Good Hits, good misses
Cases Discussion
Part II

Raphaëlle Renard Penna
Hôpital Pitié Salpétrière
Université Pierre et Marie
PSA 7.22 ng/ml, right DRE indurated
2009 Report biopsy

<table>
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<tr>
<th>Biopsy</th>
<th>Length</th>
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GLOSSARY
PCI: Prostate Capsular Invasion
PNI: Peri-nervous Invasion
ASAP: Atypical Small Acinar Proliferation
PIN: Prostatic Intral-epithelial Neoplasia

Active surveillance
• First biopsy: underestimation of volume and Gleason

• Cognitive process: imprecision ++ (prostate > 80cc)

• Image fusion: targeted biopsies are more likely to show Pca than random cores.

Portalez et al European Radiology 2012
Fradet Radiology 2010
PSA: 8, DRE : nl
1 BP + secteur 2p
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Active surveillance

- PSA < 10ng/ml
- Stade < T2a
- Gleason < 7
- < 3 carottes biopsiques et
- < 50% des carottes envahies

### Candidates for Active Surveillance?

#### Table 4

<table>
<thead>
<tr>
<th>Approach</th>
<th>Criteria for AS Eligibility</th>
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<tr>
<td>D'Amico scoring system</td>
<td>Serum PSA level ≤ 10 ng/mL, clinical stage T2a or lower, no Gleason pattern 4 or 5 at biopsy</td>
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<tr>
<td>Epstein criteria</td>
<td>Serum PSA density &lt; 0.15 ng/mL, clinical stage T1c, no Gleason pattern 4 or 5 at biopsy, fewer than three positive cores at biopsy, &lt;50% cancer involvement per core</td>
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<tr>
<td>CAPRA scoring system</td>
<td>Patient age, serum PSA level at diagnosis, primary and secondary Gleason patterns at biopsy, clinical (T) stage, and percentage of cancer involvement at biopsy*</td>
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<tr>
<td>Multiparametric MR imaging</td>
<td>Dominant tumor volume &lt; 0.5 mL, low suspicion score at multiparametric MR imaging, no extracapsular extension, no seminal vesicle invasion</td>
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<tr>
<td>examination system</td>
<td>Dominant tumor volume &lt; 0.5 mL, no Gleason 4 or 5 pattern, no extracapsular extension, no seminal vesicle invasion</td>
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</table>
Array shows results of AT (yellow) and AS (orange) decision making by using pathologic examination results (at the top row as the reference standard), multiparametric (MP

Turkbey, 2013

3 negative MRI, PSA 7 to 8, PCA3 score 14, TEP choline negative

Combine morphology (T2) and functional (DWI+/or DCE)
Ill defined margins/ Lenticular shape
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<th>Biopsy</th>
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</table>
Transitional Pca: « recognition of cancer-specific patterns »

- large volume (.4 cm³)
- higher Gleason grade (grade 4–5)
- T2-weighted MR imaging detection sensitivity is low (8%–30%).

- Suspicious signs:
  - homogeneously low signal intensity
  - ill-defined margins
  - Lenticular shape

Hoeks CMA, et al. T. Radiology. enero de 2013;266
Vargas H A et al. Radiology 2012;262
Validation of the European Society of Urogenital Radiology Scoring System for Prostate Cancer Diagnosis on Multiparametric Magnetic Resonance Imaging in a Cohort of Repeat Biopsy Patients

« Image fusion targeted biopsies are more likely to show PCa than random cores »
● « providing strong evidence for the relevance of mpMRI in PCa diagnosis and of fusion technology in guiding the cores »

Portalez et al Eur UROI 2012
PSA: 100 ng/ml. (6.5ng/ml 2 years before)
PSA: 100 ng/ml.
(6.5 ng/ml 2 years before)
PSA: 100 ng/ml. (6.5 ng/ml 2 years before)
## Biopsy Report

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**Prostatitis**
Differentiation of Prostatitis and Prostate Cancer by Using Diffusion-weighted MR Imaging and MR-guided Biopsy at 3 T

- Median apparent diffusion coefficient (ADC) of prostatitis ($1.08 \times 10^{-3}$ mm$^2$/sec) differed from prostate cancer for both peripheral zone and central gland.

- Substantial overlap exists.

- Diffusion-weighted imaging may help reduce the number of false-positive findings at prostate cancer MR imaging.

Ngel et al. April 2013 Radiology, 267,
60YO. PSA 7 .NL
DRE

Area: 0.500 cm²
Mean: 1202.689 SDev: 87.983 Sum: 1021.648 Max: 1372.517
ADC ?
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Biopsy report
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Ngel et al April 2013 Radiology, 267,
PSA: 6.5 ng/ml. Indurated right DRE.
PSA: 6.5 ng/ml. Indurated right DRE
## Biopsy report

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Some hyperplastic nodules might originate from PZ or TZ

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49 YO
Bronchial infection, PSA 8, no history of family cancer
Biopsy?

Yes or not
## Biopsy

### Biopsies droites:

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<td>12</td>
<td>7 (3 + 4)</td>
<td>non</td>
<td>oui</td>
<td>non</td>
<td>Matériau hyalin autour de la tumeur, p63-/p504a+</td>
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## Radical prostatectomy

**Taille du foyer « index » : 1,4**
**Multifocale : oui**

**Conclusion :**
*Adénocarcinome prostatique bilatéral, Gleason 7 (4 + 3).*
*pTNM 2009: pT2c Nx Mx*
MRI: after Radiation Therapy?

Recurrence: where to look?

On the location of initial index lesion

Does Local Recurrence of Prostate Cancer After Radiation Therapy Occur at the Site of Primary Tumor? Results of a Longitudinal MRI and MRSI Study

Elnasif Arrayeh, M.D.,* Antonio C. Westphalen, M.D.,* John Kurhanewicz, Ph.D.,* Mack Roach, III, M.D.,†‡ Adam J. Jung, M.D., Ph.D.,* Peter R. Carroll, M.D., M.P.H., and Fergus V. Coakley, M.D.*

Departments of *Radiology and Biomedical Imaging, †Radiation Oncology, and ‡Urology, †Helen Diller Family Comprehensive Cancer Center, University of California San Francisco, California
MRI after Radiation Therapy, HOW?

- T2-weighted + diffusion-weighted (DW) resulted in significantly better diagnostic accuracy than assessment of T2-weighted imaging alone.

- DCE MR imaging did not contribute significant incremental value in the detection of locally recurrent prostate cancer after radiation therapy.

Donati et al. Radiology March 2013
## Biopsy Report

<table>
<thead>
<tr>
<th>Biopsy</th>
<th>Length</th>
<th>Tumor Size</th>
<th>Gleason</th>
<th>PCI</th>
<th>PNI</th>
<th>ASAP</th>
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</tbody>
</table>
PSA: 1 after radical prostatectomy
MRI: WHY?

- To Identify patient with local recurrence who would benefit from salvage local therapy
  - Radiotherapy
  - Focal therapy (HIFU, cryotherapy,...)

MRIs: Recurrence After radical prostatectomy

Combine morphology (T2) and functional (DCE)+++ 

- Soft tissue nodule in the prostatectomy bed
- Isointense to muscle on T1W, slightly hyperintense to muscle on T2

Differential diag: Retained seminal vesicles may mimic soft tissue recurrence
Differential diag: Fibrosis, tumor tends to enhance earlier

Vargas Radiology: Volume 262: January 2012