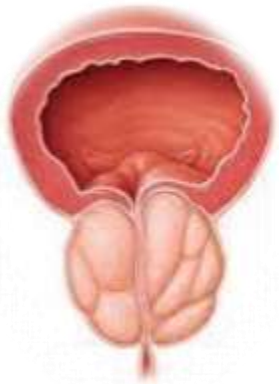
LOCALIZED PROSTATE CANCER

PANEL DISCUSSION - CHOOSING WISELY



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Special thanks AROI & ICRO

ASSOCIATION OF RADIATION ONCOLOGISTS OF INDIA

Dr. Rakesh Kapoor

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ICRO Secretary

IMPACT

Interactive **M**odules for **P**roblem based **A**ssessment and **C**ase based **T**eaching

Localized Prostate Cancer: Choosing Wisely				
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Dr. Aakriti Bhardwaj

Dr. Rabia Suzanne Angiras

Dr. Akella Sai Srividya

Dr. M Bhargava Krishna

Dr. Megha Monani

Dr. Ram Vinayak

Case history

- 60 year male not on any medication
- Presented with
  - **F**requency
  - **U**rgency
  - **N**octuria
  - PSA-12mg/dl
  - DRE- Nodularity per rectal exam both lobes
  - MRI/PSMA PET – Localized disease
  - cT2c-T2c – Tumor involves both sides
  - BIOPSY- GS (4+3)
- Localized disease
- **Intermediate risk favorable [NCCN]**

Dr. Aakriti Bhardwaj

Q-1

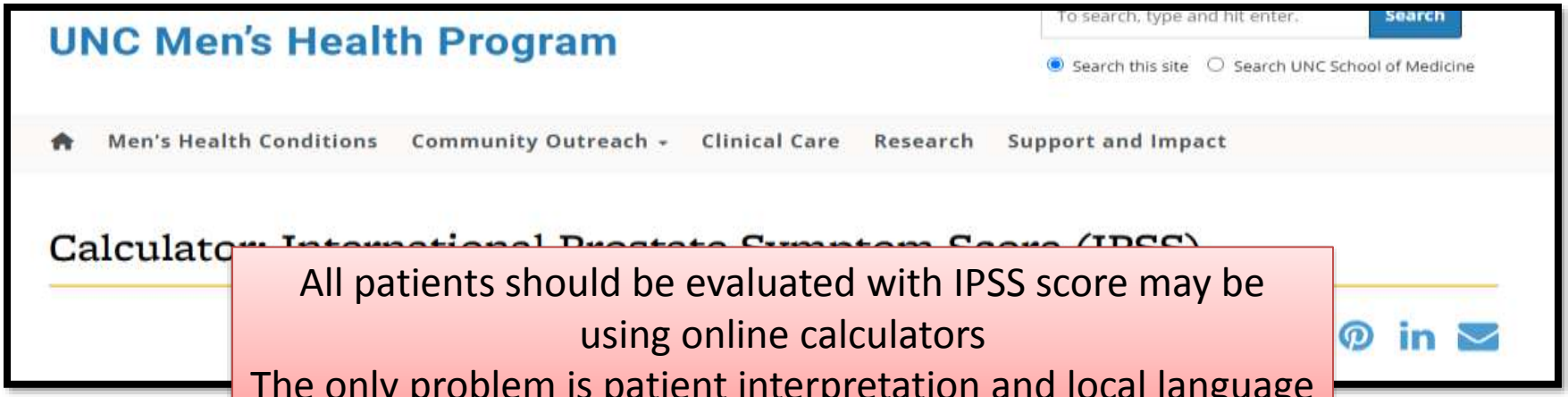
How to quantify and qualify the urinary symptoms?

IPSS

International Prostate Symptom Score

Over the past month....	Not at all	Less than 1 time in 5	Less than half the time	About half time	More than half the time	Almost always	Your score
Incomplete Emptying How often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
Frequency How often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5	
Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
Urgency How difficult you found it to postpone urination?	0	1	2	3	4	5	
Weak stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
Straining How often have you had to push or strain to begin urination?	0	1	2	3	4	5	
Over the past month....	**No**	**1 time**	**2 times**	**3 times**	**4 times**	**5 times**	**Your score**
Nocturia How many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning?	0	1	2	3	4	5	
						Total Score	

IPSS calculator



All patients should be evaluated with IPSS score may be using online calculators
The only problem is patient interpretation and local language

Total score:

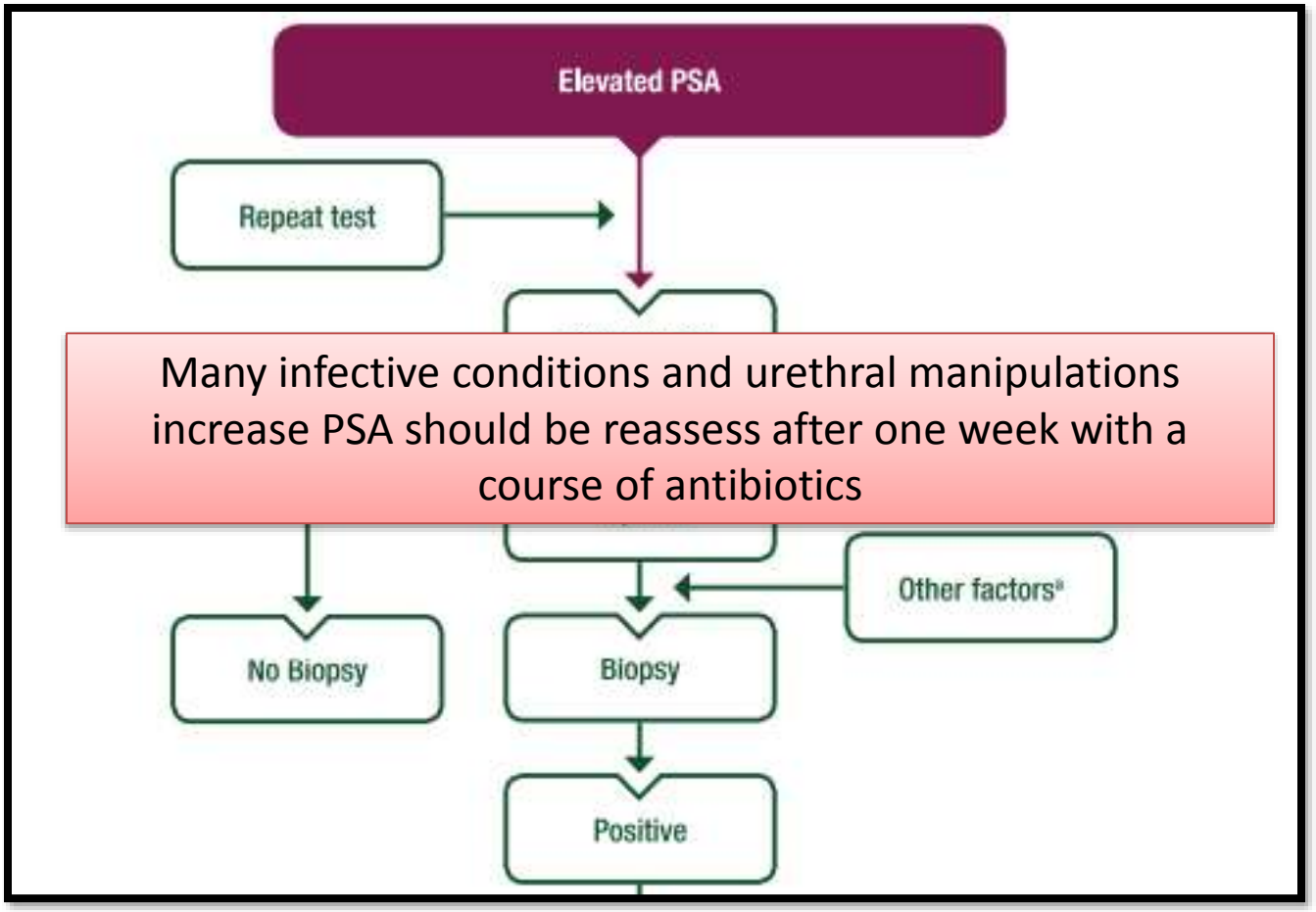
- 0-7 Mildly symptomatic;
- 8-19 moderately symptomatic;
- 20-35 severely symptomatic

Dr. Rabia Suzanne Angiras

Q-2

All raised PSA are indicative of malignancy?

What ESMO says?



5-alpha reductase inhibitors and PSA

- 5-ARIs reduce the conversion of testosterone to **dihydrotestosterone (DHT)**, which leads to:
  - Decreased prostate size (by 20-30% over 6-12 months).
  - Reduction in PSA levels due to decreased prostate volume and suppressed androgen activity.

Impact on PSA Levels:

- PSA levels are typically reduced by **50%** after 6-12 months of 5-ARI therapy.
- The reduction affects both total PSA and free PSA.

Adjusting PSA Interpretation:

- To interpret PSA levels in patients on long-term 5-ARI therapy:
  - **Double the measured PSA** value to estimate the true PSA baseline before 5-ARI use.
  - Example: If the PSA level is 2 ng/mL while on a 5-ARI, the adjusted PSA level would be approximately 4 ng/mL.

