

## Regional anesthesia in molar pregnancy with thyrotoxicosis in a remote hospital



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### ABSTRACT

Hydatidiform mole or molar pregnancy is a benign Gestational Trophoblastic Disease (GTD) that originates from the placenta. Treatment consists of vacuum evacuation but rarely hysterectomy may be required. One common complication of molar pregnancy

is hyperthyroid. Anesthetic management is often complicated by the associated systemic complications. These complications cannot be prevented, but with a better understanding of the disease, some measurements to avoid maternal mortality can be performed.

**Keywords:** spinal anesthesia, hydatidiform mole, hyperthyroid, gestational trophoblastic disease

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### INTRODUCTION

A hydatidiform mole is a gestational trophoblastic disease that originates from the placenta. It is a rare but life-threatening disorder. Human Chorionic Gonadotrophin (hCG) present in the human placenta is identical with the  $\alpha$ -subunit of the Thyroid-Stimulating Hormone (TSH) but has a weak thyroid-stimulating activity during normal pregnancy.<sup>1</sup>

The human placenta contains two thyrotrophic substances. One, called human chorionic gonadotropin, has a weak intrinsic thyroid-stimulating activity in normal pregnancy. The other, molar thyrotropin, is extracted from the tumor and serum of the patient with hydatidiform mole and differs from hCG by being larger in molecular size and longer in the duration of action. These substances, elaborated by the gestational trophoblastic tissue, are responsible for thyrotoxicosis observed in patients with the trophoblastic tumor. Clinical hyperthyroidism due to trophoblastic disease is cured by evacuation of molar tissue.<sup>2</sup>

In this article, we report the anesthetic management of a patient who developed hyperthyroidism during molar pregnancy and was scheduled for evacuation.

### CASE REPORT

The case took place at H.L. Manambai Abdul Kadir Hospital at Sumbawa Besar regency, which is 8 hours away from nearest referral hospital. A 60 kg, 25 years old woman with 14-15 weeks of molar pregnancy was scheduled for suction curettage. She was first admitted for vaginal bleeding that kept

going during her stay at the hospital. Ultrasound examination revealed molar pregnancy. She was also feeling weak and experiencing palpitations. BP was 150/100 mmHg, and HR was 124 bpm. Hemoglobin level upon admission was 9.5 g/dL (Hematocrit 28.6%, platelet 191.000/mm<sup>3</sup>). TSH level was <0.005  $\mu$ IU/mL, and FT4 was 4.83 ng/dL. Liver and kidney function tests were unremarkable.

Internal medicine consultation suggests that she is currently showing no emergency indications for surgery, that the thyroid function tests must be optimized first. She received PTU 100 mg QID, propranolol 10 mg TID, and dexamethasone IV 5 mg TID. She was then observed for 24 hours.

After 18 hours, her CBC revealed a significant drop in hemoglobin level (9.5 to 7.6 g/dL) due to continuous vaginal spotting. Blood transfusion was ordered. She was then consulted to anesthesiologist for emergency evacuation under anesthesia. Anesthesia preparations include NG tube, PTU, propranolol oral, ice packs, and dexamethasone. Intravenous beta blocker and paracetamol were not available in this hospital.

She was prepared for the intrathecal block. Consent was obtained after explaining risks due to thyrotoxicosis. We administered midazolam 2 mg IV, dexamethasone 20 mg IV, and ondansetron 4 mg IV as pre-medications. Monitoring included pulse oximetry, ECG, and noninvasive blood pressure measurement. Vital signs upon arrival at OR were BP 130/90 mmHg, PR 118 bpm, RR 18 breaths per minute, axillary temperature 37.2 °C, and VAS 20-30 mm. Spinal anesthesia was done in left lateral position at L3-L4 level, with Bupivacaine 0.5% 10 mg. The level of block was extended until T10 level.

