Unexpected Gynecologic Findings at Laparotomy

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Adnexal Mass: Gyn Etiologies

- Uterine
  - Leiomyomas
  - Pregnancy
  - Malignancy

- Tubal
  - Pregnancy
  - Hydrosalpinx
  - Malignancy

- Tubo-Ovarian
  - Abscess (TOA)
  - Torsion

- Ovarian
  - Functional cyst
  - Endometrioma
  - Neoplasm
    - Benign
    - Malignant
Factors affecting intra-operative decision-making

• Autonomy
  – Consent
• Beneficence
  – Pathology
• Fertility
• Hormonal
Uterine Leiomyomas

• Most common pelvic tumor
  – 1 in 4 white women
  – 1 in 2 black women

• Pathogenesis elusive
  – Each is monoclonal
  – Probable somatic mutation, influenced by estrogen, progesterone, & local growth factors
Uterine Leiomyomas

- Rarely malignant
  - 0.3 to 0.7% of myomatous uteri
- Usually multiple
- Symptoms (none in majority of women)
  - Pressure
  - Pain
  - Abnormal bleeding
Uterine Leiomyomas: Surgical Management

- Intramural or sub-serosal with no “stalk”: leave in-situ
- Sub-serosal with “stalk”:
  - Leave in-situ:
    - Premenopausal, unknown fertility issues, &
    - Pelvic pain was NOT indication for surgery
  - Remove:
    - Very large
    - Pelvic pain WAS indication for surgery
Intrauterine Pregnancy

• Enlarged uterus
• May be associated with ovarian luteal cysts, especially early in pregnancy:
  – Do not remove: will resolve spontaneously
  – Intra-operative ultrasound to document pregnancy
Uterine Malignancy

- Rarely diagnosed as an adnexal mass but may be associated with an adnexal mass
  - Uterine papillary-serous & clear cell adenocarcinomas can spread intraperitoneally (e.g., omentum, tubes & ovaries) like ovarian cancer
  - 20% of endometrioid ovarian cancers associated with uterine endometrial cancer
Ectopic (Tubal) Pregnancy

• Location:
  – 81% Ampullary (distal 2/3 of tube)
  – 12% Isthmus (proximal 1/3 of tube)
  – 5% Fimbrial
  – 2% Interstitial

• Triage points
  – Ruptured vs. Unruptured
  – Desires fertility vs. sterility
Ectopic (Tubal) Pregnancy

• **Salpingectomy required**
  – Uncontrolled bleeding
  – Recurrent ectopic pregnancy in same tube
  – Severely damaged tube
  – Ectopic $\geq 5$ cm

• **Salpingectomy recommended**
  – Does not desire fertility
Ectopic (Tubal) Pregnancy

• Desires fertility
  – Linear salpingostomy
  – Risk of persistent ectopic pregnancy
    • Post-op incidence: 3.9-8.3%
    • Follow serial bHCG’s weekly
    • Treat with methotrexate if rising bHCG
Ectopic (Tubal) Pregnancy

• Linear salpingostomy
  – Vasopressin (0.2 IU/ml NS) injection into tube wall at area of maximal distention
  – Longitudinal incision
  – Evacuate products
  – Flush tube
  – Control bleeders with bipolar cautery, small (6-0) sutures PRN.
Hydrosalpinx

• End-stage of pyosalpinx:
  – Distended with watery, sterile fluid

• Management:
  – Desires fertility
    • Pelvic pain reason for surgery: salpingostomy
    • No pain: leave in-situ
  – Does not desire fertility, postmenopausal:
    • Pelvic pain reason for surgery: Salpingectomy
    • No pain: leave in-situ
Tubal Malignancy

- Rare
- Spread pattern similar to ovarian CA
  - Intraperitoneal
  - Lymphatic
- Usually firm, distended tubal mass
  - Excise with adjacent ovary
  - Triage & surgical management same as for ovarian cancer
Tubo-Ovarian Abscess

- Management dependent on:
  - Rupture
  - Reproductive wishes
  - Intra-operative findings
Tubo-Ovarian Abscess

• Immediate surgery
  – Uncertain diagnosis, suspicion of rupture:
    • Septic shock
    • Generalized peritonitis
    • Falling WBC
  – Extent of disease & desire for fertility define the extent of surgery
Tubo-Ovarian Abscess

- Discovered at exploration, stable patient, unruptured, desires fertility or fertility wishes unknown:
  - Leave in-situ:
    - 70% respond to abx treatment alone
    - Greater surgical risk in acute inflammatory phase
    - 14% had subsequent intra-uterine pregnancy in one study
    - Retain ovarian function
Torsed Adnexal Mass

• More common in pregnant than non-pregnant state (28% vs. 7%)

• Management:
  – Detorsion with ovarian cystectomy:
    • No increase in risk of venous embolism
    • Follow-up U/S: 93% with black-bluish ovaries had normal follicle development
  – Frozen section, if suspicious, to rule out malignancy
Functional Ovarian Cysts

