Well-defined Prostate Cancer of Transition Zone

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Introduction

- A focal, homogeneous T2-hypointensity and irregular margins (erased charcoal sign) are characteristic features of TZ PCa
  - But these features are only present in 51% and 58% of TZ tumors
- It is common to have a PCa of the TZ present with atypical MR imaging features such as
  - Well-defined margins
  - T2 inhomogeneity or hyperintensity
  - Diffusion restriction only present either on ADC map or DWI but not on both
  - Lack of rapid contrast wash-in and –out
- In order to achieve high accuracy in the diagnosis of PCa
  - Radiologists must be familiar with atypical MR imaging features of TZ PCa
- A biopsy proven case of PCa in TZ with well-defined margins will be presented
73-year-old man with serum PSA=5.3ng/ml
Two prior negative TRUS prostate biopsies

Figure – PCa with well-defined margins in the left transition zone. A) Axial T2WI shows a homogeneous, hypointense nodule (arrow) with pseudocapsule (arrowheads) in the left TZ mimicking a benign nodule. B) ADC map shows severe diffusion restriction of the nodule (arrow). C) DCE shows rapid contrast wash-in and -out of the nodule (arrow). Since T2 was the dominant sequence for transition zone, the nodule was read as PI-RADS 3 lesion. MRI/US fusion-guided biopsy confirmed PCa, Gleason score 9.
Teaching Points

- Prostate cancer with ill-defined-margins are often present
- The margins of some PCa may be not identified or pseudo-well-defined, particularly for PCa seen in TZ
  - Likely due to compressed surrounding normal prostate tissue
  - Great mimics of benign hyperplastic nodules in TZ
- Imaging clues for accurate diagnosis include:
  - Featureless appearance of the lesion (“erased charcoal sign”)
  - Severe diffusion restriction on both DWI and ADC map
  - Abnormal early enhancement with wash-out
  - Partial irregular margins of the lesion may be detected
- If PCa of TZ still cannot be excluded after analyzing all imaging features of a well-defined nodule, an imaging-guided biopsy of the nodule will be of benefit to exclude potentially aggressive tumor
References


