MUST READS


ENDOMETRIAL CANCER: LECTURE OUTLINE

- Imaging Objectives
- Optimized Protocol
- Risk Stratification/Tx
- Relevant Questions for MRI
- Staging Criteria (Revised FIGO)
  - Pearls & Pitfalls

Drs. Evis Sala and Caroline Reinhold
ENDOMETRIAL CANCER: IMAGING OBJECTIVES

- Detection
  - Most cost effective way to detect?
- Surveillance
How to stage?
Endo Ca Practice Guidelines

- NCCN (USA): CXR only
  - CT/PET-CT in advances dz or type II histo
- ACR (USA): MRI
- ESUR (Europe): MRI
- NCI (France): MRI
- RCR (UK): MRI

NCCN Clinical Practice Guidelines in Oncology.
Uterine Neoplasms, 2012

National Cancer Institute of France: Querleu et al.
IJGC, 2011

ACR Appropriateness Criteria: “Endometrial Cancer of the Uterus”

RCR Recommendations for Cross-Sectional Imaging in Cancer Management, 2006
VERSUS FIGO
(Surgical Staging System)

- Generalizable
  - Developed and emerging nations
- Discordant with ACR, ESUR, NCI & RCR
EPIDEMIOLOGY

- Most common invasive gyn malignancy
- 4th most common cancer in women
- Overall 5 yr survival: 75% (present early)
  - 96% Stage I vs 25% Stage IV
- Peak incidence: 55-65 years
- Known risk factors
  - Common pathway: Unopposed E stimulation
PROGNOSIS (5 Year Survival)

ECa

HISTO

- Grade
- Cell Type
- Lymph BV Inv

STAGE

- Myo Inv
- Cervix Inv
- LN status

PROGNOSIS: HISTOLOGY

Histology

I
- Endometrioid Adenocarcinoma (1-3) (90%)

II
- Papillary Serous
- Clear Cell

Lymph Vascular Inv

50% Pretest probability of advanced dz!
PROGNOSIS: STAGING

STAGE

Myo Inv

Cervix Inv

LN status

PROGNOSIS: STAGING-MYO INV

Myometrial Inv

- < 50% (IA/B)
- ≥ 50% (IC)

Early Stage
- IA

Late Stage
- IB

IA

E. Sala, MD PhD

PROGNOSIS

ECa

Discordance

Grade
Cell Type
Lymph BV Inv
Myo Inv
Cervix Inv
LN status

HISTOLOGY & STAGING DIRECTS THERAPY!

- Early Stage: Low Recur Risk
  - IA, Grade 1-2
  - TAH & BSO
  - No myo inv → HRx, BrachyRx

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HISTOLOGY & STAGING DIRECTS THERAPY!

- Late Stage: High Recur Risk
  - IB-Gr 3; IA/B-Type II histology
  - TAH & BSO
  - Para-aortic & common iliac LND
  - Pelvic LND not routine, consider IF + MRI
- Implications for robotic surgery

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Relevant Questions For MRI
ESTABLISH LOCAL DZ EXTENT

- Depth of myometrial invasion?
- Invasion to cervix?
- Lymph node metastases?

Your Report Stratifies Patients

PROTOCOL (1.5/3 T System)

- Ax T2-W SS FSE
- Sag & Ax Obliq T2-W FSE (? 3D T2-W)
- Ax T1 SGE (w/ & w/o FS)
- Dynamic 3D T1 GRE
  - Sag: 1-2 min
  - Axial oblique: 3 min
- DWI/ADC (b=0, 500, 800)
  - Same plane as T2-W
PROTOCOL: Optimize Image Quality

- 8 ch cardiac coil
- Empty bladder
- NPO 6 hours prior
- Anti-peristaltic
- Anterior sat band

E. Sala, MD PhD
Optimized Protocol: A word about 3D T2-W

- Ability to reformat in any plane!
  - Slice & dice
- Decrease number of sequences
  - No more “you say potatoe”
- Standardize female pelvic protocol

Procia N et al. AJR 2010; 195:254
H/O COLON CA: PMB

T2-W
H/O OF COLON CA: PMB DYNAMICS

3D Gd T1-W FS
Optimized Protocol:
A Word About DW MR

- Compared to DCE: DW MR
  - Superior diagnostic accuracy for myo inv
  - Sig higher staging accuracy

*Beddy P, et al. Radiology 2012; 262:530*
Do NOT readout w/o
- Tumor Grade
- Histology

Grade 3, Papillary Serous & Clear Cell Ca
50% Pretest probability of advanced dz!

