Clinical Case Report

Medicine®

OPEN

Postoperative delirium after hysteroscopy in young woman

A case report

Zhen Liu, MD[a], Ran Li, MD[b], Siyun Wang, MD[a], Yingfang Zhou, MD[a], Ling Yin, MD[a], Yuan Qu, MM[b], Chao Peng, MD[a,*]

Abstract

Rationale: Postoperative delirium is extremely rare in young women and in minimally invasive endoscopic surgeries in gynecology and obstetrics. It greatly affects both physicians and patients. This report presents a special case of postoperative delirium after hysteroscopy in a young woman and a literature review of the associated etiology, diagnosis, and treatment.

Patient concerns: A 39-year-old woman was admitted to the gynecology ward following irregular vaginal bleeding for 3 months and an intrauterine space-occupying lesion for 1 week. Hysteroscopy, endometrial polypectomy, and fractional curettage procedures were successfully performed; however, the patient became unresponsive after surgery.

Diagnosis: Postoperative delirium.

Interventions: Sedatives and vasoactive medicines, such as dexmedetomidine, midazolam, and dopamine were administered for maintenance treatment.

Outcomes: The patients gradually regained consciousness.

Lessons: Physicians should attach importance and improvise effective clinical management strategies for postoperative delirium based on clinical specialty characteristics and related guidelines.

Abbreviations: AUB = abnormal uterine bleeding, DSM = Diagnostic and Statistical Manual of Mental Disorders, ECG = electrocardiogram, ICD = International Classification of Diseases, LMA = laryngeal mask airway, LVEF = left ventricular ejection fraction.

Keywords: case report, hysteroscopy, postoperative delirium, young woman

1. Introduction

Postoperative delirium is an acute and fluctuating mental state change accompanied by transient cerebral hypofunction. It manifests as insanity, anxiety, personality change, and memory impairment. Clinically, it can manifest as early postoperative delirium, which is characterized by impairments of memory, attention, and verbal comprehension, as well as social disability. Postoperative delirium generally occurs from the anesthesia recovery period until 5 days after surgery. Early delirium, also known as emergence delirium, occurs immediately after anesthesia, before going to the recovery room, or in the recovery room The morbidity of postoperative delirium ranges from 3.6% to 28.3%; This wide range fluctuation is due to the differences in perioperative and intraoperative risk factors.[1] Delirium commonly occurs in elderly patients and those who have undergone major chest and abdomen surgery. Typically, the morbidity in elderly patients can be as high as 30% to 50%.[2,3] Unfortunately, its pathogenesis remains unclear at present. The mainstream theory believes that it is related to cerebral ischemic damage, inflammatory factors, and neurotransmitters. The European Society of Anaesthesiology evidence-based and consensus-based guideline on postoperative delirium (Aldecoa et al, 2017) states that the risk factors for delirium include advanced age, combination of other systemic diseases, high score of preoperative accompanying disease, operation site, intraoperative bleeding, operation time, and postoperative pain.[4] Early

Editor: N/A.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Written informed consent for publication of their clinical details and clinical images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

All data generated or analyzed during this study are included in this published article.

The authors have no funding and conflicts of interest to disclose.

[a] Department of Obstetrics and Gynecology, [b] Department of Anesthesiology, Peking University First Hospital, Beijing, China.

[*] Correspondence: Chao Peng, Department of Obstetrics and Gynecology, Peking University First Hospital, Beijing, China, No.1, Xi'anmen Street, Xicheng District, Beijing, China (e-mail: 13661097766@163.com).

How to cite this article: Liu Z, Li R, Wang S, Zhou Y, Yin L, Qu Y, Peng C. Postoperative delirium after hysteroscopy in young woman. Medicine 2019;98:44 (e17663).

Received: 19 February 2019 / Received in final form: 24 August 2019 / Accepted: 26 September 2019

http://dx.doi.org/10.1097/MD.0000000000017663

identification is difficult for nonanesthesiologists due to the lack of specific symptoms and signs, which may also extend the length of hospital stay and affect patient recovery. Consequently, it is vital to prevent and treat postoperative delirium.

