Prostate MRI
2/08/2021 SAR DFP Case
Radiation Treatment Planning

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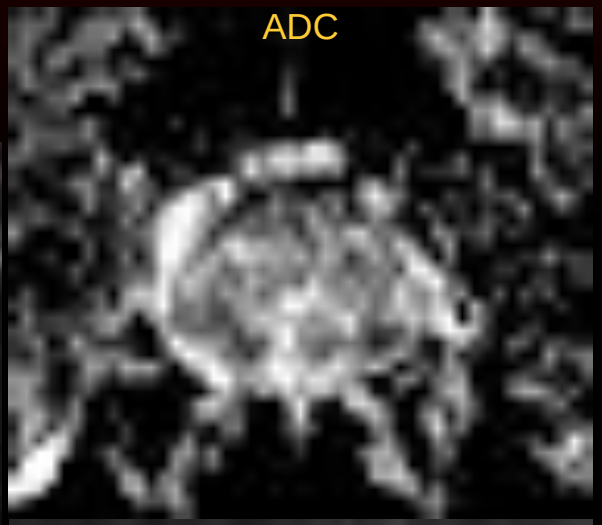
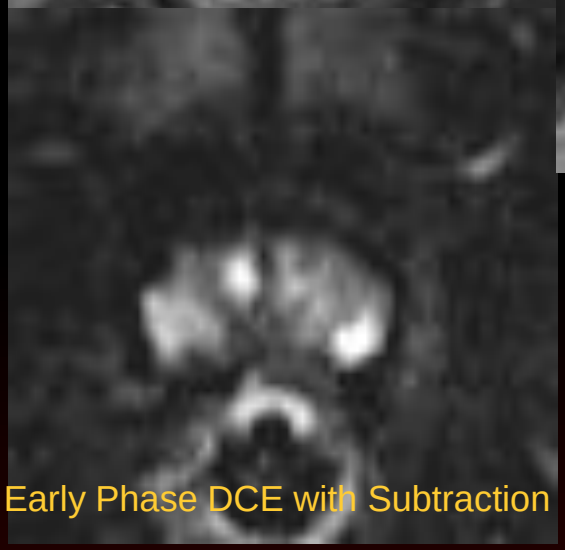
Case Background

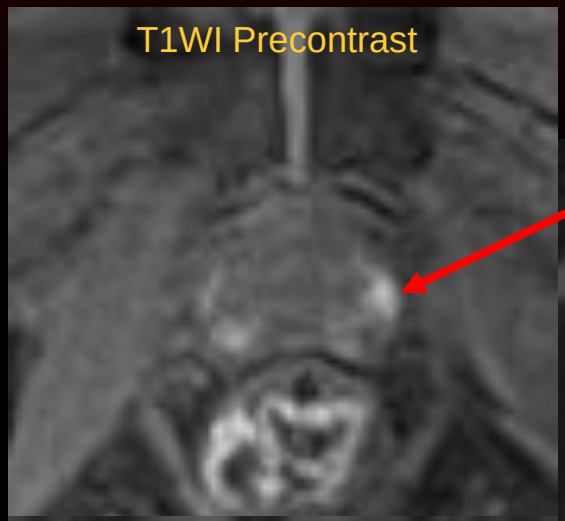
- 71 year old male with history of Gleason grade 1 prostate cancer in 10/12 cores obtained using template biopsy from outside institution
- Staging evaluation performed 8 weeks after biopsy

Staging – What do you see?

