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LETTER TO THE EDITOR

Reversible myoclonus in a patient undergoing transcervical hysteroscopic surgery

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Abstract We describe a 58-year-old woman who underwent hysteroscopic myomectomy to treat a large submucosal leiomyoma. A hypotonic glycine solution was instilled to distend the uterus. At one hour after the distending medium infusion started for hysteroscopic resection an electrolytic imbalance developed. One hour later myoclonus developed predominantly involving the bilateral sternocleidomastoidei and abdominal muscles. The patient was alert and cooperative; jerks were spontaneous and triggered by sensory stimuli. The electroencephalographic and brain computed tomography was normal. The clinical characteristics of her myoclonus resemble reticular reflex myoclonus, a form of subcortical myoclonus originating from the lower brainstem reticular formation. Given her severe hyponatremia we conjecture that she had symptomatic metabolic myoclonus caused by electrolytic disturbance. The case report we present underlines the need to detect in time and promptly treat neurological symptoms such as myoclonus suggesting resorption syndrome, an uncommon event complicating transcervical hysteroscopic surgery and urologic procedures.

Keywords Myoclonus · Transcervical histeroscopic surgery · Hyponatremia · Fluid overload · Syndrome

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Introduction

Transcervical endoscopic surgery uses a new hysteroscopy technique that entails inserting a scope into the uterine cavity and instilling a suitable distending medium to visualize the endometrium. The medium and the intrauterine pressure open the otherwise narrow uterine cavity. Commonly used distending mediums are hypotonic, electrolyte-free fluids such as 5 % mannitol, 3 % sorbitol and 1.5 % glycine. These fluids risk rapid absorption, cause fluid overload syndrome resulting in volume overload and electrolyte imbalance, and induce a low incidence (less than 0.1 %) of variable concomitant adverse effects [1, 2]. Neurological symptoms are blurred vision, nausea, vomiting, uneasiness, confusion, tiredness, altered consciousness and headache [3]. No published reports have described myoclonus complicating surgical hysteroscopy. We describe here a patient in whom reversible myoclonus developed during hyponatremia after hysteroscopic myomectomy.

Case report

A 58-year-old woman was admitted for elective hysteroscopic myomectomy to treat a large submucosal leiomyoma. She had no abnormal history and preoperative laboratory findings were normal. Anesthesia was induced with propofol 50 mg iv without endotracheal intubation. After lithotomy positioning for surgical hysteroscopy, a hypotonic, 3 L electrolyte-free 1.5 % glycine solution, resulting in an osmolarity of 200 mOsm/L, was instilled to distend the uterus. At 1 h after the distending medium infusion started for hysteroscopic resection, laboratory findings disclosed low sodium, 120 mmol/L (normal value 137–145); volumetric fluid balance was 2 L (calculated as

the difference between the amount of irrigating fluid used and the volume recovered). Myomectomy procedure was then stopped before completion and the patient was immediately infused with 7 % saline solution. Afterwards, she was kept under postanesthetic observation. One hour later, myoclonus developed and the patient was transferred to the emergency room. Neurological examination showed marked myoclonus predominantly involving the bilateral sternocleidomastoidei and abdominal muscles and left limbs, but no other focal neurological signs. The patient was alert and cooperative; myoclonic jerks were spontaneous and triggered by sensory stimuli. Myoclonus was investigated with simultaneous electroencephalographic (EEG) and electromyographic (EMG) recording through surface electrodes placed on both sternocleidomastoid, deltoid, abdominal and quadricipitis muscles. EEG electrodes were placed according to the international 10–20 system in standardized scalp locations (Fp2-T4, T4-O2, Fp2-C4, C4-O2, Fp1-T3, T3-O1, Fp1-C3, C3-O1). EEG recordings showed predominant symmetric posterior alpha activity at 8 Hz, unaccompanied by focal or generalized spike-/sharp slow waves. The EEG–EMG recording showed no abnormal cortical excitability correlating with the jerks. Brain-computed tomography 1 h later showed no cerebral edema. When the patient was infused with furosemide 250 mg and mannitol 250 mg and treated with an iv bolus of 5 mg diazepam, she was immediately sedated and the myoclonic jerks stopped. Half an hour later, when the patient woke up, myoclonus started again. After a second iv bolus of 5 mg diazepam, the myoclonus stopped and the patient was infused with diazepam 10 mg at a rate of 20 mL/h for about 12 h. Arterial blood gas analysis 2 h after the symptoms began showed hyponatremia (128 mmol/L), hypokalemia (3.2 mmol/L; normal values 3.8–5.0) and hypocalcemia (4.07 mmol/L; normal values 4.6–5.9). Electrolyte imbalance normalized within 10 h and the myoclonus gradually decreased and resolved within 24 h. The patient remained alert without neurologic sequelae. The remaining postoperative course was uneventful and the patient was discharged on the second postoperative day. During a 6-month follow-up, she remained asymptomatic with no neurologic complications.