2. Case presentation

A 39-year-old woman was admitted on May 16, 2018, for a 3-month history of irregular vaginal bleeding and a 1-week old intrauterine space-occupying lesion. Before this occurrence, the patient had a regular cycle (7/28 days) with moderate menstrual blood volume, red color, and dysmenorrhea (−). The prolonged menstruation (20 days) occurred in small volumes and with a dull-red color. The menstrual cycle showed no change, and the patient did not experience discomfort such as abdominal pain, headache, or dizziness. The last menstrual cycle persisted from April 24, 2018 to May 12, 2018. The patient was admitted to the hospital 1 week ago. Pelvic ultrasound revealed endometrium thickening (approximately 16.1 mm), with an uneven echo and no palpable blood flow signal. The patient did not complain of discomfort at that time and was admitted for further surgical treatment. She had a favorable mental state, fair sleep and appetite, normal urination and defecation, and no change in body weight. The patient was healthy previously, G_3P_2, and had undergone 1 induced abortion and 2 cesarean sections in the lower uterine segment in 2011 and 2015, respectively, at other hospitals. She had no history of psychiatric or familial hereditary diseases. The diagnosis on admission was abnormal uterine bleeding, an intrauterine space-occupying lesion, mild anemia, and a cesarean section history.

On admission, her hemoglobin level was 90 g/L, and electrocardiography revealed T-wave changes, normal left ventricular ejection fraction, and mild mitral and tricuspid regurgitation; no obvious abnormality was found in the remaining examinations. The patient had definite surgery indications and no contraindications. A combination of hysteroscopy, endometrial polypectomy, and fractional curettage was performed under intravenous general anesthesia (remifentanil and propofol). The surgery went smoothly, but the patient soon became unresponsive. Her blood pressure was 120/80 mm Hg, heart rate was 90 beats/min, and oxygen saturation was 100%. She coughed a small amount of pink frothy sputum, with bilateral isochoric and light reflex (+). Nervous system examination revealed no positive signs, and no distinct abnormality was found on electrolyte and other auxiliary examinations. The patient was given sputum aspiration. A laryngeal mask airway was placed along with an indwelling catheter. Moreover, furosemide (10 mg), methylprednisolone (40 mg), intravenous infusion of mannitol, and atropine antagonism were administered. Diagnostic examinations did not support the diagnosis of obvious organic diseases such as cardiac failure, pulmonary edema, or pulmonary embolism. The patient had dysphoria thereafter, and chest radiography revealed a small amount of effusion in the right lung. Cranial computed tomography suggested a suspicious low-density lesion in the left cerebellar hemisphere. Magnetic resonance imaging findings excluded organic diseases of the nervous system, such as intracerebral hemorrhage and cerebral infarction. The patient was transferred to the intensive care unit (ICU), where sedative medication was administered to restore calmness. However, obvious dysphoria and nonresponse occurred within 10 hours postoperatively. After repeated sedative dosage reduction, the symptoms showed no significant improvement. Therefore, dexmedetomidine (200 ug/50 mL at 3 mL/h), midazolam (50 mg/50 mL at 2 mL/h), and dopamine (160 mg/50 mL at 3 mL/h) were pumped for maintenance treatment. The patient opened her eyes and smiled hideously 11 hours after surgery; however, she was still unconscious. At 12 hours after surgery, she could speak, and gradually regained her consciousness thereafter; however, her response was slightly slow. Nervous system examination and electroencephalogram revealed no obvious abnormality. Hence, the dosage of sedatives and vasoactive agents was gradually reduced. However, the patient still had paramnesia, and she reported that she was admitted as a result of a car accident. Meanwhile, she had time-space orientation paramnesia. She insisted that her date of admission and length of hospital stay were inconsistent with the reality and could not remember her preoperative and intraoperative experience. Further questions about the patient's medical history revealed that she had a history of untreated neurasthenia, occasional headaches, and sleep disturbance when she suffered from great stress. We used the Confusion Assessment Method Scoring scale to determine the delirium score[5]; it was 9. Consultation with the psychiatry department suggested high possibility of severe delirium during the recovery period after surgery. The patient gradually recovered after symptomatic and supportive treatment, with a clear mind and accurate answers. The patient was discharged 5 days after surgery without any special discomfort.