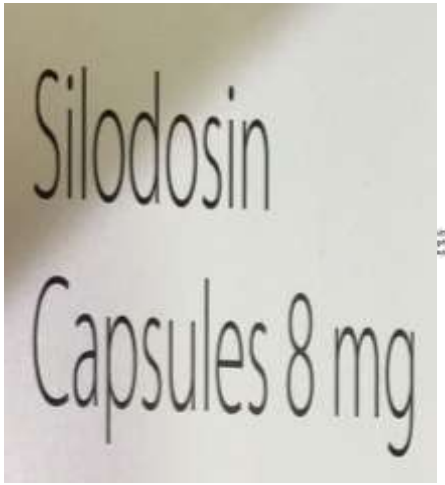
Dr. Akella Sai Srividya

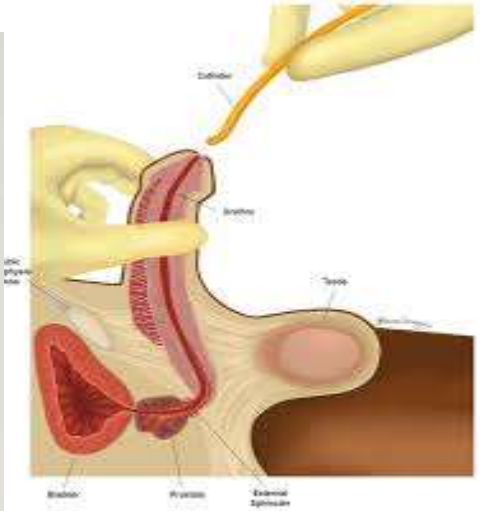
Q-3

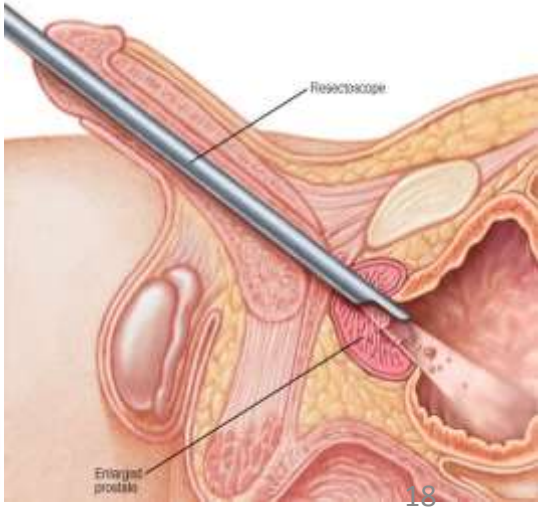
How to take care of obstructive symptoms?

Options for obstructive symptoms

- Hormonal therapy
- Medications
- Catheterization
- TURP







Aim is to avoid TURP?

ELSEVIER

Urologic Oncology: Seminars and Original Investigations 42 (2024) 165–174

UROLOGIC ONCOLOGY

Review Article

Genitourinary toxicity in patients receiving TURP prior to hypofractionated radiotherapy for clinically localized prostate cancer: A scoping review

Thomas Neerhut, BMedSt, M.D.[a,*], Richard Grills, MB.BS., FRACS (UROL.)[a],
Rod Lynch, B.Med.Sc., MB.BS., FRANZCR, AFRACMA[b],
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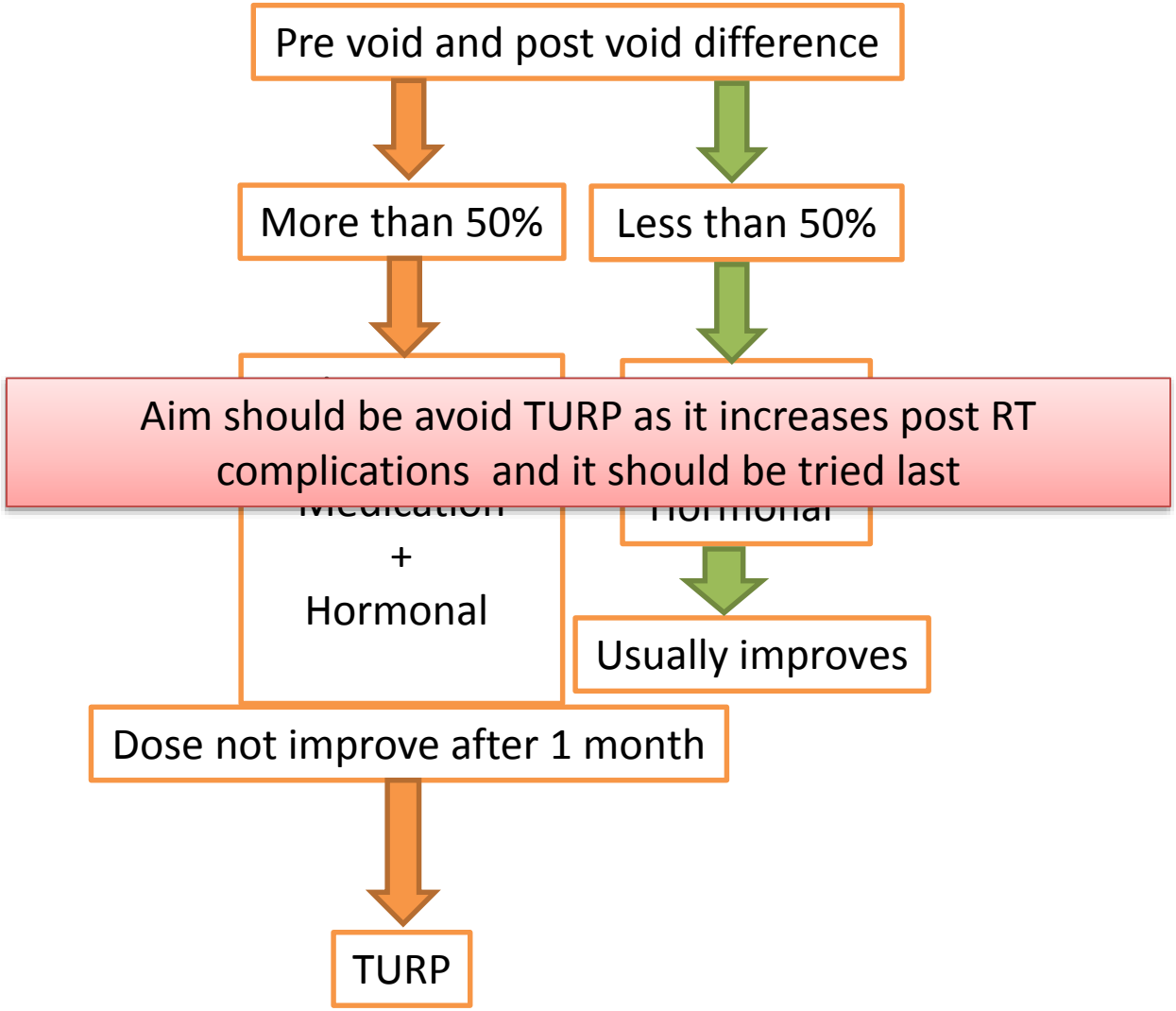
Received 17 December 2023; received in revised form 6 February 2024; accepted 27 February 2024

