

Prostate MRI Fusion Biopsy Case Presentations

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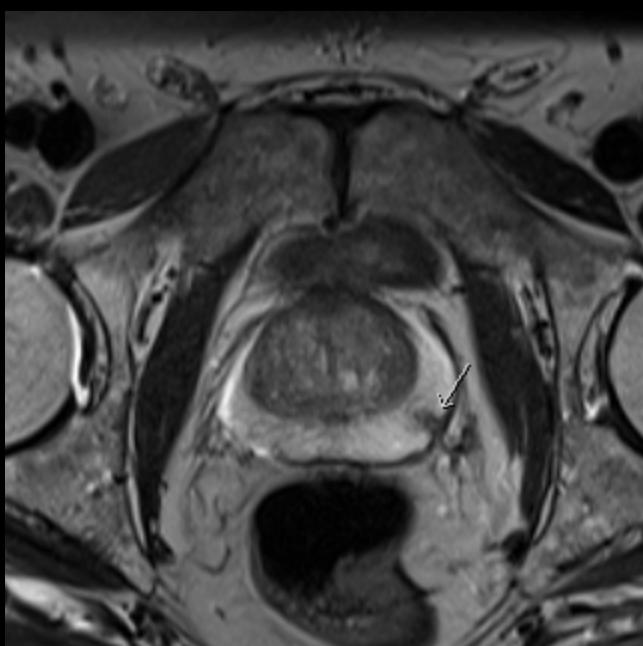
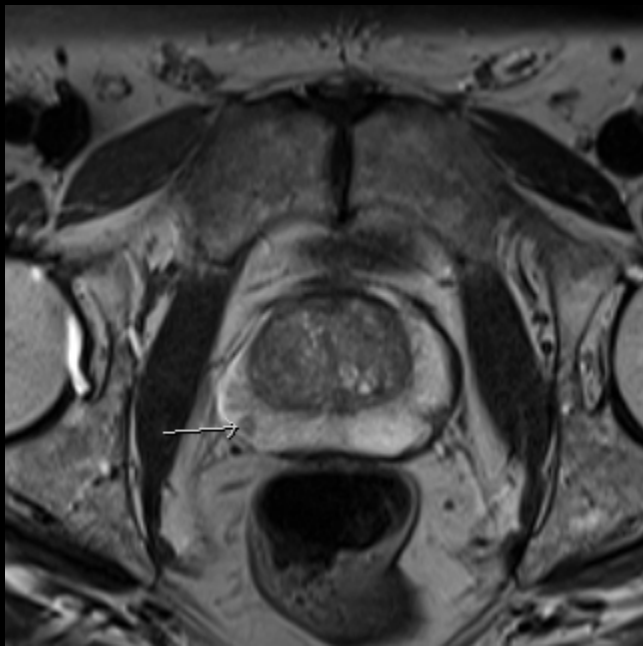
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Case 1

- 69-year-old healthy man with low risk, low volume Gleason 3+3, T1c Pca seen on 3 biopsies -- 2010, 2011 and 2013
- Patient has been on active surveillance. Agree?
- Last surveillance biopsy 2013:
 - a. Gleason 3+3(Grade group 1) in 1/6 cores of "right prostate," <1 mm, est. <5% of total core length
 - b. Gleason 3+3(Grade group 1) in 2/8 cores of "left prostate," <1 mm and 5 mm est. 10% of total core length

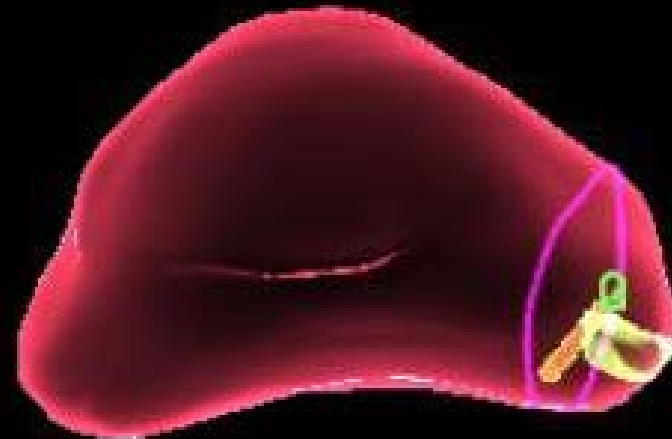
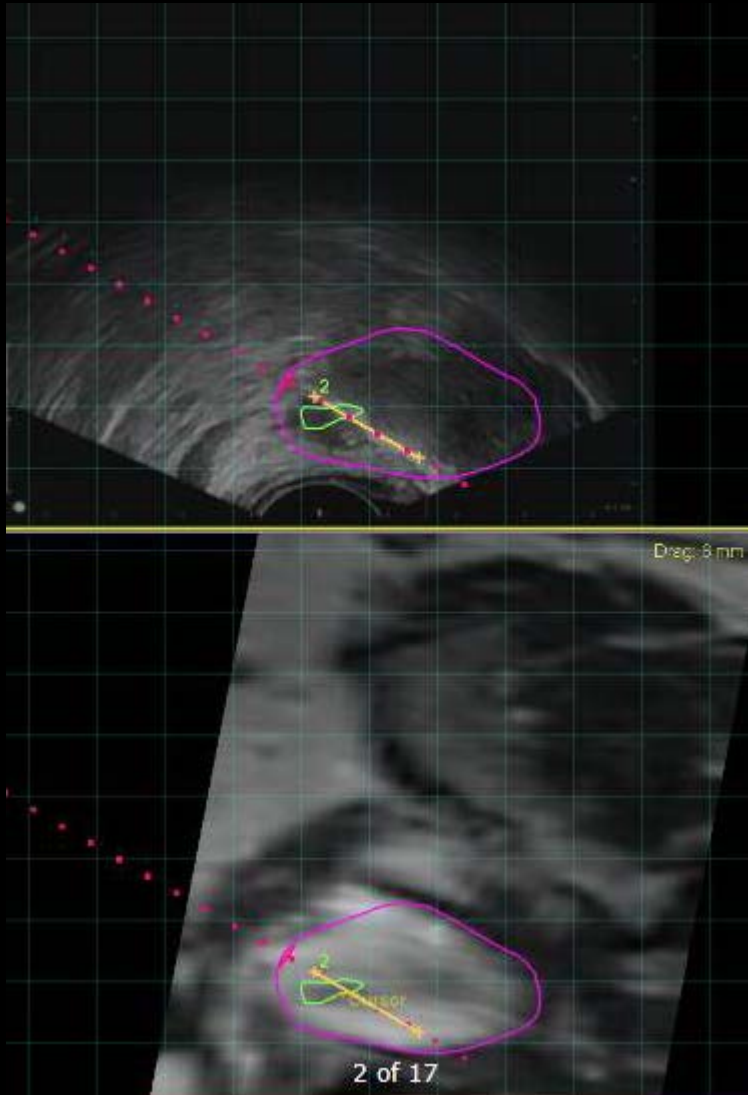
Year	PSA
2010	4.5
2011	4.7
2012	3.9
2014	5.3
2016	6.2