3. Discussion and conclusions

The risk factors for postoperative delirium can be divided into 3 categories: preoperative, intraoperative, and postoperative.

3.1. Preoperative factors

3.1.1. Aging. The older the patient, the higher is the incidence of postoperative delirium. The risk of postoperative delirium increases 1.15-fold for every additional year in patients aged over 65 years.[6,7]

3.1.2. Preoperative complications. Complications such as cognitive impairment and cerebrovascular disease can lead to memory impairment, impaired cerebrovascular regulation, and higher sensitivity to changes in blood pressure. Once the blood pressure drops, problems such as cerebral hypoxia and cerebral ischemia can occur,[8] thus increasing the incidence of postoperative delirium.

3.1.3. Mental state. Many patients have different degrees of anxiety, tension, and other adverse emotions before surgery. These result in a continuous mental stress, which affects their sleep quality,[9] thus inducing postoperative delirium.

3.1.4. Sex. Conclusions on the influence of sex on postoperative delirium occurrence are not consistent.[10–13] Therefore, more data samples are needed for verification.

3.1.5. Effects of sedatives such as sleeping pills. Habitual use of sleeping pills, especially benzodiazepines, is a risk factor for postoperative delirium.[14] This series of drugs affects the central nervous system, thus interfering with the brain's information storage process, resulting in impaired memory function.[15]

3.2. Intraoperative factors

3.2.1. Surgical types and risks. The incidence of postoperative delirium varies across surgeries. Its incidence rate in aortic, abdominal aortic, and cardiac surgeries is up to 29%, 50%, and 51%, respectively.[16]

3.2.2. Type of anesthetic and its mode of administration. Deep anesthesia increases the possibility of postoperative delirium in patients,[17] and the influence of anesthetic drugs on postoperative delirium should be comprehensively considered right from selection and dosage to patients themselves.

3.2.3. Massive blood loss and transfusion. Intraoperative bleeding is a common phenomenon. Olin et al[18] indicated that large amount of blood loss during laparoscopic surgery may increase the incidence of postoperative delirium.

3.2.4. Changes in brain network connections. Studies have shown that brain network connection changes are the cause of delirium, and postoperative delirium is also caused by central nervous system disorders.[19,20]

3.3. Postoperative factors

3.3.1. Length of stay in the ICU. Studies have found that there is a positive correlation between disease duration in surgical ICU patients and the incidence of postoperative delirium.[21]

3.3.2. Postoperative pain. The incidence of perioperative delirium shows a positive correlation with the postoperative pain score.[12]

The disease characteristics of our patient are consistent with the clinical characteristics of postoperative delirium; however, her age is slightly unique. The patient in our case is a young woman with no special medical history, which is contrary to most postoperative delirium cases. Additionally, hysteroscopy duration was short, with little blood loss, and relatively less patient suffering and body trauma. Therefore, there was minimal possibility of inducing postoperative delirium compared to major chest and abdomen surgeries. Moreover, a postoperative delirium case induced by hysteroscopy has never been reported in the literature. Our case is peculiar for 2 reasons. First, the case was complicated by neurasthenia, mild cardiac dysfunction, and anemia preoperatively, although these diseases are treated as grade B evidence related to the incidence of postoperative delirium in the guideline. Second, there was no abnormality found after an auxiliary and physical examination. The low density lesion in the cerebrum discovered through cranial imaging and the pulmonary effusion may be related to the incidence of transient cerebral ischemic damage and systemic inflammatory response. Finally, the patient gradually recovered consciousness 12 hours after surgery; however, she still had obvious memory loss as well as time and space orientation paramnesia. These conform with the characteristics of postoperative cognitive dysfunction. To treat the patient, dexmedetomidine was administered, which is a highly selective adrenoceptor agonist and has central anti-sympathetic and sedation effect. Research shows that dexmedetomidine can improve postoperative delirium.[22] Furthermore, midazolam, a benzodiazepine derivative, was administered as a supplement for sedation treatment. The guideline suggests that the conventional use of benzodiazepines should be avoided unless the patient is severely anxious. Therefore, the use of this agent should be further explored.

