioid agents.⁵ An elevated exposure to the anesthetic agent, as measured by processed electroencephalography (EEG), may also increase the risk for delirium.⁷ Modification of the anesthetic regimen in high-risk patients may represent a strategy for reducing the risk for postoperative delirium. Herein we report an unusual case of prolonged postoperative delirium in a patient with numerous risk factors and triggers.

CASE DESCRIPTION

A 56-year-old woman with hypertension and newly diagnosed diabetes mellitus presented to the hospital with dry gangrene of the small toe. She denied the use of alcohol, tobacco, or other recreational drugs and was not on any opioid medications at the time of presentation. Her course was complicated by sepsis and acute kidney injury, so surgical management was deferred. During this period, the patient experienced a brief episode of delirium, which was attributed to treatment with gabapentin 300 mg TID and oxycodone 5 mg BID. The creatinine concentration peaked at 4 mg/dL and decreased to 2.8 mg/dL on discharge. On readmission, treatment with gabapentin at the prior dose was resumed, and the patient received oral diphenhydramine 25 mg PRN for itching and oxycodone at an average dose of 30 mg/d PRN for pain management. The patient had had an uneventful diagnostic angiogram, the preparation for which she received sedation with midazolam 2 mg and fentanyl 100 µg over 40 minutes. Her creatinine had normalized to 0.8 mg/dL. The following week, she presented for femoral to anterior tibial artery bypass while under general anesthesia.

Preoperatively, the patient had an appropriate mood and affect and consented to being a part of a prospective observational study on emergence from anesthesia. After premedication with midazolam 2 mg, she underwent induction with intravenous propofol and maintenance with inhalational sevoflurane. During the 340-minute duration anesthesia, she received fentanyl 500 µg and hydromorphone 0.4 mg. As a part of the approved research protocol, a frontal EEG from an abbreviated montage was recorded during surgery for offline analysis. Two episodes of abrupt cortical arousals were

evident on the EEG as increases in high-frequency power. The first occurred early in the surgery, and the second at the conclusion of surgery. On examination of the anesthesia record, both of these cortical arousals coincided with movement by the patient, and both were treated with a bolus dose (50 mg) of propofol. Approximately 15 minutes later, the patient was extubated. On exiting the surgical suite, the patient was breathing spontaneously but not able to say her name or current location when asked.

In the recovery room, the patient became agitated and confused. At 15 minutes after emergence from anesthesia, the result of a Confusion Assessment Method for the ICU screening tool⁸ was positive. The agitation was treated with an additional 4 mg of midazolam in divided doses, and the patient received two 12.5-mg doses of promethazine. She calmed eventually and could be redirected by the staff of the postanesthesia care unit. At 1 hour after emergence, the result of a second Confusion Assessment Method for the ICU screen was positive for delirium.

After a planned transfer to the ICU, the patient continued to have periods of confusion but was stable for transfer to the floor on postoperative day (POD) 2. She was still receiving diphenhydramine despite continued episodes of confusion and agitation. After a toe amputation on POD9, the patient was disoriented and repeatedly removed her dressings and picked at her wounds. On POD11, the patient was placed in restraints and started a fire in an attempt to burn them off. The psychiatry service recommended a sepsis workup as a possible cause of delirium. She was transferred back to the ICU and received haloperidol 2 mg BID for 3 days, as recommended by the psychiatry service. The sepsis workup was negative; subsequent surgeries are shown in the [Figure](#). During this time, she also had persistent urinary retention requiring repeated urinary catheter placement.

On POD21, the patient was transferred from the ICU to the general surgical ward and paired 1:1 with a patient safety monitor. Her medical record listed near-daily episodes of confusion and aggression toward staff. She repeatedly removed her dressings and intravenous catheter. On POD42, the patient threatened suicide and was started on quetiapine 25 mg BID. When the patient developed difficulty swallowing the tablets, treatment was changed to risperidone elixir 0.5 mg via feeding tube. In the weeks that followed, the patient's clinical and mental statuses slowly

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