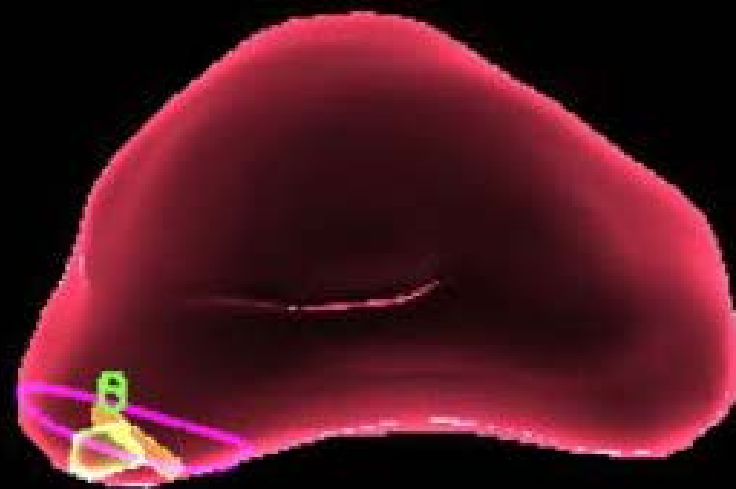
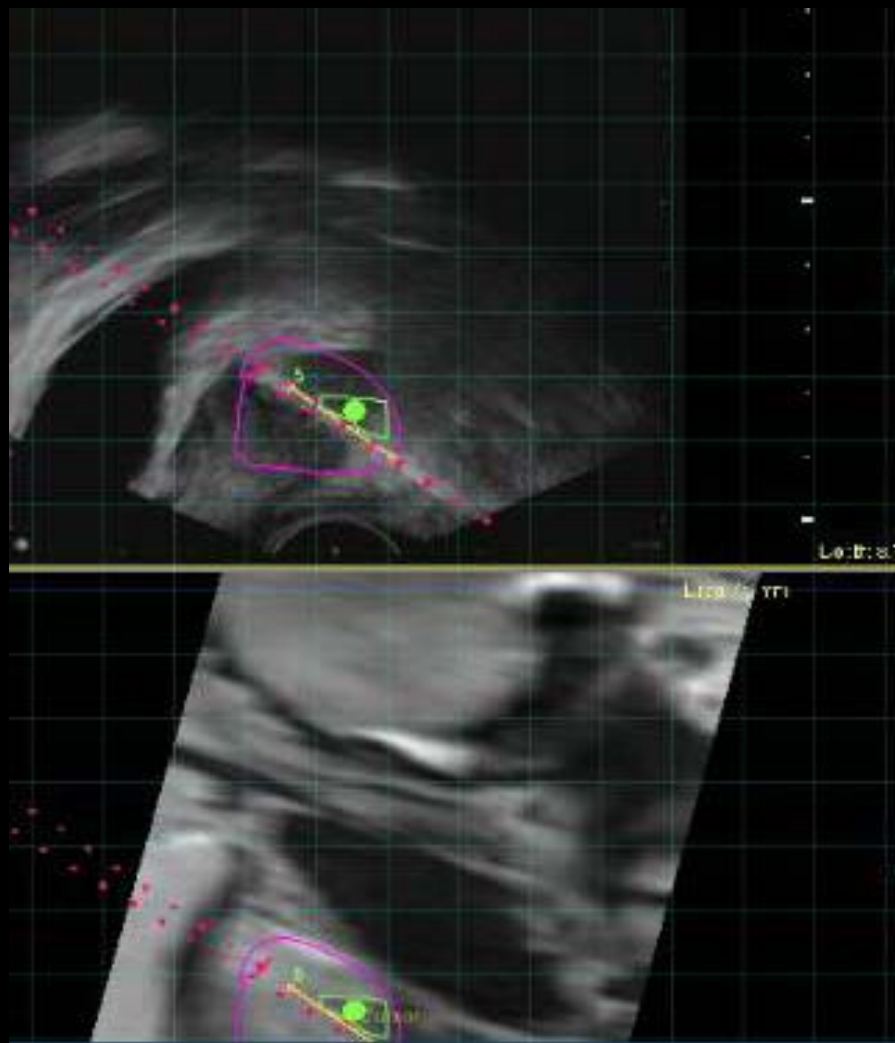
Case 1

- Multi parametric MRI results:
 - 0.8x0.5x0.9 cm lesion left peripheral zone posterolaterally at midportion of gland (PIRADS 4)
 - 0.7x 5.3 x 0.6 cm lesion right peripheral zone posterolaterally at the midportion of the gland (PIRADS 4)

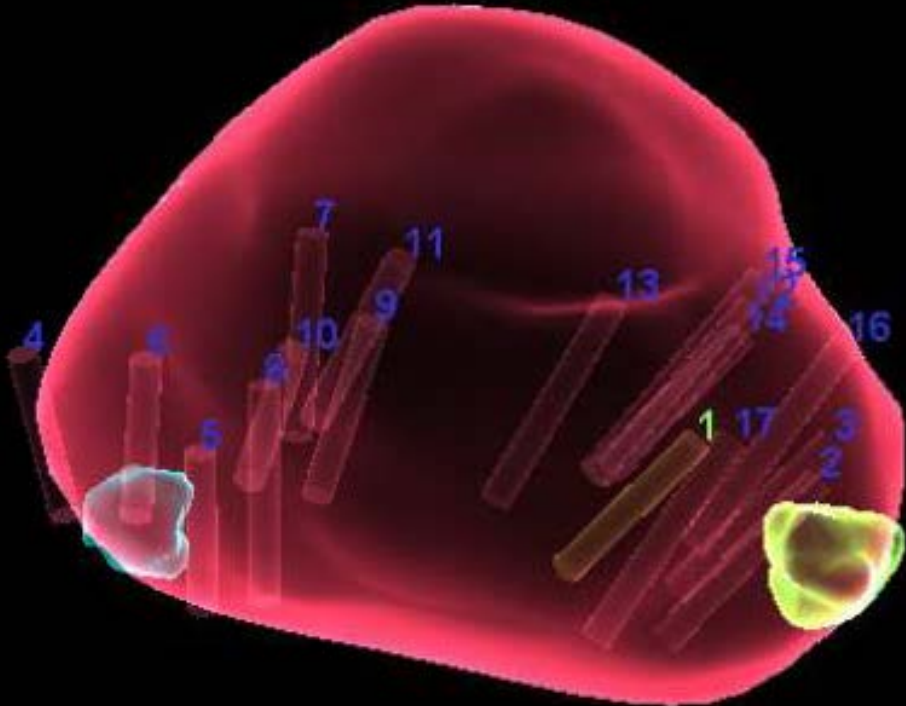
Case 1: Lesion #1 (left peripheral zone posterolaterally)
Fusion Biopsy Images



Case 1: Lesion #2 (right peripheral zone posterolaterally)
Fusion Biopsy Images



Case 1: Fusion Biopsy Summary (schematic biopsies done as well)



Case 1: MRI Fusion and Schematic Biopsy Pathology

A: Prostate, target lesion #1, core biopsy

- Prostate adenocarcinoma, Gleason combined score 9(4+5); involving 5 of 6 core fragments; 1 mm, 2 mm, 4 mm, 9 mm and 9 mm in linear extent; approximately 90% of total cores length.
- Perineural invasion present
- Prognostic Group Grade V

B: Prostate, target lesion #2, core biopsy

- Prostate adenocarcinoma, Gleason combined score 7(4+3); involving 1 of 5 core fragments; 2 mm in linear extent; approximately <5% of total cores length.
- Prognostic Group Grade III

C: Prostate, right base, core biopsy

- Benign prostatic glands and stroma with focal seminal vesicle present

D: Prostate, right mid, core biopsy

- Prostate adenocarcinoma, Gleason combined score 7(4+3); involving 1 of 2 cores; 2 mm in linear extent; approximately 8% of total cores length.
- Prognostic Group Grade III

E: Prostate, right apex, core biopsy

- Benign prostatic glands and stroma with chronic inflammation and atrophy

F: Prostate, left base, core biopsy

- Prostate adenocarcinoma, Gleason combined score 7(4+3); involving 1 of 2 cores; 6 mm in linear extent; approximately 25% of total cores length.
- Prognostic Group Grade III