Early diagnosis is the key to the effective treatment for postoperative delirium. As recommended in the guideline, postoperative delirium can be diagnosed according to the diagnostic and statistical manual of mental disorders or International Classification of Diseases-10 scoring criteria. These criteria serves as a grade A recommendation for screening, which should be performed immediately after the patient has entered the recovery room until 5 days after surgery. Currently, the therapeutics for postoperative delirium mainly include haloperidol and cholinesterase inhibitors.[23,24] The guideline recommends keys for preventing and treating postoperative delirium. Grade A recommendations include monitoring the depth of anesthesia, sufficient pain evaluation and treatment, as well as rapid identification, diagnosis, and management, whereas Grade B recommendations include fast-track surgery, sustained intraoperative analgesia therapy, and the application of small dose haloperidol (initiate at 0.25 mg at the maximal dose of 3.5 mg) and atypical antipsychotic.

Postoperative delirium has not yet attracted enough attention from non-anesthesiologists, especially in gynecology and obstetrics. Nevertheless, it affects both physicians and patients. Patients may be admitted for longer durations, and/or readmitted. Furthermore, they face high risks of death and dementia.[25] Therefore, selecting appropriate scoring criteria based on different patients in clinic, preoperative identification, management of risk factors, and explanation of the potential risk of postoperative mental state is important. Strengthening the psychological support to the patient, providing reasonable intraoperative medication, and necessary monitoring of the depth of anesthesia can also help prevent delirium. Early postoperative diagnosis, as well as effective treatment and follow-up are keys to prevent the incidence of postoperative delirium. In the meantime, clinicians, especially physicians in surgery-related departments, should identify the importance of this condition and design effective clinical management for surgery-related cognition impairments, such as postoperative delirium, based on the clinical specialty characteristics and related guidelines.

Acknowledgment

The authors would like to thank Editage (www.editage.cn) for English language editing.

Author contributions

Conceptualization: Yingfang Zhou, Ling Yin, Chao Peng.
Data curation: Zhen Liu, Siyun Wang.
Formal analysis: Siyun Wang.
Investigation: Zhen Liu, Ling Yin, Chao Peng.
Methodology: Yingfang Zhou, Ling Yin, Chao Peng.
Project administration: Ran Li.
Resources: Chao Peng.
Supervision: Yuan Qu, Chao Peng.
Validation: Chao Peng.
Visualization: Chao Peng.
Writing – original draft: Zhen Liu.
Writing – review and editing: Zhen Liu.

References

[1] Bruce AJ, Ritchie CW, Blizard R, et al. The incidence of delirium associated with orthopedic surgery: a meta-analytic review. Int Psychogeriatr 2007;19:197–214.
[2] Merkin A, Borisov I, Shushkevitch A, et al. Difficulties in diagnosing delirium in elderly patients in a general hospital. Asian J Psychiatr 2014;9:85–6.
[3] Rudolph JL, Marcantonio ER. Review articles. Postoperative delirium: acute change with long-term implications. Anesth Analg 2011;112: 1202–11.
[4] Aldecoa C, Bettelli G, Bilotta F, et al. European Society of Anaesthesiology evidence-based and consensus-based guideline on postoperative delirium. Eur J Anaesthesiol 2017;34:192–214.