Conclusion: For those who have undergone prior TURP hypofractionated radiotherapy may increase the risk of late urinary toxicity, particularly hematuria. Those with persisting bladder dysfunction following TURP are at greatest risk and careful management of these men is required. Close collaboration between urologists and radiation oncologists is recommended to discuss the management of patients with residual baseline bladder dysfunction prior to commencing hypofractionated radiotherapy.

Decision making for obstructive symptoms



Dr. M Bhargava Krishna

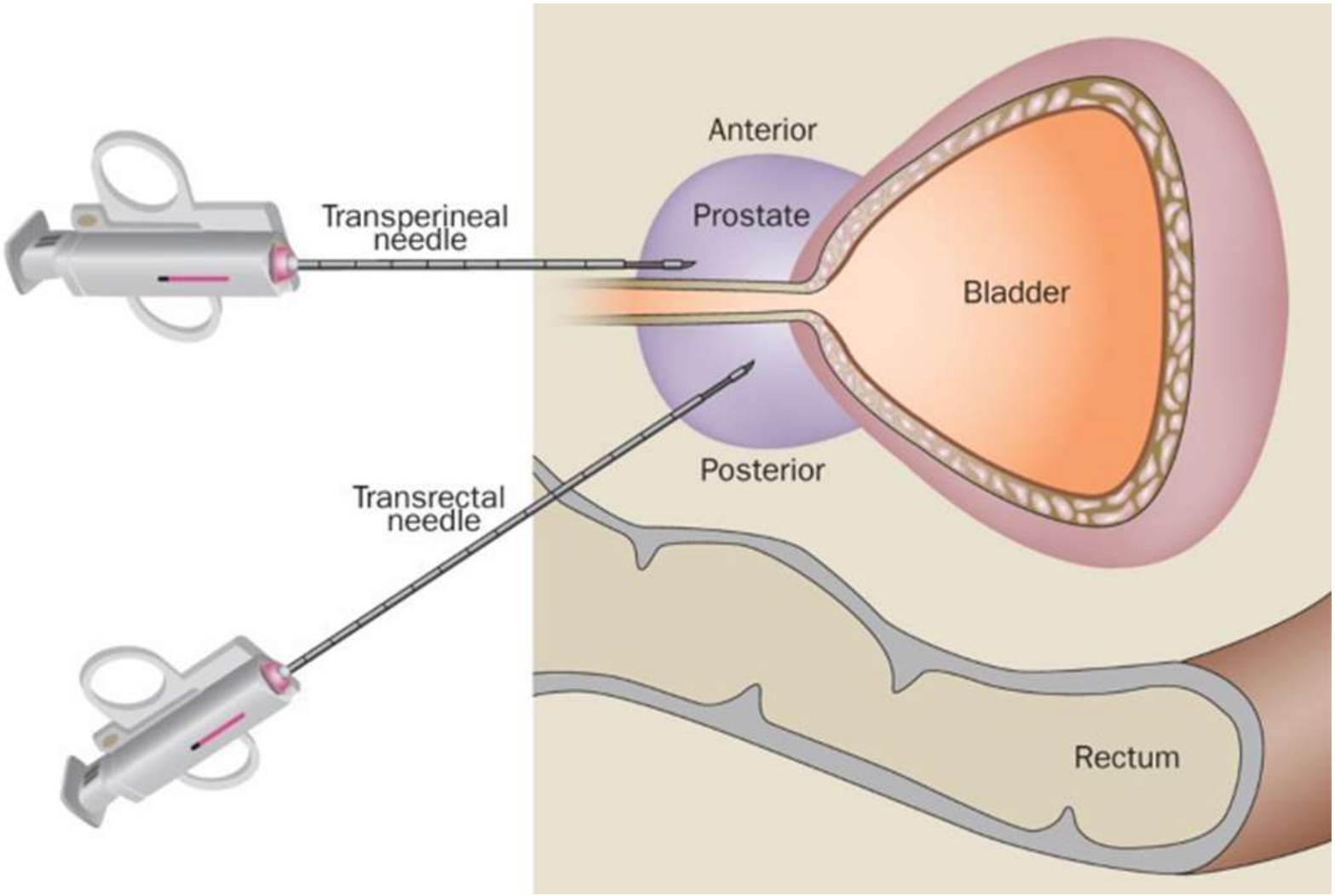
Q-4

Which type of biopsy you will prefer?