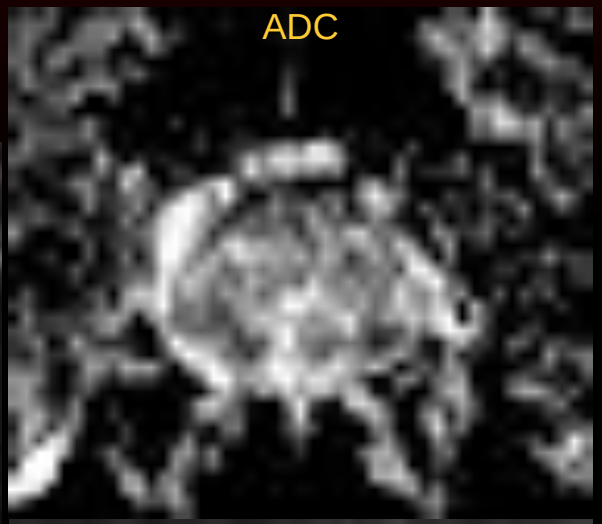


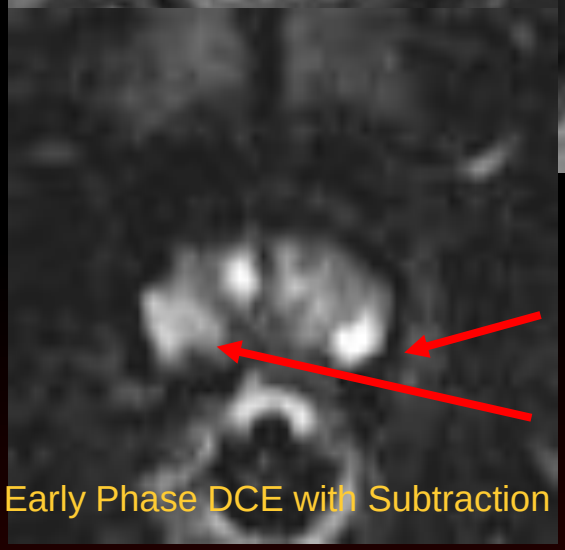


Key Findings

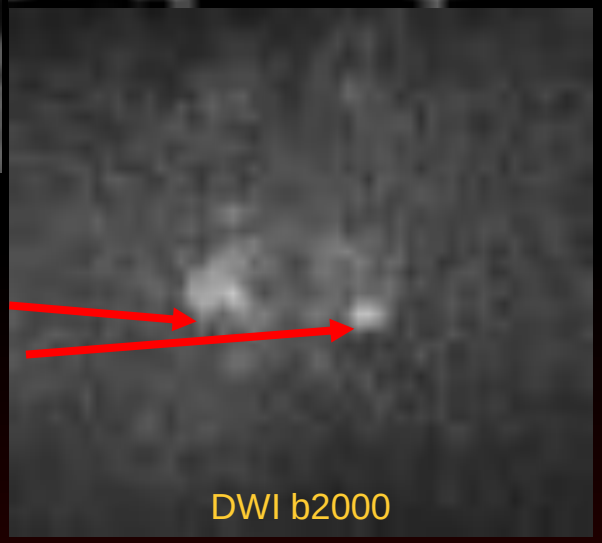


Residual post biopsy hemorrhage at 8 weeks

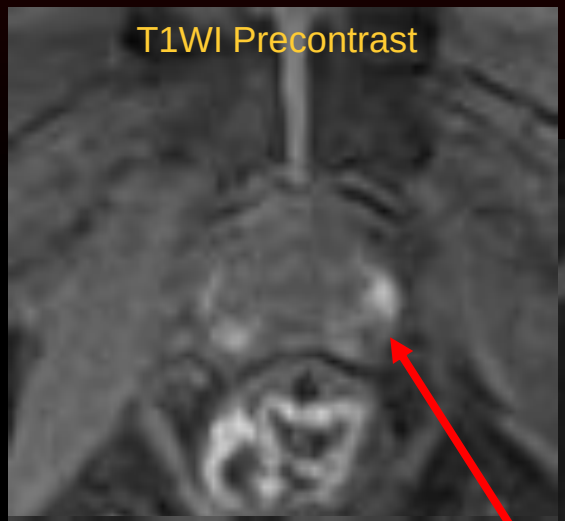


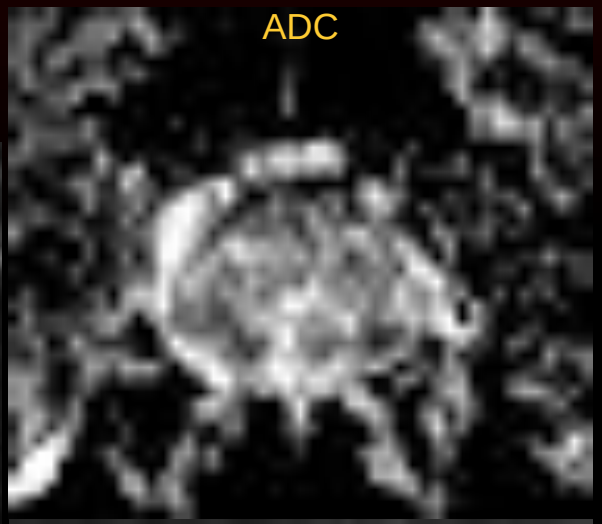


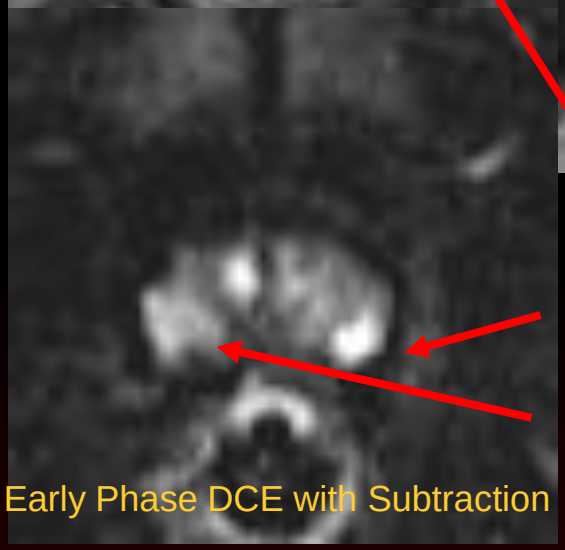
Early enhancement at sites of low signal on T2WI and increased signal on high b value images – PIRADS 4 lesions bilaterally.