[5] Inouye SK, Kosar CM, Tommet D, et al. The CAM-S: development and validation of a new scoring system for delirium severity in 2 cohorts. Ann Intern Med 2014;160:526–33.
[6] Aldecoa C, Bettelli G, Bilotta F, et al. European Society of Anaesthesiology evidence-based and consensus-based guidelines on postoperative delirium. Eur J Anaesthesiol 2017;34:192–214.
[7] Chung KS, Lee JK, Park JS, et al. Risk factors of delirium in patients undergoing total knee arthroplasty. Arch Gerontol Geriatr 2015;60: 443–7.
[8] Bagri AS, Rico A, Ruiz JG. Evaluation and management of the elderly patient at risk for postoperative delirium. Clin Geriatr Med 2008;24: 667–86.
[9] Jankowski CJ, Trenerry MR, Cook DJ, et al. Cognitive and functional predictors and sequelae of postoperative delirium in elderly patients undergoing elective joint arthroplasty. Anesth Analg 2011;112:1186–93.
[10] Rudolph JL, Jones RN, Rasmussen LS, et al. Independent vascular and cognitive risk factors for postoperative delirium. Am J Med 2007;120:807–13.
[11] Endo Y, Aharonoff GB, Zuckerman JD, et al. Gender differences in patients with hip fracture: a greater risk of morbidity and mortality in men. J Orthop Trauma 2005;19:29–35.
[12] Vaurio LE, Sands LP, Wang Y, et al. Postoperative delirium: the importance of pain and pain management. Anesth Analg 2006;102: 1267–73.
[13] Tagarakis GI, Tsolaki-tagaraki F, Tsolaki M, et al. The role of apolipoprotein E in cognitive decline and delirium after bypass heart operations. Am J Alzheimers Dis Other Demen 2007;22:223–8.
[14] Leung JM, Sands LP, Vaurio LE, et al. Nitrous oxide does not change the incidence of postoperative delirium or cognitive decline in elderly surgical patients. Br J Anaesth 2006;96:754–60.
[15] Leung JM, Sands LP, Mullen EA, et al. Are preoperative depressive symptoms associated with postoperative delirium in geriatric surgical patients? J Gerontol 2005;60:1563–8.
[16] Rengel KF, Pandharipande PP, Hughes CG. Postoperative delirium. Indian J Crit Care Med 2018;10:448–56.
[17] Radtke FM, Franck M, Lendner J, et al. Monitoring depth of anaesthesia in a randomized trial decreases the rate of postoperative delirium but not postoperative cognitive dysfunction. Br J Anaesth 2013;110:98–105.
[18] Olin K, Eriksdotter-jönhagen M, Jansson A, et al. Postoperative delirium in elderly patients after major abdominal surgery. Br J Surg 2010;92:1559–64.
[19] Sanders RD. Hypothesis for the pathophysiology of delirium: role of baseline brain network connectivity and changes in inhibitory tone. Med Hypotheses 2011;77:140–3.
[20] Rapazzini P. Functional interrelationship of brain aging and delirium. Aging Clin Exp Res 2016;28:1–4.
[21] Bhattacharya B, Maung A, Barre K, et al. Postoperative delirium is associated with increased intensive care unit and hospital length of stays after liver transplantation. J Surg Res 2017;207:223–8.
[22] Maldonado JR, Wysong A, Van der Starre PJ, et al. Dexme-detomidine and the reduction of postoperative delirium after cardiac surgery. Psychosomatics 2009;50:206–17.
[23] Wang W, Li HL, Wang DX, et al. Haloperidol prophylaxis decreases delirium incidence in elderly patients after noncardiac surgery: a randomized controlled trial. Crit Care Med 2012;40:731–9.
[24] Marcantonio ER, Palihnich K, Appleton P, et al. Pilot randomized trial of donepezil hydrochloride for delirium after hip fracture. J Am Geriatr Soc 2011;59(Suppl 2):S282–8.
[25] Witlox J, Eurelings LS, de Jonghe JF, et al. Delirium in elderly patients and the risk of postdischarge mortality, institutionalization, and dementia: a meta-analysis. JAMA 2010;304:443–51.