IDEAL BIOPSY

1. Now 12 core is usually performed
2. No absolute prostate biopsy guidelines
3. Cores from all major regions of the prostate
4. Cores from the regions that felt suspicious on TRUS/MRI

Trasperineal and transrectal



Trasperineal vs. Transrectal

Aspect	Transperineal Biopsy	Transrectal Biopsy
Procedure Access	Through the perineal skin	Through the rectum
Detection Rate	Higher detection of clinically significant cancer	Standard detection rate; higher detection of insignificant cases
Infection Risk	Lower risk due to sterile approach	Higher risk due to fecal contamination
Accuracy in Anterior Prostate	Higher (better access to anterior zones)	Lower (limited access to anterior zones)
Anesthesia Requirement	Often requires general or local anesthesia	Usually performed under local anesthesia
Pain/Discomfort	More discomfort due to access point	Generally less discomfort
Compatibility with MRI Fusion	Good compatibility with MRI-targeted fusion	Also compatible with MRI-targeted fusion
Recovery Time	Slightly longer recovery	Generally shorter recovery
Preferred in High-Risk Patients	Yes, due to lower infection risk	Less ideal for high infection risk cases
Recommendation	Preferred approach as per ESMO guidelines	Less preferred when mpMRI guidance is available

LESS INFECTION AND MORE EXPERTISE IN TRANSPERINEAL

Trasperineal and Transrectal

Table 1 Summary recommendations from the EAU [5], AUA [10] and NICE [7].

Guideline	Recommendation	Strength/Grade
EAU	Perform prostate biopsy using the TP approach due to the lower risk of infectious complications	Strong/1a
AUA	Clinicians may use either a TR or TP biopsy route when performing a biopsy	Conditional/C
NICE	The evidence suggests no significant difference in cancer detection rates between LATP biopsy and LA-TRUS biopsy, but it suggests lower rates of infection and sepsis after LATP biopsies. Centres are encouraged to take part in research and data collection, including the RCT of transrectal biopsy compared to LATP biopsy (the TRANSLATE trial) to help refine clinical practice	–

Each biopsy site should be reported individually

Including

- Location
- GS
- ISUP grade group
- Extent
- Lymphovascular invasion
- Intraductal carcinoma and invasive cribriform pattern

Kweldam CF. Disease-specific survival of patients with invasive cribriform and intraductal prostate cancer at diagnostic biopsy. Mod Pathol 2016;29:630–6.
Saeter Tel. Intraductal carcinoma of the prostate on diagnostic needle biopsy predicts prostate cancer mortality: a population-based study. Prostate 2017;77:859–65.

ISUP (International Society of Urological Pathology) Grade

ISUP Grade	Gleason Score
1	2–6
2	7 (3+4)
3	7 (4+3)
4	8 (4+4), (3+5), (5+3)
5	9–10 (4+5), (5+4), (5+5)

2014 ISUP Consensus Guidelines; updated in minor modifications in 2020

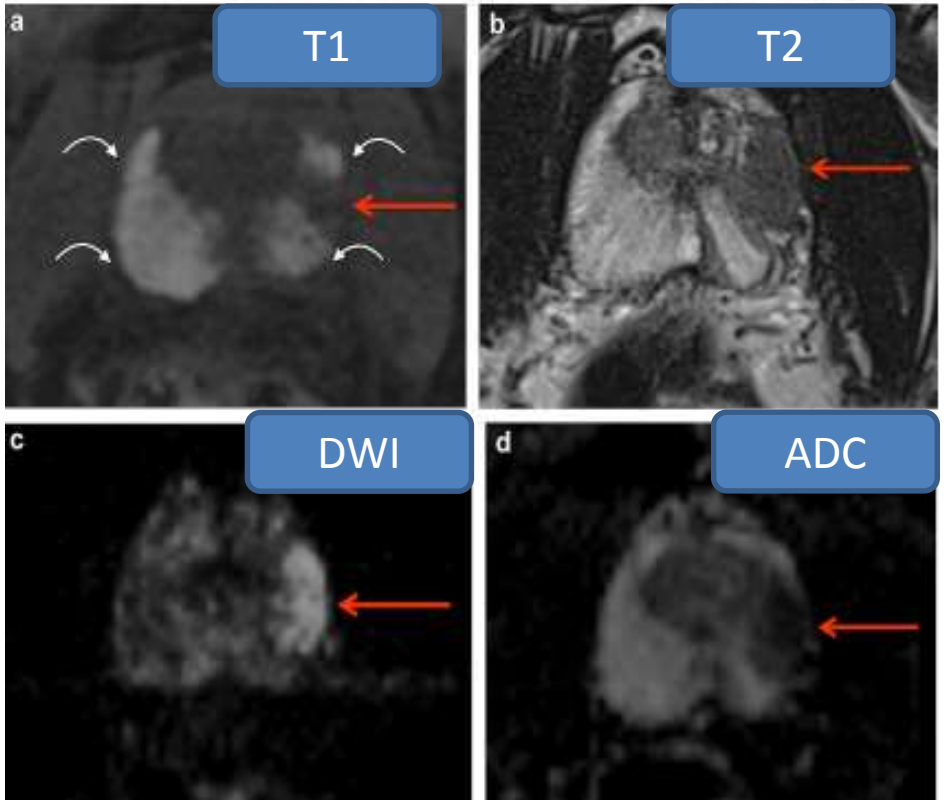
Dr. Megha Monani

Q-5

Diagnostic evaluation [**biopsy first or MRI first**?]

MRI requirements and PSMA PET?

