Abdominal Compartment Syndrome and Pulmonary Edema in Hysteroscopy Resection of Uterine Septum

Síndrome do Compartimento Abdominal e Edema Pulmonar na Ressecção Histeroscópica do Septo Uterino

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ABSTRACT

The case is a 37-year old woman scheduled for resection of uterine septum by hysteroscopy. The occurrence of two complications of hysteroscopy, the fluid overload and abdominal compartment syndrome simultaneously in our patient led to a catastrophic outcome.

Key words: Hysteroscopy; Abdominal compartment syndrome; pulmonary edema.

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CASE REPORT

37-years-old woman, 72 kg, with history of Ainfertility presented for resection of uterine septum by hysteroscopy. Her medical history and lab data were unremarkable. After the induction of anesthesia using Sufentanil 10 mg, sodium thiopental 300 mg, intubation was facilitated with 25 mg Atracurium. Anesthesia was maintained with Isoflurane in 50% oxygen and air. Hysteroscopy began with normal saline as distention media. The surgeon, however, used laparoscopic pump for hysteroscopy and up to 10 liters saline as irrigation fluid. Blood pressure and pulse rate suddenly dropped 15-20 minutes after surgery started (BP: 75/40 mmHg and PR: 30 beat/min). Atropine 0.5 mg was infused immediately and the surgeon was informed about the problem. Vital signs became stable temporarily but only after some minutes typical signs of compartment syndrome consisting of severe abdominal distention, severe bradycardia and hypotension, engorgement of cervical vein, congestion of face, increased airway pressure and cyanosis were developed. Even blood rushed out of the two IV catheters of the patient. She developed cardiac arrest and resuscitation promptly started.

We asked the surgeon to open the abdomen. Laparotomy and suction of fluid resulted in immediate improvement and the sinus rhythm was back again. Furosemide was administrated and a urine catheter was placed. However, pulmonary edema developed soon and a large amount of clear fluid repeatedly came out of the tracheal tube. The patient was unstable and required resuscitation frequently. She received epinephrine, atropine sodium bicarbonate, dexametasone and a large amount of furosemide. After 1.5 hours the patient was admitted to ICU with sinus rhythm, spontaneous ventilation, spo2 94%, blood pressure 94/53 mmHg, pulse rate 115 beat/min and good diuresis. Her pupil was dilated and minimally reactive to light. Blood analysis revealed: Na=156 mmol/l K=3.2 mmol/l Ca=6.1 PT=22 PTT=68 INR=2.7 Alb=2.1. In ICU the patient received full ventilatory support and was given thiopental drip, morphine and dexamethasone as aid to brain protection. She also received furosemide and epinephrine infusion. Several hours later her pupil size became normal and reactive to light and after 24 hours she opened her eyes on command. Laboratory data became normal but in spite of several medication and expert consultation she was still suffering from pulmonary edema. At last, 30 hours after surgery O2 saturation deteriorate, blood pressure dropped and she developed ventricular fibrillation and cardiac arrest and was finally pronounced dead after 2 hours of resuscitation. The patient family refused to allow an autopsy to be performed.

DISCUSSION

Compartment syndrome is a rare complication of hysteroscopy. Volume overload is another complication that might develop by a variety of mechanisms such as absorption across endometrium, intravasation through surgically opened venous channel and spill from fallopian tube with absorption by the peritoneum (1). Excessive intravasation may lead to fluid overload, congestive heart failure, pulmonary edema, electrolyte imbalance and dilutional coagulopathy (2,3). Different types of distention media used in hysteroscopy include saline, low viscous fluid such as sorbitol, manitol and glycine solutions and carbon dioxide, each with its distinct advantages or limitations.

In our case, saline was used as distention media (10 liter/ 20 min). In addition to large volume of fluid, laparoscopic pump rather than hysteroscopic pump was used. It is important to note that due to lack of hysterescopic pump at our medical center, laparoscopic pump was wrongly used. When working in a narrow cavity such as uterine, it is obvious that the exact management of the pressure is essential. If intrauterine pressure became greater than the patient mean arterial pressure, intravasation of distending media into the vascular system can occur, in a way that high intrauterine pressure can result in increased absorption of distention media and volume overload (4). Uterine perforation can occur during any operative hysteroscopy procedure but it is most common during septum resection, myomectomy and lysis of synechia (5). Autopsy was not conducted to see if there has been any uterine perforation in our case. The maximum fluid patients can tolerate is not obvious and it will depend on age, weight and cardiovascular status. Normal saline 0.9% can be tolerated better than other distention media and hyponatremia will not be a problem(6).

There are many case reports on hysteroscopy complications (7,8,9). Hyponatremia is a common laboratory test in volume overload. However, in our case hypernatremia was a problem, even though absorption of saline per se could not explain hypernatremia. Rapid infusion of saline predictably resulted in hyperchloremic acidosis (10,11,12). On the other hand, the patient suffered metabolic acidosis due to cardiac arrest; so the need to sodium bicarbonate in order to manage acidosis was increased and resulted in hypernatremia.

Usually one of the most common signs of volume overload is hypertension but our patient did not develop any episode of hypertension. In fact, signs of compartment syndrome masked the sign of volume overload and the simultaneous occurrence of two complications of hysteroscopy in a patient led to a catastrophic outcome. Surgeons and anesthesiologists must be familiar with and aware of complications of hysteroscopy and observe safety points. Experience and skills of surgeons is also an important factor preventing similar events.

RESUMO

O caso se refere a uma mulher de 37 anos submetida à ressecção de septo uterino por histeroscopia. A ocorrência simultânea em nossa paciente de duas complicações da histeroscopia, o excesso de fluido e a síndrome compartimental abdominal, levou a um desfecho catastrófico.

Palavras-chave: Histeroscopia; síndrome compartimental abdominal, edema pulmonar.

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