

## Gestational trophoblastic disease

### Background

Gestational trophoblastic disease (GTD) is a spectrum of tumors with a wide range of biologic behavior and potential for metastases. GTD refers to both the benign and malignant entities of the spectrum and include hydatidiform mole, invasive mole, choriocarcinoma, and placental site trophoblastic tumor. The last three are termed gestational trophoblastic tumors (GTT); all may metastasize and are potentially fatal if untreated.

The incidence of hydatidiform mole varies in different regions of the world, but has been falling. In North America the incidence is approximately 0.6 to 1.1 per 1000 pregnancies; the rate is approximately three times higher in Asia. Choriocarcinoma in North America occurs in one of every 20,000 to 40,000 pregnancies.

The risk of repeat molar pregnancy in a conception following one molar pregnancy (complete, partial, or persistent GTN) is approximately 1 percent, which is increased compared with the 1:1000 risk of molar gestation in the general population. Therefore, ultrasound should be obtained in the late first trimester of subsequent pregnancies to confirm normal fetal development. Additionally, an hCG level should be obtained six weeks after completion of subsequent pregnancies to rule out occult choriocarcinoma. (see Management of Subsequent Pregnancies, below)

Routine pathologic evaluation of the placenta, while recommended in the past, is not necessary. However, products of conception should be evaluated by a pathologist following any spontaneous or therapeutic abortion. (see Management of Subsequent Pregnancies, below)

Risk factors for malignant complication at time of presentation

- Significant uterine enlargement
- HCG over 100,000 mIU/ml at diagnosis
- Theca lutein cysts > 6 cm diameter
- Hx of previous molar pregnancy
- Maternal age greater than age 40
- Post evacuation hemorrhage not due to incomplete evacuation

### Molar Pregnancy (Hydatidiform mole)

Hydatidiform mole is classified as complete (CHM) or partial mole (PHM), which are distinguished by differences in clinical presentation, pathology, genetics, and epidemiology. The risk of malignant sequelae requiring therapy ranges from 8% to 15% with complete mole, to 1.5% to 6% with partial mole.

The most common symptom is vaginal bleeding, which occurs in 84% of patients with complete moles. Fifty percent of patients with CHM show uterine enlargement and high levels of human chorionic gonadotropin (hCG). In contrast, patients with partial mole present with signs and symptoms of an incomplete or missed abortion, and have bleeding, a small uterus, and low hCG levels.

Cytogenetic studies have characterized the two molar syndromes. In 90% of complete moles there are paternally derived chromosomes with a 46XX karyotype. Partial moles are most commonly due to a fertilization error in which a normal ovum is fertilized by two spermatozoa, resulting in a triploid karyotype (69XXY). Flow cytometry has been employed to differentiate the two molar types, but is not widely available.

## Diagnosis

The characteristic appearance of a vesicular molar pattern in CHM can often be identified in the first trimester before vaginal spotting or the passage of macroscopic vesicles. There is often no evidence of a fetus.

The early diagnosis of a partial mole is more complex and less likely, although ultrasound may demonstrate focal cystic spaces in the placenta and an increase in the transverse diameter of the gestational sac. A fetus may be seen in an advancing gestation.

## Management

Chest X-ray	-Done at evacuation. Repeat at 4 wks. Or at any increasing titer.
Pelvic exam	-Perform at 1st & 4th week after evacuation.
Blood Type	-Treat if RhoGam candidate.
Quantitative B-hCG	-Weekly until negative titer x3, then monthly for 6 months after negative
Contraception	-Defer pregnancy for at least 6 months after negative titer -BCP's preferred (Berkowitz 1998)

In both CHM and PHM, after diagnosis and workup, which includes a complete blood count (CBC),  $\beta$ -hCG, and chest X-ray, evacuation of the uterine contents is carried out by means of suction curettage followed by blunt curettage of the uterine cavity. Intravenous oxytocin is administered after the cervix is dilated and is continued for several hours postoperatively.

Rarely, in partial molar pregnancies, where the size of the fetus precludes suction curettage, medical termination may be used; these patients, however, may be at an increased risk of persistent trophoblastic disease.

In patients who desire surgical sterilization, an abdominal hysterectomy with the mole in situ can be considered if sterilization criteria have been met.

Routine repeat evacuation after the diagnosis of molar pregnancy is not warranted.

In twin pregnancies with a viable fetus and a molar pregnancy, the pregnancy may be allowed to continue with MFM and GYN Oncology consultation.

Careful follow-up is critical after evacuation of a molar pregnancy, to identify those at risk of developing malignant sequelae. Repeated weekly assays of hCG levels should be carried out until three negative levels are obtained, and then followed by monthly hCG levels times six, along with regular pelvic examinations. A chest X-ray is indicated if the  $\beta$ -hCG rises.

Contraceptive measures should be instituted, ideally using oral contraceptives, (Berkowitz 1998) and the patient advised to avoid pregnancy until hCG values have remained normal for six months. The World Health Organization states the risks of intrauterine contraception outweigh the benefits during the period of hCG monitoring.

Medical complications of molar pregnancy, including pregnancy-induced hypertension, hyperthyroidism, anemia, and hyperemesis gravidarum, are more frequently seen among patients with complete moles. Approximately 15–25% of patients with complete moles will have theca lutein cysts with ovarian enlargement of more than 6 cm. Malignant sequelae occur in less than 5% of patients with partial moles, compared with approximately 20% after evacuation of complete hydatidiform moles.