Key Findings

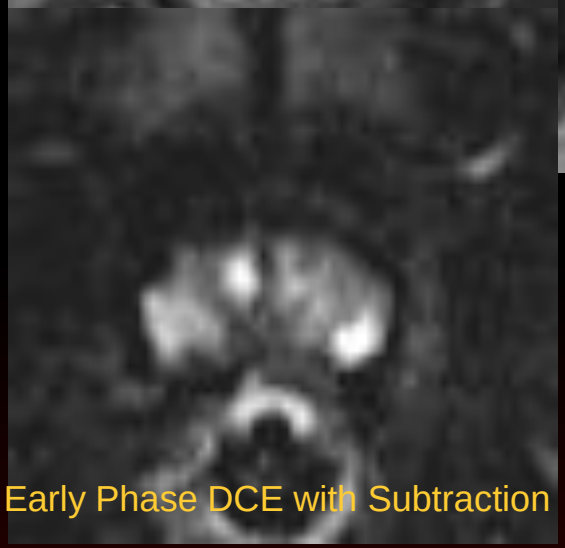






Note hemorrhage exclusion sign with enhancing areas of tumor corresponding to areas spared by hemorrhage

Key Findings



Short segments of tumor signal abut the capsule (<6mm) which is smooth without bulging or irregularity

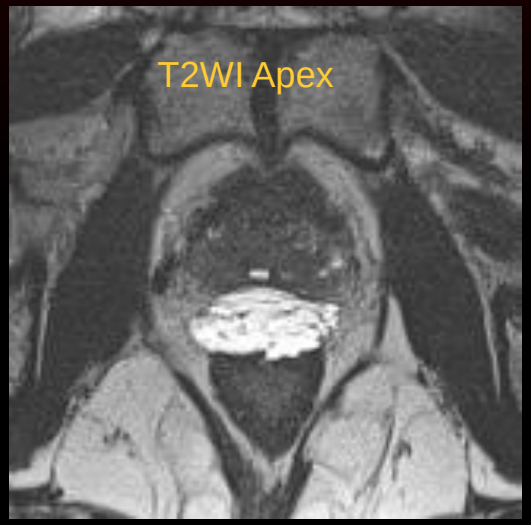
This indicates very low likelihood of minimal extraprostatic extension