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Stage IA (Myo Inv < 50%)

PEARLS
- Abnormal SI confined to inner myo
- May have partial JZ disruption

PITFALLS
- Indistinct zonal anatomy
- Poor tumor-myocardial contrast
- Polypoid tumor distending E cavity (myo thinned)
- Co-existing pathology
This Is Stage IA Also!

↑ Tumor-myometrial interface!

Sala E, et al Int J Gynecol Cancer 2009; 19:141
Stage IA (Myo Inv < 50%)

DEPTH OF MYO INV CRITICAL FOR FERTILITY SPARING PROCEDURES

Sala E. et al. Radiology 2013; 266:717-740
Pitfalls: Polypoid Ca and/or Co-existent Conditions (usu Stage I)
Stage IB (Myo Inv ≥ 50%)

**PEARLS**
- Abn’l SI extends to outer myo
- Complete JZ disruption
- Cervical mucosal enhancement

**PITFALLS**
- Fibroids distorting E canal
- Tumor extending into cornua
- Adenomyosis
- Peritumoral inflammation
- Microscopic disease
Stage IB (Myo Inv $\geq 50\%$)
PITFALL: Is there myometrial invasion?

1. Yes
2. No
3. Cannot determine
PITFALL: ADENOMYOSIS

PITFALL: MICROSCOPIC DZ

Stage IB vs Stage IIIA??
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Stage II  Cervical Stromal Inv

PEARLS

- Disruption of T2-W low SI cervical stroma
- Enhancement of cervical mucosa

EXCLUDES invasion

PITFALLS

- Polypoid extension into cervix
- Endocervical gland involvement
Stage II  Cervical Stromal Inv
Stage II  Cervical Stromal Inv
Stage II Pitfall: Extension into Cervical Canal

NO!

ENDO CA: ? STAGE II
Pitfall: Polypoid Endometrial Cancer

- Polypoid extension into endocervical canal
- Mucosal invasion

Stage IA
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 IC > 50% Myo Inv | IA < 50% Myo Inv  
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| IV    | IVA Bladder/Rectal Inv  
 IVB Distant Mets | IVA Bladder/Rectal Inv  
 IB Distant Mets |
STAGE IIIA: Serosal /Adnexal Inv

E. Sala, MD, PhD
Stage IIIB: Vaginal/Parametrial Inv

E. Sala, MD, PhD
ENDOMETRIAL CA: Stage IIIC

T2WI

E. Sala, MD PhD
A WORD ABOUT LYMPH NODES

Pelvic nodes > 8 mm are abnormal (100%)

LYMPHADENOPATHY: DISTANT DZ

- Above the renal hilum
- Inguinal

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Stage IVA: Bladder/Rectal Inv
(example is cervix cancer)

Bladder mucosa invasion (CC IVA)

Bladder bullous edema (CC IIB)

E. Sala, MD PhD
Stage IVB: Distant Metastases

E. Sala, MD, PhD
ENDOMETRIAL CA: PET/CT

Pitfall: Normal Physiologic Activity
RECURRENT CANCER
PET: Sens 92-98%; Spec 88-100%

Belhocine et al. 2002
Saga et al. 2003
Chung et al. 2008

E. Sala, MD, PhD
Endometrial Ca: Conclusions

- MRI and PET/CT
  - Improve pre-tx risk stratification
  - Accurate surgical planning
    - Pts for pelvic and para-aortic LND
- Recurrence detection
Conclusions: HISTOLOGY

Histology

I
- Endometrioid Adenoca (1-3) (90%)
- Adenosq

II
- Papillary Serous
- Clear Cell

Lymph Vascular Inv

PRE-TEST PROBABILITY
Conclusions: Local Disease Extent

- Depth of Myo Inv
- Cervix Inv
- LN Mets

Your Report Stratifies Patients
THANK YOU!