Pulmonary complications are frequently observed around the time of molar evacuation among patients with marked uterine enlargement. Although the syndrome of trophoblastic embolization (deportation) has been emphasized as an underlying cause of respiratory distress syndrome following molar evacuation, there are many other potential causes of pulmonary complications in these women. Respiratory distress syndrome can be caused by high-output congestive heart failure caused by anemia or hyperthyroidism,

preeclampsia, or iatrogenic fluid overload. Generally, these complications should be treated aggressively with therapy directed by central venous or Swan-Ganz catheter monitoring and assisted ventilatory support, as required. Hyperthyroidism and pregnancy-induced hypertension usually abate promptly after evacuation of the mole and may not require specific therapy. Theca lutein cysts are associated with hCG stimulation of the ovaries. These may take several months to resolve after molar evacuation but rarely need to be removed. Surgical intervention should be reserved for rupture or torsion, which is rare.

**Follow-up Recommendations (see bulleted Management above)**

- One provider / case manager should follow the patient, if possible
- Review lab data q month
- Verify ongoing contraception each visit until follow-up period completed
- See discussion of false-positive hCG values, also known as "phantom hCG" (Appendix 1)

**Indication for further treatment**

- Plateauing of beta-hCG levels over at least three weeks ( $\pm$  10%)
- Titer greater than 20,000 mIU/ml at 4 weeks post evacuation
- Titer not less than 4 mIU/ml by 12 weeks post evacuation
- Elevated titer after reaching normal levels (r/o pregnancy)

**Persistent hCG**

If the patient is low risk by the WHO Scoring System, below, then she can be treated in the following manner.

- MTX 50 mg/m<sup>2</sup> IM weekly until the serum beta-hCG concentration falls to normal (less than 5 mIU/mL) for three consecutive weeks

**TABLE 1: WHO SCORING SYSTEM**

	0	1	2	4
AGE	≤ 39	> 39		
Antecedent pregnancy	Hydatid. mole	Abortion	Term pregn.	
Interval months from index pregnancy	4	4–6	7–12	>12
Pretreatment hCG (IU/mL)	<10 <sup>3</sup>	10 <sup>3</sup> –10 <sup>4</sup>	10 <sup>4</sup> –10 <sup>5</sup>	>10 <sup>5</sup>
Largest tumor size including uterus		3–4 cm	5 cm	
Site of metastases		spleen, kidney	GI tract	brain, liver
Number of metastases identified		1–4	4–8	> 8
Previously failed chemotherapy			single drug	≥ 2 drugs

**WHO Scoring System**

- Low risk                      WHO Score: 4 or less
- Moderate risk              WHO Score: 5-7
- High risk                      WHO Score: 8 or greater

**Indication for Gyn Oncology consultation**

- Moderate or high risk by WHO Scoring System
- Tissue diagnosis of choriocarcinoma
- Evidence of metastases (chest x-ray, pelvic exam)
- Persistence of hCG after initial chemotherapy regimen above
- Persistence of beta-hCG six months after molar evacuation

### **Management of subsequent pregnancies**

- Ultrasound should be obtained in the late first trimester of subsequent pregnancies to confirm normal fetal development
- An hCG level should be obtained six weeks after completion of subsequent pregnancies to rule out occult choriocarcinoma
- Routine pathologic evaluation of the placenta, while recommended in the past, is NOT necessary. However, products of conception should be evaluated by a pathologist following any spontaneous or therapeutic abortion.

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## **Appendix 1**

### **Characteristics of false-positive hCG values, also known as "phantom hCG"**

1. Rarely, women have persistently elevated hCG levels but are subsequently found to have a false-positive hCG assay result, sometimes after receiving chemotherapy or surgery for presumed malignant gestational trophoblastic disease.
2. Most patients with false-positive hCG values have low-level hCG elevations, but occasionally values higher than 300 mIU/mL have been recorded. False-positive hCG values result from interference with the hCG immunometric sandwich assays, most often caused by nonspecific heterophilic antibodies in the patient's sera. Many of these patients have an undefined previous pregnancy event and do not have radiographic evidence of metastatic disease.
3. False-positive hCG values also may appear after evacuation of a hydatidiform mole or following a clearly defined pregnancy event, such as an ectopic pregnancy, and a urine pregnancy test may be considered to differentiate between the two.
4. False-positive test results should be suspected if hCG values plateau at relatively low levels and do not respond to therapeutic maneuvers, such as methotrexate given for a presumed persistent mole or ectopic pregnancy.
5. Evaluation should include evaluation of serum hCG levels using a variety of assay techniques at different dilutions of patient serum, combined with a urinary hCG level if the serum level is higher than the threshold for the urinary assay, usually more than 50–60 mIU/mL. False-positive hCG assays usually will not be affected by serial dilution of patient sera and will have marked variability using different assay techniques, with most assays reflecting undetectable hCG levels.
6. Heterophilic antibodies are not excreted in the urine; therefore, urinary hCG values will not be detectable if they are the cause of serum hCG level elevation. Other techniques also are available to inactivate or strip the patient's serum of heterophilic antibodies. It is important to exclude the possibility of false-positive hCG values before subjecting these patients to hysterectomy or chemotherapy for gestational trophoblastic disease.