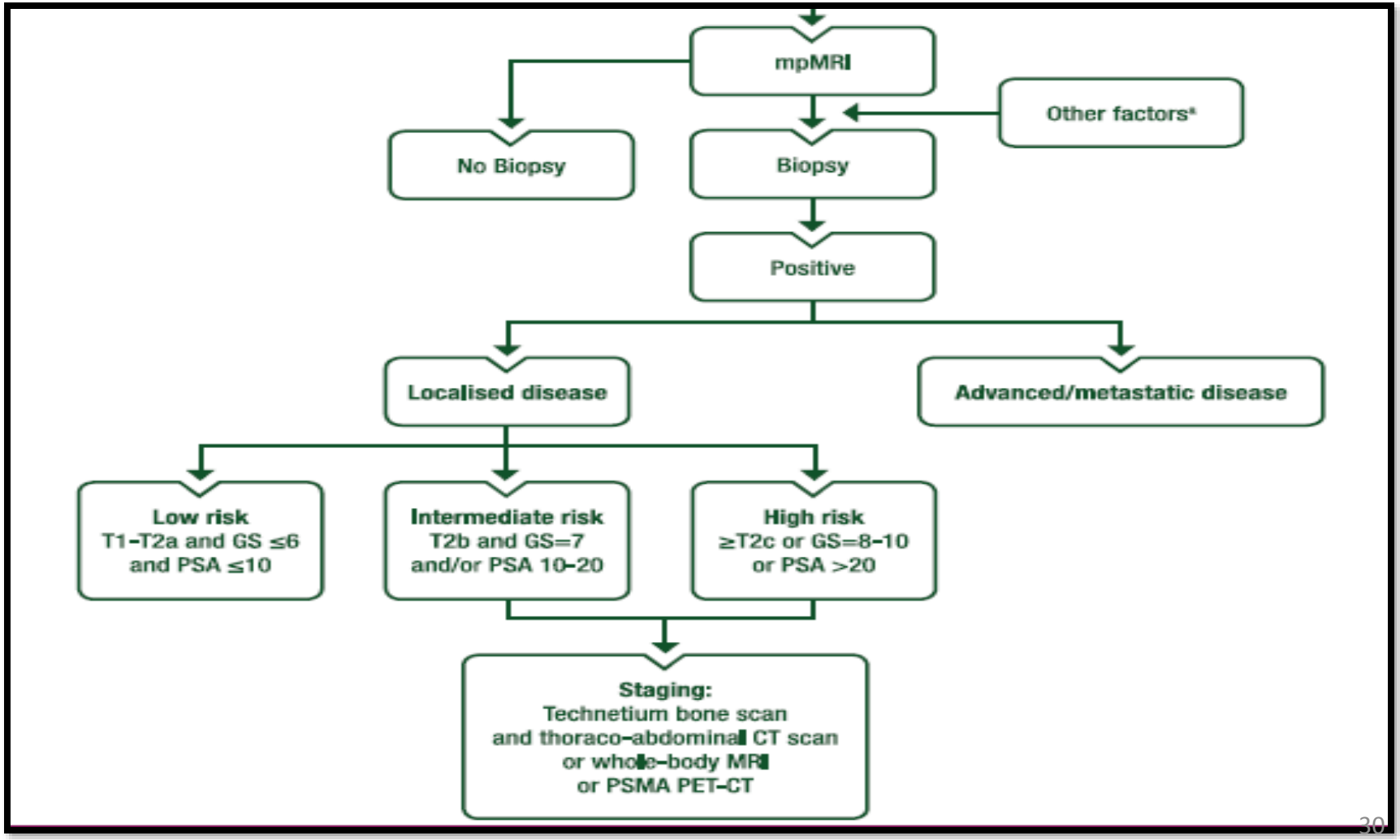
The “hemorrhage exclusion” sign



1. Multiparametric MR prostate exam of a 59-year-old male with biopsy proven adenocarcinoma involving the left mid-gland peripheral zone, Gleason score of 4+3.
2. Images were acquired only 10 days following biopsy. a Axial T1 fat-suppressed image shows hyperintense residual hemorrhage (curved white arrows) outlining.
3. a relative area of signal void (red straight arrow), illustrating the “hemorrhage exclusion” sign.
4. b Axial T2 image demonstrates a corresponding area of focal hypointensity (red arrow).
5. c Difusion-weighted image (high b-value of 1500 s/mm2) demonstrates marked hyperintensity in this region (red arrow) with associated ADC map showing marked hypointensity’
6. d consistent with restricted difusion corresponding to the tumor (red arrow

T1-weighted imaging, a sufficiently large tumor can be seen as a relatively hypointense lesion outlined by hyperintense residual blood products, producing the “hemorrhage exclusion” sign

