Tuboovarian Abscess

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Patient

- 61 year-old female with vague lower abdominal pain, constipation, intermittent nausea and vomiting for 10 days.

- PMH: significant only for tubal ligation at age 35
Patient

- PE significant for palpable 5 cm right adnexal mass, soft, non-tender. No guarding or rebound.

- Labs significant only for WBC 16.7

- Diagnostic tests performed showed a right tuboovarian abscess
Next, a differential diagnosis to keep in mind when choosing imaging....
Differential Diagnosis

- Ectopic pregnancy
- Pelvic neoplasm
- Endometrioma
- Ovarian torsion
- Hemorrhagic cyst
- Ovarian hematoma
- Appendiceal and diverticular abscesses
- Tuboovarian abscess
Definition and Epidemiology

- **Tuboovarian abscess (TOA):** Abscess involving the ovary or fallopian tube
- **Tuboovarian complex (TOC):** Edematous, dilated infected pelvic structures without abscess formation, vague margins
- **Pyosalpinx:** infected fallopian tube

- Incidence 100,000/year
- Women 20-40, peak 20-24
Anatomy that may be involved in TOA

- Mesosalpinx
- Broad ligament
- Uterosacral ligament
- Ampullar ligament
- Ovarian ligament

http://www.infertilitypa.com/images/pelvic.jpg
Causes of TOA

- Pelvic inflammatory disease (PID)
- IUD (older devices, Dalkon Shield)
- Pelvic surgery
- Intra-abdominal processes/infections
- Infertility treatments
  - Ovarian hyperstimulation
  - Oocyte retrieval
PID and TOA

• Virtually all cases of primary TOA
• TOA is most severe/late form of PID
• 1/3 hospitalized with PID, 15% of PID
• Reproductive tract flora migrates into pelvic peritoneal cavity, endometritis → salpingitis
• Tissue damage, surfaces adhere and form a closed space
• Bowel, ovary, fallopian tube, peritoneum, uterus and omentum can be involved
• Perfusion is compromised, anaerobes flourish
Intra-abdominal process

- Any cause of bowel perforation adjacent to adnexa can lead to TOA
  - Appendicitis
  - Diverticulitis

- Intraperitoneal spread of infection with abscess formation as described with PID
Pathogens

- Polymicrobial
  - Strep species
  - E. Coli
  - Other gram negatives enterics
  - Gonococci and Chlamydia common in PID but rare in TOA

- Anaerobes
  - Bacteroides
  - Prevotella
  - Peptostreptococcus
Signs and Symptoms

- 90% abdominal/pelvic pain
- 60-80% fever/leukocytosis
- 80-90% Palpable mass
- Findings of ileus are common, TOA can lead to bowel obstruction (distension, decreased bowel sounds)
Moving on to imaging: Case images and description of when to use ultrasound, CT, and MRI for TOA
**Ultrasound**

- Test of choice for suspected TOA
- Transvaginal is best for visualizing adnexa
- Differentiates between TOA and TOC
- Sensitivity 82%, specificity 91%
- Increased availability, tolerability, speed and decreased cost (compared with CT, MRI)
- Ultrasound guided drainage
Ultrasound TOA

- Complex cystic, thick walled, well-defined mass/contiguous masses in adnexa or retrouterine
- Usually hypoechoic
- Can be multiloculated with septations or solid components leading to varied echotexture
- Air fluid levels
- Free fluid
- Indistinct uterine margins

Ultrasound TOA

Ultrasound TOC

- Dilated fallopian tubes
- Echogenic Fluid (pyosalpinx)
- Enlarged, hyperemic ovary (oophoritis) can be seen with ultrasound but not shown here

Ultrasound of Patient

- Complex, hypoechoic cystic mass predominately containing fluid and debris
- 5.0 x 5.4 x 6.7 cm
- Slight peripheral Doppler color flow only
Computed Tomography

- Adjunct to ultrasound if atypical, unresponsive to therapy or differential is large
- CT recommended to evaluate for full range of collections if free fluid/peritonitis
- Look for abscess in adnexa
  - Thick walled, fluid density (low attenuation mass)
  - Internal septations common
  - Internal gas bubbles
  - Loss of definition of uterine wall
  - Thickened uterosacral ligaments/increased density of presacral and perirectal fat
  - Hydronephrosis if ureters involved
  - Para-aortic LAD
CT of Patient

- Contrast enhanced CT Abd/Pelvis
- 5.0 x 5.2 cm right adnexal fluid collection, closely associated with uterus and broad ligament
- Heterogeneously enhancing rim
- Indistinct uterine margins

![CT Scan Image]
CT of Patient

- Non-dependent gas
- Compressed loop of small bowel
- Appendix visualized with no evidence of inflammation
- No diverticulitis
- Consistent with TOA
CT of Patient: Reconstructions
Magnetic Resonance Imaging

- MRI also accurate at diagnosing PID, however not well studied
- Good soft tissue contrast between pelvic organs
- Visualize fluid filled tubes, abscesses, and smaller amounts of free fluid than ultrasound
- Abscess with low intensity on T1 and high on T2 and thick, irregular walls
- Not first line for evaluation of pelvic masses
- Cost, time
Magnetic Resonance Imaging

Now that we have seen how to diagnose TOA, what are the treatment options?
Treatment

- No standard of care

- **Medical**: Inpatient 10 day trial of IV broad spectrum antibiotics with anaerobic coverage, especially if young, stable.
  - Watch for sepsis
  - If condition does not improve in 2-3 days, further intervention warranted
  - Mass may take up to 6 months to resolve
Radiologic Drainage

- **Ultrasound guided drainage**: 80-85% effective
  - Transcutaneous is standard
  - Transvaginal with endovaginal sonographic can be more direct if abscess better visualized, but can be painful if PID or prepubescent
  - Transgluteal, transrectal can be chosen depending on location of abscess
  - Drainage catheter placement or needle aspiration
  - Avoids risks associated with general anesthesia and surgery
  - Minimally invasive
Radiologic Drainage

- Drainage catheter placed in adnexal mass in woman with PID

Surgical Drainage

- **Laparoscopic drainage**: 90-95% effective
- **Laparotomy**:
  - Often used if diagnosis of TOA versus perforated viscus unclear
  - increased in women over childbearing age
  - unstable/septic
  - rupture of TOA
  - Resection of all infected organs (hysterectomy, salpingo-oophorectomy), assess for metastatic abscesses
  - Drawbacks include loss of future fertility and endogenous estrogen if premenopausal
TOA Risks

- If left untreated, TOA associated with:
  - increased morbidity from rupture and peritonitis
  - chronic pelvic pain
  - adhesion formation
  - ectopic pregnancy
  - impaired future fertility
Patient

- Patient did not improve on antibiotics so exploratory laparotomy with abscess drainage was performed.
- Tip of appendix adherent to superior aspect of mass, question of small appendiceal tear but no frank appendicitis
- Diagnosis: TOA from prior episode of undiagnosed appendicitis
Conclusions

• TOA is an abscess of the adnexa, caused most often by PID, but also from instrumentation and GI tract infections

• Diagnostic imaging first line is transvaginal sonography, with CT and MRI offering additional detail in complicated or unclear cases

• Serious condition which must be treated due to avoid known sequelae

• Treatment includes medical, radiologic and surgical options
References

References

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