But where is the $\beta$-hCG coming from?

Erin E. Stevens, MD
SUNY Downstate Gynecologic Oncology Fellow
WAGO Annual Meeting
Tumor Board Presentation
Case Presentation

- 45 year old female presented to ER in August 2011 complaining of right hip pain x 4 months
- Found to have $\beta$-hCG of 75.19
- Pelvic X-ray: mild-moderate degenerative changes, no fracture
- Pelvic Ultrasound: no IUP or ectopic seen
### History

- **Past Ob History:** No prior pregnancies
- **Past Gyn History:** 16/28/6, primary infertility with h/o fibroids s/p myomectomy, h/o ovarian cysts s/p cystectomy, no h/o STD, PID, abnormal paps, last intercourse 3-4 weeks ago
- **Past Medical History:** None
- **Past Surgical History:** R ovarian cystectomy 1997, abdominal myomectomy 2000
- **Medications:** Percocet, Neurontin, Senna, Colace
- **Allergies:** NKDA
- **Social History:** Married, denies toxic habits; born and lives in Haiti, visiting US since July 2012
Physical Exam

- **BP**: 120/83  
- **HR**: 97  
- **RR**: 18  
- **T**: 97.6

- **Height**: 5’3”  
- **Weight**: 180 lbs

- **General**: NAD, AAO x 3

- **Chest**: CTAB, RRR S1+S2

- **Abdomen**: +BS soft, NTND, obese

- **Extremities**: Right hip ROM limited by pain, sensation intact

- **Speculum**: normal 2x2 cm cervix, no bleeding or discharge noted

- **Vaginal Exam**: no CMT, os closed, uterus mobile 8 week size, no adnexal masses; Rectovaginal exam confirmatory
β-hCG Trend & Intervention

- B-hCG Level
- MTX #1
- MTX #2
- Surgery
Operative Intervention

- D&C, Diagnostic L/S
- Findings: Minimal tissue obtained on D&C, mild pelvic adhesions on laparoscopy, no ectopic
- Pathology: Inactive endometrium
Mid-October 2012: referral made to Gyn Onc

β-hCG trend reviewed to date

Commercial assay used by lab confirmed

Serial dilutions (Hook effect) done in lab

Hyperglycosylated hCG – send out test (2 weeks)

Quest Diagnostics Nichols Institute in California
Hyperglycosylated hCG

- Aberrant glycosylation
- Same polypeptide structure as hCG with larger N- and O-linked oligosaccharides
- hCG-H promotes growth of cytotrophoblast cells, placental implantation, trophoblastic invasion
- Lab test: monoclonal antibody that binds hCG-H
More Laboratory Studies

- **Quest Diagnostics Nichols Institute**
  - **hCG, Total, Quant**: 205 mIU/mL (<5 mIU/mL)
  - **Hyperglycoslated hCG**: 9.0 mcg/L (<1 mcg/L)
Gestational Trophoblastic Neoplasia

- **Quiescent Form**
  - Highly differentiated trophoblast cells
  - Non-malignant, non-invasive
  - Persistently low hCG
  - No hCG-H
  - No treatment indicated until hCG >3,000 IU/L

- **Minimally Invasive Form**
  - Malignant trophoblast cells
  - Low hCG levels
  - hCG-H elevated (> 1 mcg/L)
  - WHO staging
  - Requires chemotherapy
Diagnosis: Minimally Invasive Gestational Trophoblastic Neoplasm

Plan: CT head, chest, abdomen, pelvis to determine metastatic disease for WHO scoring and determination of chemotherapy regimen
GTN: WHO Scoring System

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Score</th>
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<tbody>
<tr>
<td><strong>Age, y</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Antecedent pregnancy</strong></td>
<td>Mole</td>
</tr>
<tr>
<td><strong>Pregnancy event to treatment interval, mo</strong></td>
<td>&lt;4</td>
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<tr>
<td><strong>Pretreatment hCG, mIU/mL</strong></td>
<td>$&lt;10^3$</td>
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<td><strong>Largest tumor mass, including uterus, cm</strong></td>
<td>&lt;3</td>
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<tr>
<td><strong>Site of metastases</strong></td>
<td>—</td>
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<tr>
<td><strong>No. of metastases</strong></td>
<td>—</td>
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<tr>
<td><strong>Previous failed chemotherapy</strong></td>
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GI, gastrointestinal; hCG, human chorionic gonadotropin.
Total score for patient is obtained by adding individual scores for each prognostic factor: low risk <7; high risk ≥7.

IR Biopsy
Immunostains

AE1/AE3

HHF35

LCA

Bcl2
β-HCG Staining

CD99

β-HCG
Synovial Sarcoma

- Rare, slow growing, locally aggressive tumor
- 8-10% of all soft tissue sarcomas
- Occur most in young adults, more often men
- Cytogenically characterized by chromosomal translocation t(X; 18) (p11;q11)
- Most common symptoms: swelling/tenderness
- High rate of metastasis: often lungs
- 5 year survival rates: 24-68% (rare tumor)
Synovial Sarcoma: Prognosis

- **Good Prognosis**
  - Young age
  - Small tumor size
  - Tumor calcification
  - Intratumoral mast cells
  - Distal location of tumor

- **Bad Prognosis**
  - Poorly differentiated
  - Tumor necrosis
  - Vascular invasion
  - High mitotic rate
  - High proliferative index
  - DNA aneuploidy
Other hCG Secreting Tumors

- Gynecologic cancers
- Bladder cancer
- Renal cancer
- Prostate cancer
- GI cancers
- Neuroendocrine tumor
- Lung cancer

- Breast cancer
- Head and neck cancers
- Hematologic cancers
- Sarcoma (4 reports)
  - Osteosarcoma (shoulder)
  - Leiomyosarcoma (spermatic cord, small/large intestine)
Thank you!