Good hits & Good misses:
Peripheral zone/ Transition zone  
Cases/Discussion Part I

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61 yo. PSA: 4.5ng/ml. %fPSA : 6.8%  
2 negative previous biopsy

Pearls:
• Transitional Pca: Ill defined low signal
• T2 WI might be quite accurate to localize prostate cancer, beside the functional sequences
• Suspicious signs:
  – Inhomogeneous low SI, ill defined: “erased charcoal sign” – PI-RADS 4
  – Involving fibromuscular stroma or the anterior horn of PZ, usually lenticular or water-drop shaped – PI-RADS 5


Pearls:
• Combine morphology (T2) and functional (DWI+/or DCE +/or MRSI)

• At least T2+DWI


• DWI: no cost. Accurate
• DCE: contrast. Vascular tumor
• MRSI: Non everywhere available
Pearls:

- MR as prebiopsy tool allows to localize the tumor, but it is complicated to transfer the MR information to the US screen to achieve a target biopsy.

- It should be performed a precise report using morphological diagram to indicate the location of the lesion, in order to combine the information of the MRI to the US screen to target the biopsy.


One year later; PSA: 9.88 ng/ml

MRI: PI-RADS 5

Previous MRI

Current MRI

2nd targeted Bx \(\rightarrow\) PCa

Pearls:

- Target prostate biopsy
- Appropriate reporting with the diagram of the lesion
- Complementary functional sequences \(\rightarrow\) improve Bx detection rate

47 yo. PSA: 17 ng/ml. %fPSA: 18%

 Pearls:

• Prostatitis: abundance cells, inflammatory → ↓ADC, ↓ high citrate, ↑ vascularization ~ PCa
• Prostatitis more common bilateral, diffuse
• PCa: focal
• DWI seems to show slight different results compared to MRSI and DCE.

58 yo. PSA: 3,9 ng/ml   % fPSA : 7,5%

 Pearls:

• Dx challenge prostatitis & prostate cancer
• Similar MRI findings
• Prostatitis different ADC from PaC, although overlap!


**Pearls:**

- Multiparametric analysis of T2-weighted, DWI, MRSI and/or DCE correlate the imaging findings to cancer aggressiveness
- Unimportant prostate cancer could be defined as cancer confined to the organ, 0.5 cm³ or less volume, lower choline-plus-creatinine-to citrate ratios, higher ADCs values and less vascularized tumors

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**Pearls:**

- Analyze the combined Mp information
- Morphology and functional signs
- Might be overlapping of signs on a functional sequence but might not be in others
- Use different functional acquisition
- Different biologic information: DWI # MRSI # DCE
- MRSI: metabolism
- DWI: cellularity
- DCE: vascularization

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**Pearls:**

- Integration of Mp-MRI for diagnosis
- Final criteria on the dominant sequence (morphology & functional)
- Standardization on PI-RADS score
- Structured report
  - DWI: Focal high SI with low ADC
  - DCE: Asymmetric lesion curve type 3- PI-RADS 5
  - MRSI: Choline > 2 times citrate peak


**Pearls:**

- Mp-MRI can be used to select patients at risk of PaC (clinically) for its detection.
- Mp-MRI has the potential to help avoid a large number of negative biopsies. High NPV


**Pearls:**

- Combine different imaging modalities
- Multidisciplinary evaluation → avoid overdiagnosis
- BPH → high PSA, high hypermetabolism
- Analyze morphology & functional information

55 yo  
PSA: 9 ng/ml. %fPSA 14%

Dx: Bilateral Pca. Gleason 4+3

MRI: PI-RADS 3/4

Pearls:

- T2 WI is sensitive but not specific
- Functional sequences improve sensitivity/specificity
- Low-signal-intensity lesions with a wedge shape and a diffuse extension without mass may be reliable signs of benignity. but not always! Combine functional sequences.
- There is not always strict correlation with MRI/histology


58 yo. PSA: 7.4 ng/ml

PI-RADS 4

Bx: Negative - BPH

Pearls:

- DWI analysis combined T2 + DWI + ADC
- Not only ADC criteria. Evaluate also on DWI on high b value
- Normal prostate tissue could be = to Pca. High on DWI and low in ADC. (Especially on the TZ) use b>1000 to overcome the overlap
- Be aware of ≠ ADC values for the central / peripheral gland
- Low ADC could be due to stromal BPH → hyperechoic

63 yo. PSA: 8.2ng/ml  
Bx: Bilateral Pca

**Prostatectomy stage: T2**

• Capsular irregularity can be seen at any time after biopsy, in organ-confined PCa.
• It is independent of the degree of hemorrhage
• MRI staging criteria and guidelines for scheduling studies should consider the postbiopsy effect: scar & hemorrhage of the “capsule” to avoid overstaging → direct signs

Pearls:

• Qayyum A. Effect of prior biopsy on Endorectal MRI and spectroscopy. AJR 2004; 183:1079.

**MRI staging : T3 (indirect sign)**