- Follicular cysts
- Corpus luteum cysts
- Theca lutein cysts
Follicular Cysts

- Most frequent ovarian cystic structure
- Usually multiple, thin-walled
- Size variable:
  - 3 to 15 cm, usually <6-8 cm
- Dependent on gonadotrophins for growth
- Most resolve spontaneously (rupture or resorption)
Corpus Luteum Cysts

- Develop from mature graafian follicle
- Size: 3 to 10 cm, occasionally larger
- Development:
  - Hemorrhage into cyst few days after ovulation
  - Blood resorbs, leaving cyst
- Signs & symptoms
  - Unilateral pelvic pain, tender adnexa, occasionally massive bleeding
Premenopausal Cystic Adnexal Mass

- 286 women
- Rx: estrogen/progestin x 6 weeks
  - Prevent formation of new cysts
- No resolution = surgery
  - All had a pathologic condition
  - Most malignancies in the 8-10 cm size
Theca Lutein Cysts

- Least common physiologic cyst
- Bilateral
- Moderate to massive ovarian enlargement
  - Honeycombed, lobulated appearance
  - Gray to bluish-tinged cysts
  - Up to 20-30 cm in diameter
Theca Lutein Cysts

• Etiology: excess gonadotrophins
  – Exogenous: drugs to induce ovulation
  – Endogenous: molar pregnancy, pregnancies with large placenta

• Management:
  – Leave in-situ & handle gently
    • Slowly resolve spontaneously
    • Bleeding from cysts hard to control
Endometriosis & Endometriomas

• Incidence
  – 7-10% of women in general population
  – Up to 50% of premenopausal women
  – 38% prevalence in infertile women
  – 71-87% prevalence in women with chronic pelvic pain
Endometrioma

• Ovarian surface may be smooth
• Contents: “chocolate cyst” (old blood)
• Common associated findings:
  – Associated “powder burns” on pelvic peritoneum
  – Ovary stuck to pelvic side wall
  – Hemosiderin deposits in abdomen &/or pelvis (e.g., on omentum)
Endometrioma

- Frequently associated with extra-ovarian endometriosis
  - Biopsy to document disease
- Multiple treatment options:
  - Hormonal
  - Cystectomy with ovarian reconstruction
  - Cyst stripping or ablation
  - USO, BSO, +/- Hysterecomy
- Frequently rupture: copiously irrigate
- As surprise finding: if looks like endometriosis, no obvious malignancy, leave in situ for postop discussion of management
Ovarian Neoplasm: Risk of Malignancy

• Risk by menopausal status:
  – Premenopausal: 7-13% malignant
  – Postmenopausal: 30-45% malignant

• Excludes non-neoplastic masses
## Ovarian Neoplasm: Risk of Malignancy by Age

<table>
<thead>
<tr>
<th>Age</th>
<th>% Malignant</th>
<th>Tumor histology</th>
</tr>
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<tbody>
<tr>
<td>&lt;20 (n=61)</td>
<td>8</td>
<td>80% Germ cell, 20% Stromal</td>
</tr>
<tr>
<td>20-29 (n=294)</td>
<td>4</td>
<td>33% ea: EOC, Germ cell, Stromal</td>
</tr>
<tr>
<td>30-39 (n=171)</td>
<td>14</td>
<td>70% EOC, 20% Stromal</td>
</tr>
<tr>
<td>40-49 (n=128)</td>
<td>35</td>
<td>93% EOC</td>
</tr>
<tr>
<td>50-59 (n=104)</td>
<td>46</td>
<td>95% EOC</td>
</tr>
<tr>
<td>60-69 (n=79)</td>
<td>49</td>
<td>100% EOC</td>
</tr>
<tr>
<td>&gt;70 (n=24)</td>
<td>24</td>
<td>100% EOC</td>
</tr>
</tbody>
</table>
## Distribution of Benign Ovarian Neoplasms by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Serous</th>
<th>Mucinous</th>
<th>Teratoma</th>
<th>Stromal</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>20%</td>
<td>11%</td>
<td>70%</td>
<td>0%</td>
</tr>
<tr>
<td>20-29</td>
<td>15%</td>
<td>11%</td>
<td>72%</td>
<td>1%</td>
</tr>
<tr>
<td>30-39</td>
<td>17%</td>
<td>12%</td>
<td>67%</td>
<td>4%</td>
</tr>
<tr>
<td>40-49</td>
<td>43%</td>
<td>8%</td>
<td>43%</td>
<td>3%</td>
</tr>
<tr>
<td>50-59</td>
<td>46%</td>
<td>14%</td>
<td>21%</td>
<td>17%</td>
</tr>
<tr>
<td>60-69</td>
<td>59%</td>
<td>11%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td>&gt;70</td>
<td>53%</td>
<td>24%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25%</td>
<td>12%</td>
<td>58%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Suspicious Ultrasound