Discussion

Reversible myoclonic jerks unaccompanied by neurological symptoms, such as headache, blurred vision, nausea, vomiting, uneasiness, confusion, tiredness, altered consciousness, seizures and coma, have never been described in a patient undergoing surgical hysteroscopy. Although our patient had most of the usual complications caused by the absorption of fluid distension media during surgical hysteroscopy (including volume overload and electrolyte imbalance), she experienced none of the more severe complications such as serum hypo-osmolality or cerebral edema [4]. The amount of fluid absorption in our patient was presumably influenced by the extent of the myomectomy to treat the large leiomyoma but probably not by the resection time. The principle mechanism for fluid absorption in surgical hysteroscopy is direct absorption into opened vessels during hysteroscopic resections [3]. The driving force is the intrauterine fluid pressure, which can be higher than the hydrostatic venous and arterial pressure [3].

What type of myoclonus our patient experienced remains controversial. The clinical characteristics—including myoclonus at rest, generalized myoclonic jerks, predominantly axial myoclonic activity involving the sternocleidomastoid muscles first then spreading to caudal muscles and highly stimulus-sensitive jerks—resemble reticular reflex myoclonus, subcortical myoclonus originating from the lower brainstem reticular formation and sometimes manifesting during electrolyte imbalance (hyponatremia) [5, 6]. We were unable to obtain somatosensory-evoked potentials, motor-evoked potentials and back-averaging EEG to confirm suspected myoclonus of subcortical origin, because our patient was treated in an emergency department and therapy resolved her symptoms within 24 h.

Hyponatremia related to fluid absorption manifested in our patient with myoclonic jerks alone instead of the more common neurological complications ranging from headache, confusion to coma [3]. The brain adapts to hyponatremia by extruding intracellular electrolytes and organic osmolytes including excitatory amino acids, such as glutamate and aspartate that can trigger seizures in the absence of detectable cerebral edema [7]. The speed at which hyponatremia developed in our patient, the prompt resolution and subsequent absence of cerebral edema probably prevented severe neurological symptoms from developing.

Given her moderate hyponatremia (120 mmol/L), we conjecture that our patient had symptomatic metabolic myoclonus caused by an electrolyte imbalance [5, 6]. This conclusion agrees with our patient's normal EEG cortical excitability during myoclonus. The fact that our patient's myoclonus responded transiently to diazepam, then gradually decreased as the electrolyte imbalance normalized agrees with the known partial usefulness of benzodiazepines in reticular reflex myoclonus [6]. We consider it unlikely that our patient's myoclonus arose from anesthetics [8].

The case report we present underlines the need to detect in time and promptly treat neurological symptoms such as myoclonus suggesting resorption syndrome, an uncommon event complicating transcervical hysteroscopic surgery and urologic procedures.

Conflict of interest The authors declare that they have no conflict of interest.

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