Diagnostic work up



Multiparametric Mp-MRI

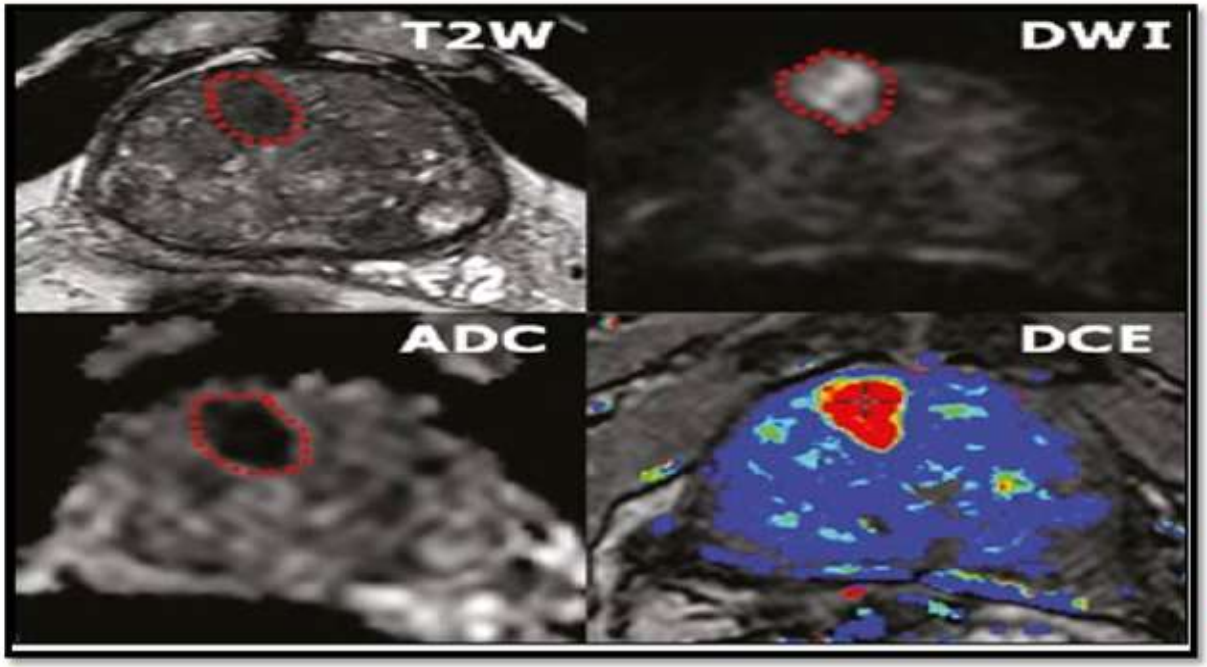
Summary:

These examples show how mpMRI provides a **multifaceted view** of prostate cancer through different imaging sequences:

- **T2WI** offers anatomical details.
- **DWI** highlights areas of restricted diffusion (common in malignant tumors).
- **DCE-MRI** detects abnormal blood flow in cancerous tissues.
- **MRS** (though less commonly used) may provide metabolic information to further characterize the tumor.

By combining these different imaging techniques, mpMRI enhances our ability to **diagnose, localize, stage, and monitor prostate cancer**, leading to more accurate treatment decisions and improved patient outcomes.

MULTIPARAMETRIC MRI PROSTATE



Multiparametric MRI imaging incorporates T2-weighted, diffusion-weighted, and dynamic contrast-enhanced

Multiparametric MRI incorporating functional imaging has led to a paradigm shift in how prostate cancer is diagnosed and increasingly in how it is followed-up

Multiparametric magnetic resonance imaging (mp-MRI), combining the morphological assessment of T2-weighted imaging (T2WI) with diffusion-weighted imaging (DWI), dynamic contrast-enhanced (DCE) perfusion imaging and spectroscopic imaging (MRSI)

Sangeeta Ghai/Indian journal of urology/2015

8th FEB 2019/PROSTATE

The “erased charcoal” sign

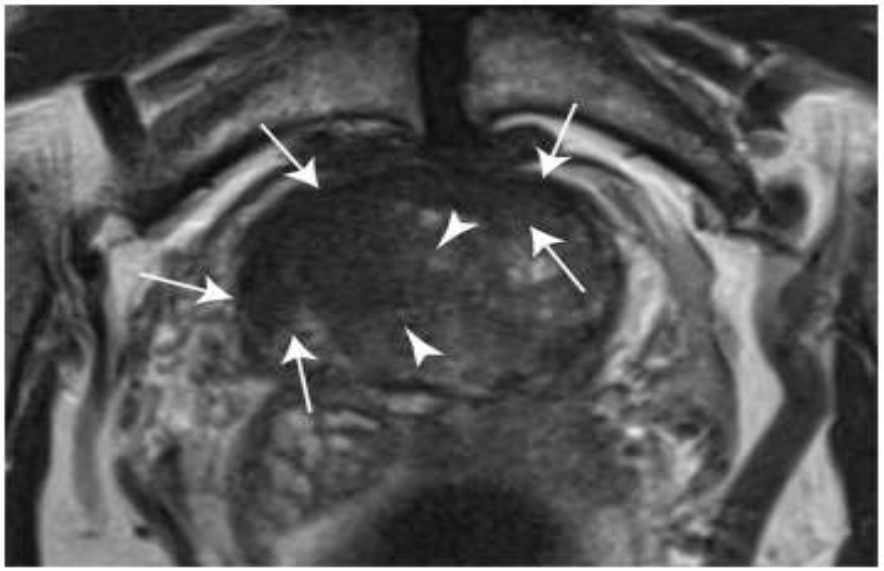


Fig. 1. Axial T-2W MRI of the prostate at the base of the gland (TR=4750, TE=103) with TZ tumor illustrating the “erased charcoal” sign (*arrowheads*). The TZ is hypertrophied from benign prostatic hyperplasia and occupies the majority of the gland’s volume at this level. *Arrows* delineate a 3.5 cm lenticular area of T-2W hypointensity with non-circumscribed margins (PI-RADS ™ score 5 for the T-2W category).

