Trophoblastic diseases

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Trophoblastic diseases

- A group of rare diseases that involve abnormal growth of cells inside a woman’s uterus.
- They develop from trophoblasts (the cells that would normally form the placenta during pregnancy).
- During early embryo development, trophoblasts form tiny projections called “chorionic villi”. In time, these will develop into placenta that will protect and nourishes the growing fetus.
- Trophoblastic diseases consist of several types; they can be benign or malignant.
Types of trophoblastic diseases

- Hydatidiform mole
- Invasive mole
- Choriocarcinoma
- Placental-site trophoblastic tumor
- Epithelioid trophoblastic tumor
Hydatidiform Mole

- 2 forms of abnormal gestational processes, result from abnormal fertilization:
- 2 types:
  - **complete mole**: an empty egg is fertilized by two spermatozoa (or a diploid sperm), yielding a *diploid* karyotype composed of entirely paternal genes
  - **partial mole**: a normal egg is fertilized by two spermatozoa (or a diploid sperm), resulting in a *triploid* karyotype with a predominance of paternal genes
- **Normal conception**
  - 2 sets of genes
  - 1 paternal
  - 1 maternal
  - normal fetus

- **Complete mole**
  - 2 sets of paternal genes
  - no maternal genes
  - no fetus

- **Partial mole**
  - 3 sets of genes
  - 1 maternal
  - 2 paternal
  - non-viable fetus
- **complete hydatidiform mole** → does not permit embryogenesis = *never* contains fetal parts, and the chorionic epithelial cells are diploid (46,XX or, uncommonly, 46,XY).

- **partial hydatidiform mole** → compatible with early embryo formation and may contain fetal parts, has some normal chorionic villi, and is almost always triploid (e.g., 69,XXY).
Uterus in normal vs mole pregnancy

Normal Uterus

Molar Pregnancy
Normal Pregnancy versus Mole – histology
Normal Pregnancy versus Mole – Ultrasound

Vesicles
“Snow storm”
Morphology: cystically dilated chorionic villi (grapelike structures); villi are covered by varying amounts of mildly to highly atypical chorionic epithelium
<table>
<thead>
<tr>
<th>Feature</th>
<th>Complete Mole</th>
<th>Partial Mole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karyotype</td>
<td>46,XX (46,XY)</td>
<td>Triploid (69,XXY)</td>
</tr>
<tr>
<td>Villous edema</td>
<td>All villi</td>
<td>Some villi</td>
</tr>
<tr>
<td>Trophoblast proliferation</td>
<td>Diffuse; circumferential</td>
<td>Focal; slight</td>
</tr>
<tr>
<td>Atypia</td>
<td>Often present</td>
<td>Absent</td>
</tr>
<tr>
<td>Serum hCG</td>
<td>Elevated</td>
<td>Less elevated</td>
</tr>
<tr>
<td>hCG in tissue</td>
<td>++++</td>
<td>+</td>
</tr>
<tr>
<td>Behavior</td>
<td>2% choriocarcinoma</td>
<td>Rare choriocarcinoma</td>
</tr>
</tbody>
</table>
- incidence $\Rightarrow$ 1 to 1.5 per 2000 pregnancies; higher incidence in Asian countries.

- Moles are most common **before maternal** age 20 years and **after** age 40 years

- Early monitoring of pregnancies by ultrasound $\Rightarrow$ early diagnosis of hydatidiform mole.
Signs and symptoms

- Vaginal bleeding during 1st trimester of pregnancy (m/c)
- Elevations of hCG in the maternal blood
- Hyperemesis (severe nausea & vomiting)
- Absence of fetal parts by ultrasound
- Passage of vaginal tissue described as grape-like vesicles
- Pre-eclampsia
- Uterus size looks larger than expected for a normal pregnancy

- Less dramatic in partial mole compared to complete mole
Treatment

- Stabilize patient condition
- Surgical evacuation of uterine contents
- Close monitoring of serum hCG levels → if persistently high → further evaluation to rule out invasive mole or malignancy
• Prognosis:
  • **complete moles:**
    - 80% to 90% → no recurrence
    - 10% → invasive mole (invades myometrium)
    - 2% to 3% → choriocarcinoma.
  • **Partial moles:**
    - better prognosis and rarely give rise to choriocarcinomas.
Choriocarcinoma

- Very aggressive malignant tumor arises from gestational chorionic epithelium or from gonads.
- Rare (1 in 30,000 preg); more common in Asian and African countries.
- Risk greater before age 20 and after age 40.
- 50% arise in complete hydatidiform moles; 25% arise after an abortion, and most of the rest in normal pregnancy.
Clinically: **bloody, brownish discharge** and **very high titer of hCG** in blood and urine.

- very hemorrhagic, necrotic masses within the myometrium
- chorionic villi are **not** formed; tumor is composed of anaplastic cytотrophoblast and syncytiotrophoblast.
**Prognosis:**

- Aggressive disease
- Widespread dissemination via **blood** to lungs (50%), vagina, brain, liver, and kidneys.
- Lymphatic invasion is **uncommon**
- Despite extreme aggressiveness, good response to chemotherapy.