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Suction curettage was performed in about 30 minutes with acceptable blood loss (<500 mL). No remarkable events happened during the procedure. Postoperatively the patient was transferred back to the ward with Paracetamol 750 mg QID as analgetic. Blood transfusion was given in the ward.

## DISCUSSION

The treatment of hydatidiform mole is a surgical evacuation. Serious morbidity and even mortality can be seen if no precautionary measures are taken during the evacuation of the molar pregnancy. Thyrotoxicosis, anemia, and dehydration due to bleeding aggravate cardiac dysfunction and respiratory insufficiency.<sup>1</sup> Epidemiologic studies have reported wide regional variations in the incidence of hydatidiform mole. Hydatidiform pregnancy occurs in 1:1000 pregnancies worldwide. Incidence is higher in Asian countries.<sup>3</sup>

Trophoblastic hyperthyroidism should alert the anesthesiologist to a potentially life-threatening situation. Kim et al in 1976 reported such a case in which hyperthyroidism progressed to thyroid storm after an emergency evacuation of the mole.<sup>2</sup>

Hydatidiform mole refers to an abnormal pregnancy characterized by varying degrees of trophoblastic proliferation (both cytotrophoblast and syncytiotrophoblast) and vesicular swelling of placental villi associated with an absent or an abnormal fetus/embryo. Complete hydatidiform mole most commonly presents with vaginal bleeding, usually occurring at 6-16 weeks of gestation in 80-90% of cases. The other classic clinical signs and symptoms include uterine enlargement greater than expected for gestational dates (28%), hyperemesis (8%), and pregnancy-induced hypertension in the first or second trimester (1%).<sup>4</sup>

Ultrasonography and increased hCG levels play a critical role in the diagnosis of both complete and partial moles. Ultrasonography has virtually replaced all other means of preoperative diagnosis. Approximately 50% of patients with complete mole have pre-evacuation hCG levels 100,000 mIU/mL. A single hCG determination, however, is seldom helpful in differentiating complete mole from a normal intrauterine pregnancy, multiple gestations, or a pregnancy complicated by diseases such as erythroblastosis fetalis or intrauterine infections.<sup>4</sup>

Complications associated molar pregnancy should be well known by the anesthesiologist. They include acute pulmonary distress, hyperthyroidism with potential for thyroid storm, severe anemia, pregnancy-induced hypertension, trophoblastic emboli, malignant neoplasm, hyperemesis gravidarum, disseminated intravascular coagulation, hemorrhage, and ovarian theca lutein cysts.<sup>5</sup>

Burch-Wartofsky Score is commonly used to predict the likeliness of thyroid storm to happen.<sup>6</sup> A score below 25 indicates an unlikeliness, and score above 45 indicates the likeliness of thyroid storm to happen. Score between 25 and 45 indicates an impending thyroid storm. Parameters used for this score include body temperature, CNS status, gastrointestinal-hepatic dysfunction, cardiovascular function, the presence of congestive heart failure, and precipitative history.

Anemia in molar pregnancy is mostly secondary to chronic occult per vaginal bleeding. Severe anemia can lead to left ventricular failure leading to cardiopulmonary distress. An inadvertent fluid overload could occur during a central neuraxial block in an attempt to sustain blood pressure. Careful fluid administration should be applied to prevent inadvertent fluid overload.<sup>7</sup>

This patient showed the classic manifestation of molar pregnancy, with the presence of vaginal spotting, anemia, and hyperthyroid symptoms. Ultrasound examination confirms obstetrician's suspicion of molar pregnancy. The clinical manifestations of hyperthyroidism are due to the high serum levels of circulating hCG and Thyrotropin in the plasma of such patients.<sup>8</sup> Hyperthyroidism should be controlled pre-operatively whenever possible. In the thyrotoxic patient, anti-thyroid medication, beta blockers and supportive measures such as fluid resuscitation are necessary to minimize the risk of precipitating thyroid storm.<sup>9</sup>