- Bilateral > Unilateral
- Predominant solid component
- Size >10 cm
- Thick & numerous septa
- Papillary or nodular structures
- Ascites
Postmenopausal Unilocular Cystic Mass

• Review of 17 series

• Cyst size
  – <5 cm: 440 (3 malignant)
  – 5-10 cm: 46 (1 malignant)
  – >1 cm: 43
  – Not stated: 40

• Risk of malignancy
  – 4/569 (0.7%)

Roman: Gynecol Oncol 69:1, 1998
Intraoperative Diagnosis of an Ovarian Mass

• Management complex
• Need to consider
  – Mass characteristics
  – Evidence of peritoneal implants: tumor or endometriosis
  – Age
  – Menopausal status
  – Reproductive wishes
Intraoperative Diagnosis of an Ovarian Mass

• If diagnosed at laparoscopy for another indication
  – Biopsy any peritoneal implants or ovarian surface abnormality
  – Defer management

• If diagnosed at laparotomy for another indication
  – Follow algorithms
Premenopausal Adnexal Mass: Intraoperative Diagnosis

• When in doubt, DON’T cut it out!
• Intraoperative or postoperative gyn oncology consult
Premenopausal Adnexal Mass: Intraoperative Diagnosis

Desires Fertility

- <4-6 cm: No intervention
- >6 cm, cystic: Cystectomy
- Solid Mass Cyst > 15-20 cm: Remove adnexa
- Bilateral Solid Masses: Remove most suspicious mass

If malignant:

- Biopsy contralateral mass
- Frozen section Malignant
- Remove mass
Premenopausal Adnexal Mass: Intraoperative Diagnosis

Does NOT desire Fertility

<40 y/o

Cyst, <4-6 cm

Cystectomy

>6 cm

Remove mass

>40 y/o

Remove mass

F.S. Malignant

F.S. Malignant

Remove other ovary

Remove other ovary
Postmenopausal Adnexal Mass: Intraoperative Diagnosis

- **Unilateral Mass**
  - F.S. Benign
    - Consider removal of other ovary
  - F.S. Malignant
    - Remove other ovary
    - Tumor markers intraop

- **Bilateral Masses**
  - Remove both Ovaries
  - F.S. only if prepared to completely stage
  - Tumor markers intraop
Intraoperative Diagnosis of Ovarian Malignancy

- Gyn oncology consult if available
- May require second operation for staging
- Obtain appropriate tumor markers intraoperatively or immediately postoperatively
Ovarian Cancer Surgical Staging

• Abdomino-pelvic washings
• Peritoneal biopsies: pelvic side-walls, cul-de-sac, bladder peritoneum, gutters, diaphragms
• Omentectomy
• Bilateral pelvic & para-aortic lymphadenectomy
Ovarian Cancer Surgical Staging

• Does not include hysterectomy or biopsy of a normal contralateral ovary
  – Usually TAH, BSO if no fertility issues
• Desires fertility
  – If contralateral ovary normal, leave in-situ
  – If both ovaries abnormal, leave uterus in-situ
• 30% upstaged (microscopic spread) if completely staged
Use of Tumor Markers

- Germ cell tumors:
  - AFP, bHCG, LDH
- Epithelial tumors
  - CA-125, CEA
- Stromal tumors
  - Granulosa cell: Inhibin, CA-125
  - Sertoli Leydig: Testosterone, CA-125
A 26 y/o woman undergoes laparotomy for suspected ruptured appendix and is found to have a 6 cm right ovarian mass that has torsed, with the fallopian tube, 2x on its pedicle. The most appropriate management is:

- a) Detorsing the adnexa and leaving it in-situ
- b) Detorsing the adnexa and performing an ovarian cystectomy
- c) Detorsing the adnexa and removing the tube & ovary if they remain blue-black
- d) Removing the adnexa without detorsing
Questions

• A 30 y/o nulligravid female undergoes laparotomy for presumed appendicitis. Pre-operative WBC was 20,000, & she was non-toxic. Intraoperatively, she is found to have bilateral 6cm tubo-ovarian abscesses that are fixed in the cul-de-sac & non-ruptured. The best management is:
  – a) Bilateral adnexectomy
  – b) Bilateral adnexectomy & hysterectomy
  – c) Drain abscesses & insert drains
  – d) Close patient & treat with antibiotics
A 34 y/o woman undergoes laparotomy for planned colectomy. She is found to have an 8 cm irregular, solid left ovarian mass. The left adnexa is removed & sent for frozen section which reveals a low grade serous carcinoma. The other ovary is normal as is complete exploration. The most appropriate management is:

- a) Biopsy right ovary for frozen section, draw tumor markers
- b) Proceed with staging & tumor markers
- c) Remove right tube & ovary, stage, & draw tumor markers
- d) Remove uterus, right tube & ovary, stage, & draw tumor markers