G: Prostate, left mid, core biopsy

- Prostate adenocarcinoma, Gleason combined score 7(3+4); involving 2 of 6 core fragments; 3 mm and 5 mm in linear extent; approximately 40% of total cores length.
- Prognostic Group Grade II

H: Prostate, left apex, core biopsy

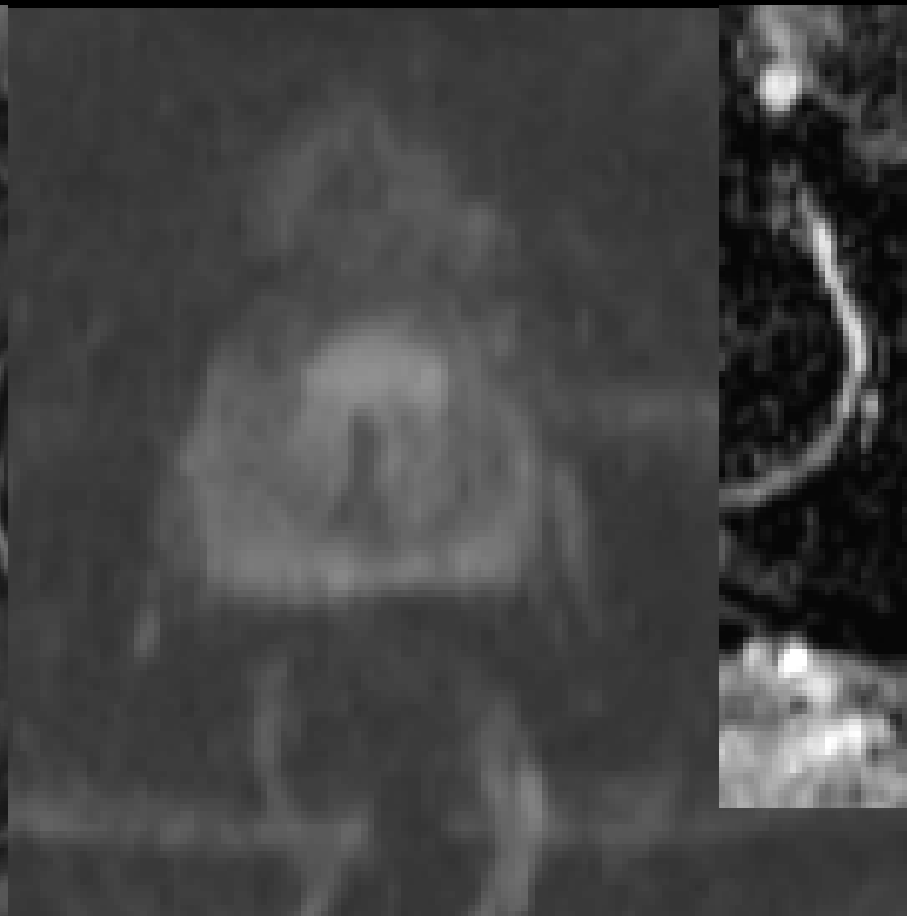
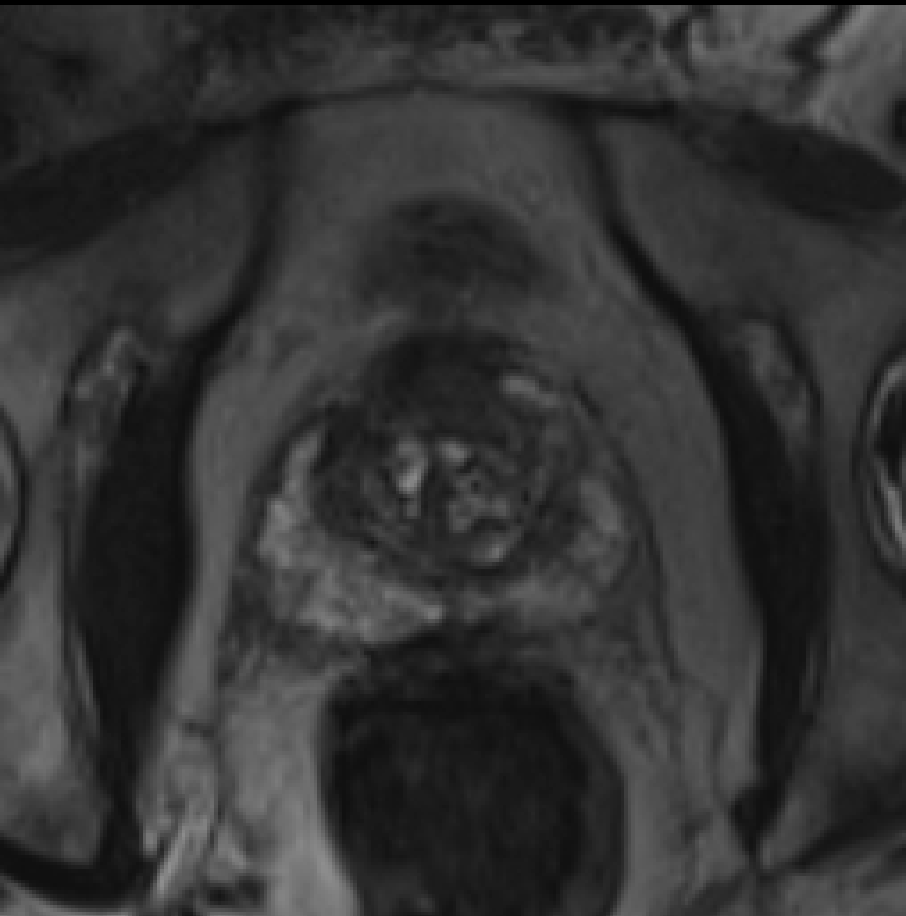
- Benign prostatic glands and stroma

Case 2

- 70-year-old gentleman with low-grade low volume prostate cancer currently on active surveillance. Previous prostate biopsy (outside April 2014) demonstrated Gleason 3+3 in 3 of 5 cores “left prostate”
- PSA 01/21/2016: 11.2 ng/mL
- Recommendation: MP MRI to potentially evaluate targets prior to AS biopsy

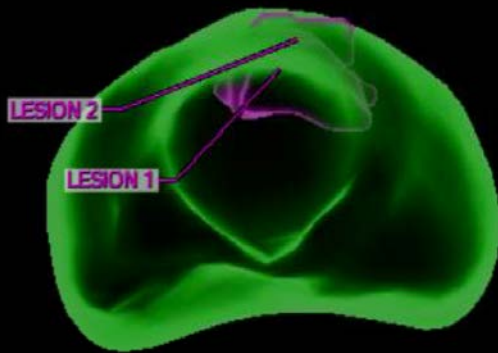


Case 2: MP MRI

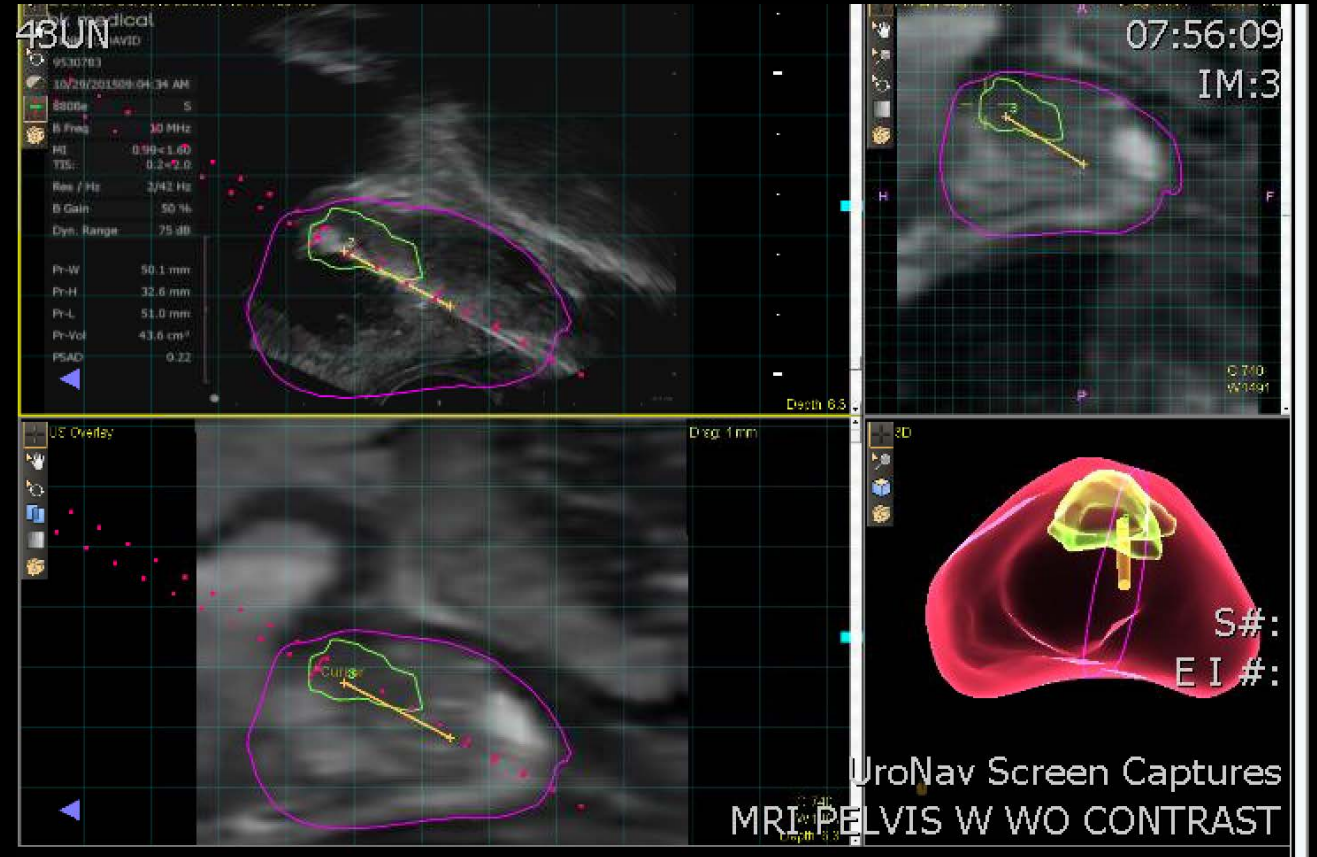


Case 2: MP MRI Sept 2015

- 2 lesions identified
 - 1.9 x 0.8 x 1.5 cm lesion within the transition zone on the left anterior base and left anterior mid prostate (**PIRADS 5**)
 - 1.3 x 0.6 x 1.0 cm left mid anterior stroma (**PIRADS 3**)



Fusion Biopsy images (lesion 1)



Fusion and Schematic Biopsy Pathology

Diagnosis:

A: Prostate, right apex, needle biopsy

- Benign prostatic glands and stroma, no tumor seen

B: Prostate, right mid, needle biopsy

- Benign prostatic glands and stroma, no tumor seen

C: Prostate, right base, needle biopsy

- Benign prostatic glands and stroma, no tumor seen

D: Prostate, left apex, needle biopsy

- Benign prostatic glands and stroma, no tumor seen

E: Prostate, left mid, needle biopsy

- Prostate adenocarcinoma, Gleason combined score 6 (3+3, grade group 1), involving 1 of 2 cores, length of carcinoma 1.5 mm, 10% of tissue involved with carcinoma

F: Prostate, left base, needle biopsy

- Prostate adenocarcinoma, Gleason combined score 6 (3+3), grade group 1), involving 1 of 3 cores, length of carcinoma 3 mm, 20% of tissue involved with carcinoma

G: Prostate, anterior mid base, Lesion #1, core biopsy

- Prostate adenocarcinoma, Gleason combined score 7 (3+4, grade group 2), involving 3 of 3 cores, lengths of carcinoma 5 mm, 2 mm and 2 mm, 40% of tissue involved with carcinoma

H: Prostate, anterior left apex, Lesion #2, core biopsy

- Prostate adenocarcinoma, Gleason combined score 6 (3+3, grade group 1), involving 3 of 4 cores, lengths of carcinoma 4 mm, 2 mm and 1 mm, 20% of tissue involved with carcinoma

Patient management

- Informed of higher risk prostate cancer, Gleason 3+4, (Grade group 2)
- Attended MDC clinic, met with urology and radiation oncology
- Elected Robotic-assisted laparoscopic radical prostatectomy with bilateral nerve sparing

FSA: Bladder neck, right, biopsy
- Stroma only, no invasive carcinoma identified

FSB: Bladder neck, left, biopsy
- Stroma and focal crush artifact, negative for carcinoma by IHC

FSC: Prostate, apical, anterior, biopsy
- Stroma and focal crush artifact, negative for carcinoma by IHC

D: Lymph nodes, bilateral, regional node dissection
- No metastatic carcinoma identified (0/7)

E: Prostate, radical prostatectomy

Tumor histologic type: adenocarcinoma

Tumor grade (Gleason system): 3+4 (grade group 2)

Approximate percentage of prostate involved: 10%

Extent of invasion:
Location of tumor involvement in prostate: bilateral, apex to mid, posterior and anterior
Confinement within the prostatic capsule: confined
Lymphovascular invasion: not involved
Seminal vesicle invasion: not involved

Histologic assessment of surgical margins: not involved

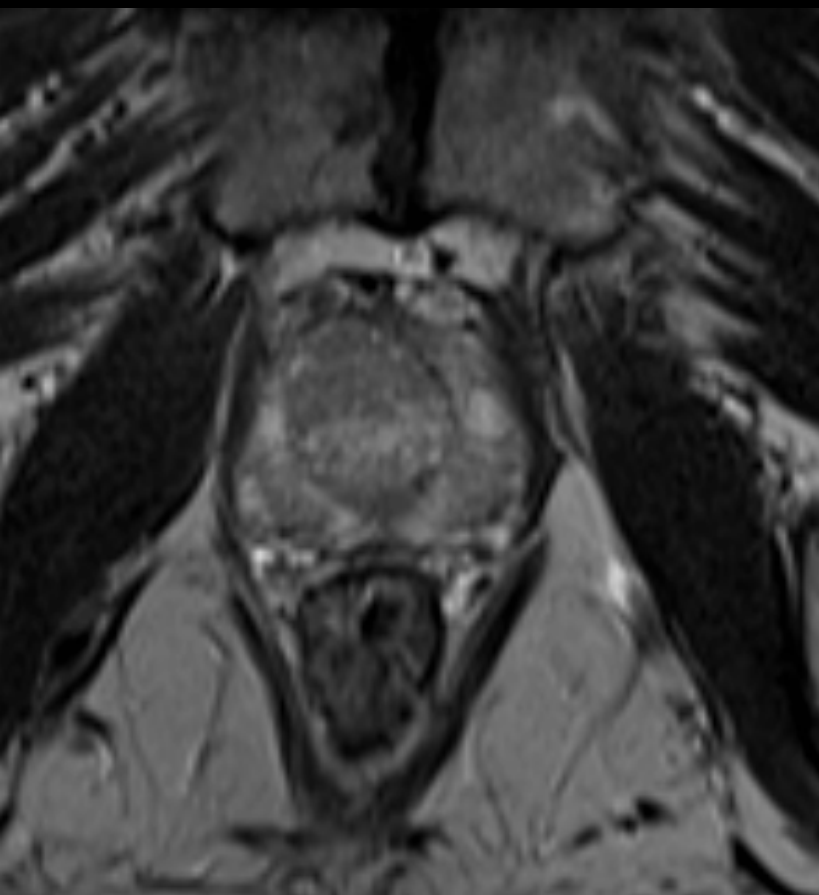
Other significant findings: nodular hyperplasia

Lymph nodes: separately submitted, see specimen D above, 0/7 total

AJCC Stage (prostate primary): pT2c pN0 pMx

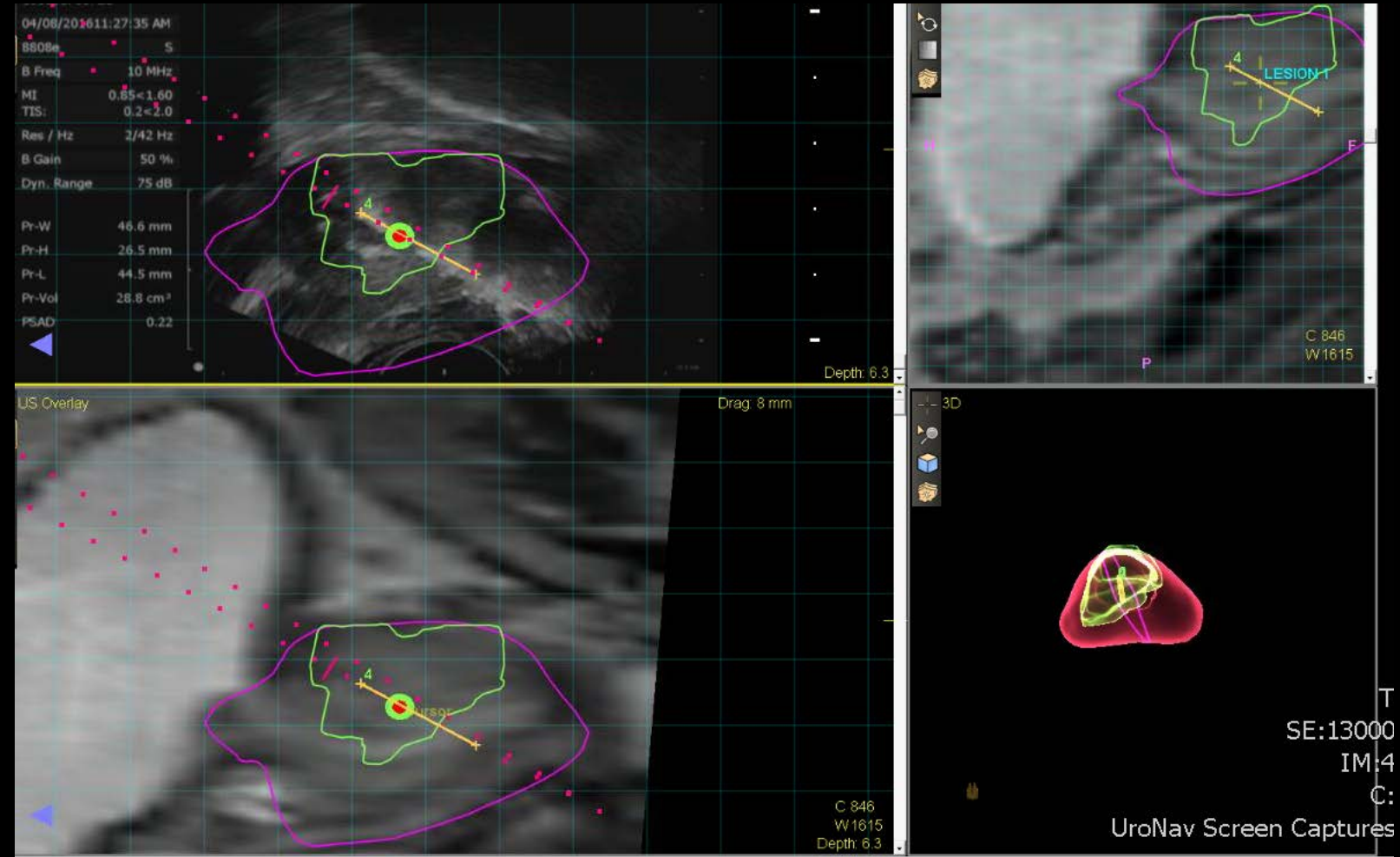
Case 3: Elevated, Rising PSA in the context of prior negative biopsy

- 68 yo man with LUTS and elevated PSA
 - biopsy in 2011: 35 g volume, negative for malignancy
- PSA increasing from 6.25 in 2015 to 7.8 2016, repeat was 9.36
- Multi para metric MRI recommended prior to biopsy



MP MRI: Large anterior target

- 2.5 x 1.6 x 2.1 cm lesion anterior transition zone extending from base to apex (PIRADS 5)
- Fusion biopsy



Pathology

Diagnosis:

A: Prostate, right apex, needle biopsy

- Benign prostatic glands and stroma
- No evidence of malignancy

B: Prostate, right mid, needle biopsy

- Benign prostatic glands and stroma
- No evidence of malignancy

C: Prostate, right base, needle biopsy

- Benign glands and stroma
- No evidence of malignancy

D: Prostate, left apex, needle biopsy

- Adenocarcinoma Gleason grade 3+3=6 (Grade group 1)
- Tumor involves 2 of 3 tissue cores
- Tumor measures a total of 6 mm of 34 mm combined score length (18%)

E: Prostate, left mid, needle biopsy

- Atypical small acinar proliferation; inconclusive for malignancy

F: Prostate, left base, needle biopsy

- Benign prostatic glands and stroma
- No evidence of malignancy

G: Prostate, target #1, anterior transitional zone, core biopsy

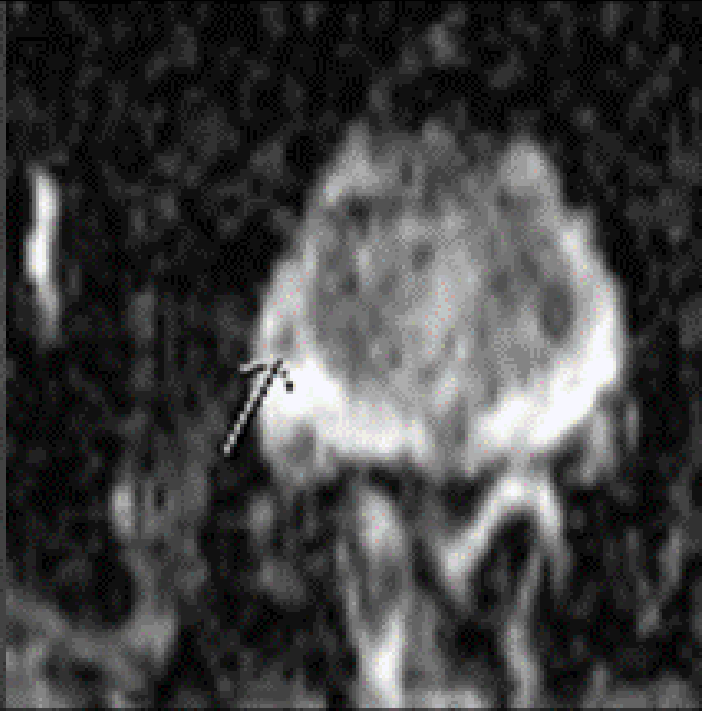
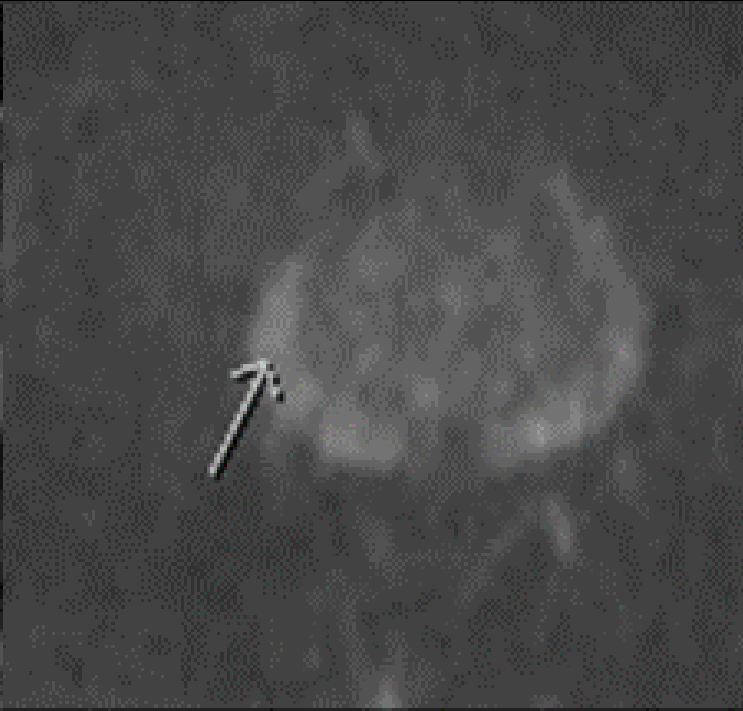
- Adenocarcinoma, Gleason's grade 3+4=7 (Grade group 2)
- Tumor is present in 2 of 4 tissue cores
- Tumor measures aggregate 15 mm of 52 mm combined score length (29%)

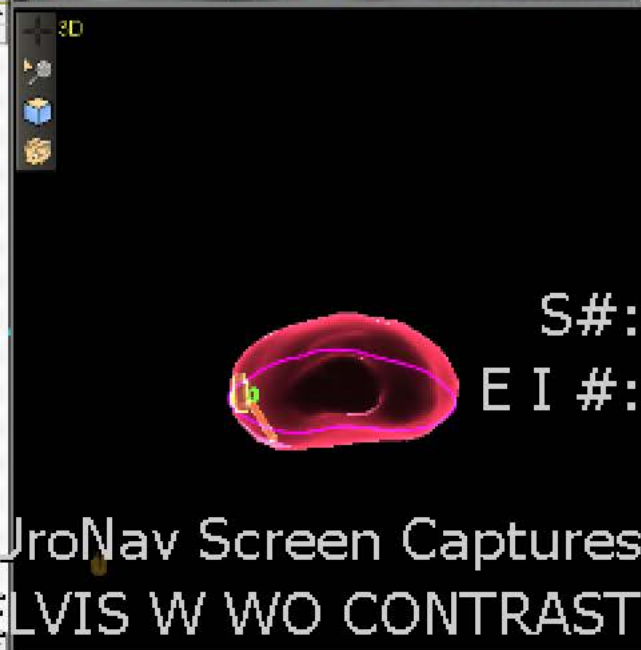
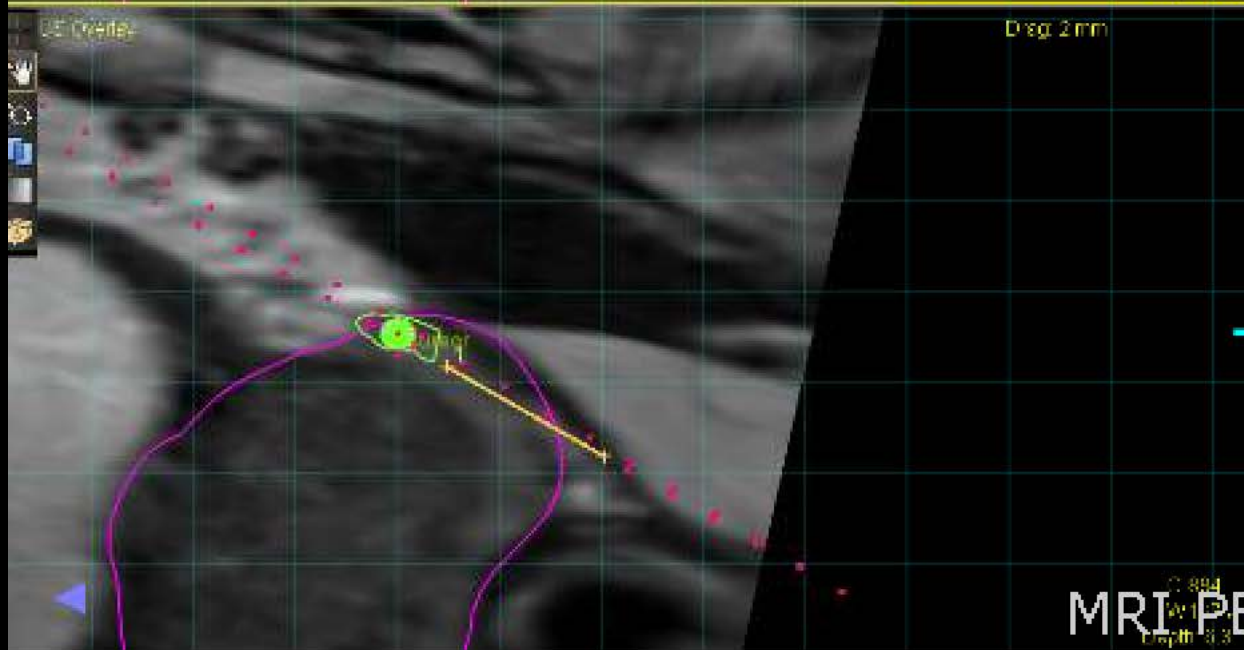
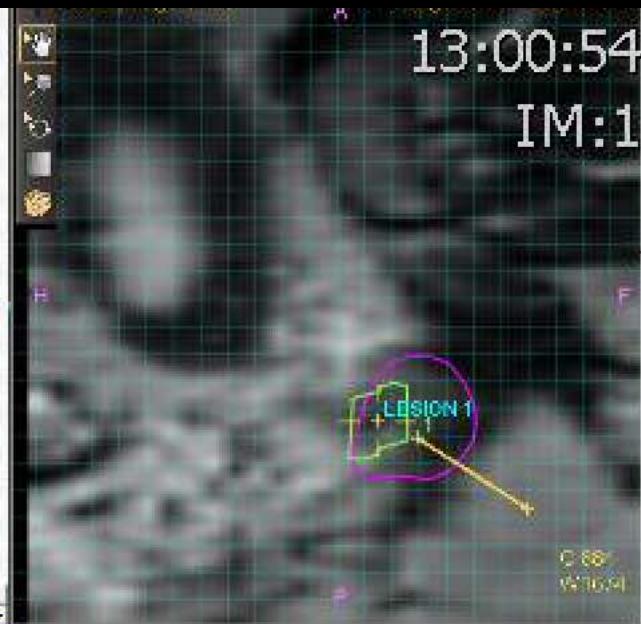
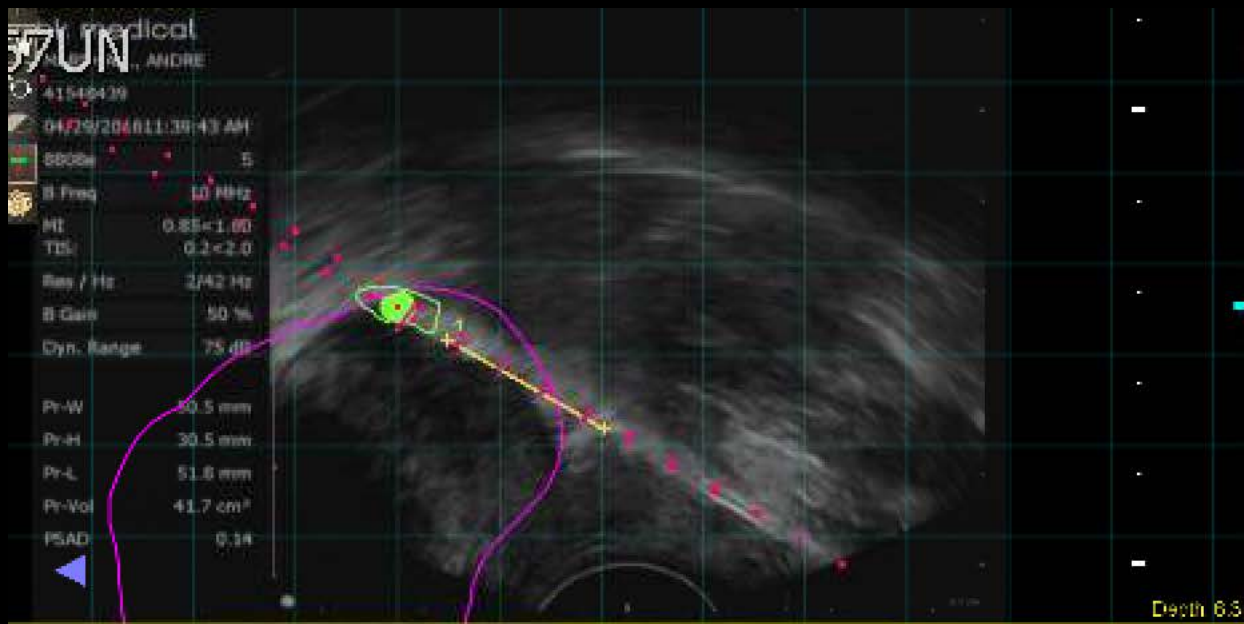
Treatment

- Patient elected robotic-assisted laparoscopic radical prostatectomy, non-nerve sparing completed 06/16/2016.
- Surgical Pathology is pending

Case 4: 56 yr old man on active surveillance

- low risk Pca diagnosed 11/04/2014, PSA 3.8 ng/mL
- PBx (11/3/14):
 - TRUS volume = 44 g
 - LEFT medial base = 3+3, 8%
 - LEFT lateral apex = 3+3, 4%
 - RIGHT medial mid = 3+3, 50%
 - RIGHT lateral mid = 3+3, 38%
 - RIGHT lateral apex = 3+3, 6%
- PSA history
 - 7/1/14 = 3.8
 - 8/20/13 = 3.6
 - 5/28/13 = 3.2
 - 6/5/12 = 2.34
 - 5/16/11 = 1.77
- Is there a biomarker test to offer?
- PSA late 2015 = 5.3
- MP MRI rec prior to biopsy





UroNav Screen Captures
 MRI PELVIS W WO CONTRAST

Case 4: Prostate Fusion and Schematic Biopsy Pathology

Final Diagnosis

A: Prostate, right apex, needle biopsy
- Benign prostatic glands and stroma.

B: Prostate, right mid, needle biopsy
- Benign prostatic glands and stroma.
- Mild chronic prostatitis.
- Focal acute prostatitis.

C: Prostate, right base, needle biopsy
- Benign prostatic glands and stroma.

D: Prostate, left apex, needle biopsy
- Benign prostatic glands and stroma.

E: Prostate, left mid, needle biopsy
- Benign prostatic glands and stroma.

F: Prostate, left base, needle biopsy
- Benign prostatic glands and stroma.

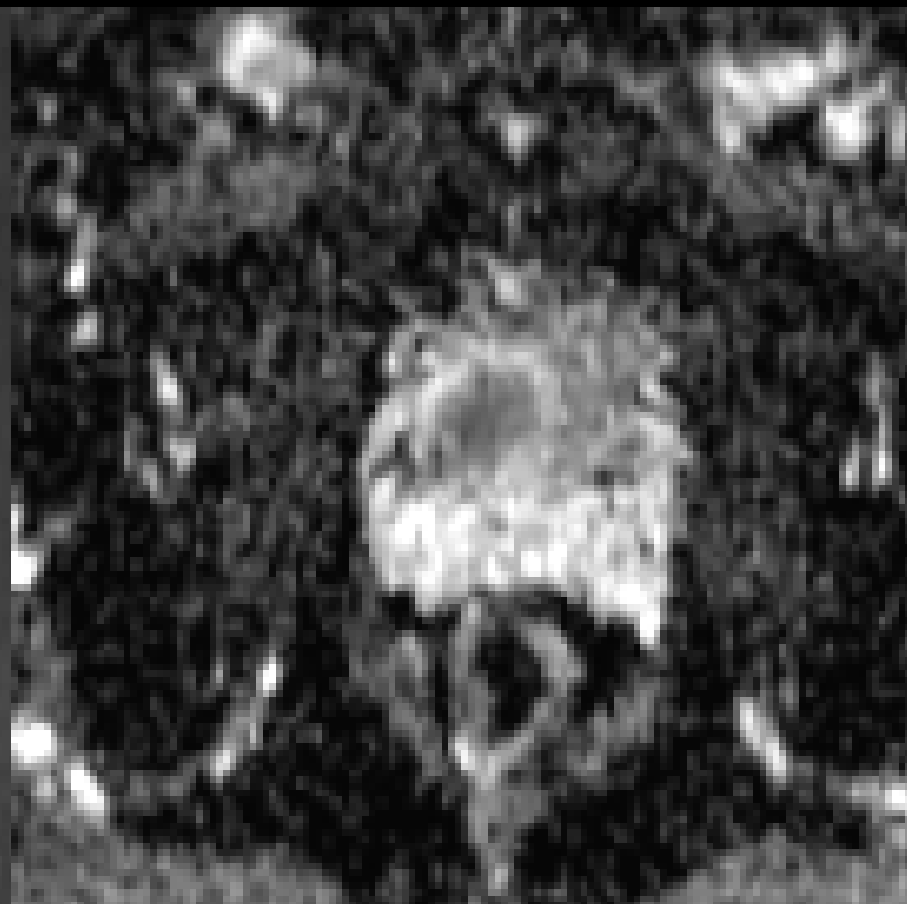
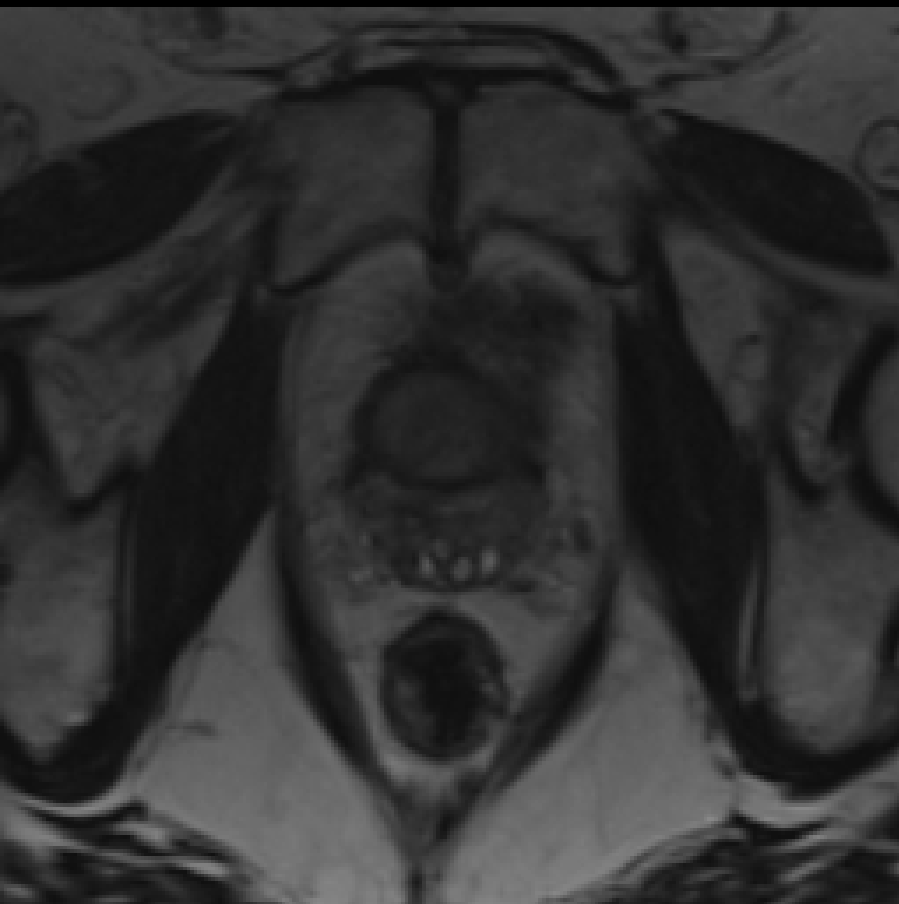
G: Prostate, target lesion #1, core needle biopsy
- Prostatic adenocarcinoma, Gleason combined score 7 (3+4), Grade Group 2, involving 4 of 4 cores, approximately 7 mm, 5 mm, 4 mm and 3 mm in linear extent, approximately 54% of total core length.
- High-grade prostatic intraepithelial neoplasia.

Case 4: Disposition

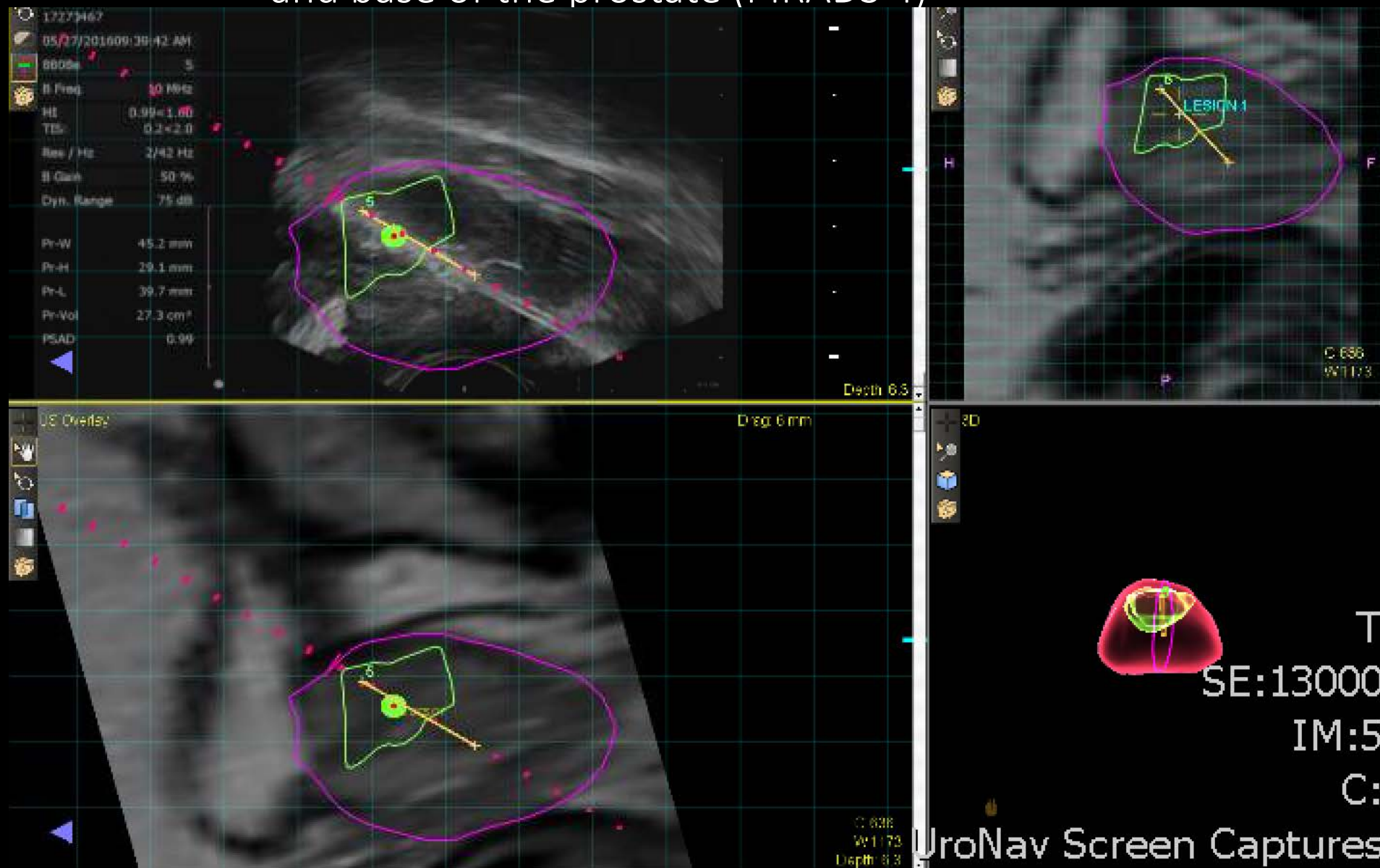
- MDC appt with urology and radiation oncology
- Patient is still deciding between surgery and radiation

Case 5: Elevated PSA and Recurrent Prostatitis

- 63 year-old with a history of multiple bouts of prostatitis and baseline PSA 20 for years, intermittently on abx
- PSA 2013 20; biopsy negative (+ for inflammation)
- PSA 2014 21; biopsy negative (inflammation again seen)
- PSA 2015 32; MP MRI prior to next biopsy



MP MRI result: 1.7 x 1.2 x 1.2 lesion within the anterior transition zone at the mid and base of the prostate (PIRADS 4)



Fusion and schematic biopsy result

A: Prostate, target lesion #1, biopsy

- Prostate adenocarcinoma, Gleason combined score 7(3+4); involving 5 of 8 cores; 3 mm, 5 mm, 8 mm, 10 mm, and 11 mm in linear extent; approximately 49% of total cc length (see comment)
- Prognostic Group Grade II

B: Prostate, right base, biopsy

- Benign prostatic glands and stroma with chronic inflammation and partial atrophy

C: Prostate, right mid, biopsy

- Benign prostatic glands and stroma (see comment)

D: Prostate, right apex, biopsy

- Prostate adenocarcinoma, Gleason combined score 6(3+3); involving 1 of 2 cores; 2 mm in linear extent; approximately 9% of total cores length (see comment)
- Prognostic Group Grade II

E: Prostate, left base, biopsy

- Benign prostatic glands and stroma with partial atrophy (see comment)

F: Prostate, left mid, biopsy

- Benign prostatic glands and stroma with chronic inflammation and partial atrophy (see comment)

G: Prostate, left apex, biopsy

- Benign prostatic glands and stroma with chronic inflammation and partial atrophy (see comment)

Disposition

- Considering surgery and radiation currently