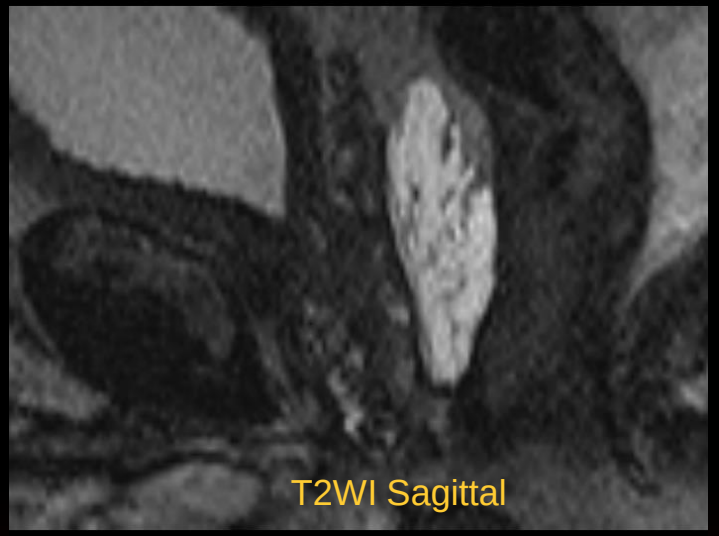
Other images show no evidence of involvement of seminal vesicles or other critical structures

Next steps

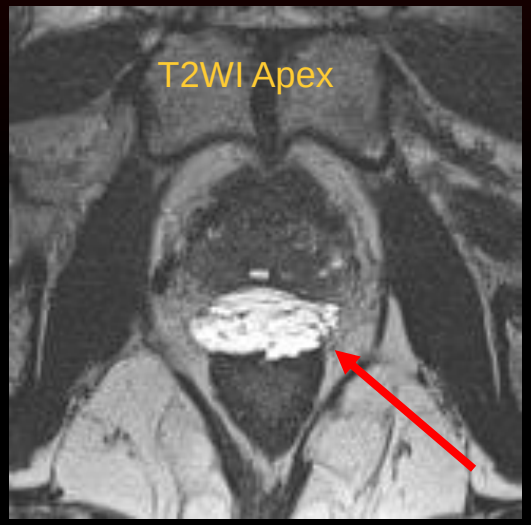
- After discussing options, patient opted for definitive radiation therapy
- Treatment planning MRI was obtained

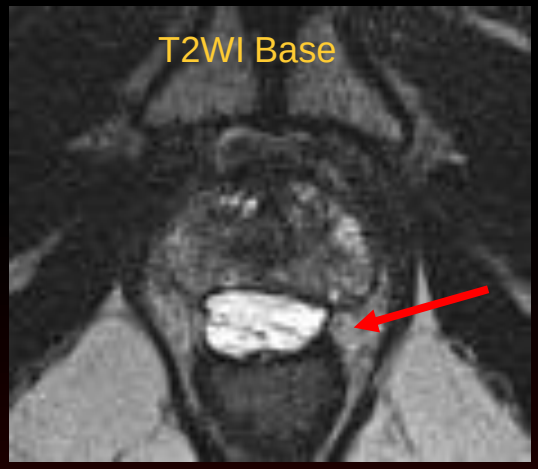
Treatment Planning MRI – New findings?



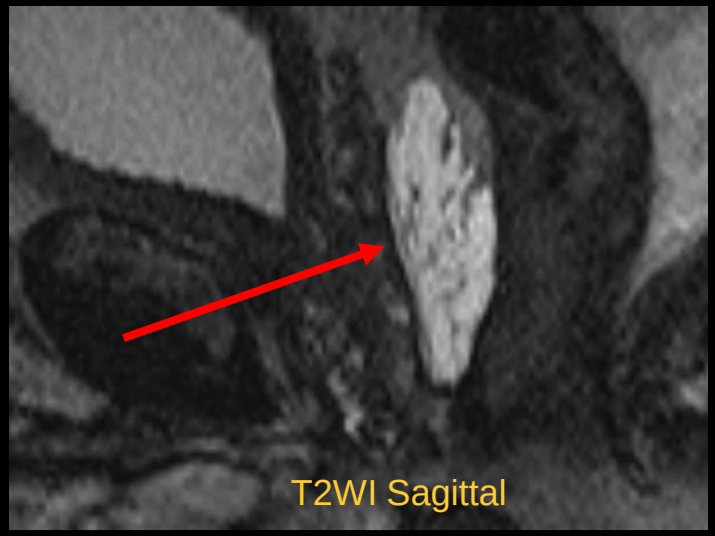


Treatment Planning MRI – New findings

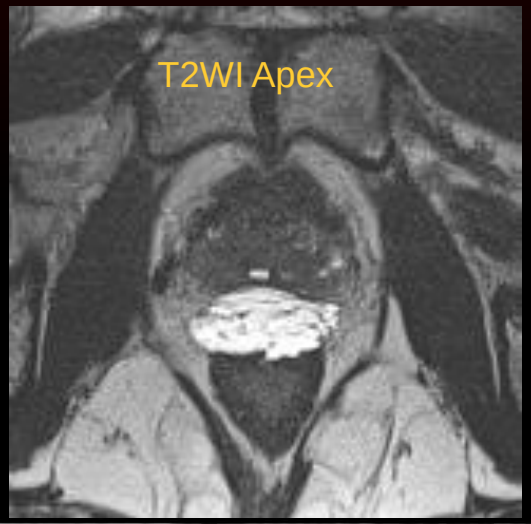


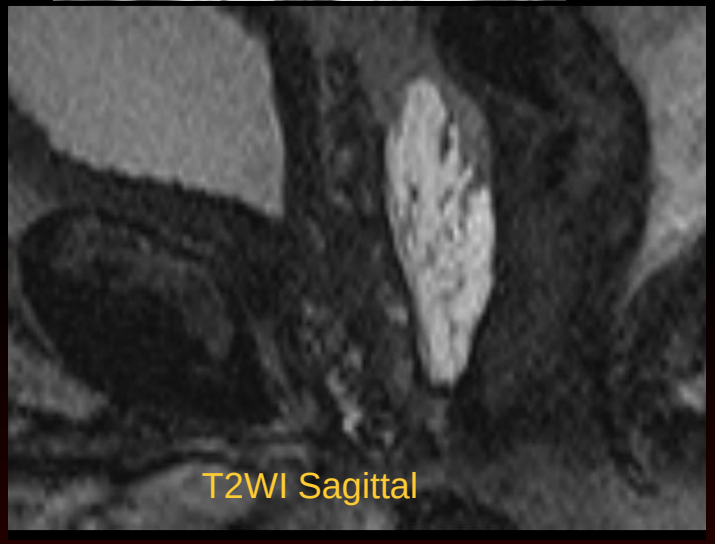


T2 bright structure represents hydrogel spacer (spaceOAR) increasingly being used for radiation treatment planning



Hydrogel Placement



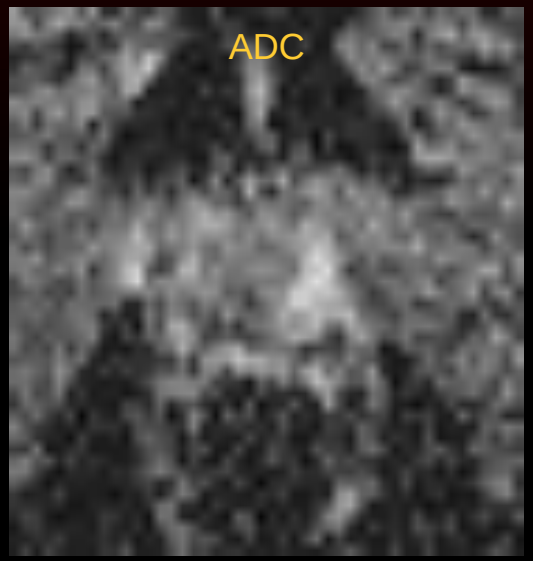


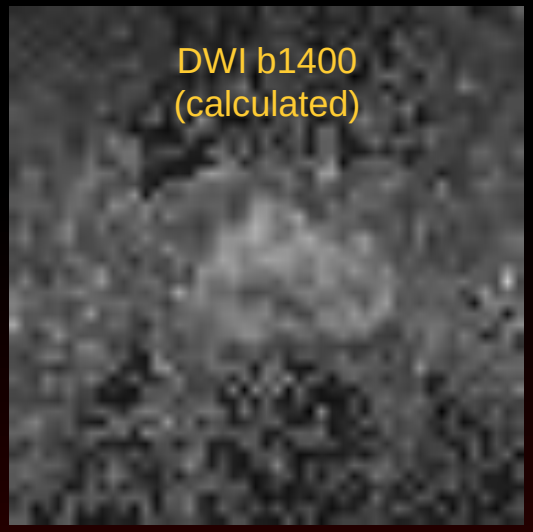
- Recently, a product with trade name SpaceOAR was introduced for us in radiation treatment planning
- It is a hydrogel that is placed between the rectum and prostate prior to prostate radiation
- It is inserted transperineally as a liquid that eventually solidifies and is resorbed in approximately 6-8 months
- Studies have shown significant dose reduction to the rectum, which is expected to reduce complications of radiation and allow better prostate treatment
- Ideal placement is symmetrical, and asymmetric placement is shown to reduce effectiveness

Companion Case Background

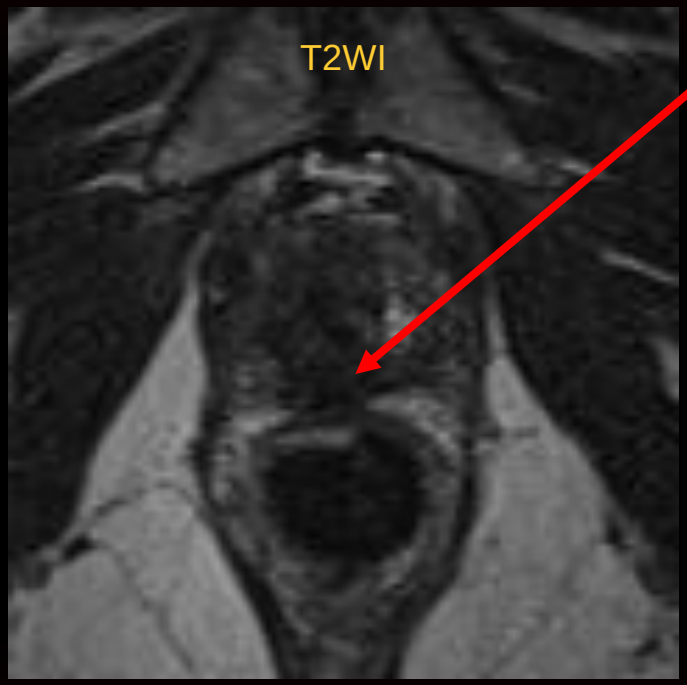
- 63 year old male with history of Gleason 9 prostate cancer treated with hormone therapy with rising PSA
- Sent for staging MRI prior to radiation

Companion case – Findings?

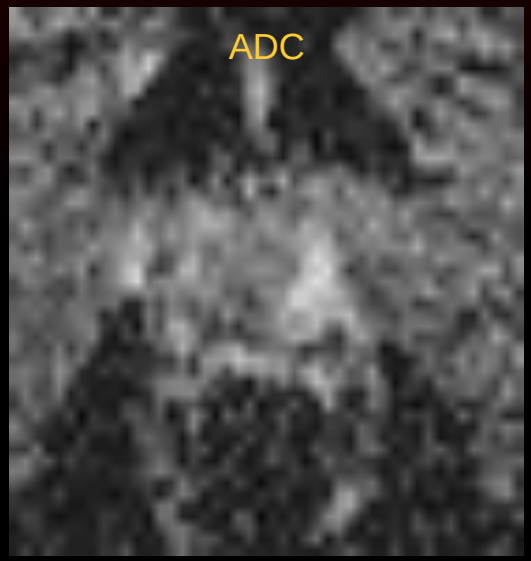


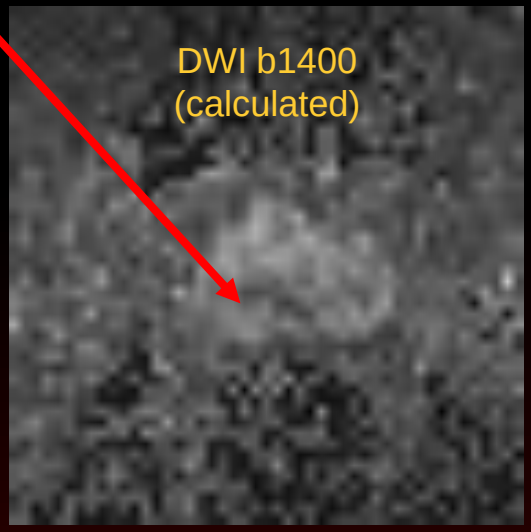


Companion case – Findings

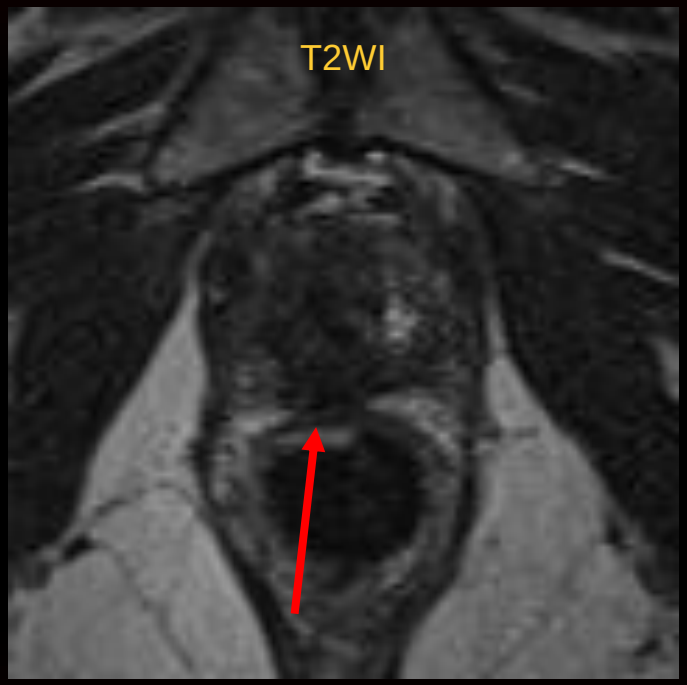


- Focal bulge and capsular irregularity art the right apex abutting the rectum
- Note the lack of increased signal on high b-value DWI
- These finding are typical of treated prostate cancer after hormone therapy





Companion case



- Presence of extraprostatic extension posteriorly is a CONTRAINDICATION for hydrogel placement
- Placement may displace tumor cells posteriorly outside the radiation field leading to treatment failure
- Hydrogel placement for radiation therapy was originally planned for this patient
- In light of suspected extraprostatic extension, placement was not performed

Teaching Points

- Understanding the purpose, appearance, and correct placement of hydrogel spacer for radiation treatment is important for all radiologists reading prostate MRI
- Presence of posterior extraprostatic extension is a contraindication for hydrogel placement
- After hormonal therapies, treated prostate cancer may appear more fibrotic and PIRADS does not apply, nevertheless EPE must be suspected with T2 dark regions extending from the capsule

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Thank You

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