MR Characterization of ovarian Neoplasms: 4 Pearls

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4:05 – 4:15pm
MR Characterization of ovarian Neoplasms: 4 Pearls in Ten Minutes

If I am to speak ten minutes, I need a week for preparation; if fifteen minutes, three days; if half an hour, two days; if an hour, I am ready now.

Woodrow Wilson
Ovarian Neoplasms

• Germ Cell Neoplasms: 15-30%
• Sex Cord Stromal Tumors: 5-10%
• Epithelial Ovarian Tumors: 60%
  – 85% of ovarian cancers
  – 45% of benign ovarian tumors
• Krukenberg Tumors: 5%
Ovarian Neoplasms
Ovarian Neoplasms: 4 Pearls

- Fat
- T1 and T2 Hypointensity
- Papillary Projections
- Multilocular cyst with varying T2 signal intensity
Ovarian Neoplasms

• Fat
  → Mature Cystic Teratoma
• T1 and T2 Hypointensity
  → Fibroma – Fibrothecoma
  → Brenner Tumor
Ovarian Neoplasms

- Papillary Projections
  → Epithelial ovarian neoplasm
- Multilocular cyst with varying T2 signal intensity
  → Mucinous Cystadenoma
T1 Hyperintensity: Differential Diagnosis – High Five

- Fat
- Hemorrhage
- Protein
- Flow
- Paramagnetic Effects
Adnexal T1 Hyperintensity

- Mature Cystic Teratoma (MCT)
  - Dermoid Cyst
- Endometrioma
- Functional Cyst
High Signal on T1
Loss of SI with Fat Saturation

• Tissue is Characterized as Fat
• Dx: Mature Cystic Teratoma
Mature Cystic Teratoma

- > 95% of germ cell neoplasms
- The only benign subtype
- Most common ovarian tumor of adolescence and pregnancy
- Radiography: Bone and teeth
Mature Cystic Teratoma

- Bilateral: 10%
- Rx: Laparoscopic removal
  - Torsion: 10% at presentation
  - < 1% Malignant degeneration
  - Preserve remainder of ovary
T1 and T2 Hypointensity

• Fibrosis
• Smooth Muscle
T1 and T2 Hypointensity

- Exophytic Leiomyoma *
- Fibroma / Fibrothecoma
- Brenner Tumor

Jeff Weinreb - Not as simple as you think

Sex cord – Stromal Tumors

- Fibroma - Fibrothecoma
- Granulosa cell tumor
- Sertoli- Leydig cell tumor
Ovarian Fibroma-Fibrothecoma

- 50% of sex cord stromal tumors
- Variable combination of fibroblasts and theca luteum cells
  - Absent theca cells: Fibroma
  - Absent fibroblasts: Thecoma
  - Mixed population: Fibrothecoma
Ovarian Fibroma-Fibrothecoma: MRI

- Low SI on T1 and T2-WI suggestive
- Claw sign with adjacent ovary
- Widened endometrial complex
  - Fibrothecoma
- Larger lesions have high T2 Signal
  - Intratumoral cyst, edema
  - Myxoid change
Brenner Tumor

- < 1% Epithelial Ovarian Neoplasms
- >98% Benign
- Ovarian Transitional Cells Surrounds by dense fibrous tissue
- 30% Ipsilateral or Contralateral Benign Ovarian Tumor
Papillary Projections

- Epithelial Ovarian Neoplasm
- Not Specific for Malignancy
- T2 Zonal Anatomy
  - Inner ↓ SI Fibrous Core
  - Outer ↑ SI Edematous Stroma
Serous Ovarian Neoplasms

- Serous Cystadenoma
- Serous Borderline Tumor (BOT)
- Low Grade Serous Cystadenocarcinoma (LGSC)
- High Grade Serous Cystadenocarcinoma (HGSC)


Mucinous Cystadenoma

- Huge Adnexal Neoplasms
- Large Size ≠ Malignancy
- MR Imaging Features
  - Multiple Locules
  - No Ascites, Papillary Projections
  - Varying degrees of mild T1 and T2 Shortening → Viscous Mucin
Axial T1-WI  FS Enhanced T1-WI
T2 FSE

FS T1 pre and Post Gd