SAR Prostate DFP

Case of the week

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History

- 71 year old male with PSA of 7.6 ng/mL.

- Patient underwent a trans-rectal ultrasound guided (TRUS) biopsy with a diagnosis of Gleason 7 cancer.

- He presents 5 weeks later for definitive management and a staging prostate MRI.
Multi-parametric prostate MR

Axial T1 image show extensive post biopsy hemorrhage in the peripheral zone (short arrow). There is a focal lesion in the right anterior peripheral zone (long arrow), that is T1 hypointense, compatible with “hemorrhage exclusion sign” and mildly hypointense on T2.
The lesion in the right anterior peripheral zone at the apex (arrows) is markedly hypointense on ADC and markedly hyperintense on high b value DWI.
Imaging finding

- 2 cm lesion in the right anterior peripheral zone, PI-RADS 5 – Very high (clinically significant cancer is highly likely to be present).
- High signal on T1-weighted images is seen throughout the peripheral zone, excluding the area of cancer (hemorrhage exclusion sign).
- Patient underwent radical prostatectomy and final pathological diagnosis showed a 2.5 cm Gleason 7 (4+3) mass in the right anterior apex without extracapsular extension.
Discussion: “Hemorrhage exclusion sign”

• Hemorrhage in areas of prostate cancer have been shown to be significantly less common/less pronounced due to reduced anticoagulation from decreased levels of citrate in tumor cells. Furthermore, the hemorrhage resolves more rapidly than the adjacent normal peripheral zone.

• Post-biopsy changes can result in decreased T2 signal intensity that may obscure or in some cases simulate the appearance of prostate cancer.
Discussion: “Hemorrhage exclusion sign”

- Post-biopsy hemorrhage has shown to exclude and outline tumors on T1 weighted images.

- Barrett et al. showed the prevalence of “hemorrhage exclusion sign” to be around 21% and the positive predictive value (PPV) of the finding alone to be between 50 – 56%. When this finding was combined with corresponding suspicious T2 weighted abnormality, the PPV increased to 96%.

- Rosenkrantz et al. has showed mass like lesions demonstrating the hemorrhage exclusion sign on T1 weighted images, when combined with area of marked signal abnormality on DWI and DCE, to be suspicious for tumor.
In conclusion, “hemorrhage exclusion sign” although less prevalent, when combined with T2 and ADC findings can be helpful in identifying tumors in patients with extensive post biopsy hemorrhage.

Reference:

