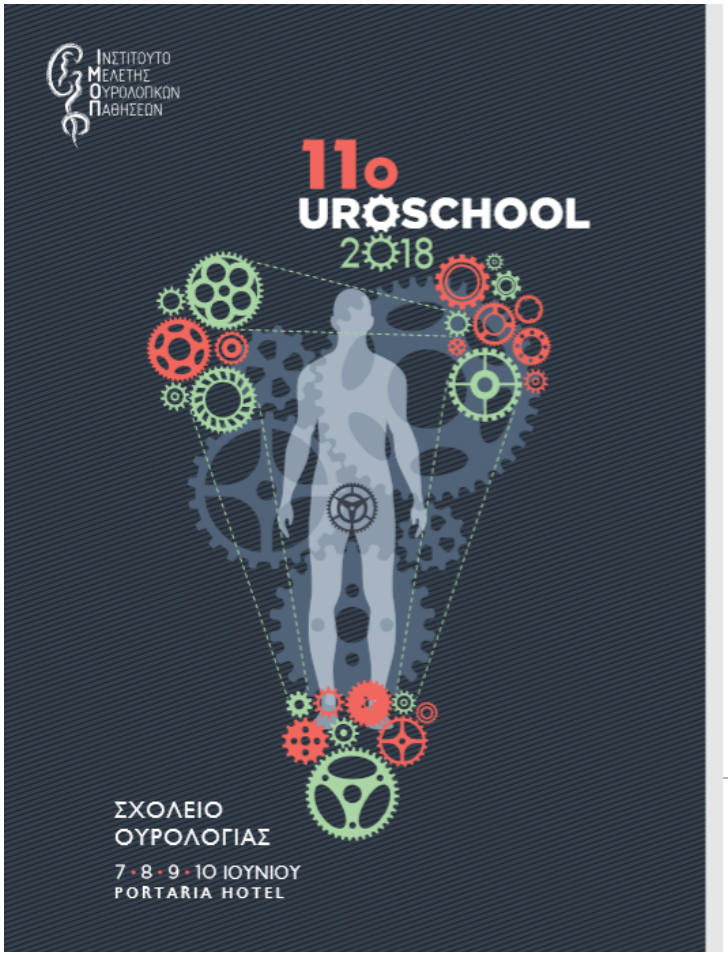


UroSkills II: Γνωριμία με τη μαγνητική τομογραφία του προστάτη και το PI-RADS

ΔΑΝΑΗ ΧΟΥΡΜΟΥΖΗ

ΑΚΤΙΝΟΛΟΓΟΣ

Disclosure Statement

The author of this exhibit have no financial or conflicts of interest to disclose.

Prostate cancer

The early diagnosis of clinically significant cancer (CSC) is challenging; current screening methods based on prostate-specific antigen (PSA) screening and transrectal ultrasound-guided (TRUS) biopsy result in overdiagnosis, and hence, overtreatment of clinically indolent prostate cancer, meanwhile underdiagnosing CSC

PI-RADSv2: How we do it.
Greer MD, Choyke PL, Turkbey B.
J Magn Reson Imaging. 2017 Feb 25

Prostate cancer

Novel diagnostic tests with higher discriminative abilities for aggressive prostate cancer are therefore urgently needed. Multi-parametric MRI might be used as a second-line diagnostic tool in men with abnormal PSA or digital rectal examination to improve selection for biopsy.

Diagnostic accuracy of multi-parametric MRI and transrectal ultrasound-guided biopsy in prostate cancer.
Thompson JE, Stricker PD.
Lancet. 2017 Feb 25;389(10071):767-76

pmMRI
Acquisition Parameters
T2W, DWI, DC

- T1-weighted MRI (T1W MRI)
- T2-weighted MRI (T2W MRI)

- Diffusion-weighted MRI (DW MRI)
- Dynamic contrast-enhanced MRI (DCE MRI)
- MR spectroscopy (MRSI)?

TABLE 1. Parameters for mpMRI Acquisition Used at Our Institution

Sequence	Repetition time (msec)/ echo time (msec)	Field of view (mm)	Pixel size (mm)	Matrix	Flip angle(s) (degrees)	Section thickness (mm)	Imaging time
T2-weighted sagittal	2925/120	140	0.27 × 0.27	304 × 234	90/100	3	1 Min 51 sec
T2-weighted axial	8869/120	140	0.27 × 0.27	304 × 234	90/180	3	5 Min 37 sec
T2-weighted coronal	2632/120	140	0.27 × 0.27	304 × 234	90/100	3	1 Min 40 sec
DW imaging	3709/52	140	1.02 × 1.02	112 × 108	90/180	2.73/0.27	4 Min 46 sec
T1-weighted axial GRE	3.7/2.2	262	1.02 × 1.02	256 × 186	2	3	0.22 Sec
T1-weighted axial dynamic contrast enhanced	3.7/2.2	262	1.02 × 1.02	256 × 186	8.5	3	5 Min 12 sec
Axial THRIVE	5.3/2.6	440	1.5 × 1.5	280 × 199	10	5	0.57 Sec

DWI is acquired at five evenly spaced b values between 0 and 750 sec/mm^2). An additional high b value DWI is obtained at $b = 2000$ sec/mm^2. GRE = gradient echo, 3D = three-dimensional, THRIVE = T1 high resolution isotropic volume examination.

pmMRI

3 Tesla or 1,5 Tesla ?

- While PI-RADSv2 endorses 3.0T for mpMRI acquisition, it must be admitted that there is no clear evidence that there is improved diagnostic capability of 3.0T over 1.5T
- Newer external phased array coils maintain SNR and image quality, even in 1.5T magnets.

Radiology ACo. MR Prostate Imaging Reporting and Data System version 2.0. 2015

The role of MRI in prostate cancer active surveillance. **Johnson** LM, **Choyke** PL, **Figg** WD, Turkbey B. Biomed Res Int. 2014;2014:203906.

The use of an endorectal coil (ERC) is not a requirement under the new guidelines but may be essential in older 1.5T systems to maintain SNR

The role of MRI in prostate cancer active surveillance. **Johnson** LM, **Choyke** PL, **Figg** WD, Turkbey B. Biomed Res Int. 2014;2014:203906.

Timing / Biopsy

- 6 weeks after TRUS-guided biopsy
- Non-biopsied areas are of primary concern and are likely not be affected by hemorrhage
- Hemorrhage can spread from the biopsy site to non-biopsy sites, rendering the mpMRI difficult to interpret.
- Re-scheduled

PI-RADSv2: How we do it.
Greer MD, Choyke PL, Turkbey B.
J Magn Reson Imaging. 2017 Feb 25

Patient Preparation

- Do not apply bowel preparation since it may trigger peristaltic motion during imaging
- Do not use antispasmotic agents due to increased cost and possible drug reactions.
- Recent ejaculation?

PI-RADSv2: How we do it.
Greer MD, Choyke PL, Turkbey B.
J Magn Reson Imaging. 2017 Feb 25

Recent ejaculation distension of seminal vesicles

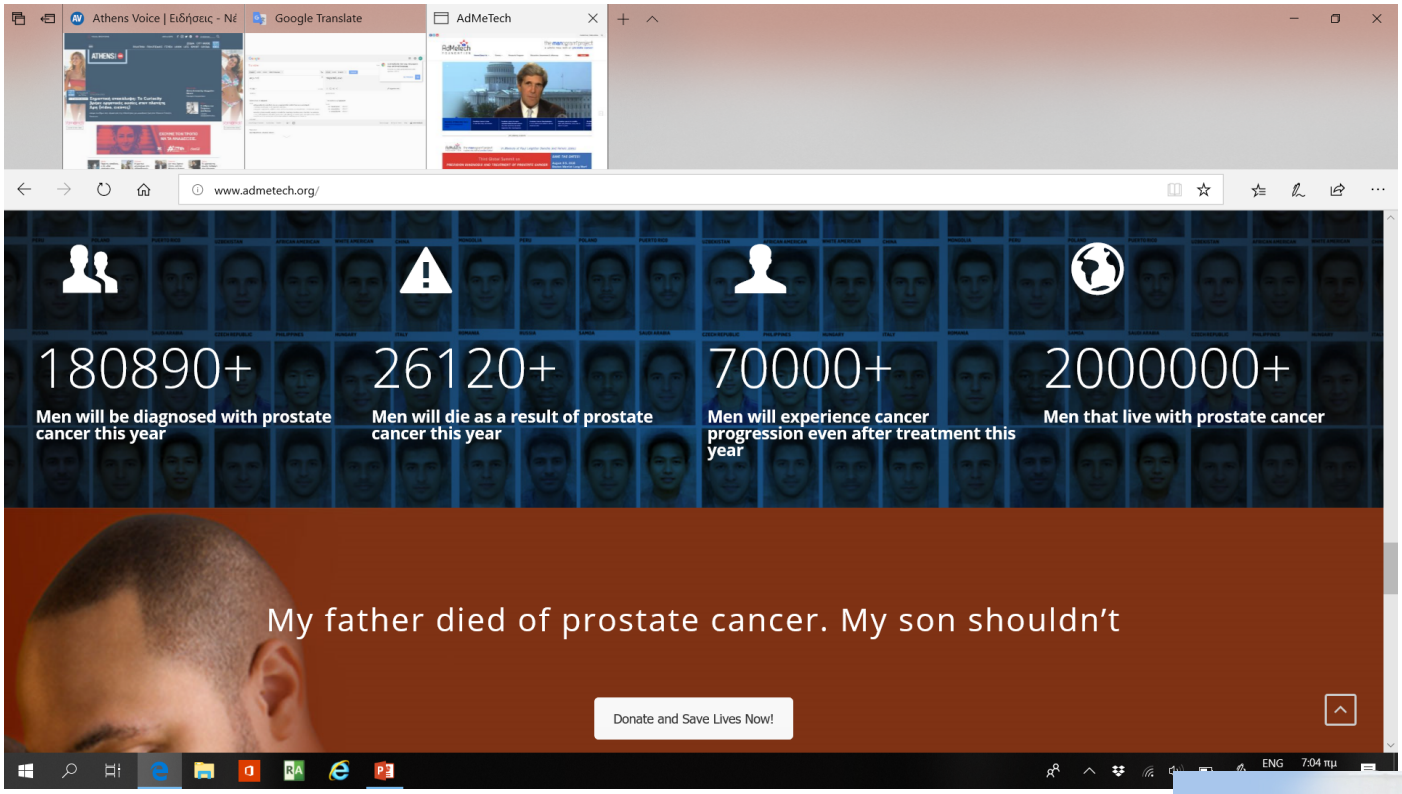
- Kabakus et al 24 retrospectively evaluated the seminal vesicles on T2W MRI of 238 men who reported timing since last ejaculation before MRI.
- For men >60 years old, ejaculation <3 days resulted in higher nondiagnostic evaluations, but the effect was less apparent in men younger than 60
- Recommendation : men abstain from ejaculation for >3 days before MRI to improve the diagnostic accuracy of the seminal vesicle
- Failure to comply is not an indication for rescheduling the patient, as the prostate parenchyma itself is unaffected.

PI-RADSv2: How we do it.
Greer MD, Choyke PL, Turkbey B.
J Magn Reson Imaging. 2017 Feb 25

Prostate imaging and reporting and data system (PI-RADS)

- PI-RADS version 1 was introduced by the European Society of Urogenital Radiology (ESUR) as a standardized scoring system to grade lesions on prostate MRI in 2012.
- PI-RADS version 2 was introduced in 2015 in a collaboration between the American College of Radiology (ACR), AdMeTech Foundation and ESUR as an update to version 1.

ADMETECH'S INTERNATIONAL PROSTATE MRI WORKING GROUP STIMULATES INTEREST OF THE AMERICAN COLLEGE OF RADIOLOGY (ACR) AND EUROPEAN SOCIETY OF UROGENITAL RADIOLOGY (ESUR) TO DEVELOP GLOBAL STANDARDS FOR HIGH QUALITY MRI (PI-RADS v2)



the manogram® project

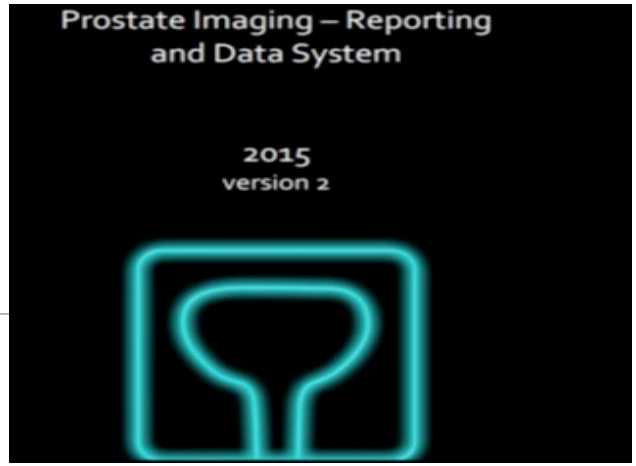
a whole new look at prostate cancer

PI-RADS v2

The update further simplifies key sequences plus simplifies terminology and reporting:

- T2 weighted images are now the most important images in transition zone evaluation
- High B-value DWI images are of key importance in assessing peripheral zone lesions

- Spectroscopy is not part of PI-RADS v2 assessment
- Dynamic contrast enhancement only plays a minor role

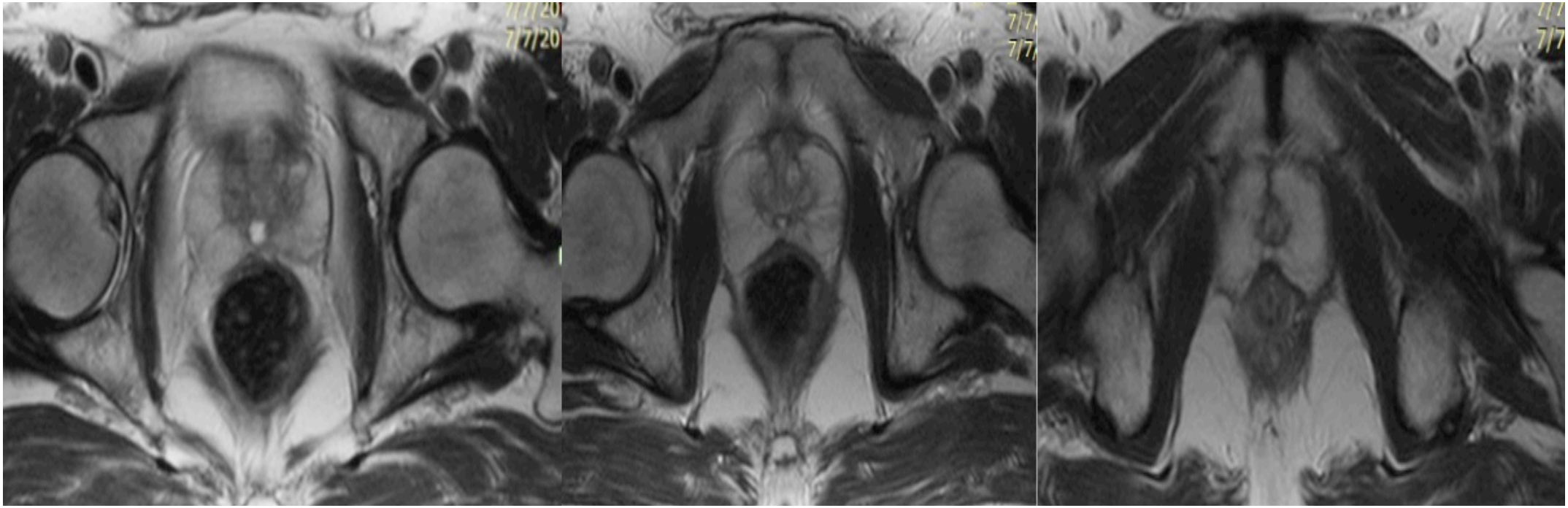


PI-RADS™ v2 Assessment Categories

PIRADS 1 – Very low (clinically significant cancer is highly unlikely to be present)
PIRADS 2 – Low (clinically significant cancer is unlikely to be present)
PIRADS 3 – Intermediate (the presence of clinically significant cancer is equivocal)
PIRADS 4 – High (clinically significant cancer is likely to be present)
PIRADS 5 – Very high (clinically significant cancer is highly likely to be present)

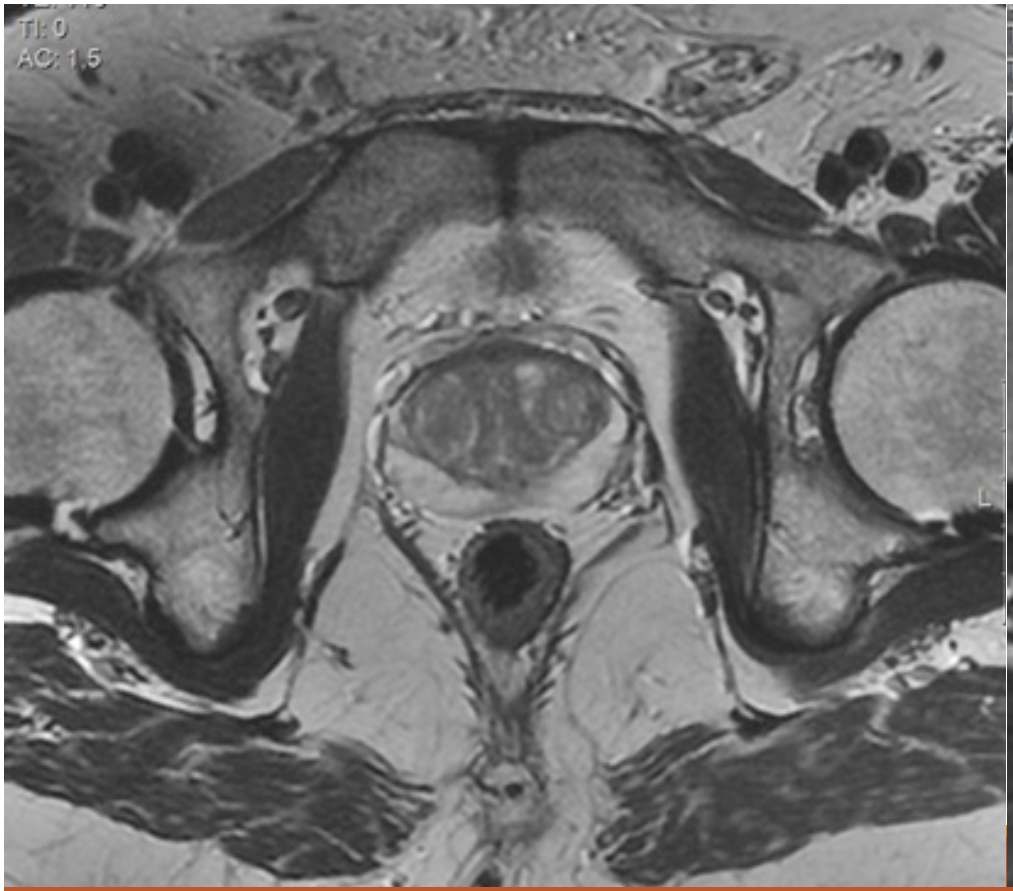
INTERPRETATION: T2W PERIPHERAL ZONE

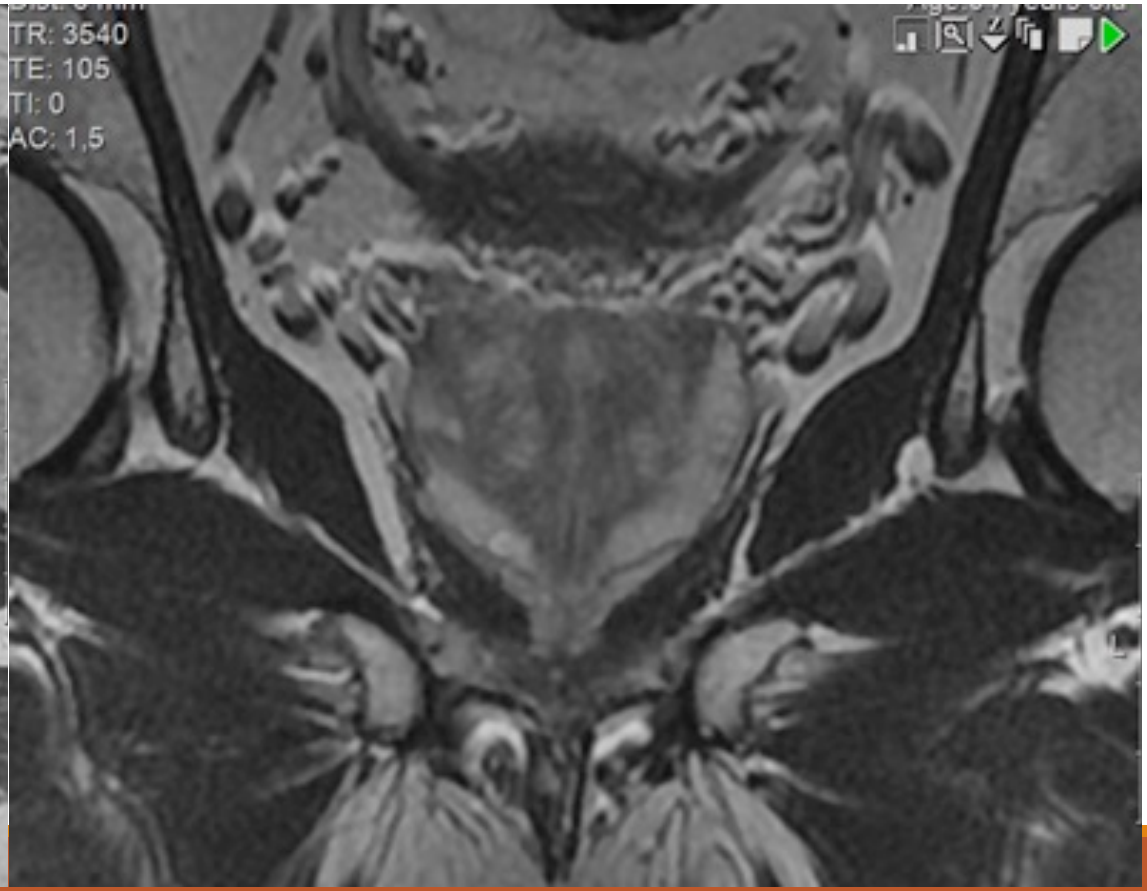
Uniform hyperintense signal intensity (normal)
PI-RADS 1



INTERPRETATION: T2W PERIPHERAL ZONE

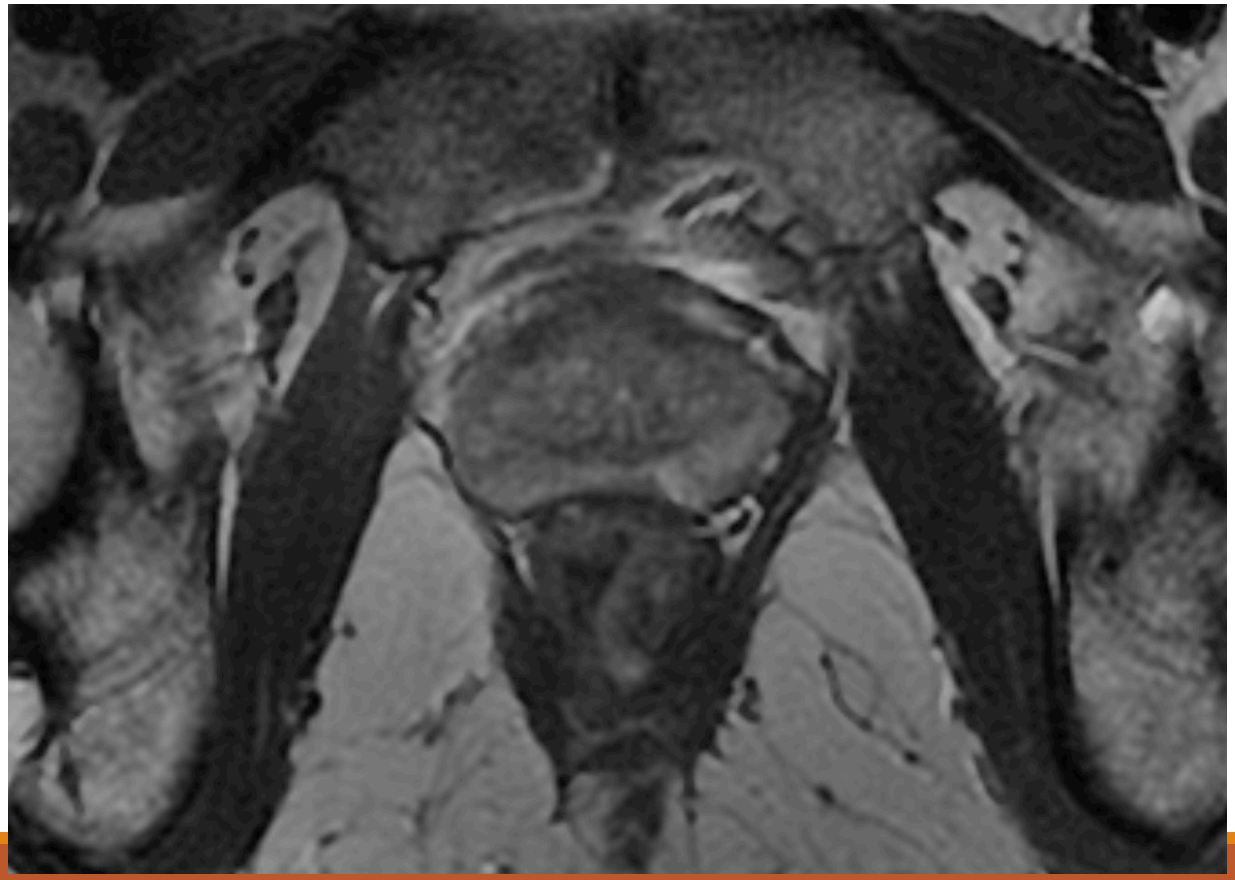
Linear or wedge-shaped hypointensity or diffuse mild hypointensity, usually indistinct margin
PI-RADS 2





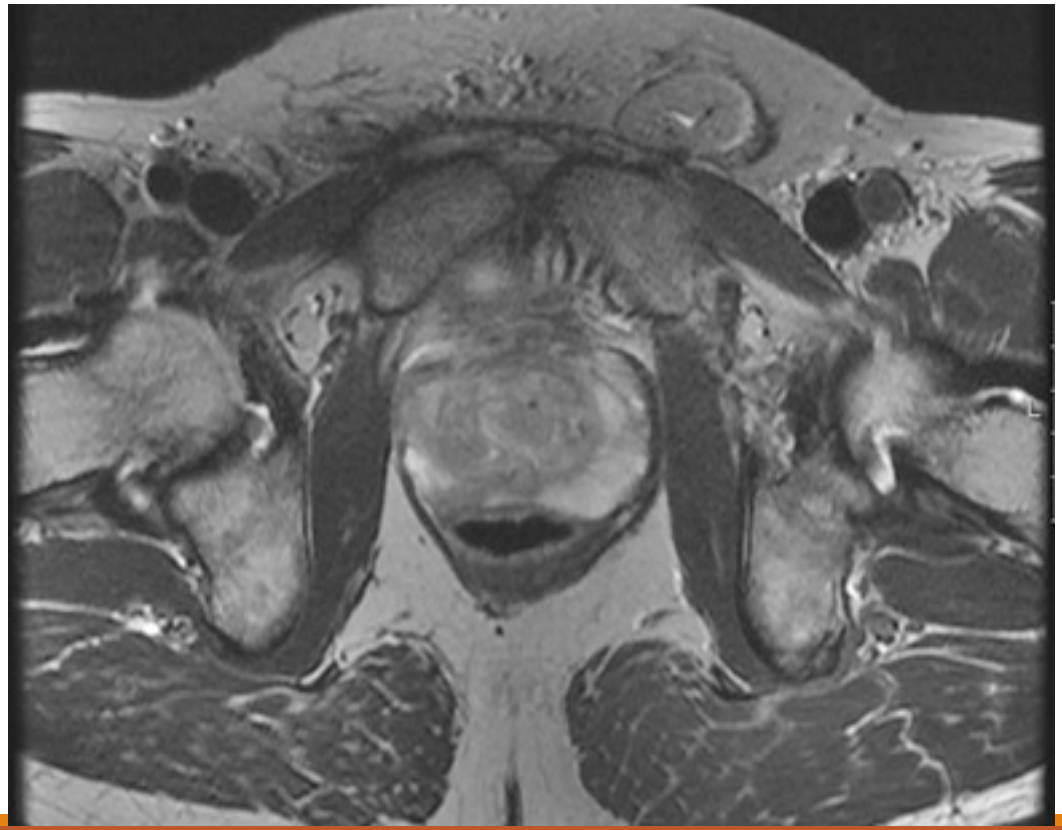
INTERPRETATION: T2W PERIPHERAL ZONE

Heterogeneous signal intensity or non-circumscribed, rounded, moderate hypointensity
PI-RADS 3



INTERPRETATION: T2W PERIPHERAL ZONE

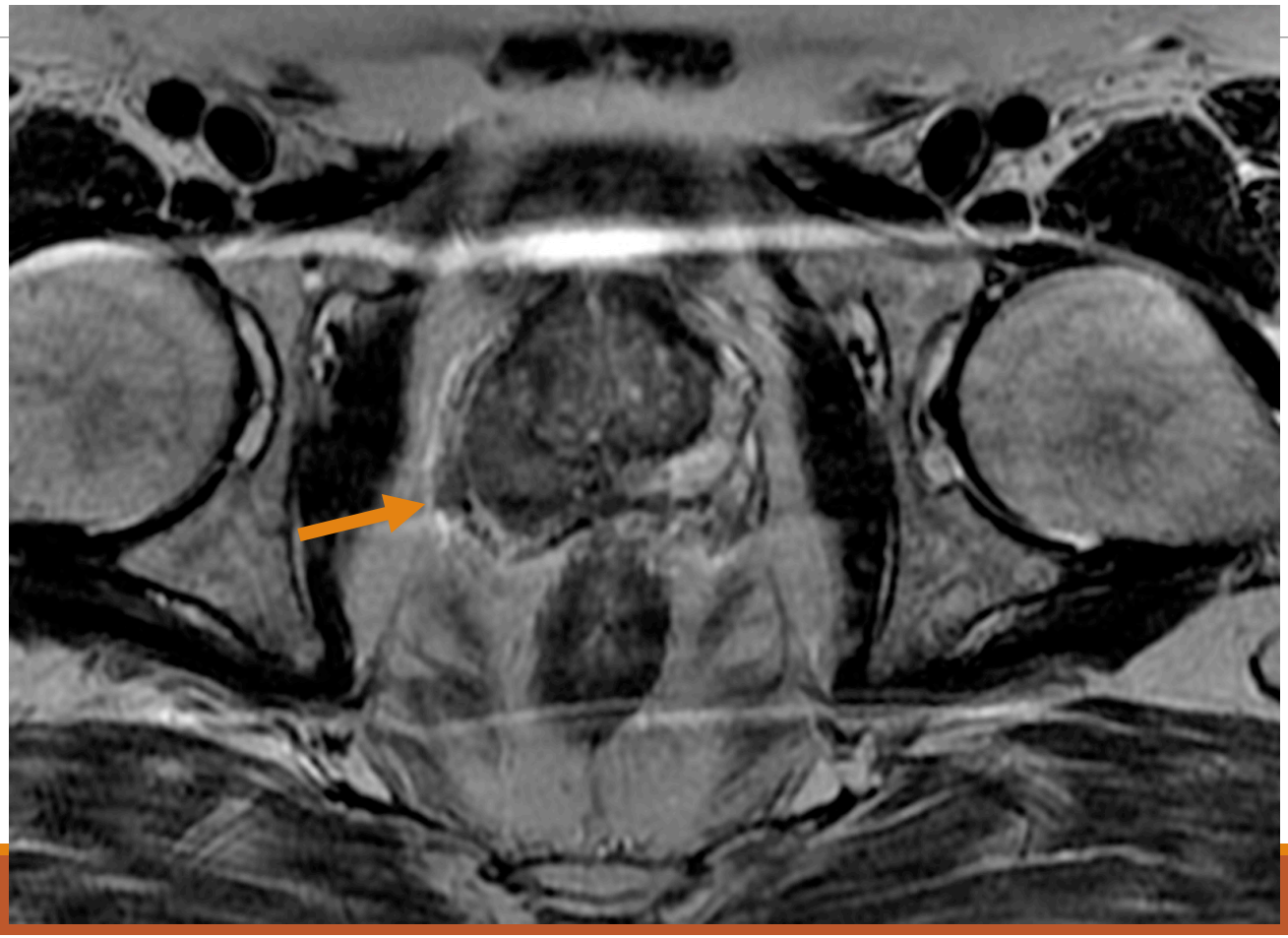
Circumscribed, homogenous moderate hypointense focus/mass confined to prostate and <1.5 cm in greatest dimension
PI-RADS 4



INTERPRETATION: T2W PERIPHERAL ZONE

Circumscribed, homogenous moderate hypointense focus/mass ≥1.5cm in greatest dimension or definite extraprostatic extension/invasive behavior

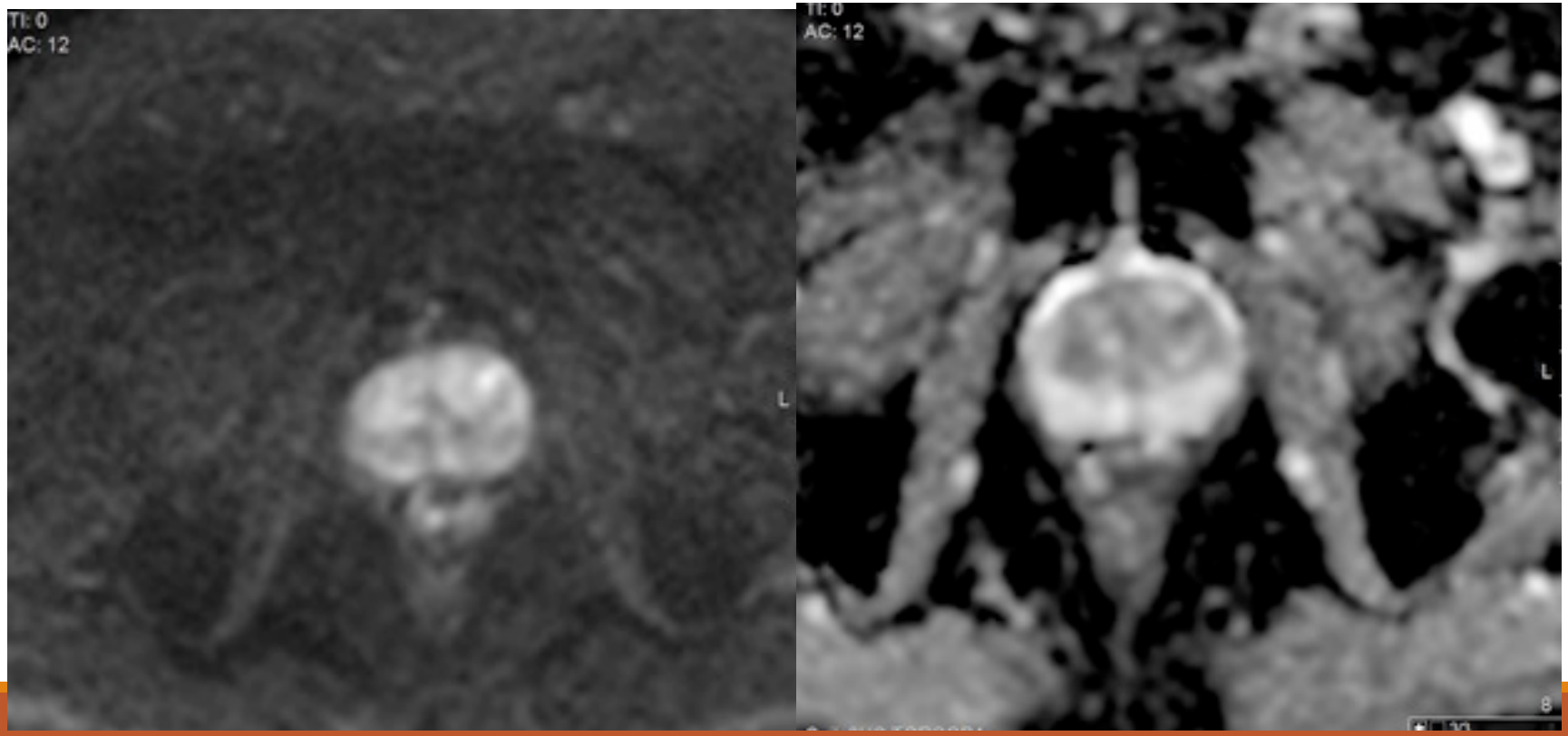
PI-RADS 5



INTERPRETATION: DWI Peripheral zone

No abnormality on ADC and high b value DWI

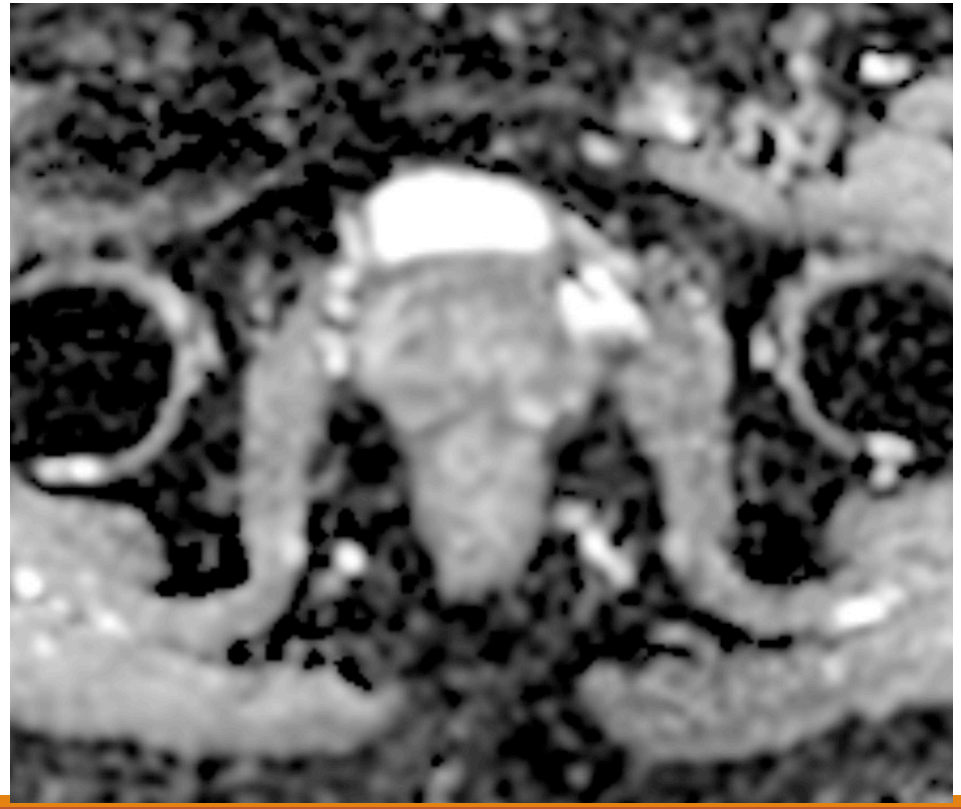
PI-RADS 1



INTERPRETATION: DWI Peripheral zone

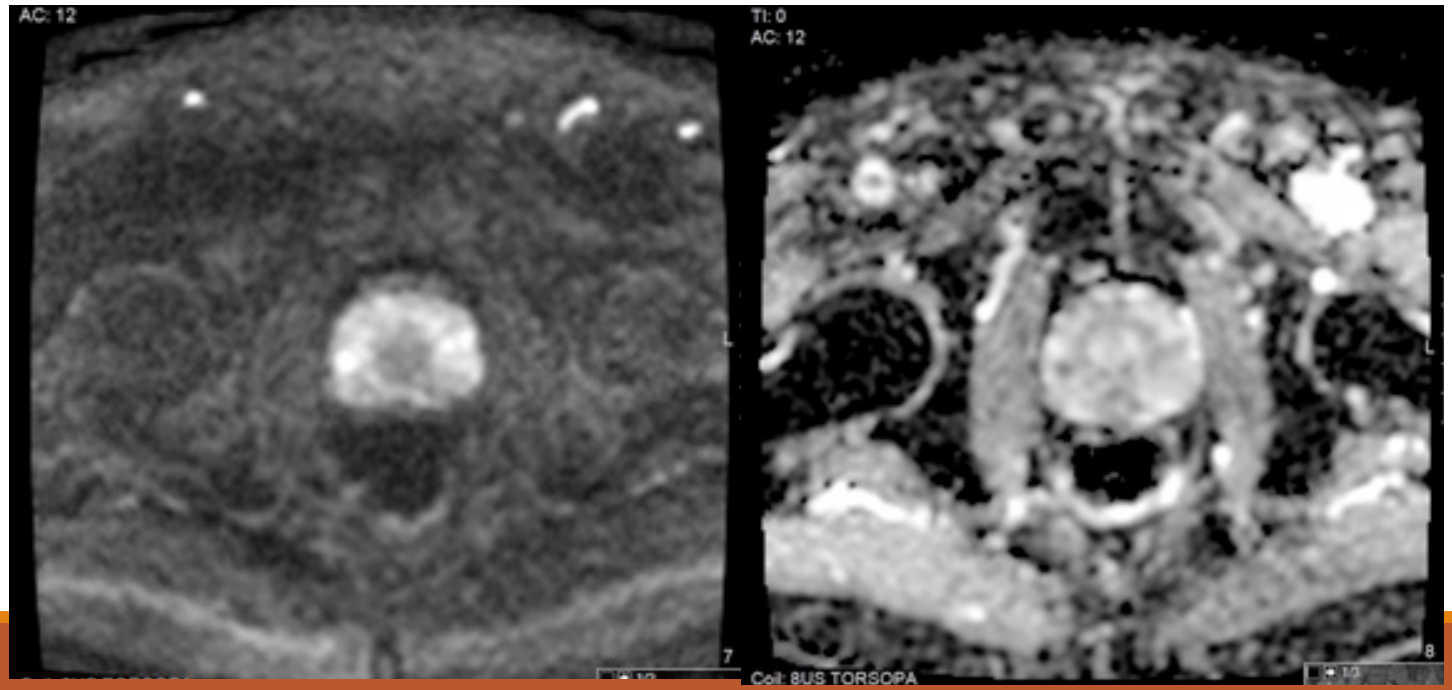
Indistinct hypointense on ADC

PI-RADS 2



INTERPRETATION: DWI Peripheral zone

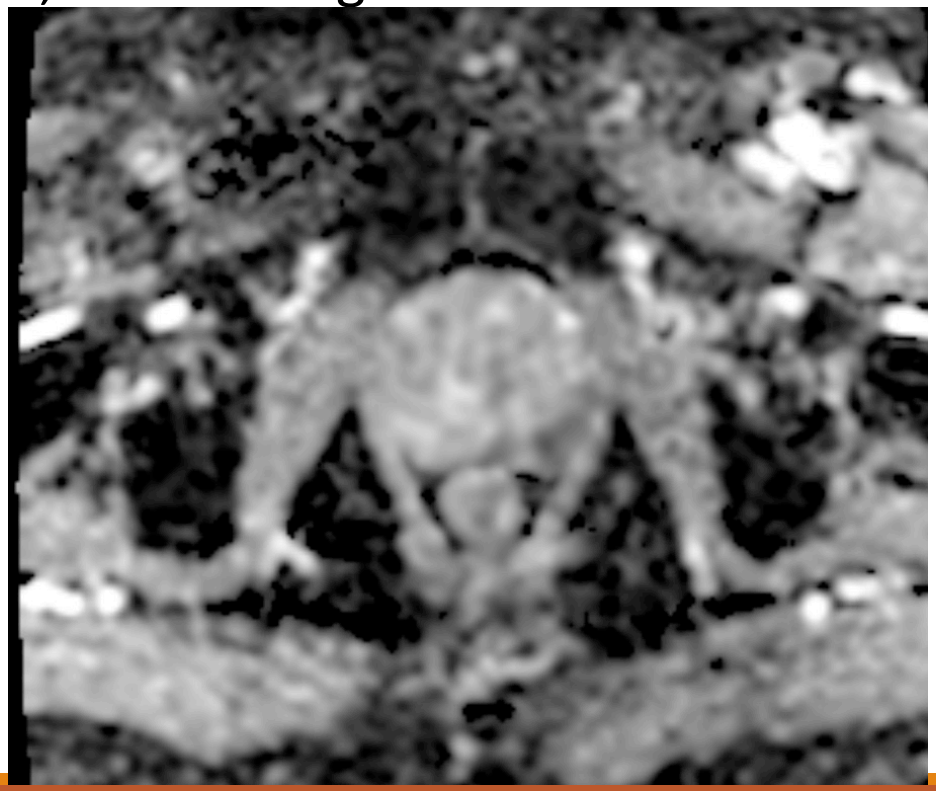
Focal mildly/moderately hypointense on ADC and isointense/mildly hyperintense on high b value DWI
PI-RADS 3



INTERPRETATION: DWI Peripheral zone

Focal markedly hypontense on ADC and markedly hyperintense on high b value DWI; <1.5cm in greatest dimension

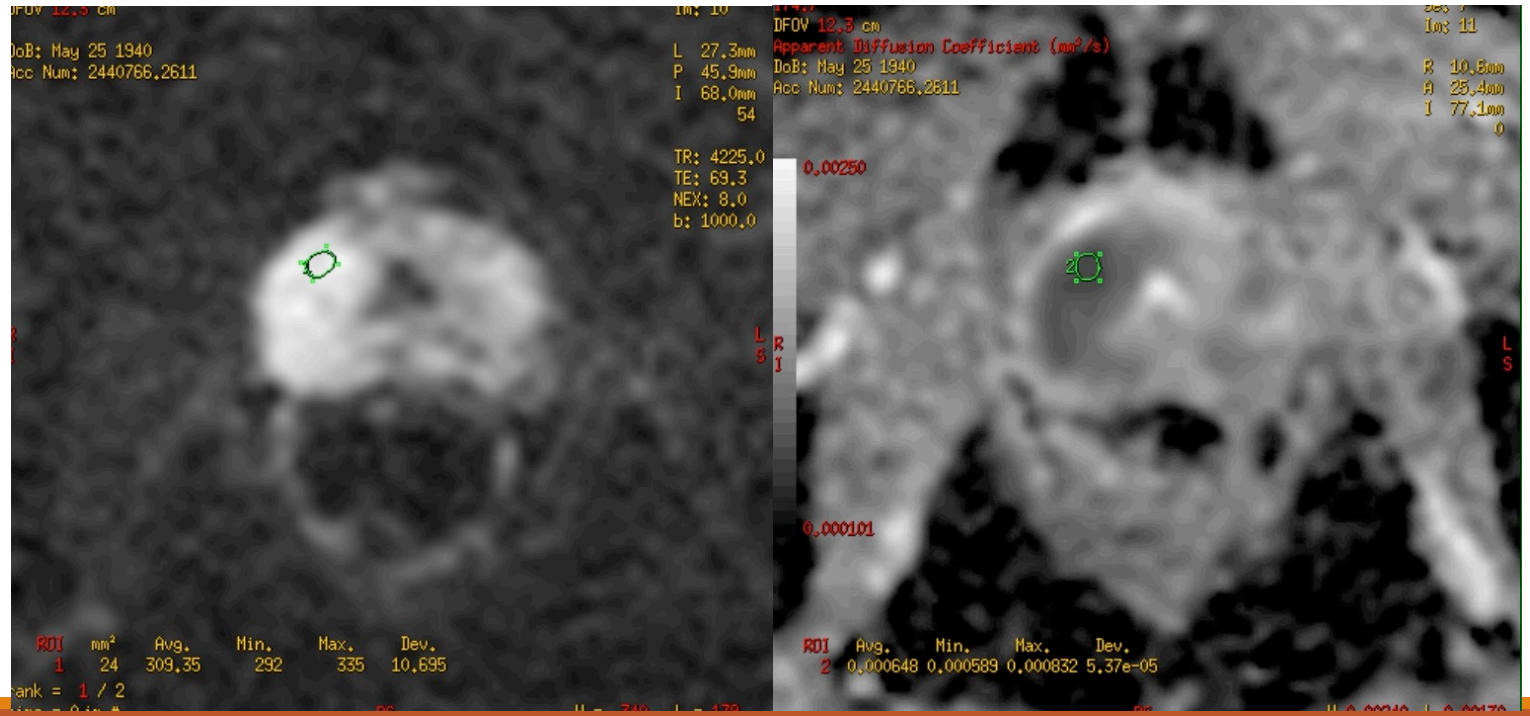
PI-RADS 4



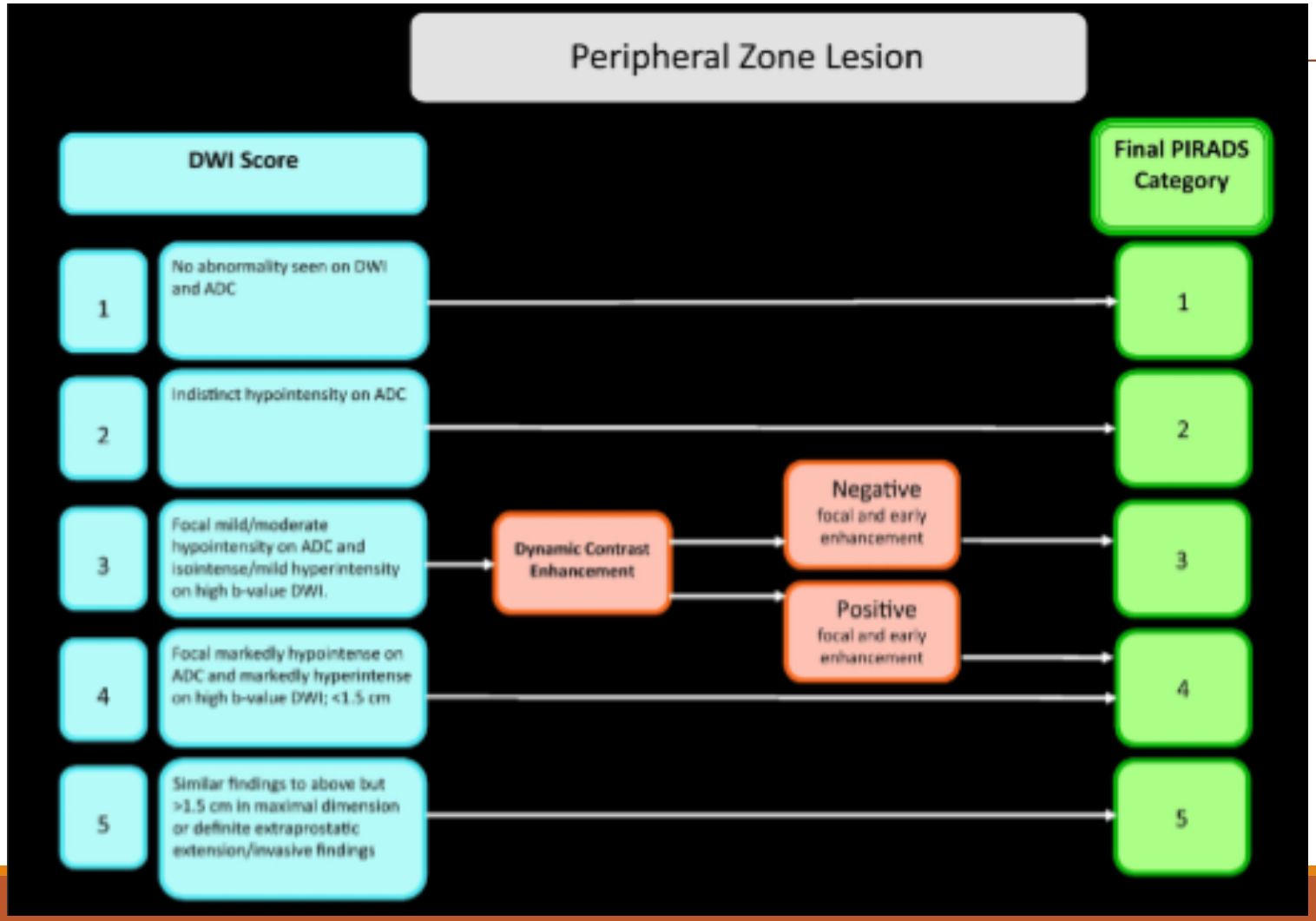
INTERPRETATION: DWI Peripheral zone

Focal markedly hypontense on ADC and markedly hyperintense on high b value DWI >1.5cm in greatest dimension or definite extraprostatic extension/invasive behavior

PI-RADS 5



PIRADS - mpMR Imaging of prostate gland

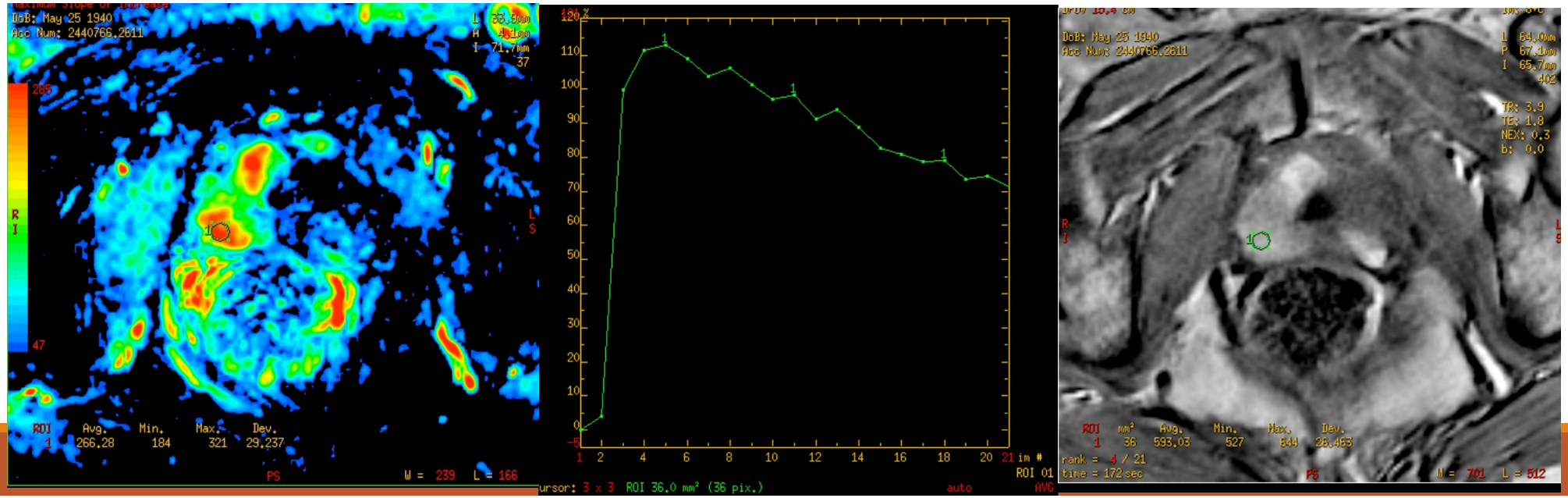


INTERPRETATION: ADC Peripheral zone

- Qualitative assessment, with or without a colour map, is recommended for ADC series
- 1400:1400 (W:L) is a useful window for ADC series to maximize lesion conspicuity
- Quantitative assessment of ADC values has not been standardized across vendors
- Despite this caveat, ADC values less than 750-900 µm2/sec, raises concern for a clinically significant PZ cancer

DCE

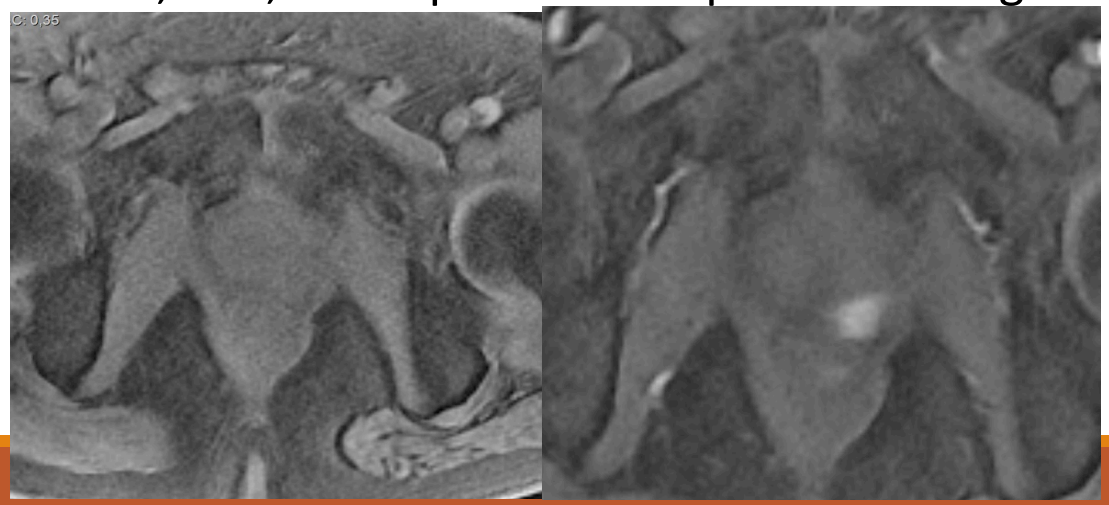
- Most PC are associated with neo-angiogenesis and increased vascular permeability resulting in pronounced contrast enhancement and a curve showing high peak enhancement and early washout
- DCE curve analyses that were part of PI-RADSv1 were completely eliminated
-



INTERPRETATION: DCE

Positive being “focal and earlier than or contemporaneously enhancement of adjacent normal tissues

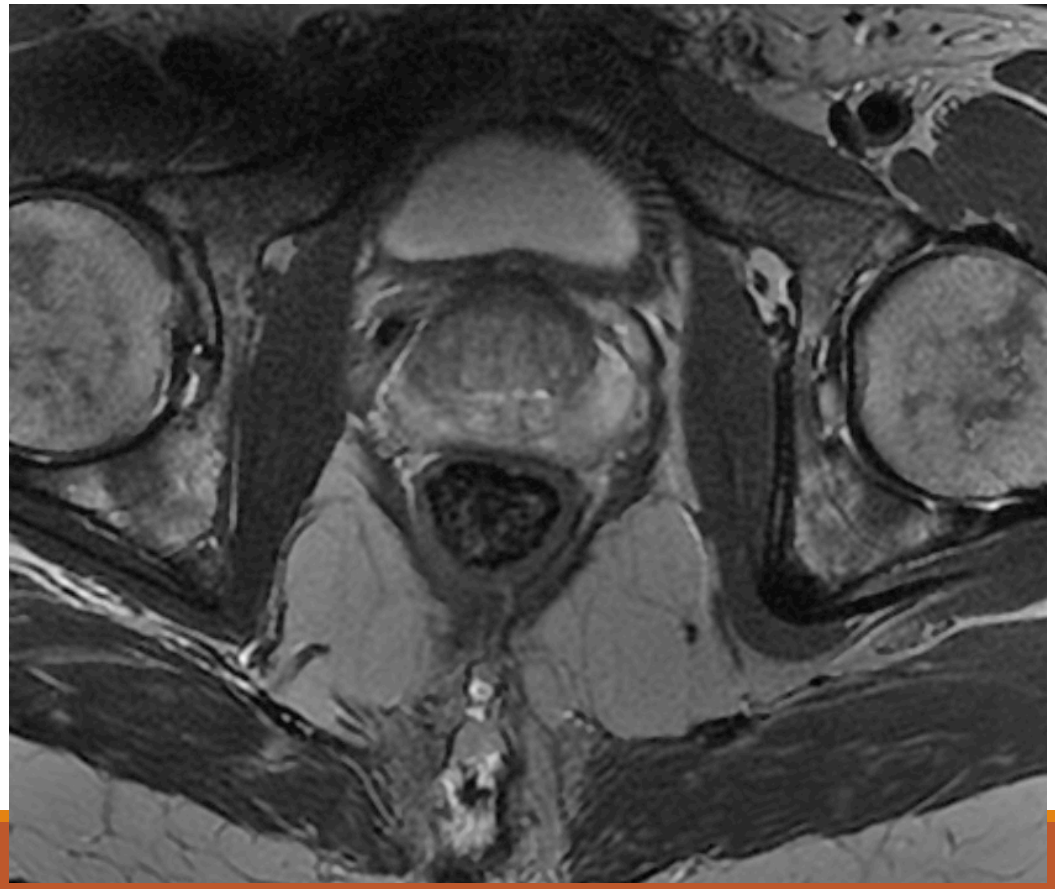
- (-) no early enhancement, or diffuse enhancement not corresponding to a focal finding on T2 and/or DWI or focal enhancement corresponding to a lesion demonstrating features of BPH onT2W
- (+) focal, and; earlier than or contemporaneously with enhancement of adjacent normal prostatic tissues, and; corresponds to suspicious finding on T2W and/or DW



INTERPRETATION: T2W TRANSITION ZONE

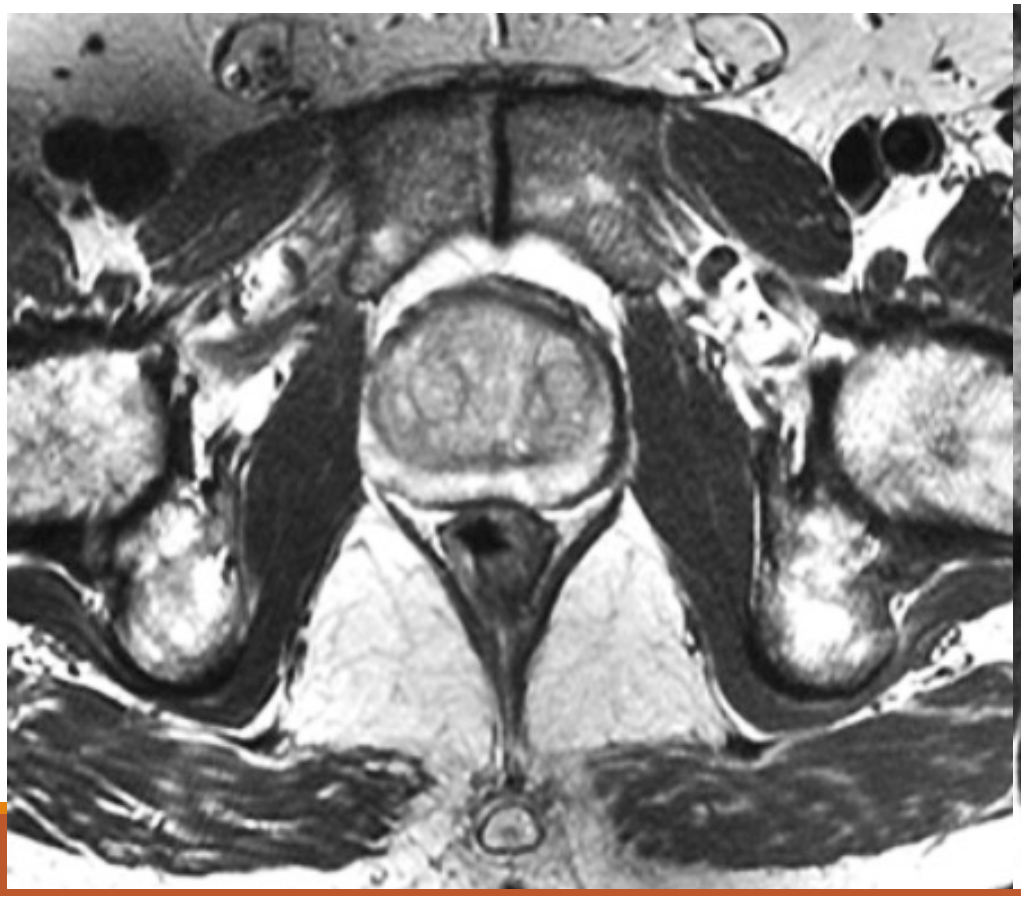
Homogeneous intermediate signal intensity (normal)

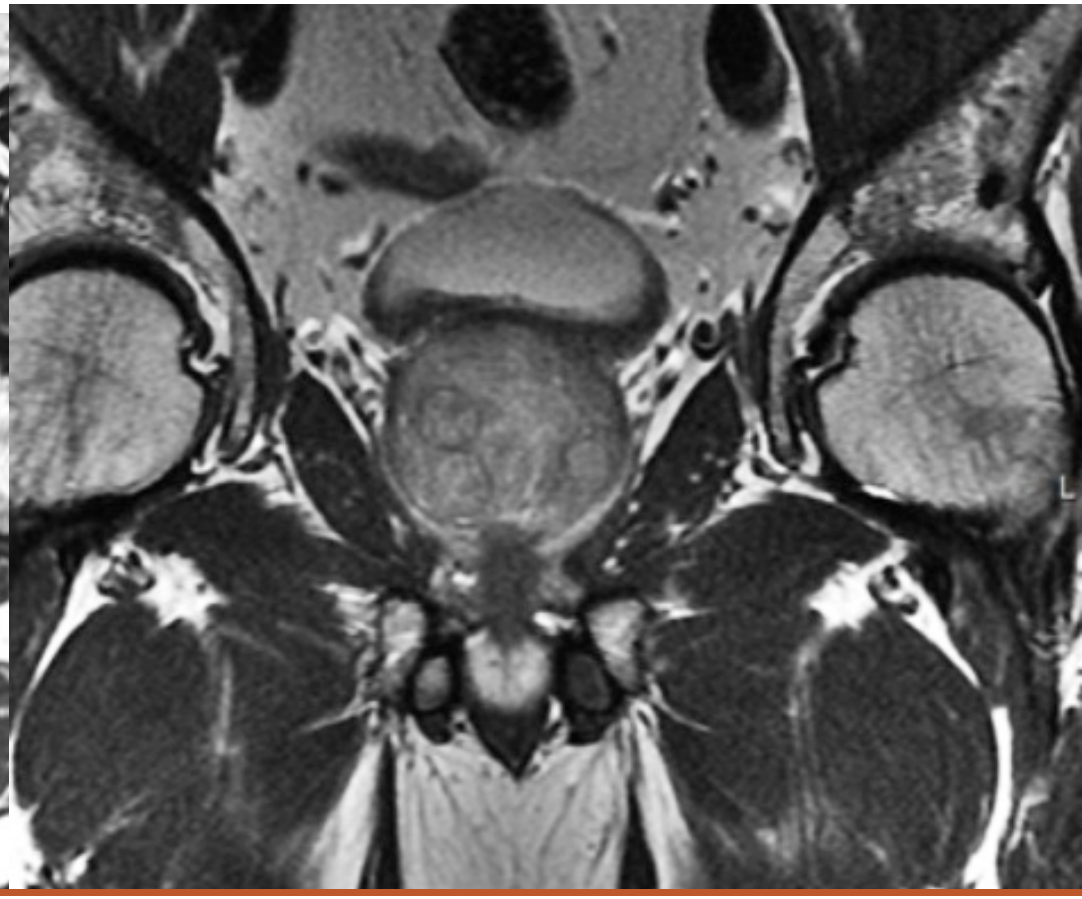
PI-RADS 1



INTERPRETATION: T2W TRANSITION ZONE

Circumscribed hypointense or heterogeneous encapsulated nodule(s) (BPH)
PI-RADS 2

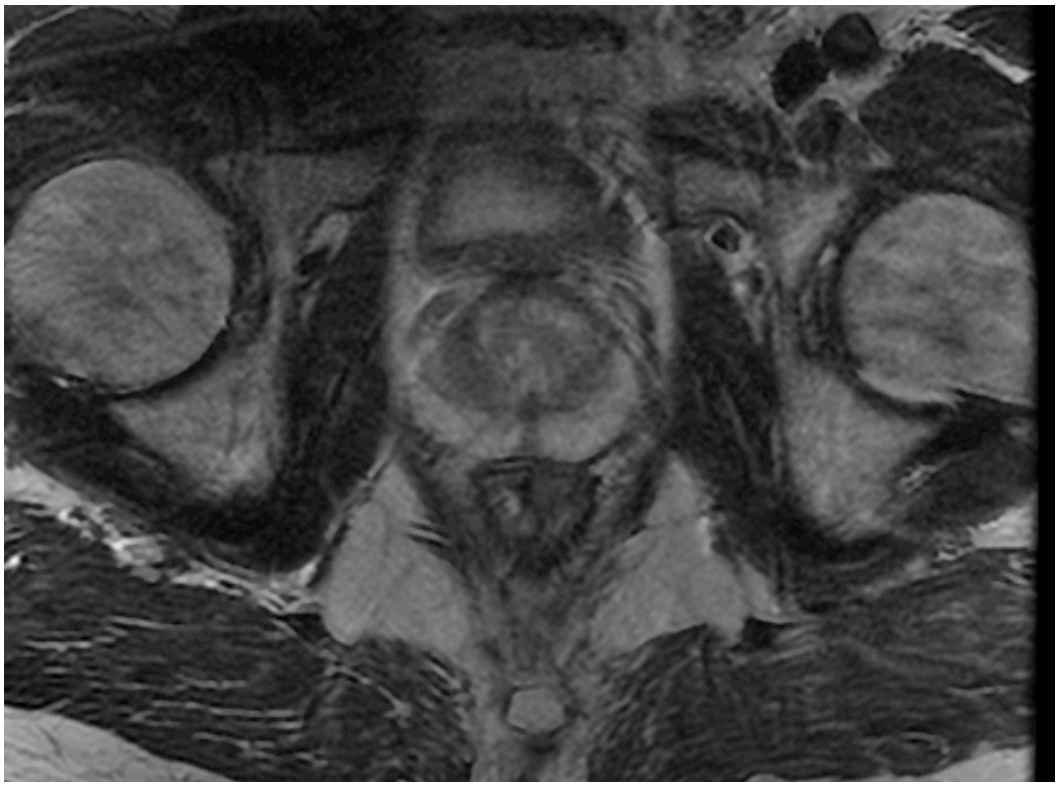




INTERPRETATION: T2W TRANSITION ZONE

Heterogeneous signal intensity with obscured margins

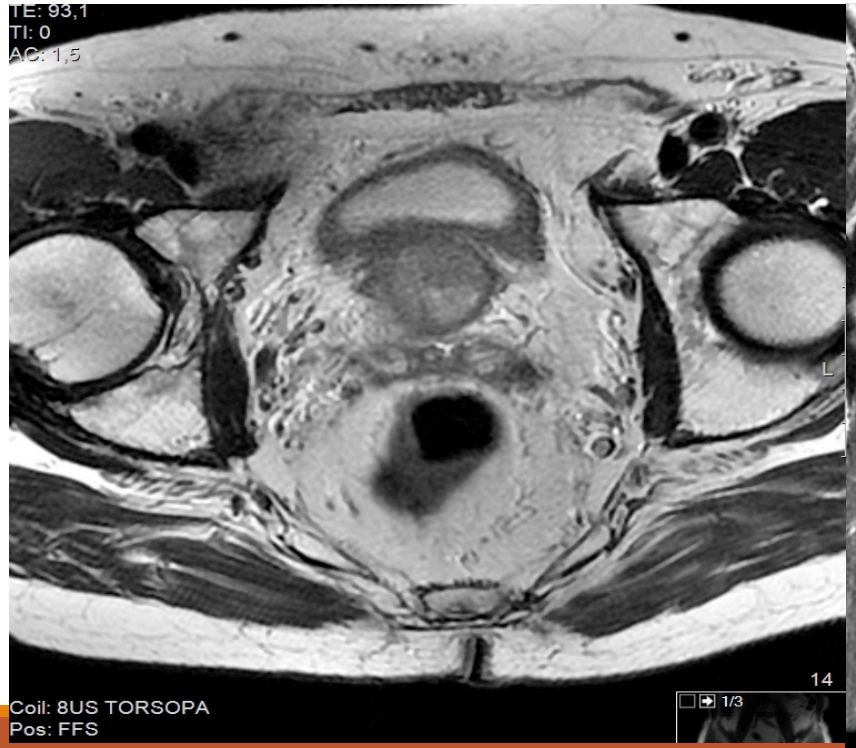
PI-RADS 3

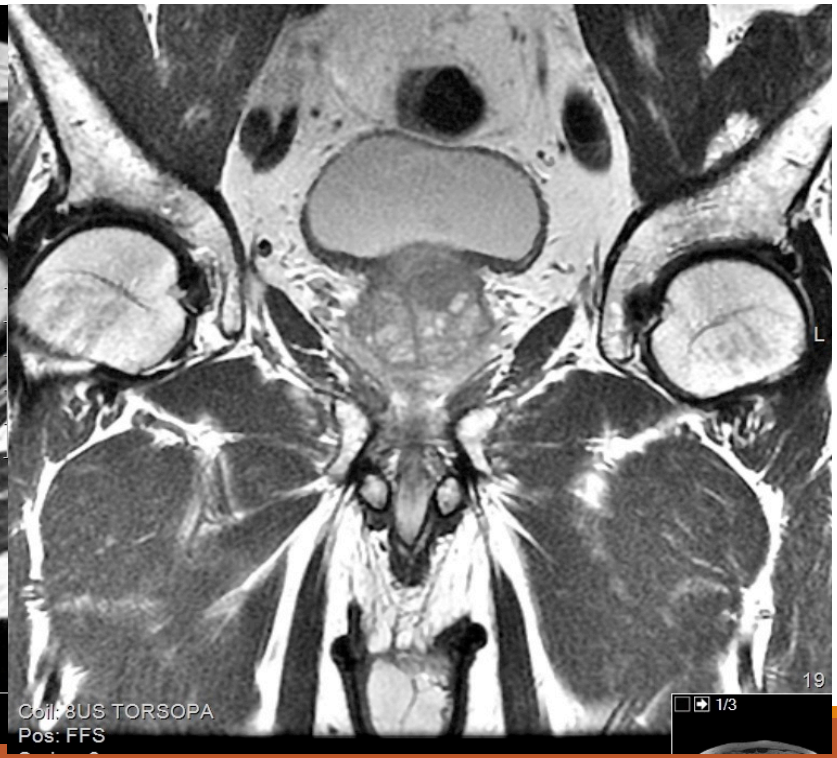


INTERPRETATION: T2W TRANSITION ZONE

Lenticular or non-circumscribed, homogeneous, moderately hypointense, and <1.5 cm in greatest dimension

PI-RADS 4

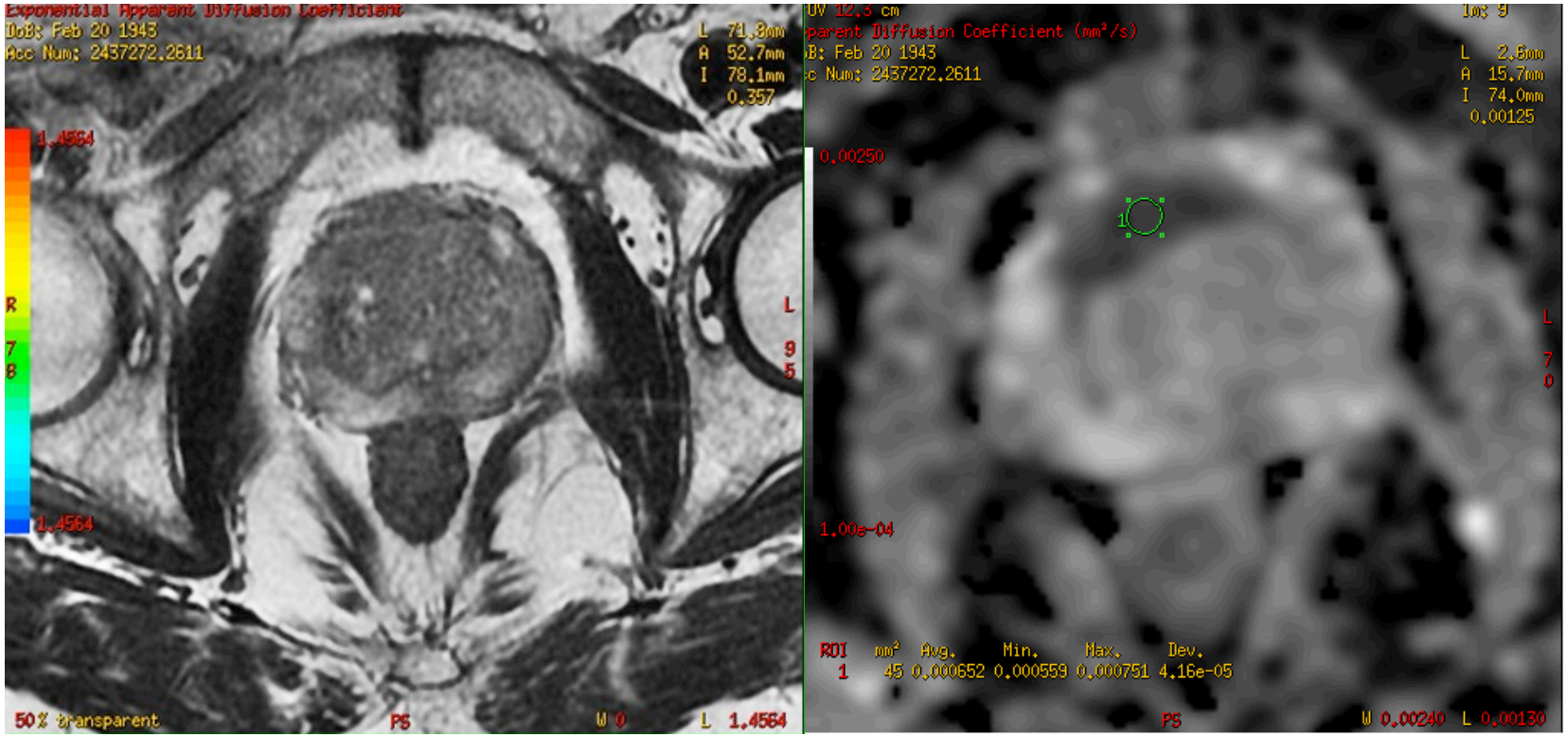




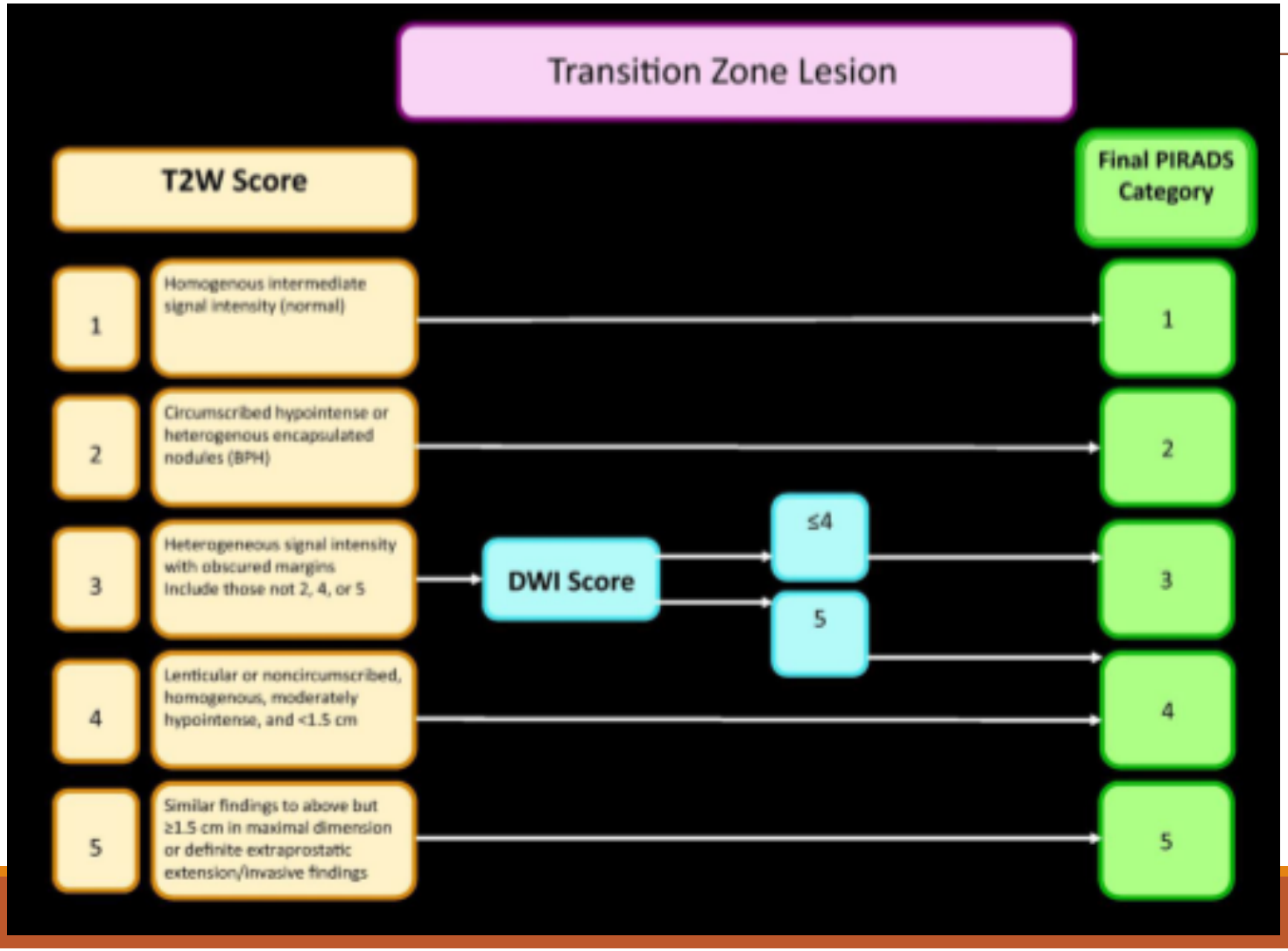
INTERPRETATION: T2W TRANSITION ZONE

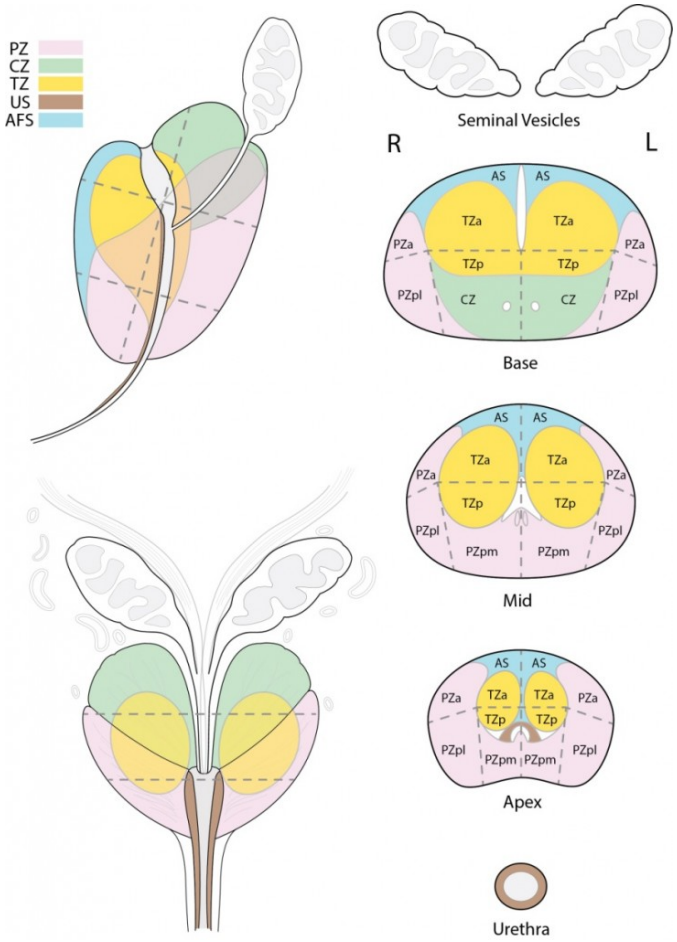
Lenticular or non-circumscribed, homogeneous, moderately hypointense >1.5 cm in greatest dimension or definite extraprostatic extension/invasive behavior

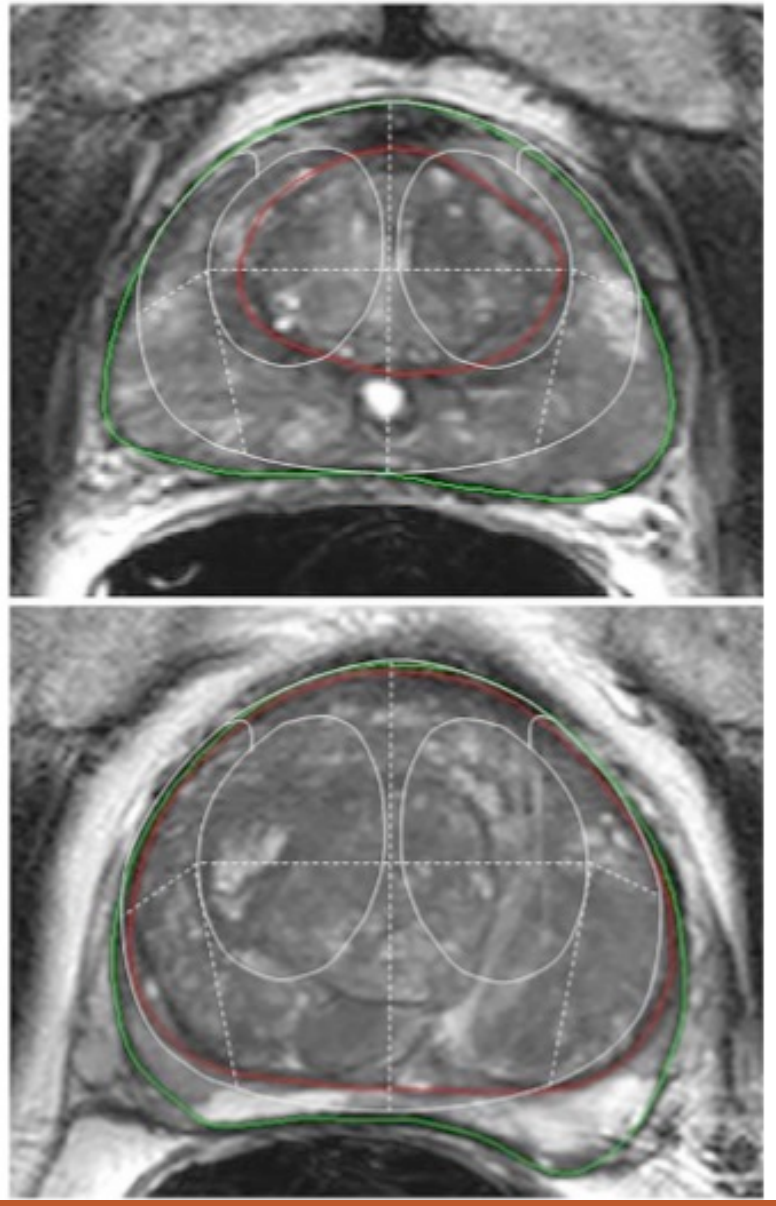
PI-RADS 5



PIRADS - mpMR Imaging of prostate gland

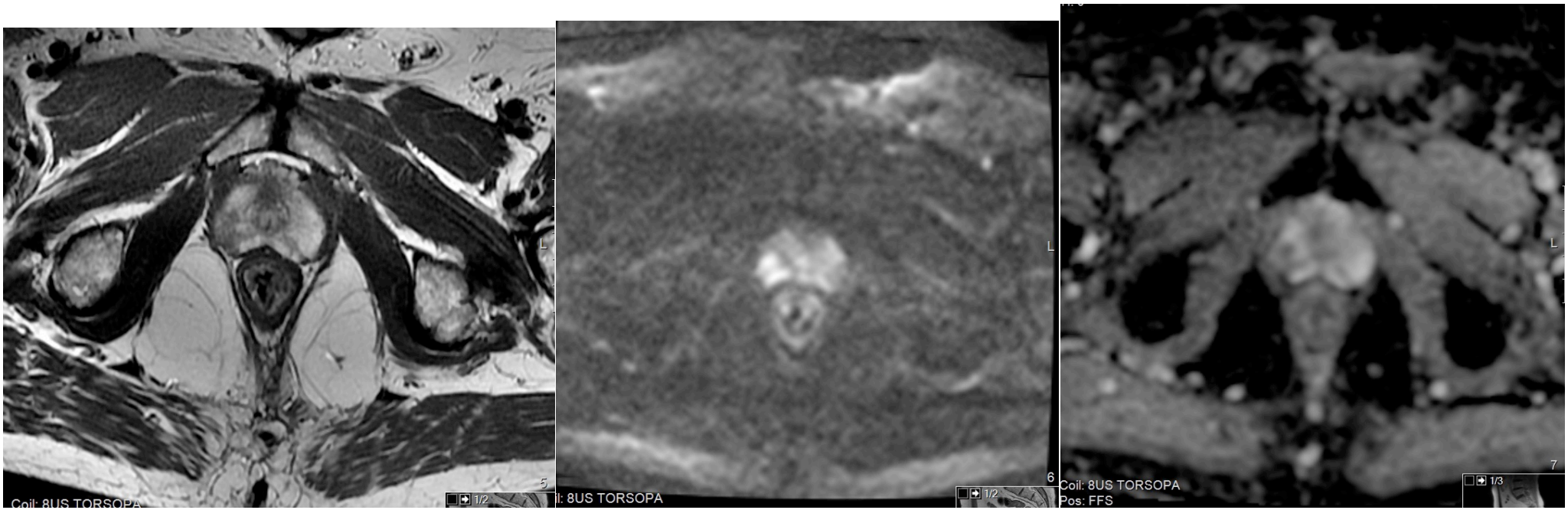




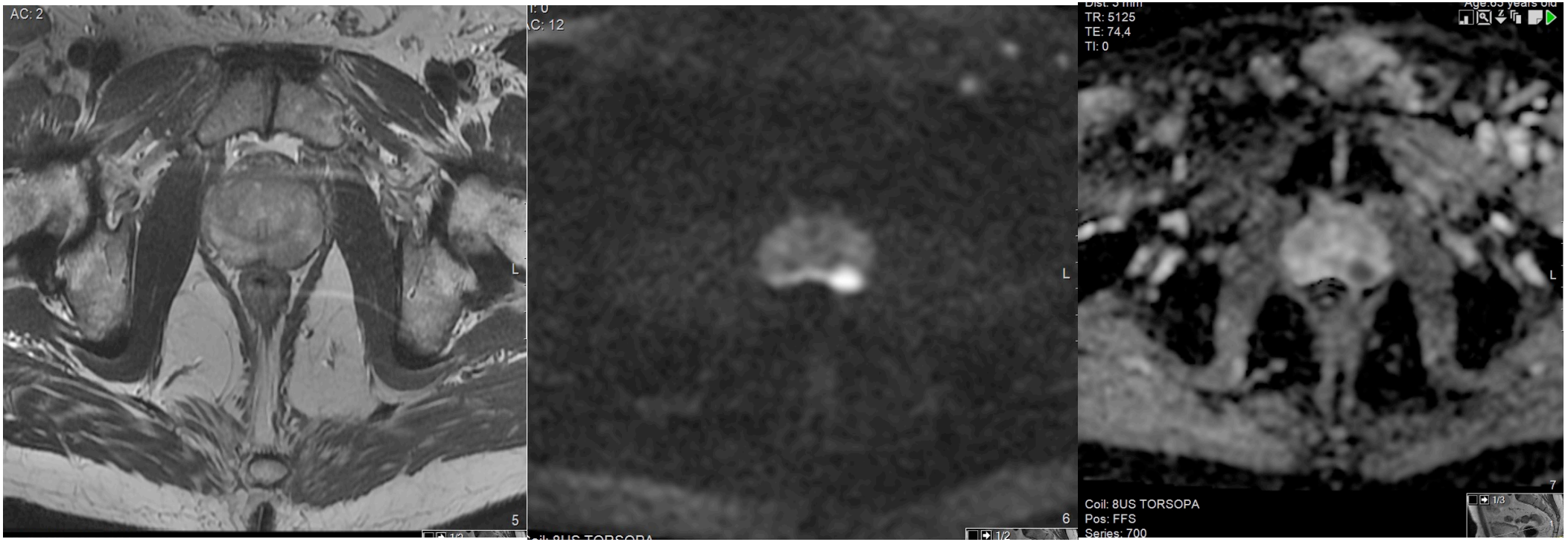


McNeal Zonal anatomy

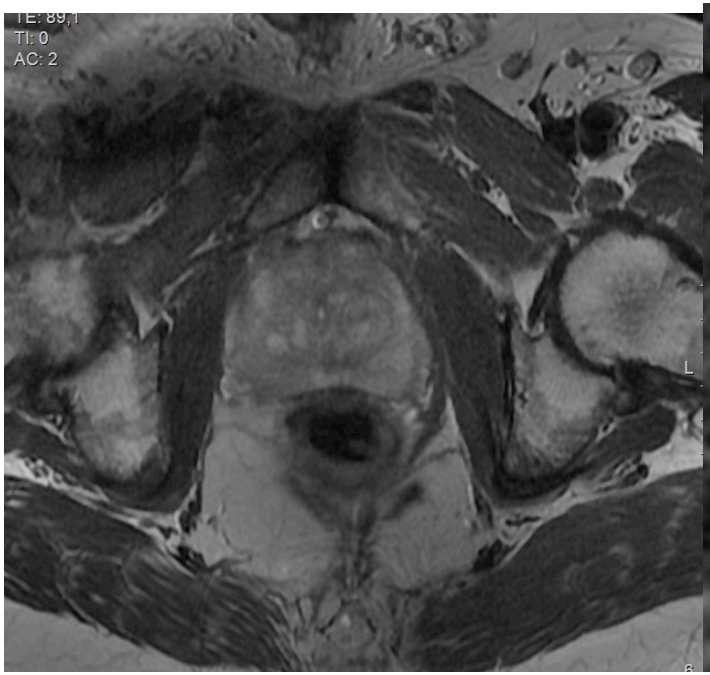
McNeal JE. The zonal anatomy of the prostate. Prostate 1981; 2:35–49

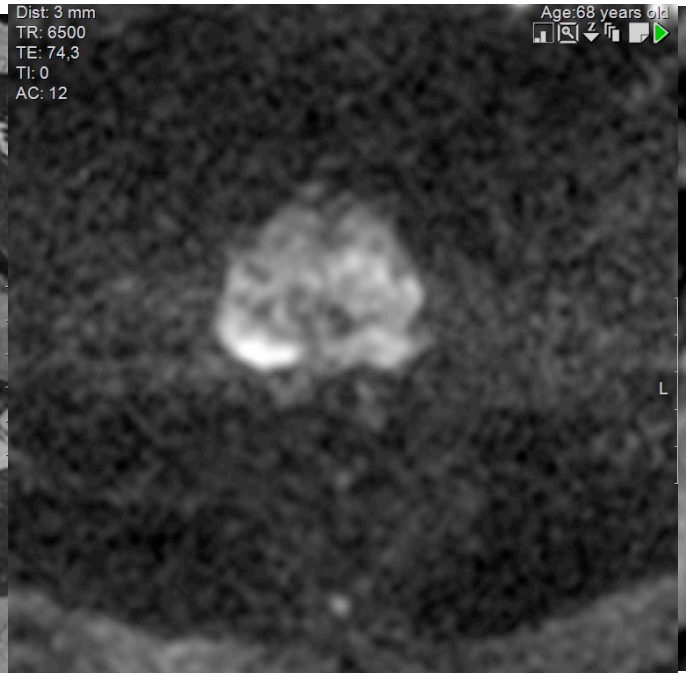


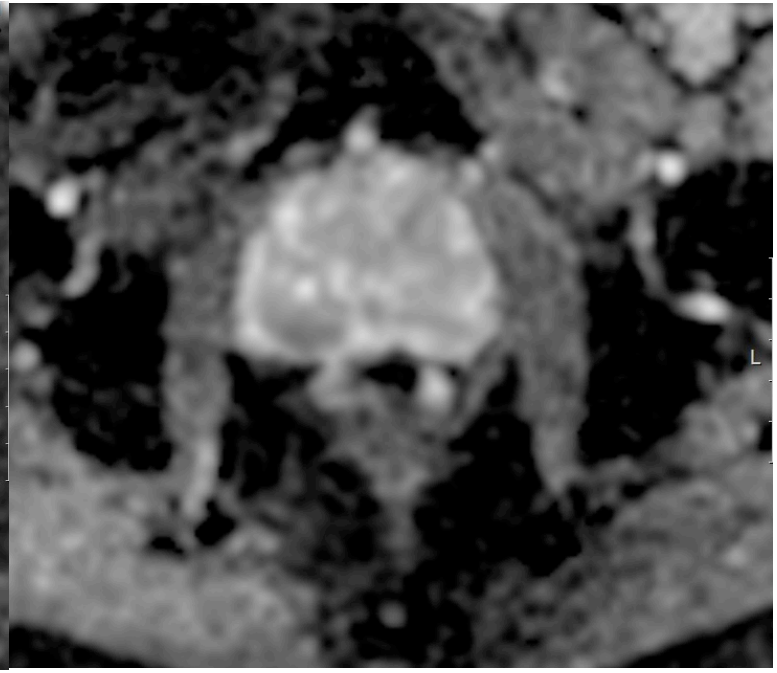
65Y
DRE -
PSA 5 ng/ml
PIRADS 4
GLEASON 3+3=6



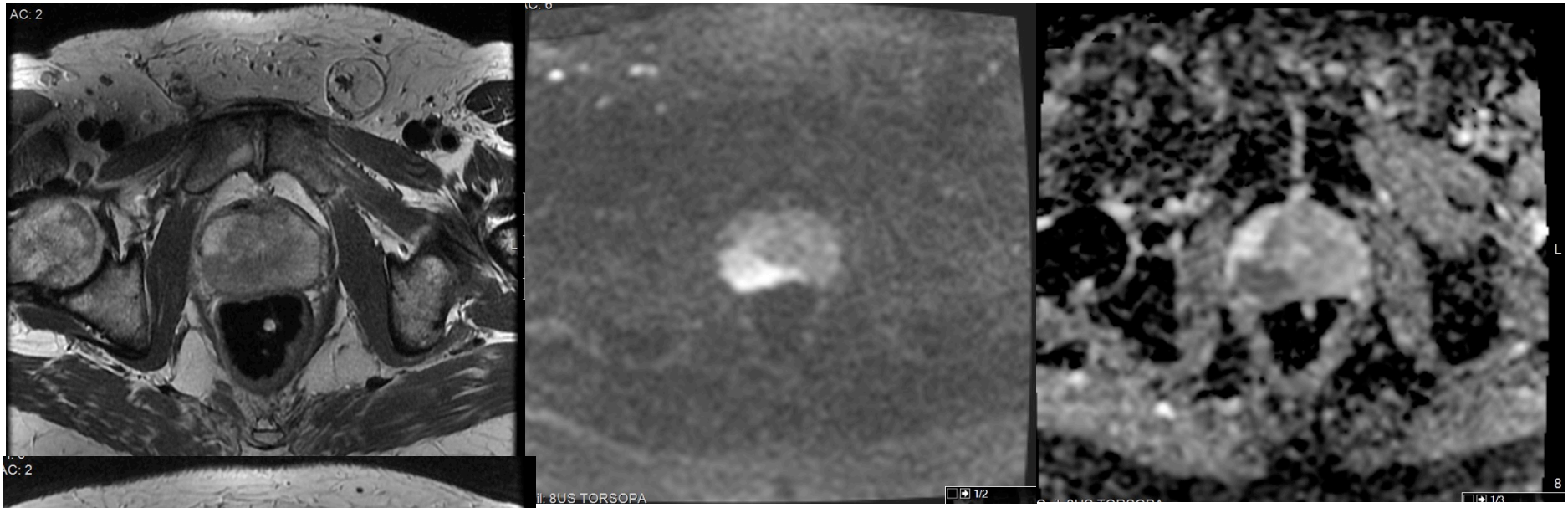
63Y
DRE -
PSA 5 ng/ml
PIRADS 4
GLEASON 3+4



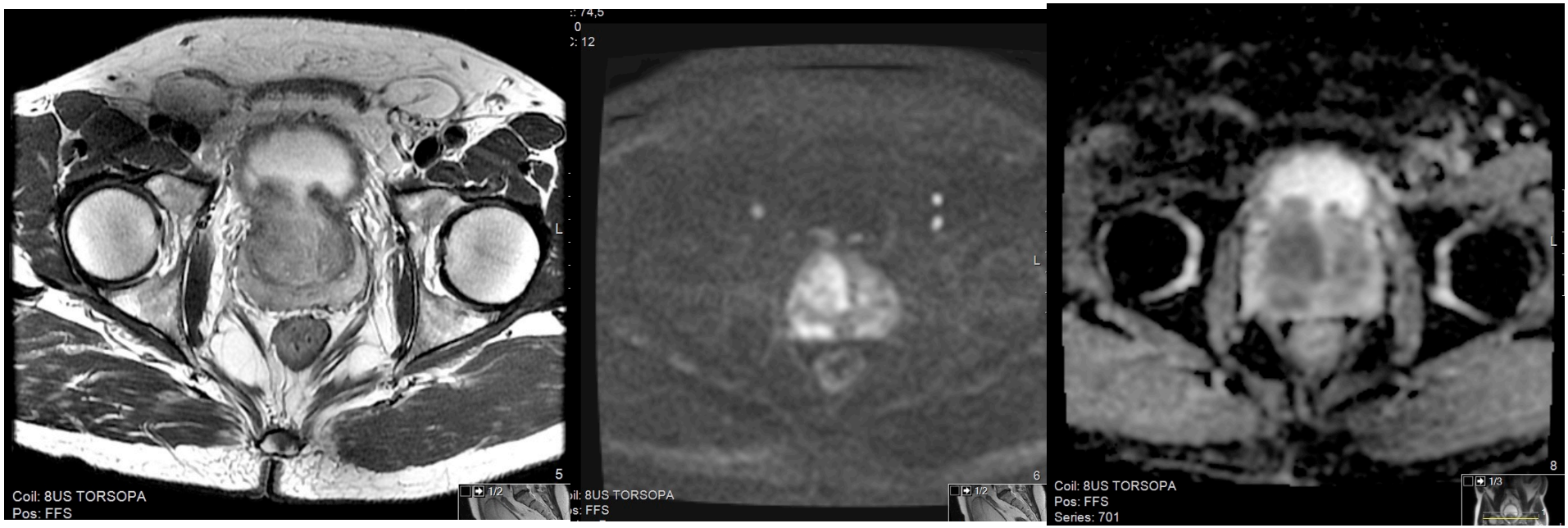




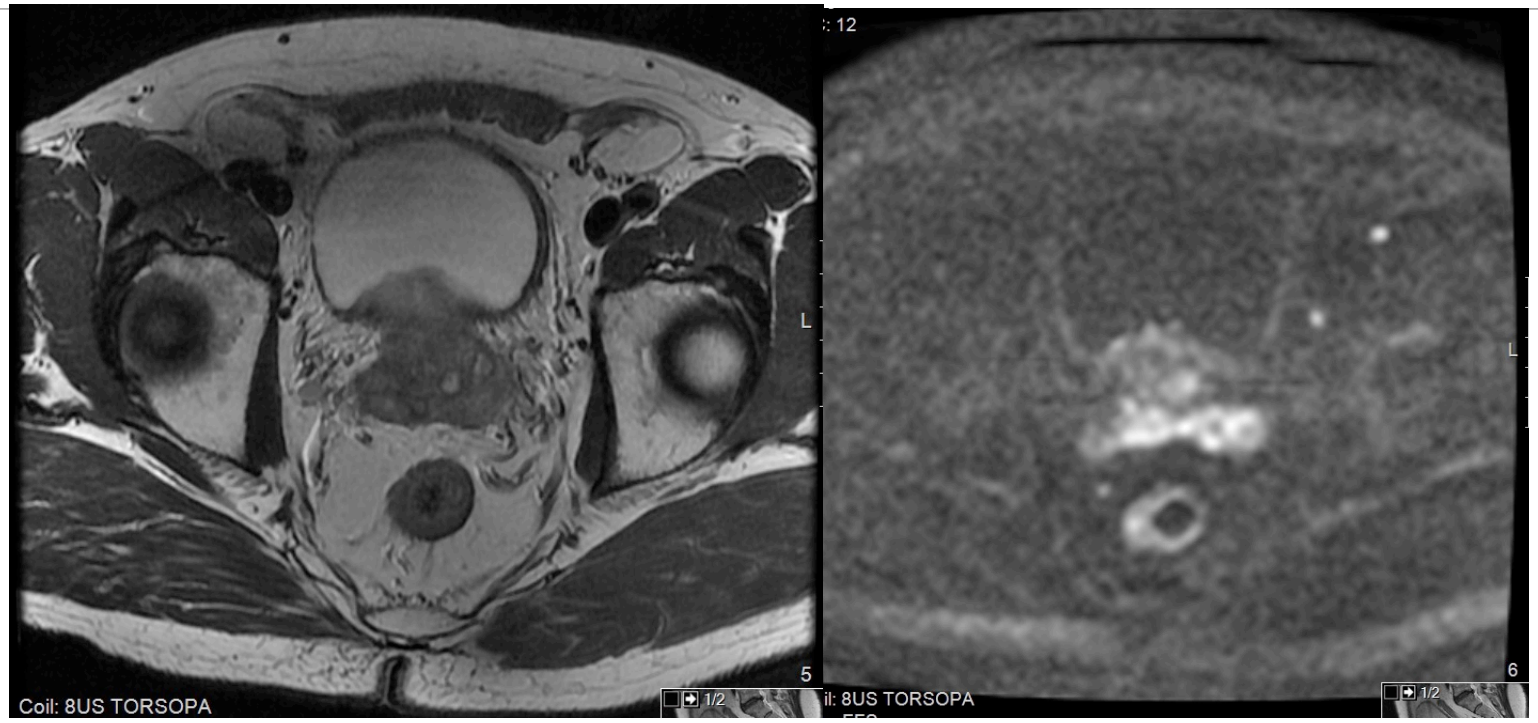
66Y
DRE -
PSA 5.7ng/ml
PIRADS 4
GLEASON 3+3=6 παρουσία τριτεύουσας διαβάθμισης 5 πολλές εστίες δεξιά.
(T2α).



60Y
DRE +
PSA 7 ng/ml
PIRADS 5
GLEASON 3+4=7 ελάχιστη αναλογία τριτεύουσας διαβάθμισης 5 εξωκαψική επέκταση. Διήθηση των σπερματοδόχων κύστεων (T3b).



66Y
DRE +
PSA 23 ng/ml
PIRADS 5
GLEASON 4+3=7 παρουσία τριτεύουσας διαβάθμισης 5
Διήθηση σπερματοδόχων κύστεων
(T3b).


L
5
Coil: 8US TORSOPA
1/2
: 12
L
6
1/2

CONTEXT:
In 2015, the updated Prostate Imaging Reporting and Data System version 2 (PI-RADSv2) for the detection of prostate cancer (PCa) was established. Since then, several studies assessing the value of PI-RADSv2 have been published.

OBJECTIVE:
To review the diagnostic performance of PI-RADSv2 for the detection of PCa.

CONCLUSIONS:
PI-RADSv2 shows good performance for the detection of PCa. PI-RADSv2 has higher pooled sensitivity than PI-RADSv1 without significantly different specificity.

PATIENT SUMMARY:
We reviewed all previous studies using Prostate Imaging Reporting and Data System version 2 (PI-RADSv2) for prostate cancer detection. We found that the updated PI-RADSv2 shows significant improvement compared with the original PI-RADSv1.

Diagnostic Performance of **Prostate Imaging** Reporting and Data System Version 2 for Detection of **Prostate** Cancer: A Systematic Review and Diagnostic Meta-analysis.
Woo S, Suh CH, Kim SY, Cho JY, Kim SH.
EUR urol. 2017 Feb 11.

MP-MRI για την ανίχνευση του καρκίνου του προστάτη -CSC

- Εντόπιση του όγκου στον προστάτη (PZ ή TZ)
- Μέγεθος
- Ιστολογικά χαρακτηριστικά (Gleason)?

Pokorny MR et al (2014) Prospective study of diagnostic accuracy comparing prostate cancer detection by transrectal ultrasound-guided biopsy versus magnetic resonance (MR) imaging with subsequent MR-guided biopsy in men without previous prostate biopsies. Eur Urol 66(1):22–29

PI-RADS v2

- DWI for the peripheral zone (PZ)
  sensitivity 57-93 % and specificity 57-100 %
- T2-WI for the TZ
  sensitivity 57%-88% specificity 28%-94%,

PI-RADS Prostate Imaging - Reporting and Data System: 2015, Version 2.
Weinreb JC, Barentsz JO, Choyke PL, Cornud F, Haider MA, Macura KJ, Margolis D, Schnall MD, Shtern F, Tempany CM, Thoeny HC, Verma S.
Eur Urol. 2016 Jan;69(1):16-40.

MP-MRI για την ανίχνευση του καρκίνου του προστάτη-CSC

- Η ακρίβεια της μαγνητικής τομογραφίας στην ανίχνευση PC ποικίλλει ανάλογα με τον ορισμό των κλινικά σημαντικών PC
- Κατώφλι mpMRI που χρησιμοποιείται
- PI-RADS 3 θεωρείται θετική ή αρνητική?

When a PI-RADS overall assessment score of 3 was used as threshold for a positive mpMRI, 100 % sensitivity and 100 % NPV was achieved for detection of Gleason 4+3 PC, at the expense of 19 % specificity due to many false positives.

When a PI-RADS overall assessment score of 4 was used as a threshold for the detection of Gleason 4+3 PC, specificity increased to 61 % (indicating less false positives), with still having a sensitivity of 92 % and a NPV of 99 %

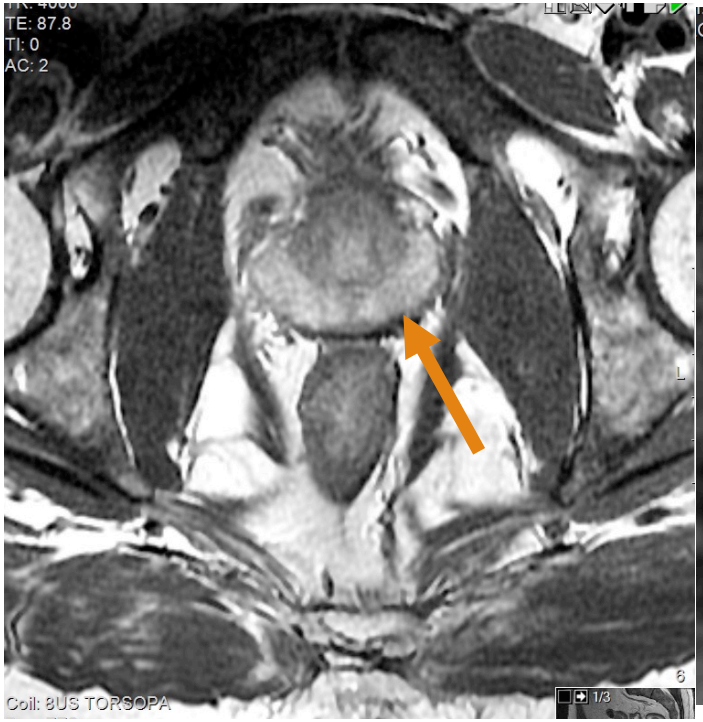
Abd-Alazeez M et al (2014) Performance of multiparametric MRI in men at risk of prostate cancer before the first biopsy: a paired validating cohort study using template prostate mapping biopsies as the reference standard. Prostate Cancer Prostatic Dis 17(1):40–46

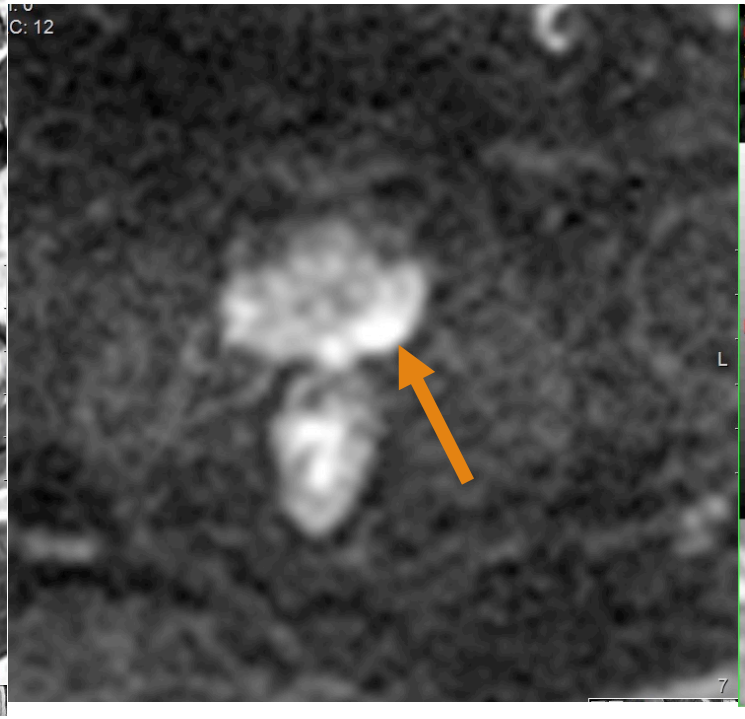
Εκτίμηση της επιθετικότητας του όγκου mpMRI

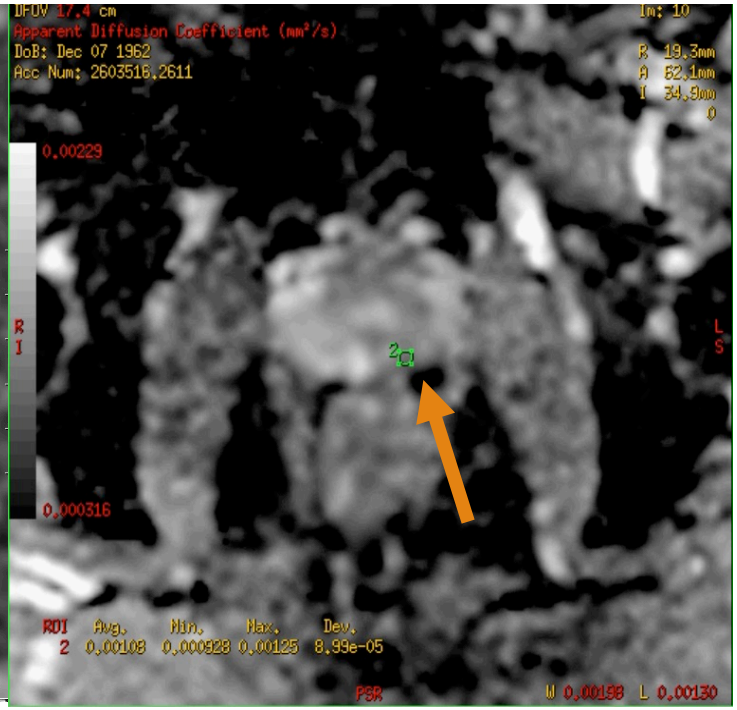
- DWI, χαμηλότερες τιμές ADC συνδέονται στενά με υψηλότερο Gleason σκορ
- T2-WI, χαμηλότερο SI φαίνεται να σχετίζεται με υψηλότερο Gleason σκορ

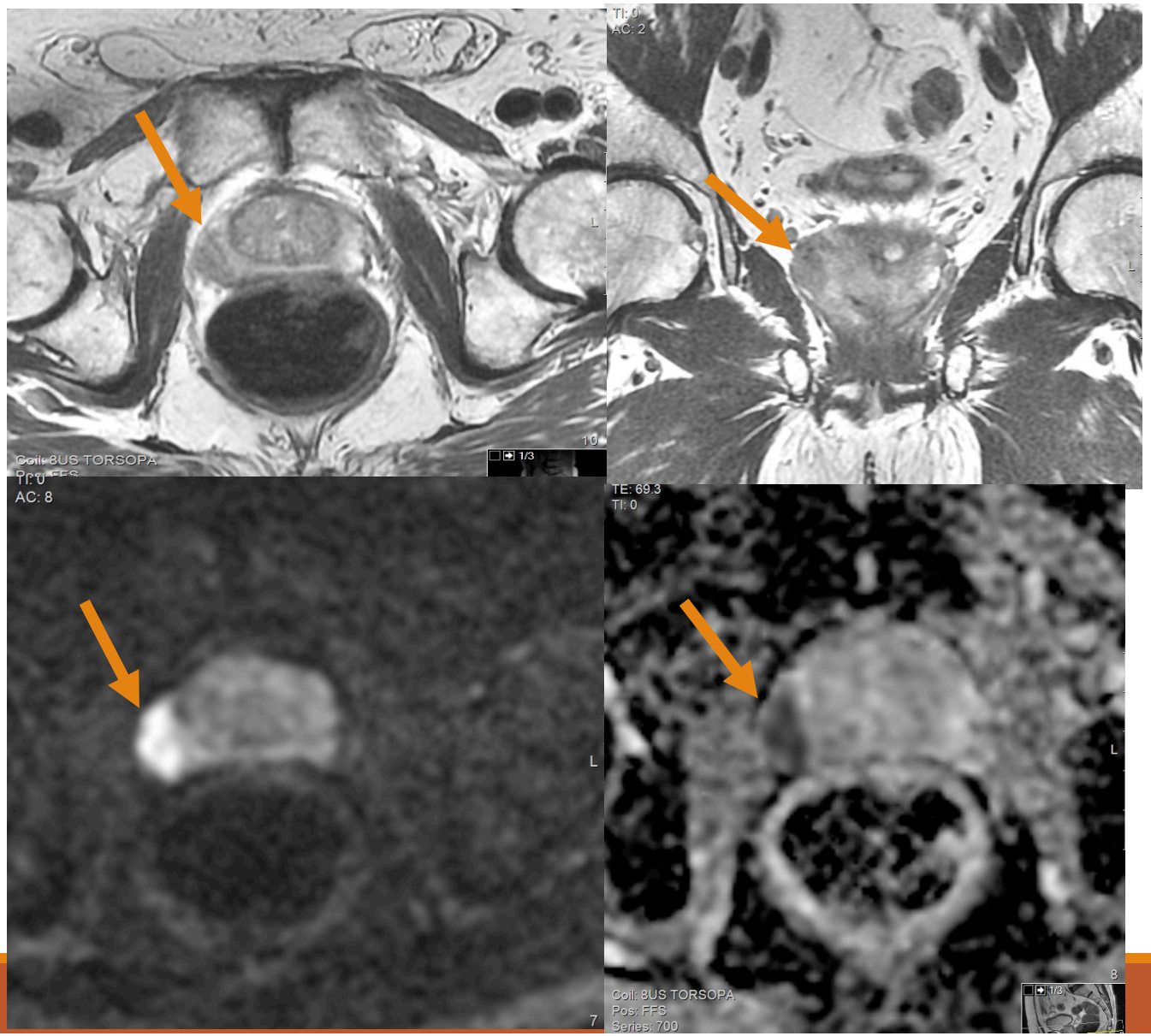
Bratan F et al (2013) Influence of imaging and histological factors on prostate cancer detection and localisation on multiparametric MRI: a prospective study. Eur Radiol 23(7):2019–2029

Gleason 3+4


TE: 87.8
TI: 0
AC: 2
Coil: 8US TORSOPA


C: 12


DFOV 17.4 cm
Apparent Diffusion Coefficient (mm²/s)
DoB: Dec 07 1962
Acc Num: 2603516.2611
0.00229
0.000316
ROI Avg. Min. Max. Dev.
2 0.00108 0.000928 0.00125 8.99e-05
PSR


TI: 0
AC: 2
Coil: 8US TORSOPA
TI: 0
AC: 8
TE: 69.3
TI: 0
Coil: 8US TORSOPA
Pos: FFS
Series: 700

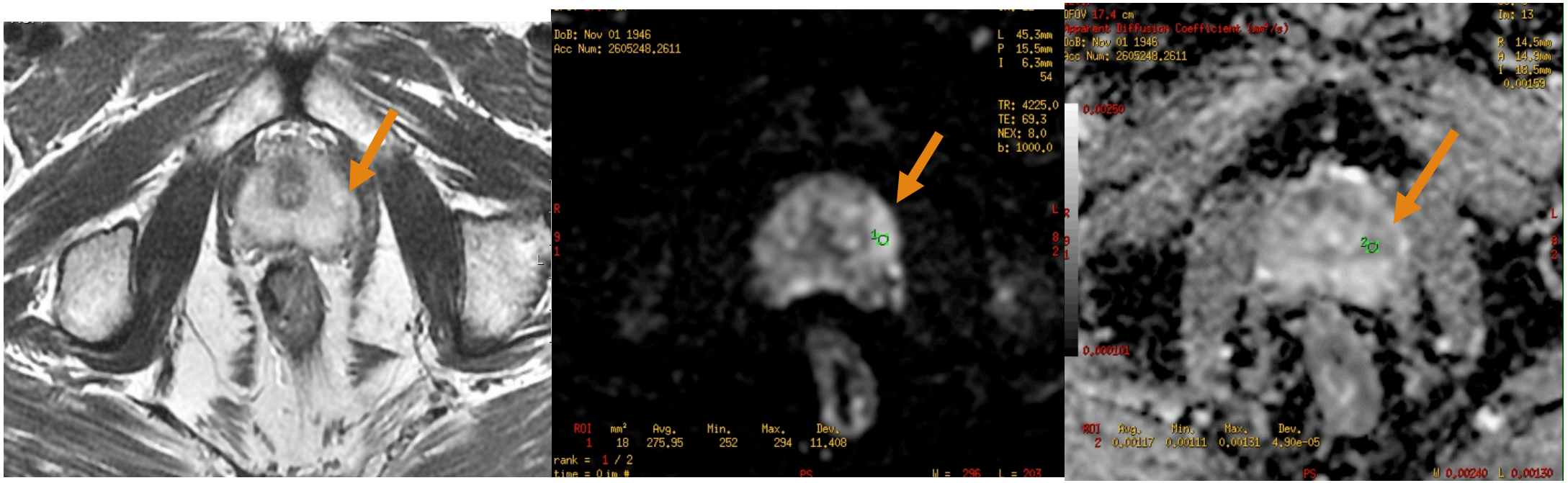
Gleason 4+5

Εκτίμηση του μεγέθους του όγκου με mpMRI

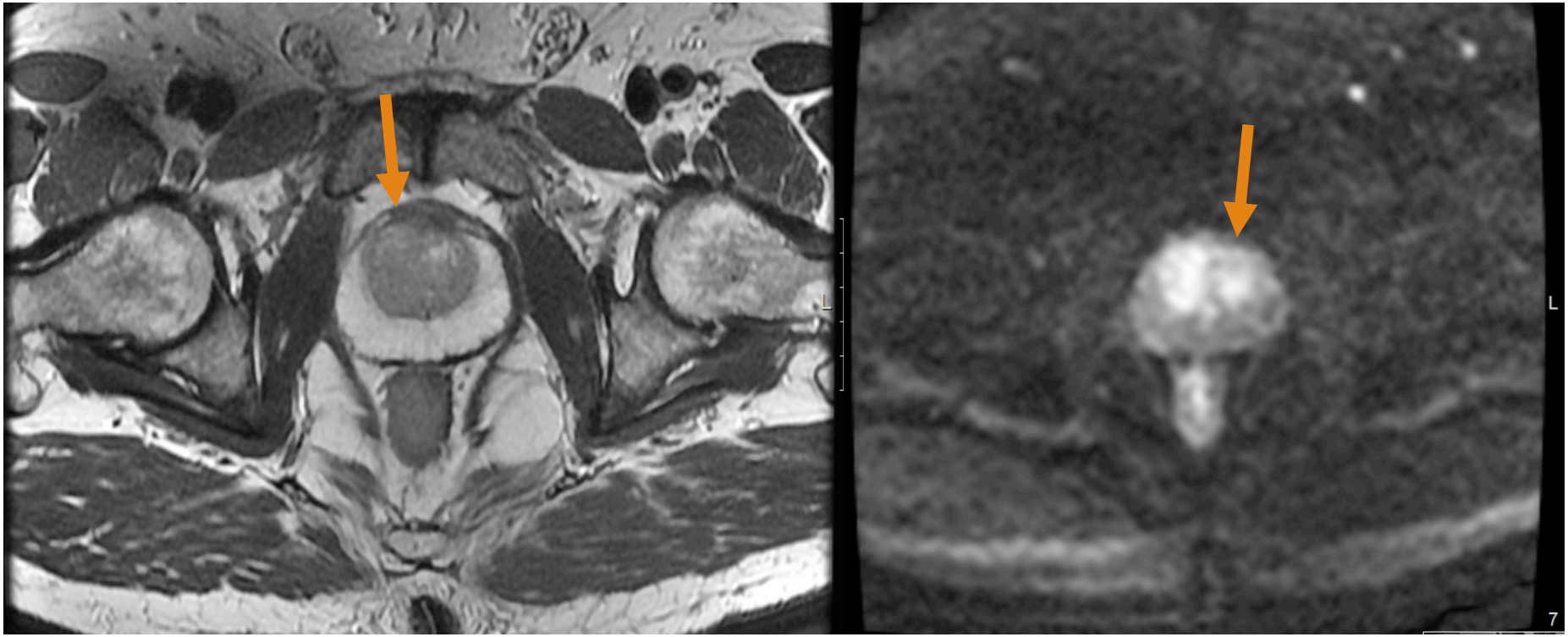
- Το μέγεθος του όγκου μπορεί να μετρηθεί σε υψηλής ευκρίνειας εγκάρσιες, οβελιαίες και στεφανιαίες τομές T2-WI.
- Πολύ μικροί όγκοι < 1 mm είναι κάτω από το όριο ανίχνευσης της mpMRI.

Bratan F et al (2013) Influence of imaging and histological factors on prostate cancer detection and localisation on multiparametric MRI: a prospective study. Eur Radiol 23(7):2019–2029

Εκτίμηση του μεγέθους του όγκου με mpMRI



Εκτίμηση του μεγέθους του όγκου με mpMRI



Abdom Radiol (NY). 2018 May 11. doi: 10.1007/s00261-018-1631-z. [Epub ahead of print]
Evaluating the size criterion for PI-RADSv2 category 5 upgrade: is 15 mm the best threshold?
An JY1, Harmon SA2, Mehralivand S3,4,5, Czarniecki M3, Smith CP3, Peretti JA1, Wood BJ1, Pinto PA4, Choyke PL3, Shih JH6, Turkbey B7.
Abstract
PURPOSE:
The purpose of the study was to determine if the ≥ 15 mm threshold currently used to define PIRADS 5 lesions is the optimal size threshold for predicting high likelihood of clinically significant (CS) cancers.
MATERIALS:
Three hundred and fifty-eight lesions that may be changed from category 4 to 5 or vice versa on the basis of the size criterion (category 4: n = 288, category 5: n = 70) from 255 patients were evaluated. Kendall's tau-b statistic accounting for inter-lesion correlation, generalized estimation equation logistic regression, and receiver operating curve analysis evaluated two lesion size-metrics (lesion diameter and relative lesion diameter-defined as lesion diameter/prostate volume) for ability to identify CS (Gleason grade ≥ 3 + 4) cancer at targeted biopsy. Optimal cut-points were identified using the Youden index. Analyses were performed for the whole prostate (WP) and zone-specific sub-cohorts of lesions in the peripheral and transition zones (PZ and TZ).
RESULTS:
Lesion diameter showed a modest correlation with Gleason grade (WP: $\tau_B = 0.21$, $p < 0.0001$; PZ: $\tau_B = 0.13$, $p = 0.02$; TZ: $\tau_B = 0.32$, $p = 0.001$), and association with CS cancer detection (WP: AUC = 0.63, PZ: AUC = 0.59, TZ: AUC = 0.74). Empirically derived thresholds (WP: 14 mm, PZ: 13 mm, TZ: 16 mm) performed similarly to the current ≥ 15 mm standard. Lesion relative lesion diameter improved identification of CS cancers compared to lesion diameter alone (WP: $\tau_B = 0.30$, PZ: $\tau_B = 0.24$, TZ: $\tau_B = 0.42$, all $p < 0.0001$). AUC also improved for WP and PZ lesions (WP: AUC = 0.70, PZ: AUC = 0.68, and TZ: AUC = 0.74).
CONCLUSIONS:
The current ≥ 15 mm diameter threshold is a reasonable delineator of PI-RADS category 4 and category 5 lesions in the absence of extraprostatic extension to predict CS cancers. Additionally, relative lesion diameter can improve identification of CS cancers and may serve as another option for distinguishing category 4 and 5 lesions.
KEYWORDS:
Biopsy; Multi-parametric MRI; PI-RADS version 2; PSA; Prostate cancer; Prostate imaging reporting and data system

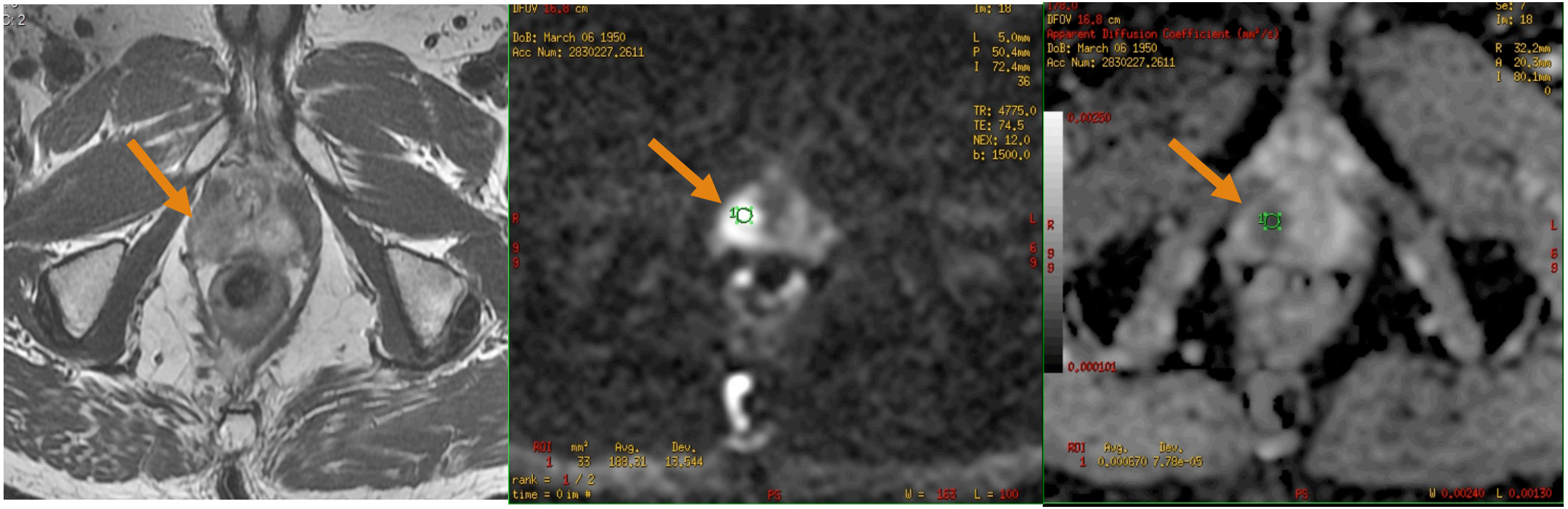
Κλινικός ρόλος της μαγνητικής τομογραφίας στην έγκαιρη ανίχνευση PC σε ασθενείς με αυξημένο PSA

- Δυνατότητα της mpMRI να επιλέγει όγκους υψηλού βαθμού κακοήθειας (higher grade) και μεγάλους (larger volume)
- Διαχωρισμός κλινικά σημαντικών όγκων από τους κλινικά ασήμαντους
- Εκτίμηση των ασθενών που είναι υποψήφιοι για βιοψία ή παρακολούθηση

Schoots IG et al (2015) Magnetic resonance imaging in active surveillance of prostate cancer: a systematic review. Eur Urol 67(4):627–636

Η χρήση της MP-MRI στη βιοψία του προστάτη

- Πριν την TRUS καθοδηγούμενη βιοψία, οι βλάβες εντοπίζονται με MP-MRI ώστε να μπορεί να γίνει στοχευμένη βιοψία αντί συστηματική τυχαία δειγματοληψία της περιφερικής ζώνης του προστάτη.
- Οι στοχευμένες βιοψίες σε περιοχές του προστάτη, όπως προσδιορίζονται στο MP-MRI ανιχνεύουν κλινικά σημαντικούς καρκίνους του προστάτη και οδηγούν σε χαμηλότερα ποσοστά διάγνωσης κλινικά ασήμαντων όγκων.


DFOV 16.8 cm
DoB: March 06 1950
Acc Num: 2830227.2611
L 5.0mm
P 50.4mm
I 72.4mm
TR: 4775.0
TE: 74.5
NEX: 12.0
b: 1500.0
ROI mm² Avg. Dev.
1 33 188.31 13.544
rank = 1 / 2
time = 0 im #
W = 183 L = 100
DFOV 16.8 cm
Apparent Diffusion Coefficient (mm²/s)
DoB: March 06 1950
Acc Num: 2830227.2611
R 32.2mm
A 20.3mm
I 80.1mm
0.00250
0.000101
ROI Avg. Dev.
1 0.000570 7.78e-05
W 0.00240 L 0.00130

Αναβολή βιοψίας όταν η MRI είναι αρνητική?

- Σε άνδρες με φυσιολογικά ευρήματα στην MRI (PI-RADS 1 ή 2), ο κίνδυνος κλινικά σημαντικού PC είναι πολύ χαμηλός

Futterer JJ et al (2015) Can clinically significant prostate cancer be detected with multiparametric magnetic resonance imaging? A systematic review of the literature. Eur Urol 68(6):1045–1053

J Cancer Res Clin Oncol. 2018 May;144(5):987-995. doi: 10.1007/s00432-018-2616-6. Epub 2018 Mar 5.

Can Prostate Imaging Reporting and Data System Version 2 reduce unnecessary prostate biopsies in men with PSA levels of 4-10 ng/ml?

Xu N1, Wu YP1, Chen DN1, Ke ZB1, Cai H1, Wei Y1, Zheng QS1, Huang JB1, Li XD2, Xue XY3.
Author information

Abstract

PURPOSE:

To explore the value of Prostate Imaging Reporting and Data System Version 2 (PI-RADS v2) for predicting prostate biopsy results in patients with prostate specific antigen (PSA) levels of 4-10 ng/ml.

METHODS:

We retrospectively reviewed multi-parameter magnetic resonance images from 528 patients with PSA levels of 4-10 ng/ml who underwent transrectal ultrasound-guided prostate biopsies between May 2015 and May 2017. Among them, 137 were diagnosed with prostate cancer (PCa), and we further subdivided them according to pathological results into the significant PCa (S-PCa) and insignificant significant PCa (Ins-PCa) groups (121 cases were defined by surgical pathological specimen and 16 by biopsy). Age, PSA, percent free PSA, PSA density (PSAD), prostate volume (PV), and PI-RADS score were collected. Logistic regression analysis was performed to determine predictors of pathological results. Receiver operating characteristic curves were constructed to analyze the diagnostic value of PI-RADS v2 in PCa.

RESULTS:

Multivariate analysis indicated that age, PV, percent free PSA, and PI-RADS score were independent predictors of biopsy findings, while only PI-RADS score was an independent predictor of S-PCa ($P < 0.05$). The areas under the receiver operating characteristic curve for diagnosing PCa with respect to age, PV, percent free PSA, and PI-RADS score were 0.570, 0.430, 0.589 and 0.836, respectively. The area under the curve for diagnosing S-PCa with respect to PI-RADS score was 0.732. A PI-RADS score of 3 was the best cutoff for predicting PCa, and 4 was the best cutoff for predicting S-PCa. Thus, 92.8% of patients with PI-RADS scores of 1-2 would have avoided biopsy, but at the cost of missing 2.2% of the potential PCa cases. Similarly, 83.82% of patients with a PI-RADS score ≤ 3 would have avoided biopsy, but at the cost of missing 3.3% of the potential S-PCa cases.

CONCLUSIONS:

PI-RADS v2 could be used to reduce unnecessary prostate biopsies in patients with PSA levels of 4-10 ng/m

Send to

J Med Imaging Radiat Oncol. 2018 Apr;62(2):183-187. doi: 10.1111/1754-9485.12678. Epub 2017 Oct 9.

Magnetic resonance imaging of the prostate and targeted biopsy, Comparison of PIRADS and Gleason grading.

Bastian-Jordan M[1,2].

Abstract

INTRODUCTION:

Multiparametric magnetic resonance imaging (mpMRI) of the prostate has become integral in the investigation of suspected prostate cancer. Regions of interest are graded using the PIRADS scoring system, and in our institution, lesions graded as PIRADS 3-5 undergo sampling by MRI-guided biopsy. Limited data currently exists on PIRADS grading and biopsy results.

METHODS:

Retrospective review of 343 MRI-guided biopsies (MRGB) performed between April 2013 and December 2016 was conducted. This included patients irrespective of whether they were biopsy naïve, biopsy negative or known low-grade malignancy. A Gleason score (G) >= 3+4 was considered to reflect clinically significant disease (CSD).

RESULTS:

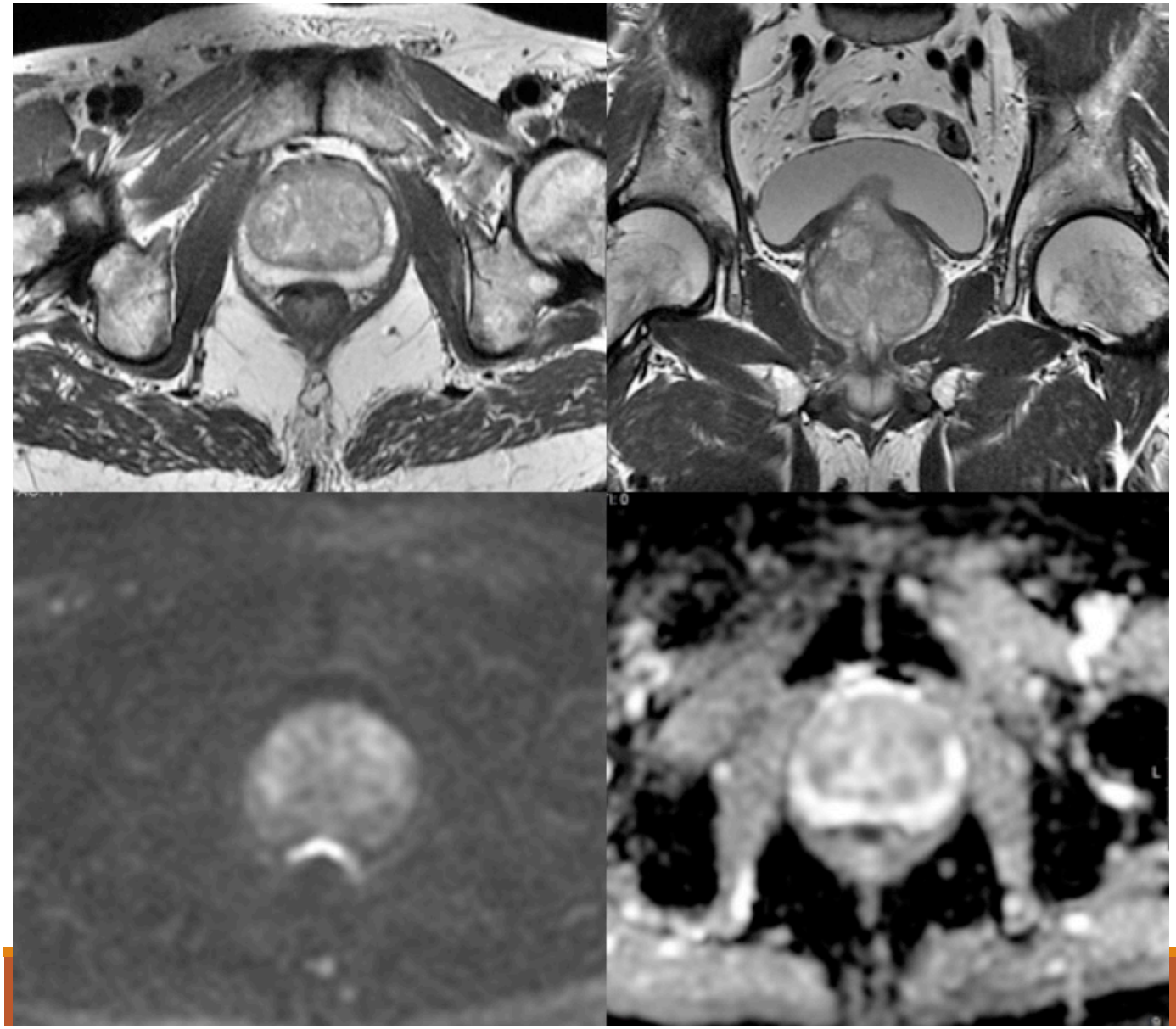
Of the 18 PIRADS 2 cases (at referrer request) who went to biopsy, 16 were negative and two had small volume Gleason 6 cancer. A total of 75 PIRADS 3 cases were biopsied with 88% negative or small volume Gleason 6 cancer, only 12% yielded ≥ G 3+4. Of the 133 PIRADS 4 lesions, 24% were negative, 25% were G6 and 51% were ≥ G 3+4. A total of 117 PIRADS 5 cases were biopsied with 7% negative, 13% Gleason 6 and 80% considered significant (≥ G 3+4). Of all biopsies, 230 (67%) had a positive result (≥ G6) with 171 of these (75%) being considered CSD, with overall CSD of 50% (171/343).

CONCLUSIONS: This paper demonstrates the incidence of CSD for different PIRADS grades. The low incidence of CSD in PIRADS 3 lesions suggests that in low clinical risk men, follow up in priority to biopsy may be an alternative treatment pathway

Αναβολή βιοψίας όταν η MRI είναι αρνητική?

Κίνδυνος να καθυστερήσει τη διάγνωση του PC, αν και η πλειοψηφία των PC που χάνονται με mpMRI φαίνεται να είναι χαμηλής κακοήθειας και περιορισμένοι στο όργανο.

De Visschere PJ et al (2015) What kind of prostate cancers do we miss on multiparametric magnetic resonance imaging? Eur Radiol



PSA 9 ng/ml

Κωδ.Εισαγωγής: 413265
ΑΜΚΑ: 30046002272

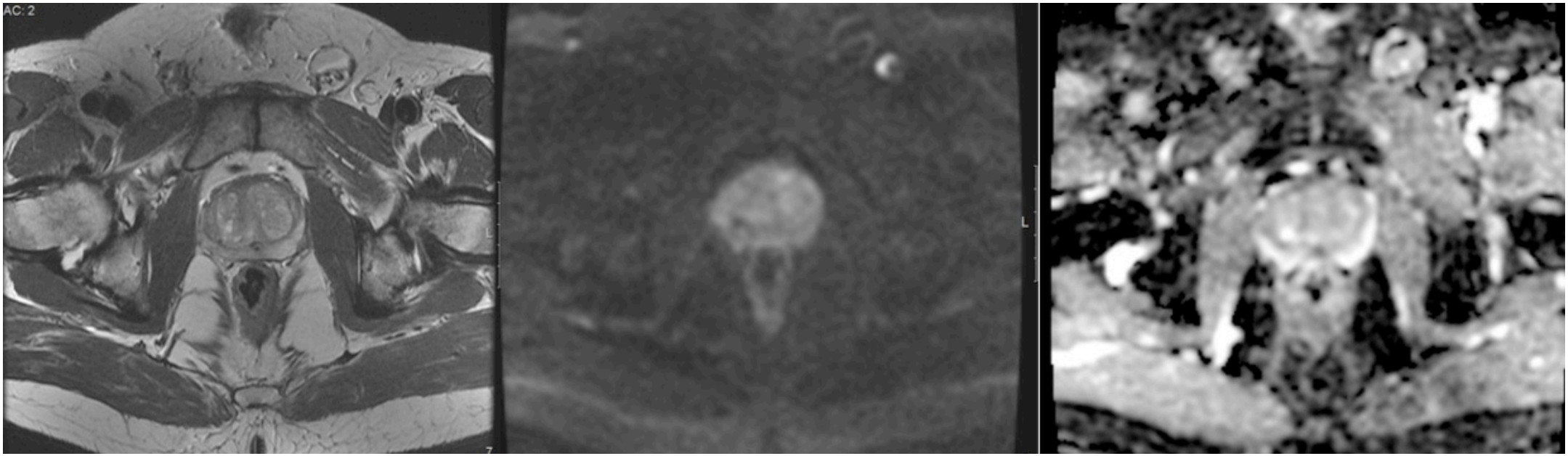
Αριθμός Παρασκευάσματος: 5052/17 & D8259/17

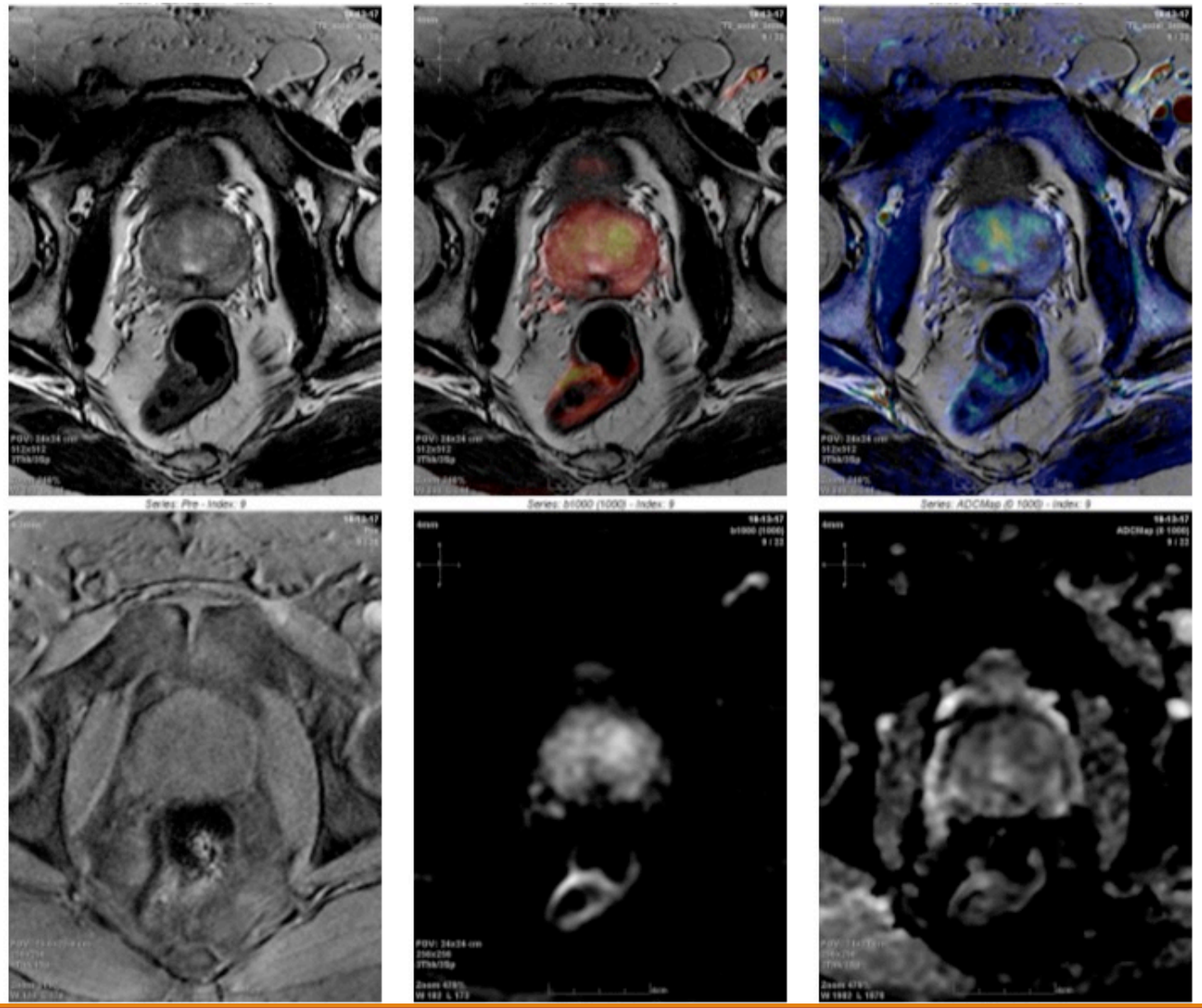
Είδος Παρασκευάσματος: Υλικό βιοψίας προστάτη αδένα.

Μακροσκοπική περιγραφή: Με ενδείξεις "1-37" παραλάβαμε τριανταεπτά λευκόφαια κυλινδρικά ιστοτεμάχια μήκους 0,4-1,8εκ.

Μικροσκοπικά ευρήματα: Τα ιστοτεμάχια παρουσιάζουν υφή προστάτη αδένα.
Όλοι οι προστατικοί αδένες διατηρούν την βασική τους στιβάδα και επενδύονται από εκκριτικά κύτταρα χωρίς ατυπίες, ενώ κατά την μεγαλύτερη έκταση είναι μεγάλοι και επενδύονται από κυβοειδή ή εκκριτικά κύτταρα με βαθυχρωματικούς πυρήνες.
Στο στρώμα παρατηρούνται αραιές φλεγμονώδεις διηθήσεις αποτελούμενες από λεμφοκύτταρα, πλασματοκύτταρα, λίγα ηωσινόφιλα και ουδετερόφιλα πολυμορφοπύρηνα.

Συμπέρασμα: Εστίες ατροφίας των προστατικών αδενίων.
Εστιακές ήπιου βαθμού αλλοιώσεις χρονίας, ενεργού, μη ειδικής προστατίτιδας.
Δεν παρατηρείται κακοήθης νεοπλασματική εξεργασία.


AC: 2



BJU Int. 2018 May 17. doi: 10.1111/bju.14397. [Epub ahead of print]

Computer-aided diagnosis of prostate cancer on magnetic resonance imaging using a convolutional neural network algorithm.

Ishioka J[1], Matsuoka Y[1], Uehara S[1], Yasuda Y[1], Kijima T[1], Yoshida S[1], Yokoyama M[1], Saito K[1], Kihara K[1], Numao N[2], Kimura T[3], Kudo K[4], Kumazawa I[5], Fujii Y[1].

Abstract

OBJECTIVES:

To develop a computer-aided diagnosis (CAD) algorithm with a deep learning architecture for detecting prostate cancer on magnetic resonance imaging (MRI) to promote global standardization and diminish variation in the interpretation of prostate MRI.

PATIENTS AND METHODS:

We retrospectively reviewed data from 335 patients with a prostate specific antigen level of less than 20 ng/ml who underwent MRI and extended systematic prostate biopsy with or without MRI-targeted biopsy. The data were divided into a training data set (n = 301), which was used to develop the CAD algorithm, and two evaluation data sets (n = 34). A deep convolutional neural network (CNN) was trained using MR images labeled as "cancer" or "no cancer" confirmed by the above-mentioned biopsy. Using the CAD algorithm that showed the best diagnostic accuracy with the two evaluation data sets, the data set not used for evaluation was analyzed, and receiver operating curve analysis was performed.

RESULTS:

Graphics processing unit computing required 5.5 hours to learn to analyze 2 million images. The time required for the CAD algorithm to evaluate a new image was 30 msec per image. The two algorithms showed area under the curve values of 0.645 and 0.636, respectively, in the validation data sets. The number of patients mistakenly diagnosed as having cancer was 16/17 patients and 7/17 patients in the 2 validation data sets, respectively. Zero and 2 oversights were found in the 2 validation data sets, respectively.

CONCLUSION:

We developed a CAD system using a CNN algorithm for the fully automated detection of prostate cancer using MRI, which has the potential to provide reproducible interpretation and a greater level of standardization and consistency. This article is protected by copyright. All rights reserved.

KEYWORDS:

computer-aided diagnosis; deep learning; magnetic resonance imaging; neural network; prostate biopsy

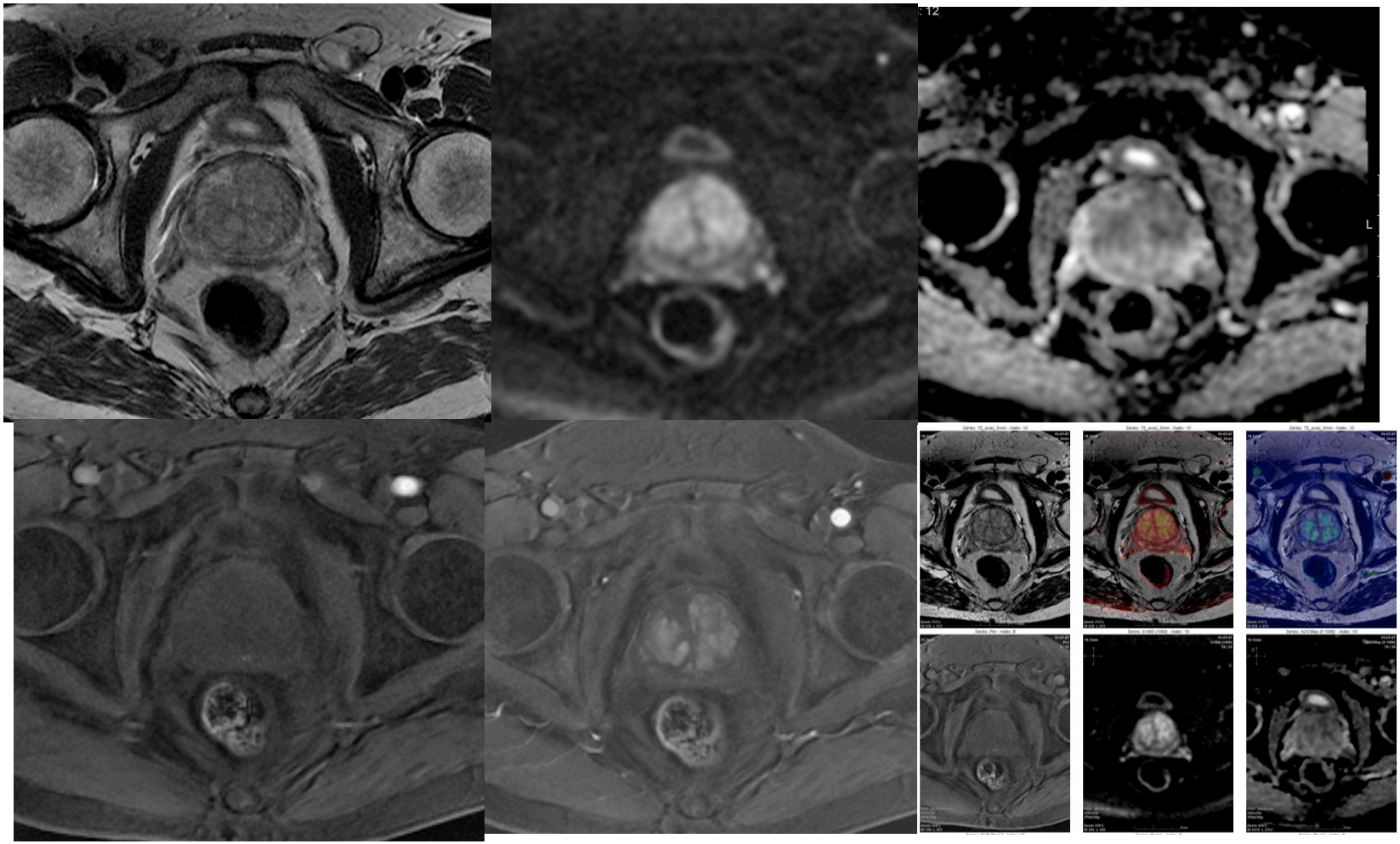
Chairman of Alibaba Group

Μικροσκοπικά ευρήματα

1-21. Τα ιστοτεμάχια εμφανίζουν υφή προστάτη αδένα.
Σε ένα απο τα ιστοτεμάχια με την ένδειξη "23" αναγνωρίσθηκε εστία μεγαλυτερας διαμέτρου 0,5χιλ., με παρουσία νεοπλασματικής εξεργασίας απο κυλινδρικά ή κυβοειδή κύτταρα με αμφοφιλικό ή αραιοχρωματικό κυτταρόπλασμα και με υποστρόγγυλους πυρήνες, λίγοι απο τους οποίους έχουν εμφανή πυρήνια.
Τα νεοπλασματικά κύτταρα διατάσσονται σε αδενοειδείς σχηματισμούς με ποικίλα μεγέθη, με ανισοκατανομή και διαταραχή του αξονικού τους προσανατολισμού.
Δεν παρατηρούνται νεοπλασματικές διηθήσεις νευρικών κλάδων.
Ανοσοϊστοχημικά οι νεοπλασματικοί αδενοειδείς σχηματισμοί εμφανίζουν έντονη κοκκιώδη κυτταροπλασματική θετικότητα στο P504s, ενώ με την αρνητικότητα τους στην p63 και τις κερατίνες 34BE12 καταδεικνύεται σε αυτούς η απουσία βασικών κυττάρων.
Στην υπόλοιπη έκταση του υλικού οι προστατικοί αδένες διατηρούν την βασική τους στιβάδα και επενδύονται απο εκκριτικά κύτταρα χωρίς ατυπίες.
Ορισμένοι προστατικοί αδένες περιβάλλονται απο πολλαπλούς στιχους βασικών κυττάρων ενω άλλοι είναι μικροί και επενδύονται απο ατροφικό επιθήλιο ενω παρατηρούνται επίσης και εστίες με παρουσία μεγαλύτερων και ανωμάλου σχήματος ή διακλαδιζόμενων προστατικών αδένων, οι οποίοι επενδύονται απο κυβοειδή εκκριτικά κύτταρα με αυξημένη πυρηνοπλασματική αναλογία.

Συμπέρασμα

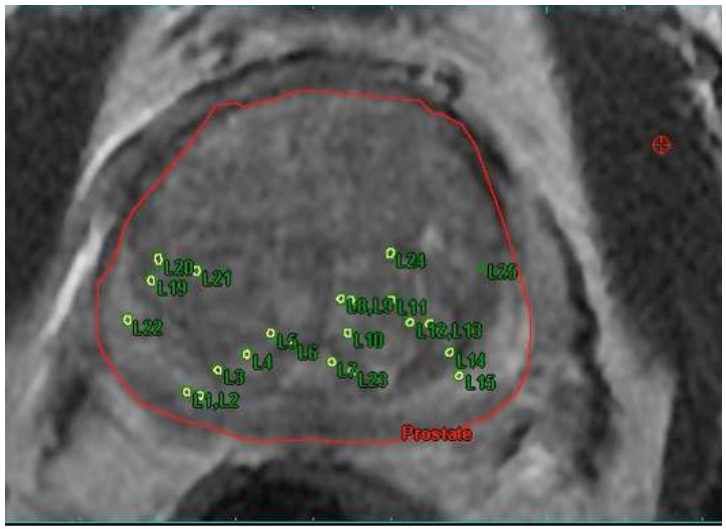
Μικρή εστία μεγαλυτέρας διαμέτρου 0,5χιλ. αδενοκαρκινώματος του προστάτη αδένα στο υλικό με τη ένδειξη "23", το οποίο στο παρόν υλικό έχει άθροισμα βαθμίδων κατά Gleason 3+3=6/10.
Αλλοιώσεις ατροφίας και μετατροφικής υπερπλασίας του προστατη αδένα.
Αλλοιώσεις βασικοκυτταρικής υπερπλασίας.



Στα ιστοτεμάχια με ενδείξεις "12" και "25" αναγνωρίζονται δύο εστίες μεγαλυτέρας διαμέτρου 4 χιλ. και 0,5 χιλ. αντίστοιχα με παρουσία νεοπλασματικής εξεργασίας από κυλινδρικά ή κυβοειδή κύτταρα με αμφοφιλικό ή αραιοχρωματικό κυτταρόπλασμα και με υποστρόγγυλους πυρήνες οι οποίοι κατά τη μεγαλύτερη έκταση έχουν εμφανή πυρήνια.
Τα νεοπλασματικά κύτταρα διατάσσονται σε αδενοειδείς σχηματισμούς με ποικίλα μεγέθη, με ανισοκατανομή και διαταραχή του αξονικού τους προσανατολισμού.
Δεν παρατηρούνται νεοπλασματικές διηθήσεις νευρικών κλάδων.
Σε όλη την υπόλοιπη έκταση του υλικού οι προστατικοί αδένες διατηρούν τη βασική τους στιβάδα καιτοιχα επενδύονται από εκκριτικά κύτταρα χωρίς ατυπίες ενώ κατά θέσεις επενδύονται από πολλαπλούς στοίχους βασικών κυττάρων.
Στο στρώμα παρατηρούνται εστιακά πολύ αραιές λεμφοπλασματοκυτταρικές φλεγμονώδεις διηθήσεις.

Συμπέρασμα:

Δύο μικρές εστίες αδενοκαρκινώματος του προστάτη αδένα μεγαλυτέρας διαμέτρου 4 χιλ. και 0,5 χιλ. στις βιοψίες με τις ενδείξεις "12" και "25" αντίστοιχα, το οποίο στο παρόν υλικό έχει άθροισμα βαθμίδων κατά Gleason 3+3=6/10.
Εστιακές αλλοιώσεις βασικοκυτταρικής υπερπλασίας του προστάτη αδένα.
Εστιακές ηπιότατες αλλοιώσεις χρονίας προστατίτιδας χωρίς ειδικούς χαρακτήρες.



Αναβολή βιοψίας όταν η MRI είναι αρνητική?

- Η μη ανίχνευση ασήμαντων PC είναι πλεονέκτημα ή μειονέκτημα?

Klotz L (2013) Active surveillance: patient selection. Curr Opin Urol 23(3):239–24

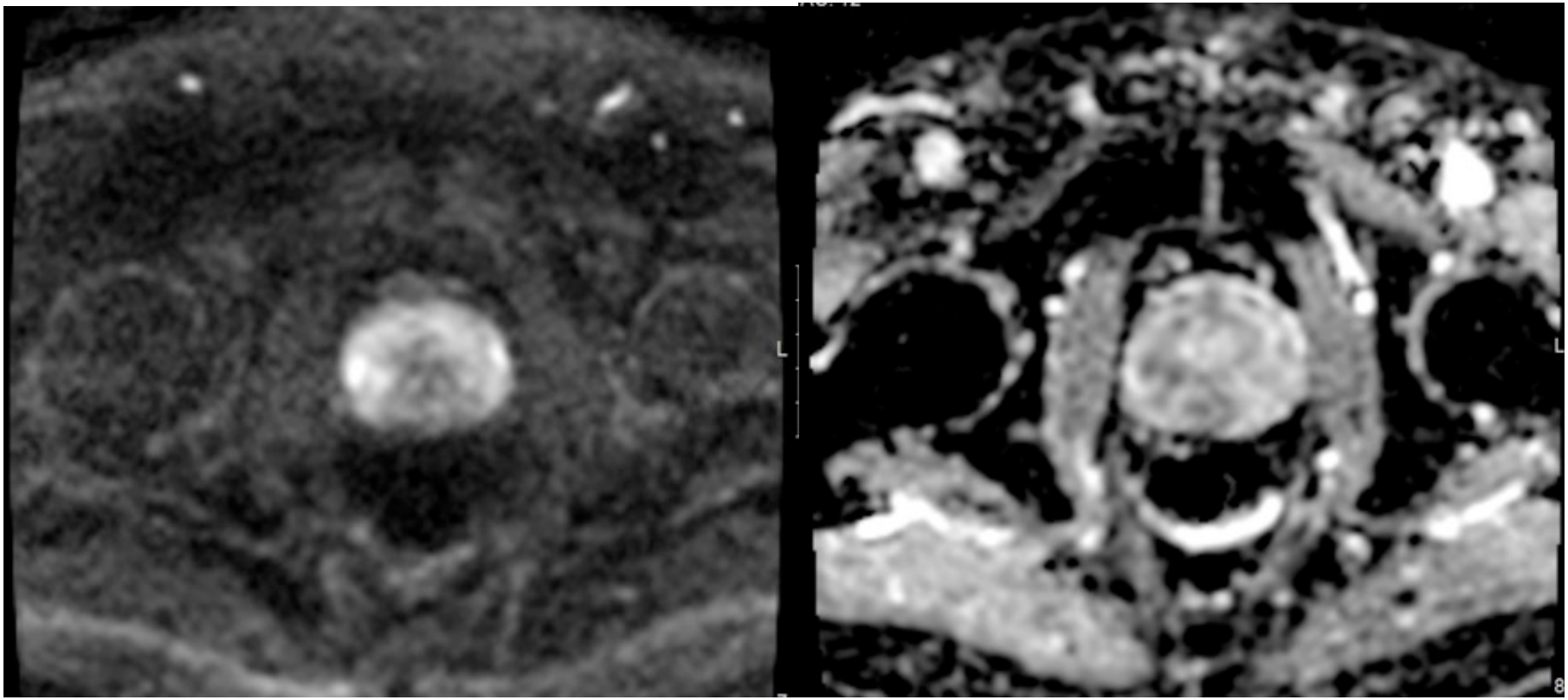
MR-TRUS fusion

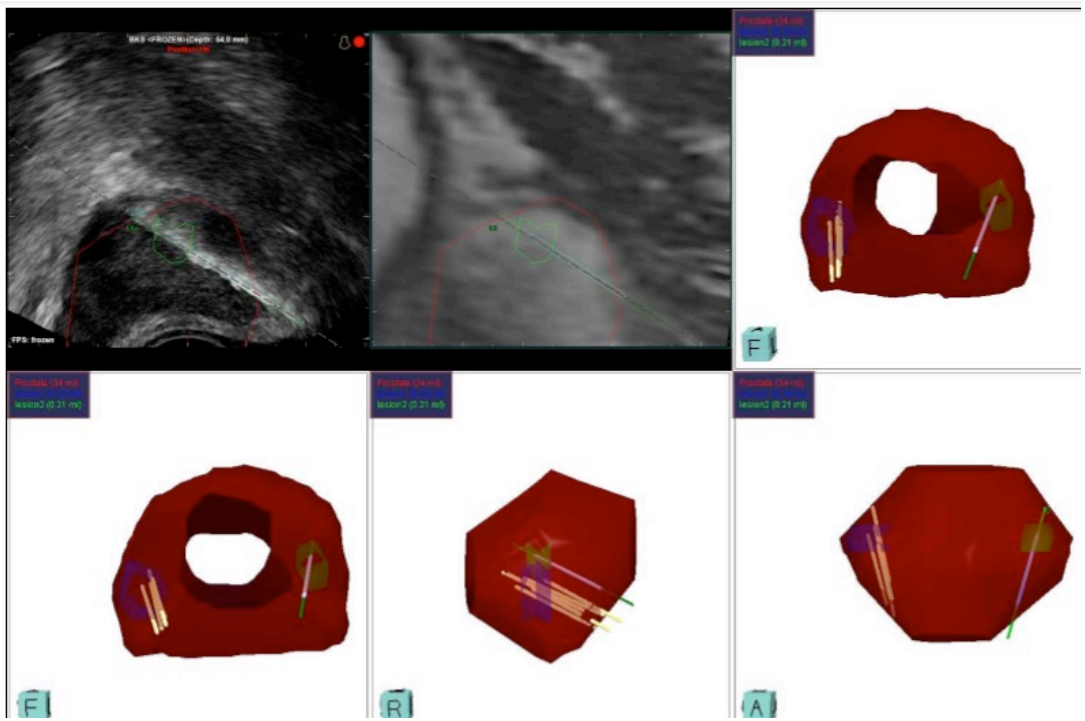
- Με βάση τις τομές της μαγνητικής τομογραφίας κατευθύνεται η βιοψία υπό την καθοδήγηση TRUS, συνδυάζοντας έτσι την υψηλή ευαισθησία της μαγνητικής τομογραφίας για τον εντοπισμό ύποπτων αλλοιώσεων με την πρακτικότητα των διαδικασιών βιοψίας TRUS.
- Αποφυγή ανίχνευσης κλινικώς ασήμαντων όγκων, ενώ επιτρέπει τη διάγνωση σημαντικών όγκων που είναι δύσκολο να ανιχνευθούν με συμβατικές τεχνικές (πρόσθιοι, μέση γραμμή, και κορυφή του προστάτη)

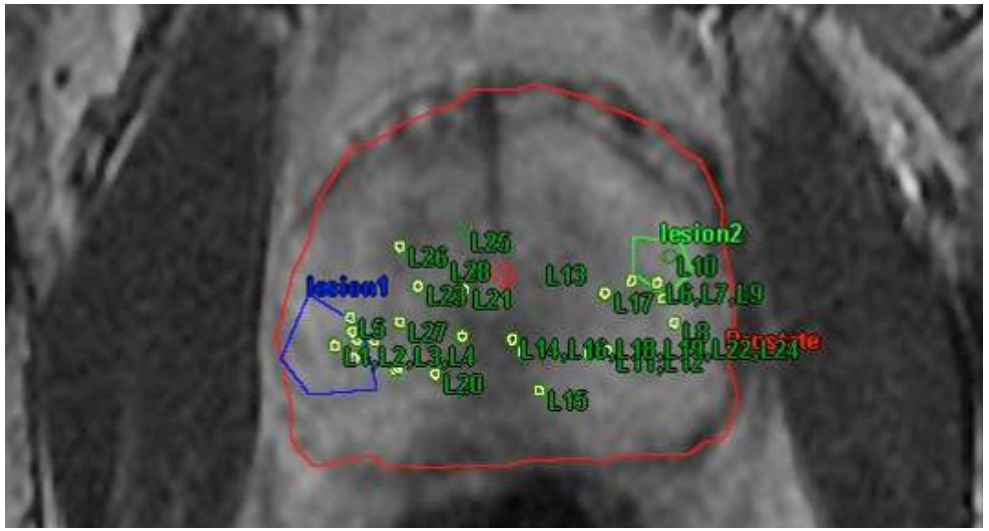
Value of targeted prostate biopsy using magnetic resonance-ultrasound fusion in men with prior negative biopsy and elevated prostate-specific antigen.

Sonn GA, Chang E, Natarajan S, Margolis DJ, Macairan M, Lieu P, Huang J, Dorey FJ, Reiter RE, Marks LS. Eur Urol. 2014 Apr;65(4):809-15

PIRADS 4




F
F
R
A


lesion2
lesion1
L26
L25
L28
L13
L10
L23
L21
L17
L6,L7,L9
L5
L27
L8
L1,L2,L3,L4
L14,L16
L18
L22-L24
L20
L15

Μικροσκοπικά ευρήματα:

Τα ιστοτεμάχια εμφανίζουν υφή προστάτη αδένα.

Εννέα από τους εικοσιοκτώ ιστοτεμάχια (το ιστοτεμάχιο '5" σε έκταση 2,3χιλ., το ιστοτεμάχιο "9" σε έκταση 0,3χιλ., το ιστοτεμάχιο "10" σε έκταση 0,9χιλ., το ιστοτεμάχιο "11" σε έκταση 0,8εκ., το ιστοτεμάχιο, το ιστοτεμάχιο "14" σε έκταση 0,2χιλ., το ιστοτεμάχιο "15" σε έκταση 0,5χιλ., το ιστοτεμάχιο "19" σε έκταση 0,1χιλ., το ιστοτεμάχιο "24" σε έκταση 0,3χιλ. και το ιστοτεμάχιο "27" σε έκταση 1,3εκ.), εμφανίζουν κατάληψη από νεοπλασματική εξεργασία από κυλινδρικά ή κυβοειδή κύτταρα, με αμφοφιλικό ή αραιοχρωματικό κυτταρόπλασμα και με υποστρόγγυλους πυρήνες, οι οποίοι κατά την μεγαλύτερη έκταση έχουν εμφανή πυρήνια.

Τα νεοπλασματικά κύτταρα διατάσσονται κατά την μεγαλύτερη έκταση σε αδενοειδείς σχηματισμούς με ποικίλα μεγέθη, με ανισοκατανομή και διαταραχή του αξονικού τους προσανατολισμού και σε μικρότερη έκταση σε συγχωνευμένους αδενοειδείς σχηματισμούς.

Σε ορισμένες θέσεις οι νεοπλασματικοί σχηματισμοί διηθούν μικρούς νευρικούς κλάδους.

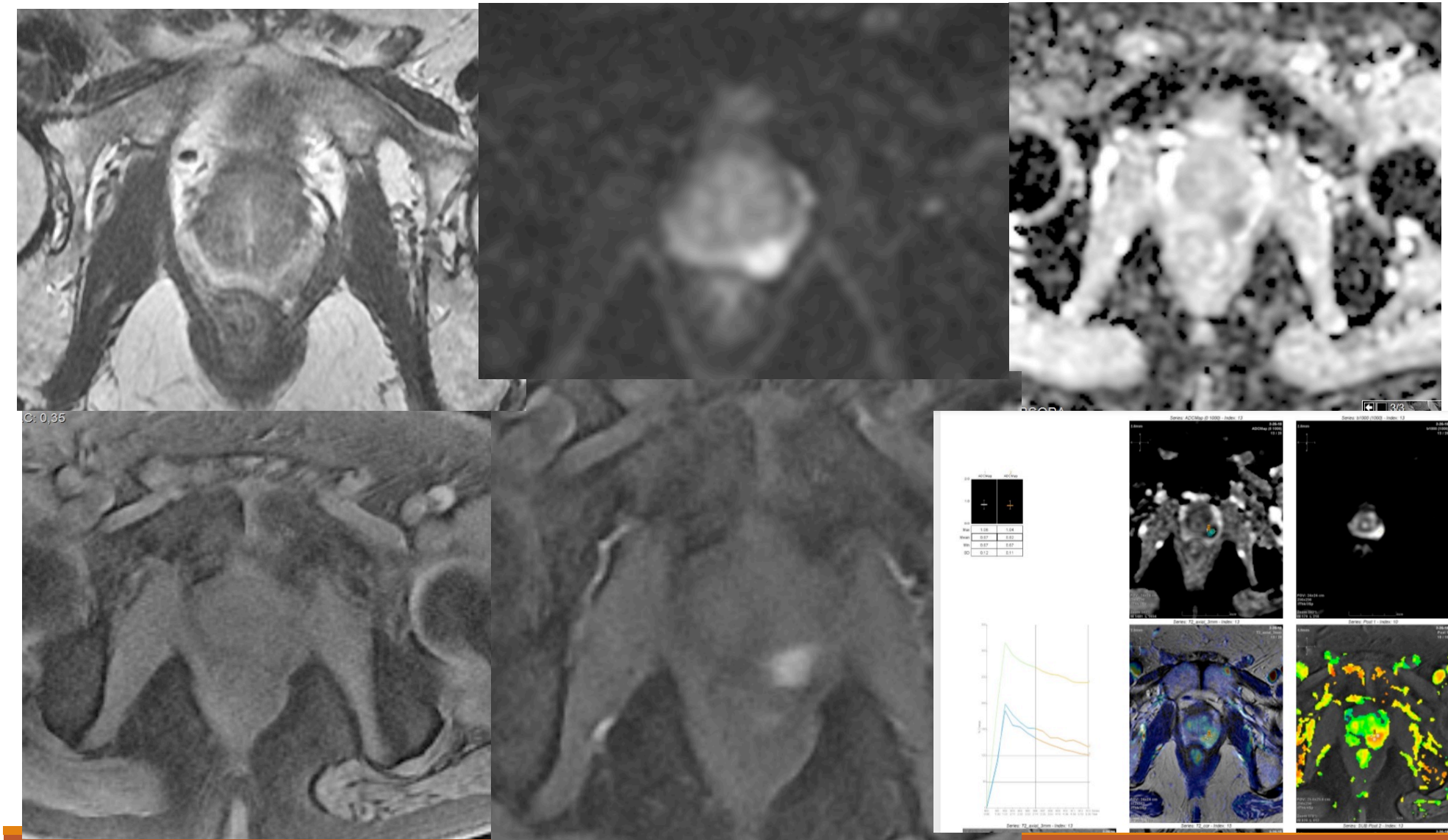
Στην υπόλοιπη τους έκταση τα ανωτέρω ιστοτεμάχια καθώς και όλα τα υπόλοιπα αποτελούνται από προστατικούς αδένες οι οποίοι διατηρούν την βασική τους στιβάδα και επενδύονται από εκκριτικά κύτταρα χωρίς ατυπίες.

Κατά την μεγαλύτερη τους έκταση οι προστατικοί αδένες είναι μεγάλοι, υποστρόγγυλοι ή κυματοειδή παρυφή και εμφανίζουν σχετικά πυκνή διάταξη.

Σε μικρή έκταση παρατηρούνται επίσης εστίες με παρουσία προστατικών αδένων, οι οποίοι επενδύονται από πολλαπλούς στίχους βασικών κυττάρων.

Συμπέρασμα:

Αδενοκαρκίνωμα του προστάτη αδένα, το οποίο στο παρόν υλικό έχει άθροισμα βαθμίδων κατά Gleason 3+4=7/10.

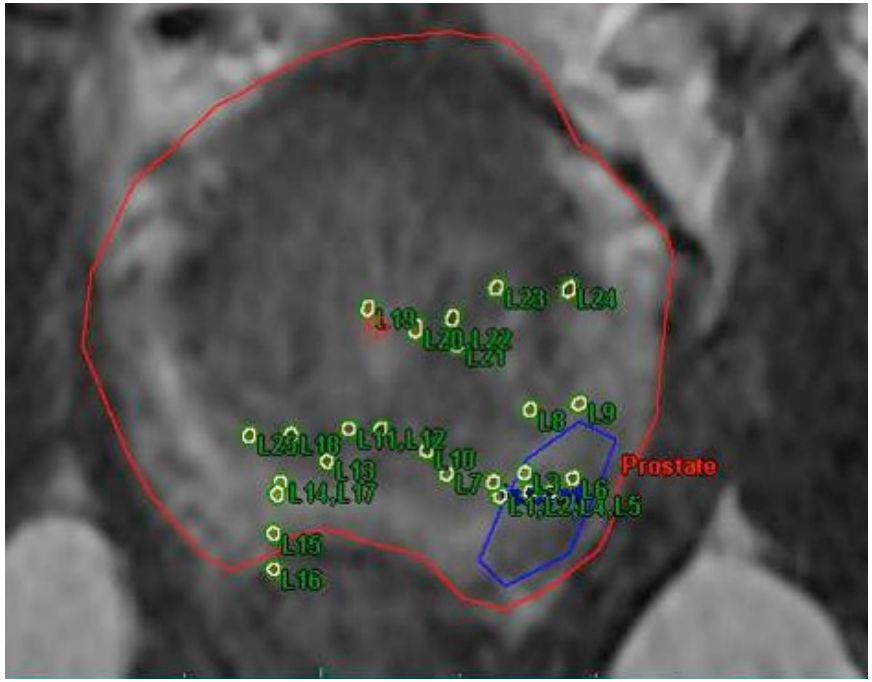


Είδος Παρασκευάσματος: Υλικό βιοψίας προστάτη αδένα.

Μακροσκοπική περιγραφή:
Σε δοχείο με ενδείξεις από "1-25" παραλάβαμε αντίστοιχα εικοσιπέντε λευκόφαια κυλινδρικά ιστοτεμάχια, μήκους από 0,3-1,7εκ.

Μικροσκοπικά ευρήματα:
Τα ιστοτεμάχια παρουσιάζουν υφή προστάτη αδένα.
Τα ιστοτεμάχια με ενδείξεις "1", "2", "7", "8", "11", "20", "21", "22" και "24" εμφανίζουν σε αρκετό τμήμα της έκτασης τους κατάληψη από νεοπλασματική εξεργασία από κυλινδρικά ή κυβοειδή κύτταρα με αμφοφιλικό ή αραιοχρωματικό κυτταρόπλασμα και με υποστρόγγυλους πυρήνες οι οποίοι κατά την μεγαλύτερη έκταση έχουν εμφανή πυρήνια.
Τα νεοπλασματικά κύτταρα διατάσσονται σε αδενοειδείς σχηματισμούς με ποικίλα μεγέθη, με ανισοκατανομή και διαταραχή του αξονικού τους προσανατολισμού και σε μικρότερη αναλογία σε συγχωνευόμενους αδενοειδείς σχηματισμούς και σε ηθμοειδείς σχηματισμούς.
Παρατηρείται επίσης εστία περινευριδιακής διήθησης.
στην υπόλοιπη έκταση του υλικού παρατηρούνται αλλοιώσεις αδενικής και στρωματικής υπερπλασίας και εστιακές αλλοιώσεις βασικοκυτταρικής υπερπλασίας.

Συμπέρασμα:
Αδενοκαρκίνωμα του προστάτη αδένα σταν ιστοτεμάχια με ενδείξεις "1", "2", "7", "8", "11", "20", "21", "22" και "24" το οποίο στο παρόν υλικό έχει άθροισμα βαθμίδων κατά Gleason 3+4=7/10.



Abstract
Gland Surg. 2018 Apr;7(2):166-187. doi: 10.21037/gs.2018.03.06.

"Super-active surveillance": MRI ultrasound fusion biopsy and ablation for less invasive management of prostate cancer.

Bloom JB[1], Gold SA[1], Hale GR[1], Rayn KN[1], Sabarwal VK[2], Bakhutashvili I[3], Valera V[1], Turkbey B[4], Pinto PA[1], Wood BJ[3].
Author information

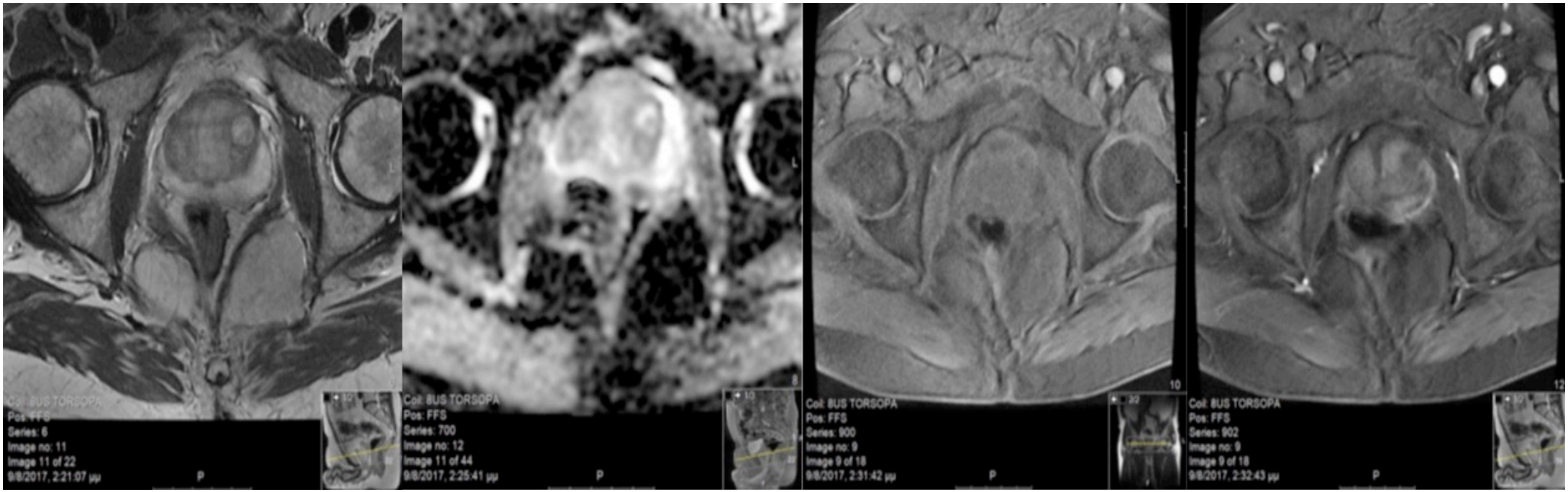
Abstract

Multiparametric magnetic resonance imaging (mpMRI) of the prostate has allowed clinicians to better visualize and target suspicious lesions during biopsy. Targeted prostate biopsies give a more accurate representation of the true cancer volume and stage so that appropriate treatment or active surveillance can be selected. Advances in technology have led to the development of MRI and ultrasound fusion platforms used for targeted biopsies, monitoring cancer progression, and more recently for the application of focal therapy. Lesions visualized on mpMRI can be targeted for ablation with a variety of energy sources employed under both local and general anesthesia. Focal ablation may offer an alternative option for treating prostate cancer as compared to the well-established interventions of whole-gland radiation or prostatectomy. Focal ablation may also be an option for patients on active surveillance who wish to be even more "active" in their surveillance. In this review, we describe the advancements and development of fusion biopsies, the rationale behind focal therapy, and introduce focal ablative techniques for indolent prostate cancers ("super-active surveillance"), including cryoablation and focal laser ablation (FLA) and the subsequent MRI/biopsy surveillance.

KEYWORDS:

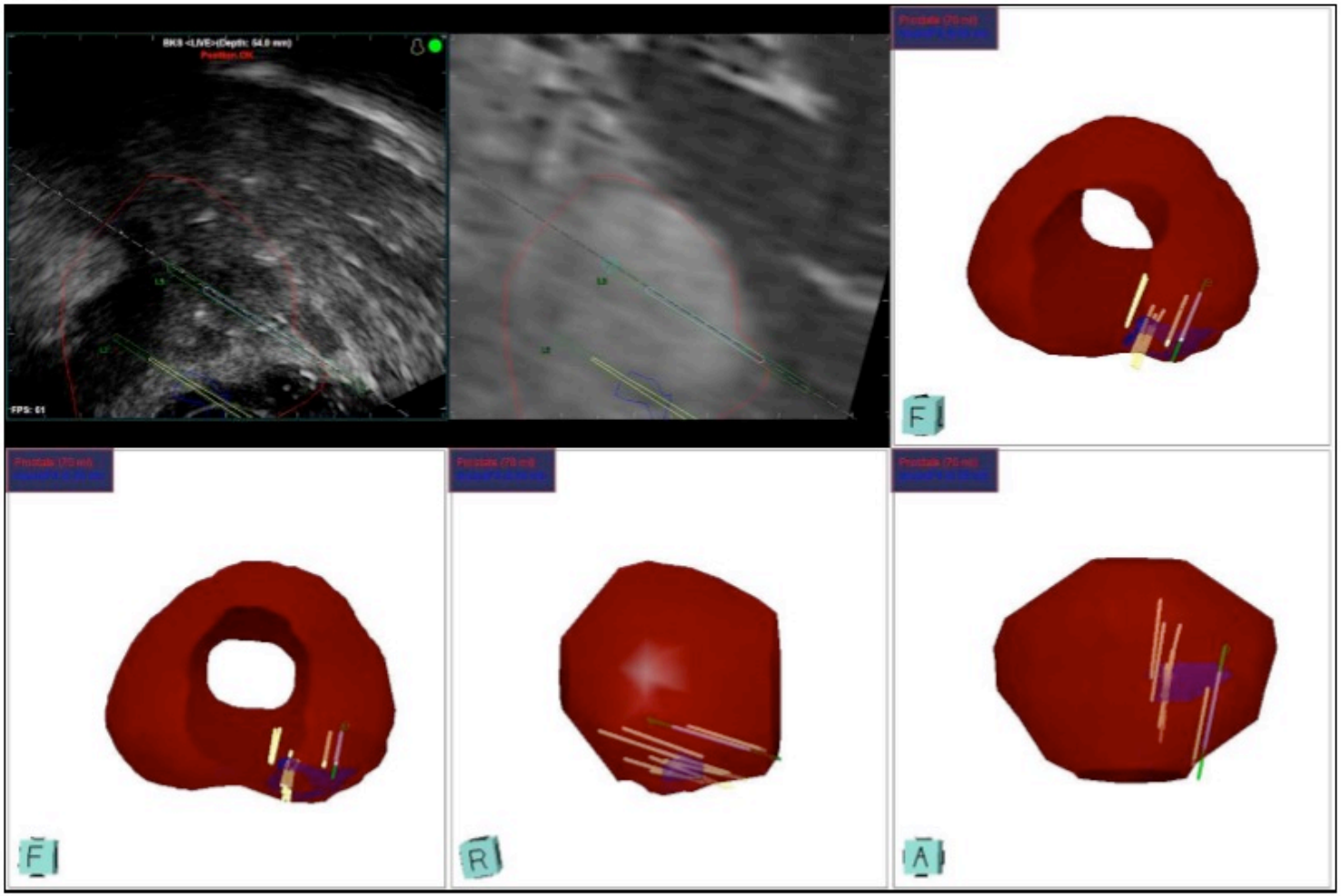
Multiparametric magnetic resonance imaging (mpMRI); TOOKAD; cryotherapy; focal ablation; focal laser ablation (FLA); high-intensity focused ultrasound (HIFU); irreversible electroporation (IRE)

PI-RADS 4

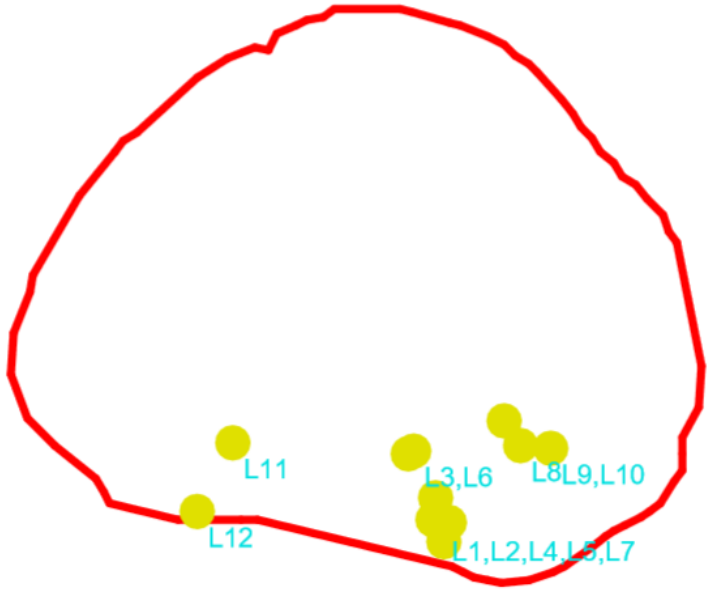

Col: BUS TORSOPA
Pos: FFS
Series: 6
Image no: 11
Image 11 of 22
9/8/2017, 2:21:07 μμ
P
Col: BUS TORSOPA
Pos: FFS
Series: 700
Image no: 12
Image 11 of 44
9/8/2017, 2:25:41 μμ
P
Col: BUS TORSOPA
Pos: FFS
Series: 900
Image no: 9
Image 9 of 18
9/8/2017, 2:31:42 μμ
P
Col: BUS TORSOPA
Pos: FFS
Series: 902
Image no: 9
Image 9 of 18
9/8/2017, 2:32:43 μμ
P

MRI ultrasound fusion biopsy

Image 9



Pathology Report



Είδος Παρασκευάσματος: Υλικό βιοψίας προστάτη αδένα.

Μακροσκοπική περιγραφή

1-12. Σε δοχείο με ενδείξεις απο "1-12" αντίστοιχα παραλάβαμε απο ένα λευκόφαιο κυλινδρικό ιστοτεμάχιο, μήκους απο 0,6-1,8εκ.

Μικροσκοπικά ευρήματα

1-12. Τα ιστοτεμάχια εμφανίζουν υφή προστάτη αδένα, με παρουσία στα ιστοτεμάχια με τις ενδείξεις "1", "8", "10" απο μίας εστίας μεγαλυτέρας διαμέτρου 2, 5 και 0,3χιλ. αντίστοιχα νεοπλασματικής εξεργασίας απο κυλινδρικά ή κυβοειδή κύτταρα, με αμφολικό ή αραιοχρωματικό κυτταρόπλασμα και με υποστρόγγυλους πυρήνες, οι οποίοι σε αρκετή έκταση εχουν εμφανή πυρήνια.
Τα νεοπλασματικά κύτταρα διατάσσονται σε αδενοειδείς σχηματισμούς, με ποικίλα μεγέθη, με ανισοκατανομή και διαταραχή του αξονικού τους προσανατολισμού.
Στην υπόλοιπη έκταση του υλικού παρατηρούνται αλλοιώσεις βασικυτταρικής υπερπλασίας.

Συμπέρασμα

Τρείς εστίες αδενοκαρκινώματος του προστάτη αδένα, μεγαλυτέρας διαμέτρου 2χιλ. - 5χιλ. και 0,3χιλ., τις βιοψίες με τις ενδείξεις "1", "8" και "10" αντίστοιχα το οποίο στο παρόν υλικό έχει άθροισμα βαθμίδων κατά Gleason 3+3=6/10.

Diagn Interv Radiol. 2018 May-Jun;24(3):115-120. doi: 10.5152/dir.2018.17422.

MRI/US fusion-guided prostate biopsy allows for equivalent cancer detection with significantly fewer needle cores in biopsy-naive men.

Yarlagadda VK[1], Lai WS[1], Gordetsky JB[2], Porter KK[3], Nix JW[1], Thomas JV[3], Rais-Bahrami S[4].

Abstract

PURPOSE:

We aimed to investigate the efficiency and cancer detection of magnetic resonance imaging (MRI) / ultrasonography (US) fusion-guided prostate biopsy in a cohort of biopsy-naive men compared with standard-of-care systematic extended sextant transrectal ultrasonography (TRUS)-guided biopsy.

METHODS:

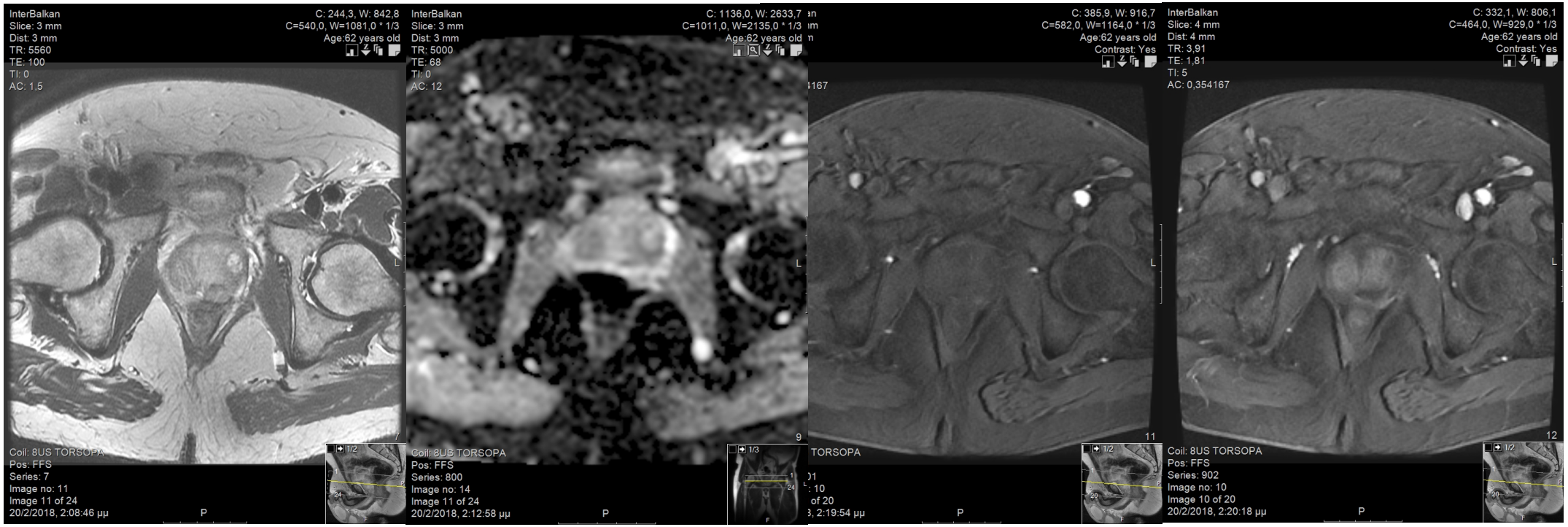
From 2014 to 2016, 72 biopsy-naive men referred for initial prostate cancer evaluation who underwent MRI of the prostate were prospectively evaluated. Retrospective review was performed on 69 patients with lesions suspicious for malignancy who underwent MRI/US fusion-guided biopsy in addition to systematic extended sextant biopsy. Biometric, imaging, and pathology data from both the MRI-targeted biopsies and systematic biopsies were analyzed and compared.

RESULTS:

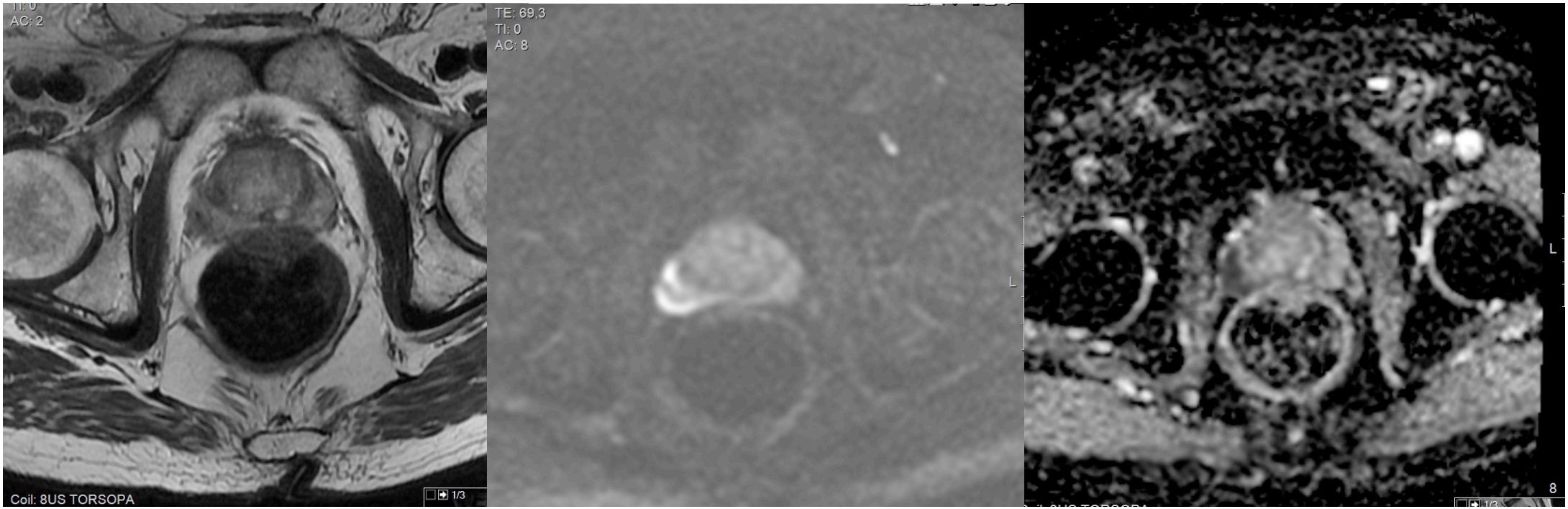
There were no significant differences in overall prostate cancer detection when comparing MRI-targeted biopsies to standard systematic biopsies (P = 0.39). Furthermore, there were no significant differences in the distribution of severity of cancers based on grade groups in cases with cancer detection (P = 0.68). However, significantly fewer needle cores were taken during the MRI/US fusion-guided biopsy compared with systematic biopsy (63% less cores sampled, P < 0.001)

CONCLUSION: In biopsy-naive men, MRI/US fusion-guided prostate biopsy offers equal prostate cancer detection compared with systematic TRUS-guided biopsy with significantly fewer tissue cores using the targeted technique. This approach can potentially reduce morbidity in the future if used instead of systematic biopsy without sacrificing the ability to detect prostate cancer, particularly in cases with higher grade disease.

Post-High-intensity focused ultrasound



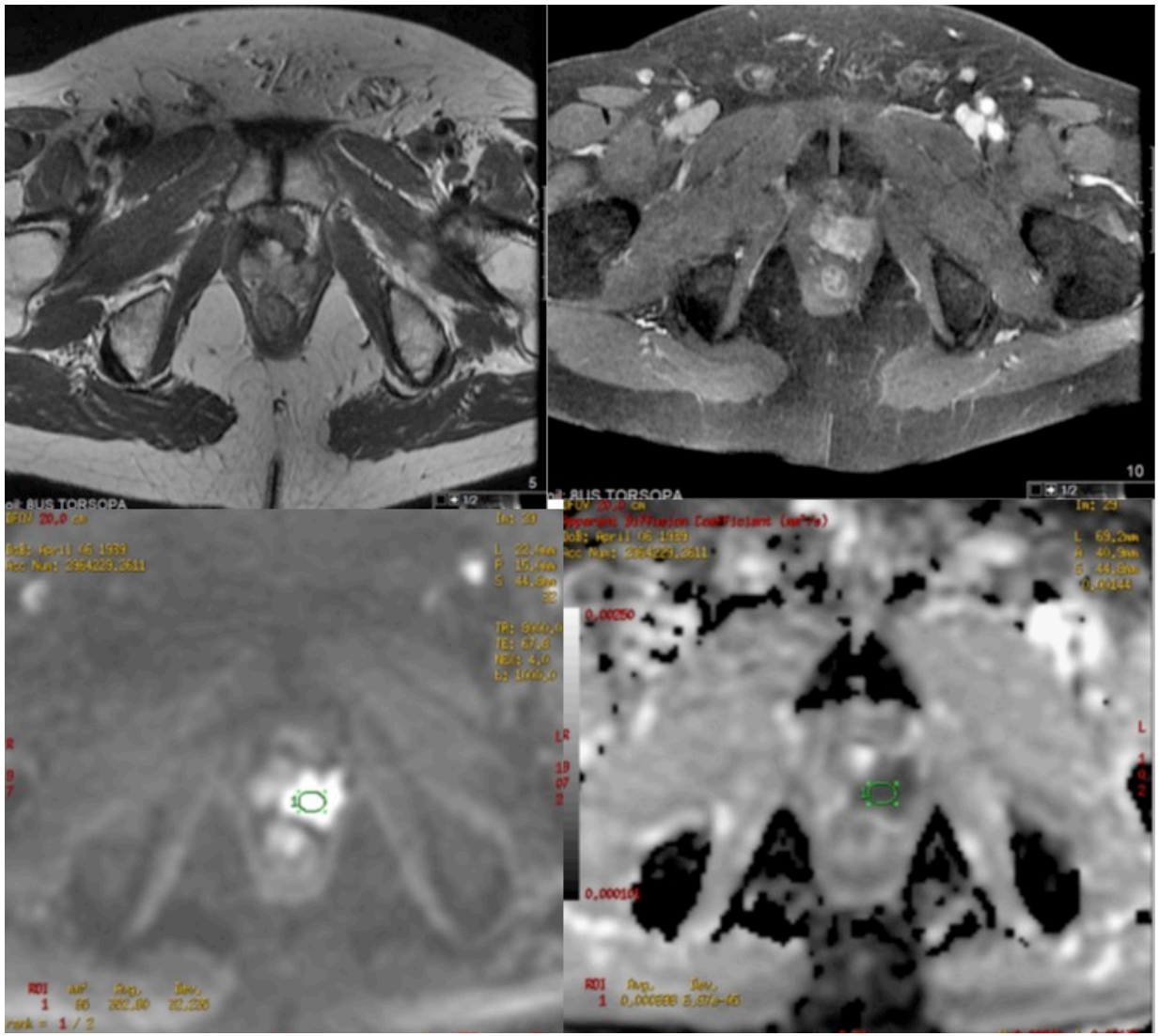
Staging

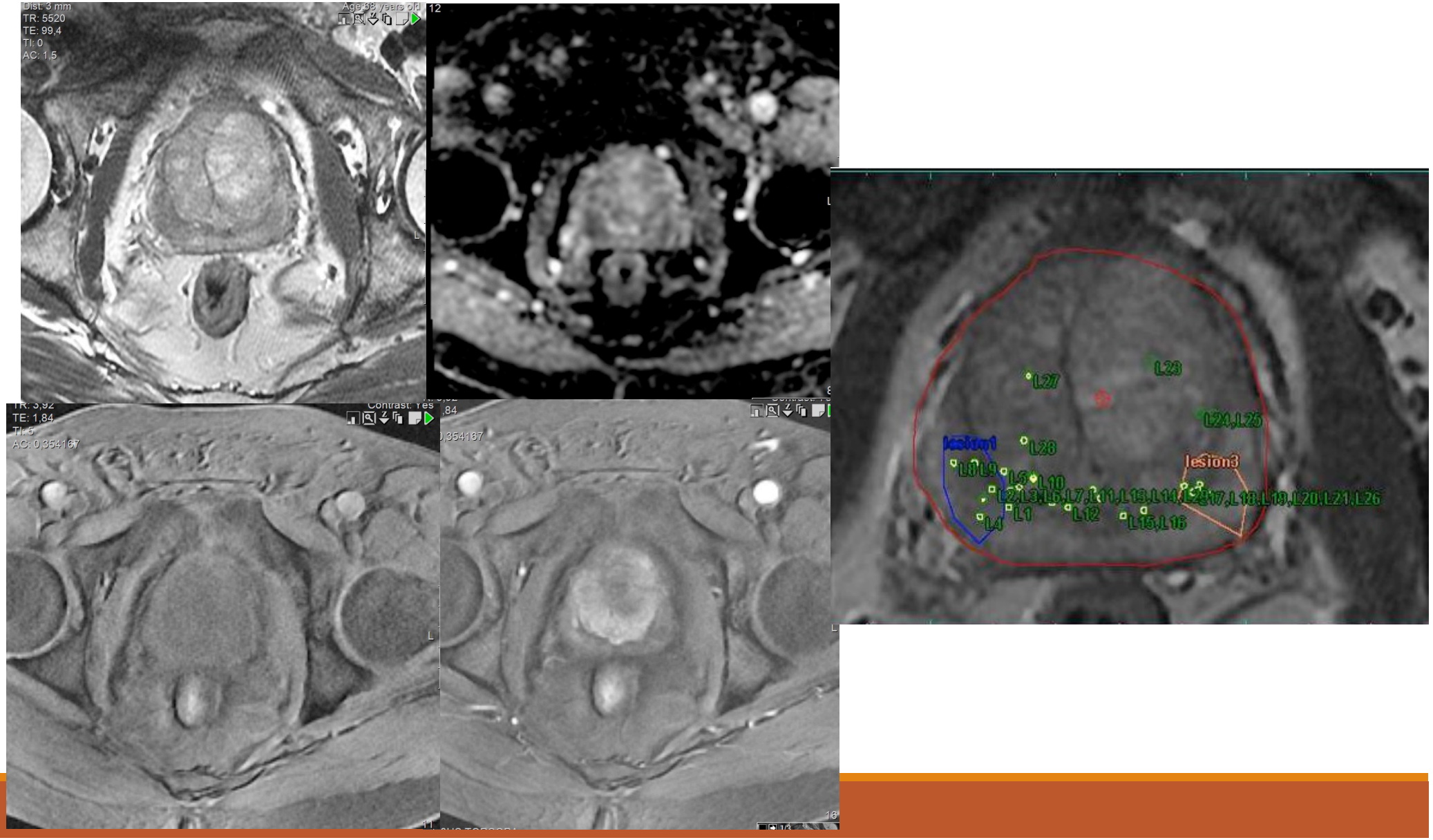


When mpMRI is performed before biopsy, hemorrhagic post-biopsy artefacts are avoided, and, in case of a positive diagnosis of PC, the imaging is immediately available for staging

There are currently no guidelines for evaluation for recurrent disease after prostatectomy, radiation therapy, or focal therapy, although MRI has utility for follow-up in those settings.

Mertan FV, Greer MD, Borofsky S, et al. Multiparametric Magnetic Resonance Imaging of Recurrent Prostate Cancer. Top Magn Reson Imaging 2016;25:135–147.


5
10
BUS TORSOPA
BUS TORSOPA


Dist: 3 mm
TR: 5520
TE: 99,4
TI: 0
AC: 1,5
Age: 68 years old
TR: 3,92
TE: 1,84
TI: 5
AC: 0,354167
Contrast: Yes
L27
L23
L24,L25
L28
lesion1
lesion3
L9
L10
L1
L12
L15,L16

Αριθμός Παρασκευάσματος: Γ202/15 & Β1504/15

Είδος Παρασκευάσματος: Υλικό βιοψίας προστάτη αδένα.

Μακροσκοπική περιγραφή:
Σε δοχείο με ενδείξεις από "1-30" παραλάβαμε είκοσι εννιά λευκόφαια κυλινδρικά ιστοτεμάχια μαλακής σύστασης μήκους 0,5-2,2εκ.

Μικροσκοπικά ευρήματα:
Τα ιστοτεμάχια παρουσιάζουν υφή προστάτη αδένα.
Όλοι οι προστατικοί αδένες διατηρούν τη βασική τους στιβάδα και επενδύονται από εκκριτικά κύτταρα χωρίς ατυπίες ενώ σε μικρή έκταση είναι μεγάλοι, ήπια κυστικά διατεταμένοι και με πτυχωτή προς τον αυλό παρυφή.
Ορισμένοι προστατικοί αδένες περιβάλλονται από πολλαπλούς στοίχους βασικών κυττάρων.
Κατά θέσεις παρατηρείται επίσης ήπια υπερπλασία του ινομυώδους στρώματος.
Στο στρώμα παρατηρούνται εστιακά ηπιότατες φλεγμονώδεις διηθήσεις αποτελούμενες από λεμφοκύτταρα και λιγότερα πλασματοκύτταρα.

Συμπέρασμα:
Ήπιες αλλοιώσεις αδενικής και στρωματικής υπερπλασίας του προστάτη αδένα.
Εστιακές αλλοιώσεις βασικοκυτταρικής υπερπλασίας και εστιακές ηπιότατες αλλοιώσεις χρονίας προστατίτιδας χωρίς ειδικούς χαρακτήρες.
Στοιχεία κακοήθους νεοπλασματικής εξεργασίας δεν παρατηρούνται στο παρόν υλικό.

Br J Radiol. 2018 Apr;91(1084):20170603. doi: 10.1259/bjr.20170603. Epub 2018 Feb 13.

In-bore MRI-guided biopsy: can it optimize the need for periodic biopsies in prostate cancer patients undergoing active surveillance? A pilot test-retest reliability study.

Elfatairy KK[1,2,3], Filson CP[4,5,6], Sanda MG[4,5,6], Osunkoya AO[4,6,7,8], Geller RL[7], Nour SG[1,2,6].

Abstract

OBJECTIVE:
To evaluate the test-retest reliability of repeated in-bore MRI-guided prostate biopsy (MRGB).
METHODS:
19 lesions in 7 patients who had consecutive MRGBs were retrospectively analysed. Five patients had 2 consecutive MRGBs and two patients had 3 consecutive MRGBs. Both multiparametric MRI and MRGBs were performed using a 3T MRI scanner. Pathology results were categorized into benign, suspicious and malignant. Consistency between first and subsequent biopsy results were analysed as well as the negative predictive value (NPV) for prostate cancer.
RESULTS:
15 lesions (≈79%) had matching second biopsy and 4 (21%) had non-matching second biopsy. Lesions with both Prostate Imaging - Reporting and Data System(PIRADS) categories 1 and 4 were all benign and had matching pathology results. Lesions with non-matching results had PIRADS categories 2, 3 and 5. NPV for prostate cancer in first biopsy was 87.5%. Overall agreement was 78.9% and overall disagreement was 21.1%.κ = 0.55 denoting moderate agreement (p = 0.002). 10/19 lesions had a third biopsy session. 9/10 (90%) had matching pathology results across the three biopsy sessions and all matching lesions were benign.
CONCLUSION:
In-bore MRI-guided prostate biopsy may have a better reliability for repeat biopsies compared to TRUS biopsy. Final conclusion awaits a prospective analysis on a larger cohort of patients. Advances in knowledge: This pilot study showed that repeated prostate in-bore MRI-guided prostate biopsy may have better reliability compared to TRUS biopsy with a suggested high NPV.

PMID:
29308912
DOI:
10.1259/bjr.20170603

Abstract

PURPOSE:
To evaluate the diagnostic performance and inter-reader reliability of the multiparametric magnetic resonance imaging (mpMRI) basedprostate imaging reporting and data system (PI-RADS) version 1 and version 2 for the assessment of prostate cancer.
CONCLUSION:
PI-RADS v2 improved diagnostic performance for the assessment of suspicious intraprostatic lesions identified in PI-RADS v1 for both readers and led to higher inter-reader reliability. These results suggest that PI-RADS v2 is a reliable and replicable reporting system for the assessment of prostate cancer.

Eur J Radiol. 2016 Apr;85(4):726-31. doi: 10.1016/j.ejrad.2016.01.011. Epub 2016 Jan 19.
Assessment of PI-RADS v2 for the Detection of Prostate Cancer.
Kasel-Seibert M[1], Lehmann T[2], Aschenbach R[3], Guettler FV[3], Abubrig M[4], Grimm MO[5], Teichgraeber U[3], Franiel T[3].

PIRADS 2

- Readers with varying experience will agree on detection of 86% of index lesions (defined as the largest and/or strongly positive on the dominant sequence)
- Agreement is reached on only 57% of all lesions.

PI-RADSv2: How we do it.
Greer MD, Choyke PL, Turkbey B.
J Magn Reson Imaging. 2017 Feb 25

Abstract

Purpose: To determine the interobserver reproducibility of the Prostate Imaging Reporting and Data System (PI-RADS) version 2 lexicon.

Conclusion: Experienced radiologists achieved moderate reproducibility for PI-RADS version 2, and neither required nor benefitted from a training session. Agreement tended to be better in PZ than TZ, although was weak for DCE in PZ. The findings may help guide future PI-RADS lexicon updates

Radiology. 2016 Apr 1:152542. [Epub ahead of print]

Interobserver Reproducibility of the PI-RADS Version 2 Lexicon: A Multicenter Study of Six Experienced ProstateRadiologists.

Rosenkrantz AB[1], Ginocchio LA[1], Cornfeld D[1], Froemming AT[1], Gupta RT[1], Turkbey B[1], Westphalen AC[1], Babb JS[1], Margolis DJ[1].

Abstract

INTRODUCTION:

In an effort to limit prostate cancer (PCa) overdiagnosis and overtreatment, which have occurred in response to widespread prostate specific antigen testing, numerous strategies aimed at improved risk stratification of patients with PCa have evolved. Multiparametricmagnetic resonance imaging (MRI) is being used in concert with prostate specific antigen testing and prostate biopsies to improve sensitivity and specificity of these tests. There are limited data on how multiparametric MRI can be incorporated into active surveillance (AS) protocols.

EVIDENCE ACQUISITION:

A PubMed literature search of available English language publications on PCa, AS, and MRI was conducted. Appropriate articles were selected and included for review. Bibliographies were also used to expand our search.

EVIDENCE SYNTHESIS:

Data from 41 studies were reviewed. AS inclusion criteria and protocols varied among studies, as did indications for use ofMRI. Technological improvements are briefly highlighted. Studies are broadly categorized and discussed according to the role of MRI in patient selection, disease staging, and monitoring in AS protocols.

CONCLUSIONS:

Although improvements in MRI technology have been useful for biopsy guidance and in the diagnosis and staging of PCa, this literature search demonstrates that more prospective research is needed, specifically regarding how this promising technology can be incorporated into AS protocols

Urol Oncol. 2016 Mar 29. pii: S1078-1439(16)00076-4. doi: 10.1016/j.urolonc.2016.02.020. [Epub ahead of print]

Use of mpMRI in active surveillance for localized prostate cancer.

Scarpato KR[1], Barocas DA[2]