Case of the Month November 2015: Krukenberg Tumour

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November, 2015
70 year-old female presents with a 6 month history of severe worsening heartburn, constipation, and vague lower abdominal and pelvic pain.

**Vitals:**
- Non febrile
- HR 80
- BP 145/95

**CBC:** Normal
**Liver enzymes:** Normal
**Lipase:** Normal

**Past Medical Hx:**
Remote history of bladder tumour resection.
Previous smoker, quit 10 years ago

**Physical Exam:**
Mild epigastric tenderness
Negative Murphy’s
Mild tenderness in RLQ and LLQ
DRE negative
Investigations

- Diagnostic Imaging: CT and Ultrasound
- Gastroscopy and Colonoscopy
- Biopsy and Pathology
Axial image demonstrating thickened gastric wall
CT axial image of bilateral adnexal masses
Coronal reformats of adnexal masses
Sagittal Reformats of adnexal masses
CT imaging findings

- Abnormal thickening of the gastric body wall with mucosal enhancement.

- Abnormal strand of the fat planes within the gastrohepatic ligament as well as inferior to the gastric body.

- Extensive omental nodularity beneath anterior abdominal wall in keeping with omental metastases.

- Moderate volume of pelvic free fluid.

- Large heterogenous enhancing mass in the right adnexa suspicious for a solid right ovarian mass. Similar appearing mass in the left adnexa.
Ultrasound Left Adnexa with Doppler
Ultrasound Right Adnexa with Doppler
Ultrasound Findings

- The uterus is anteverted and atrophic. Normal endometrium.

- Right adnexal lobulated mass measuring 5.4 x 3.2 cm with associated hypervascularity.

- Left adnexal lobulated mass measuring 4.4 x 3.2 cm with associated hypervascularity.

- Free fluid within the pelvis.
Gastroscopy demonstrated severe gastritis along the lesser curve from the mid body to the GE junction. A visible tumour extended from the distal esophagus to the lesser curvature just proximal to the antrum. There was marked linitis plastica.

Colonoscopy was unremarkable aside from diverticuli.

Biopsies from the first endoscopy showed poorly differentiated adenocarcinoma of the stomach. The second biopsy demonstrated small foci of signet ring cell carcinoma.

Pathology confirmed metastatic HER2-neu negative gastric cancer.
Diagnosis:

In the context of *signet ring cell gastric carcinoma*, the bilateral adnexal masses are favoured to be *bilateral ovarian metastases* in keeping with *Krukenberg tumour.*
Krukenberg Tumor

“Signet ring” subtype of metastatic ovarian tumor, also known as carcinoma mucocellulare.

The most common primary tumours are stomach and colon, followed by breast, lung, and contralateral ovarian tumour.

Epidemiology

Krukenberg tumors are 5-10% of all ovarian tumors, and up to 50% of all metastatic ovarian tumours.

Pathology

Histology demonstrates mucin-secreting “signet ring” cells; the cells typically originate from the stomach, followed by colorectal, breast, lung, contralateral ovarian carcinoma, pancreas, and cholangiocarcinoma.

Jung et al 2002
Pathology: Signet Ring Cells

Nests and clusters of signet ring cells filled with basophilic mucin seen infiltrating spindled stroma
Diagnostic Imaging Characteristics of Krukenberg Tumour

CT:

Ovarian masses may be mixed cystic-solid or primarily solid, and may be indistinguishable from primary ovarian carcinoma. Krukenberg tumor may be suspected if there are additional gastric or colonic lesions identified.

Ultrasound:

Findings are typically bilateral solid ovarian masses with well-defined margins. A characteristic feature for Krukenberg tumor includes an irregular hyper-echoic solid pattern and “moth-eaten like cyst formation” (Radiopaedia).
Benign vs Malignant Epithelial Neoplasms

Epithelial ovarian tumours represent 60% of all ovarian neoplasms and 85% of malignant ovarian neoplasms (Jung et al).

Table 3
Features that Suggest Either Benign or Malignant Epithelial Neoplasms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Benign</th>
<th>Malignant</th>
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</thead>
<tbody>
<tr>
<td>Component</td>
<td>Entirely cystic</td>
<td>Large soft-tissue mass with necrosis</td>
</tr>
<tr>
<td>Wall thickness</td>
<td>Thin (less than 3 mm)</td>
<td>Thick</td>
</tr>
<tr>
<td>Internal structure</td>
<td>Lacking</td>
<td>Papillary projection</td>
</tr>
<tr>
<td>Ascites</td>
<td>None</td>
<td>Peritoneal, anterior to uterus</td>
</tr>
<tr>
<td>Other</td>
<td>...</td>
<td>Peritoneal implants, pelvic wall invasion, adenopathy</td>
</tr>
</tbody>
</table>

Jung SE et al, Radiographics 2002
Treatment and Prognosis

- Treatment varies widely depending on primary tumour, extent of metastases, invasion of nearby organs, and overall baseline health of the patient.

- Many patients receive chemotherapy; some receive radiation; some may receive surgery for the primary tumour and/or debulking surgery.

- Prognosis also varies widely depending on the primary tumour and extent of metastases.
Case report conclusion

- Our patient was diagnosed with metastatic HER2-neu negative signet ring cell carcinoma with Krukenberg ovarian tumour metastases.

- She received six cycles of ECF/X chemotherapy and now continues on Capecitabine.

- She was not a candidate for radiation therapy and has not undergone surgery.

- She is now 1 month post-chemo and progress reports indicate she is declining in health but still living at home with her husband.

- Follow up imaging post-chemo is still pending.
References