Perioperative management of hyperthyroidism focuses on the control of the sympathetic activity so that cardiovascular side effects are not manifested. Because blood loss may be substantial at surgery, appropriate blood products should be available.<sup>2</sup> The patient should be immediately put on anti-thyroid drugs to achieve euthyroid. Propylthiouracil (PTU) and methimazole work by inhibiting thyroid hormone synthesis. Beta-blockers, in this case, propranolol, ameliorate actions of T3 and T4 in tissues and also inhibit adrenergic effects. Iodides (lugol, potassium iodide) block thyroid hormone release, inhibit both T3 and T4 formation and decrease thyroid gland size. Steroids inhibit the conversion of T4 to T3 and decrease TSH release. However, it may take days or sometimes weeks before the patient achieve euthyroid status. Nevertheless, in our case, antithyroid medication was given preoperatively even though its effect may only be beneficial after surgery.

Communication between anesthetist and obstetrician ideally should begin soon after the diagnosis of molar pregnancy has been established to provide adequate time for a comprehensive preoperative workup. Particular emphasis is placed on patient's cardiopulmonary status, electrolyte abnormality,

coagulation status, and oxygen-carrying capacity.<sup>5</sup> Preoperative laboratory tests should include CBC, coagulation study, electrolyte, thyroid function tests, and chest radiograph. Arterial blood gas should be taken should the patient possess signs or symptoms of pulmonary edema.

Thyroid storm is a life-threatening emergency which is usually encountered in 2-4% patients in the postoperative period.<sup>8</sup> Anesthetist must be familiar with the symptoms of a thyroid storm. Marked elevation of body temperature, tachycardia, chest pain, shortness of breath, anxiety, and irritability, excessive sweating, arrhythmias, pulmonary edema and congestive cardiac failure may present. If unrecognized the condition is invariably fatal. Combined use of anti-thyroid drugs,  $\beta$ -blockers, and corticosteroids restores serum T3 concentration to within normal range within 24 to 48 hours. Paracetamol, combined with internal and external cooling, may be helpful in alleviating hyperpyrexia. In the absence of cardiac insufficiency,  $\beta$ -blockers to ameliorate symptoms should be started preoperatively.

The common anesthetic technique for surgical procedures for evacuating molar pregnancy suggests that general anesthesia as the technique of choice.<sup>5</sup> Invasive monitoring is recommended for uterus size greater than 16 weeks, decreased PaO<sub>2</sub>, evidence of pulmonary edema, severe pregnancy-induced hypertension, and thyrotoxicosis. However, uterine relaxation caused by certain inhaled anesthetics may further increase blood loss. Therefore, inhaled anesthetics with known tocolytic qualities, such as halothane, enflurane, and isoflurane, should be used in low concentrations

In our case, we preferred to use regional anesthesia. The sympathetic block induced by spinal anesthesia can be helpful. It also avoids the tocolytic effect of volatile anesthesia. The patient was calm and cooperative, so the technique was considered relatively easy. It can also avoid the effects of ventilation on the pulmonary system. And because the patient was somewhat alert, complications like thyroid storm and cardiopulmonary distress can be detected earlier compared to general anesthesia.

Laurent et al administered propranolol, a long-acting  $\beta$ 1, and  $\beta$ 2 blocker before and after surgery to control sympathetic activation. Esmolol, a short-acting  $\beta$ 1 blocker, has also been used to attenuate the hemodynamic response to laryngoscopy and intubation in patients with pregnancy-induced hypertension.<sup>9</sup>

The patient was discharged two days after the procedure with no known complications. Anti-thyroid medications were continued and she will be evaluated periodically by an internist.

## CONCLUSION

Anesthetists should be well aware of perioperative complications associated with molar pregnancy. Pre-anesthesia workup, pre-operative optimization, and well-thought anesthesia technique of choice are mandatory for any case of molar pregnancy.

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