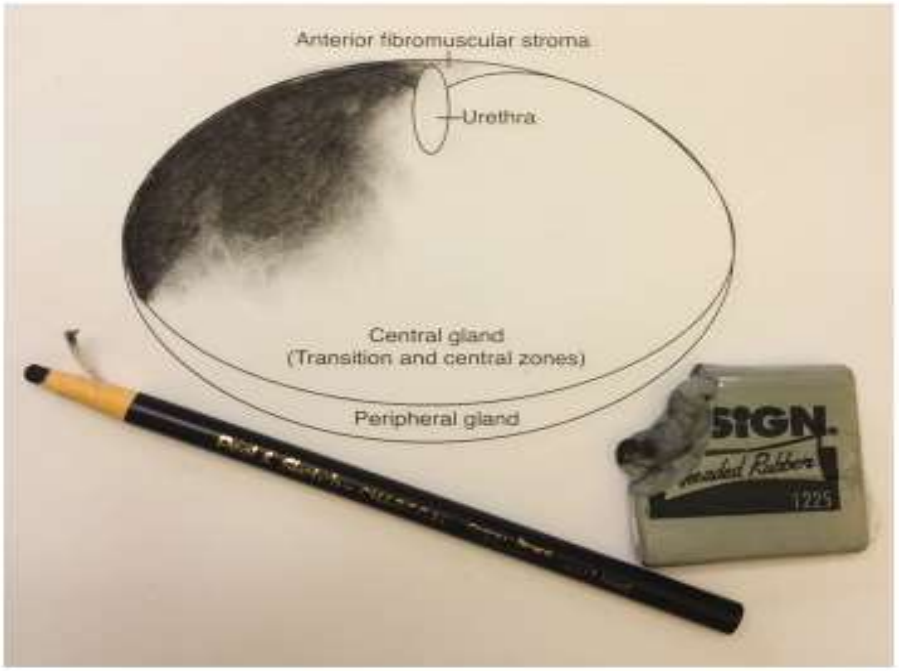
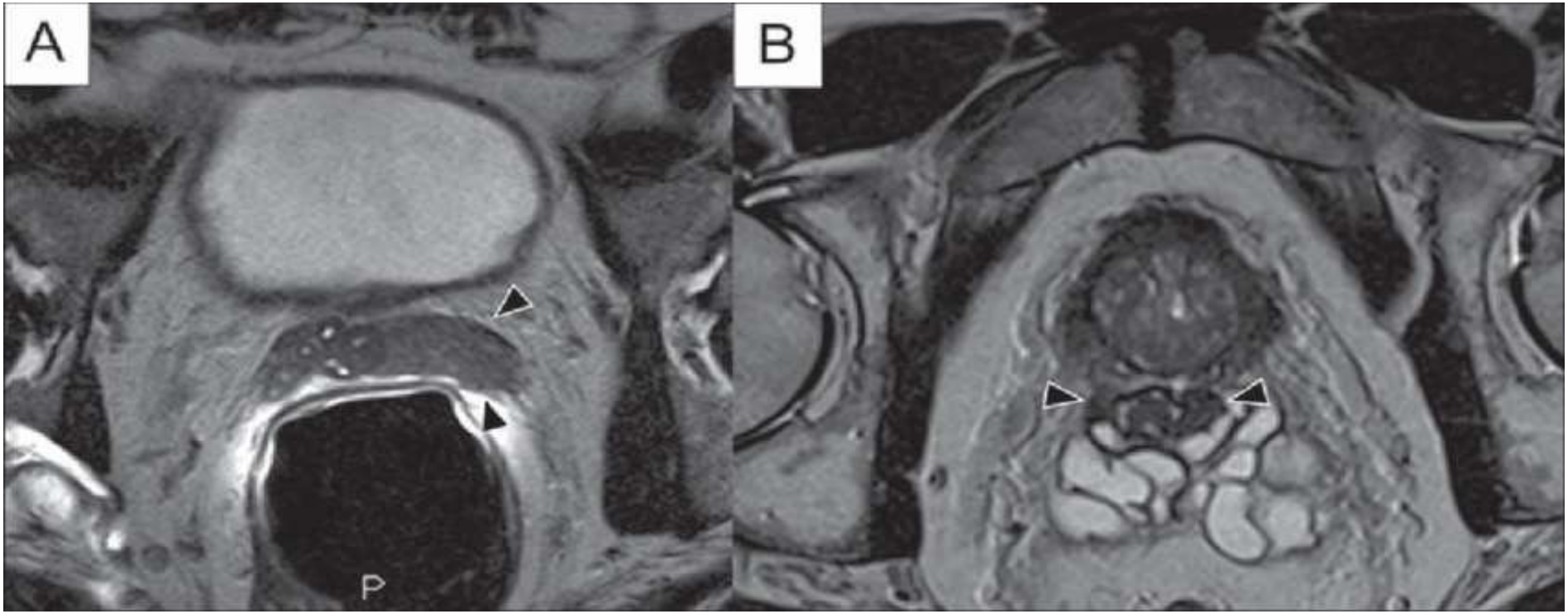


Fig. 2. Axial schematic of the base of the prostate shows a hypertrophied TZ due to benign prostatic hyperplasia. The charcoal drawing of a TZ tumor parallels the tumor in the MRI in Fig. 1. The tumor margins are smudged with the shown eraser.

The erased charcoal sign describes the typical appearance of focal prostate cancer in the transition zone characterized as homogeneous hypo intensity on T2WI with ill-defined borders, akin to a charcoal pencil drawing smudged with an eraser, often with a lenticular or water drop-like shape.

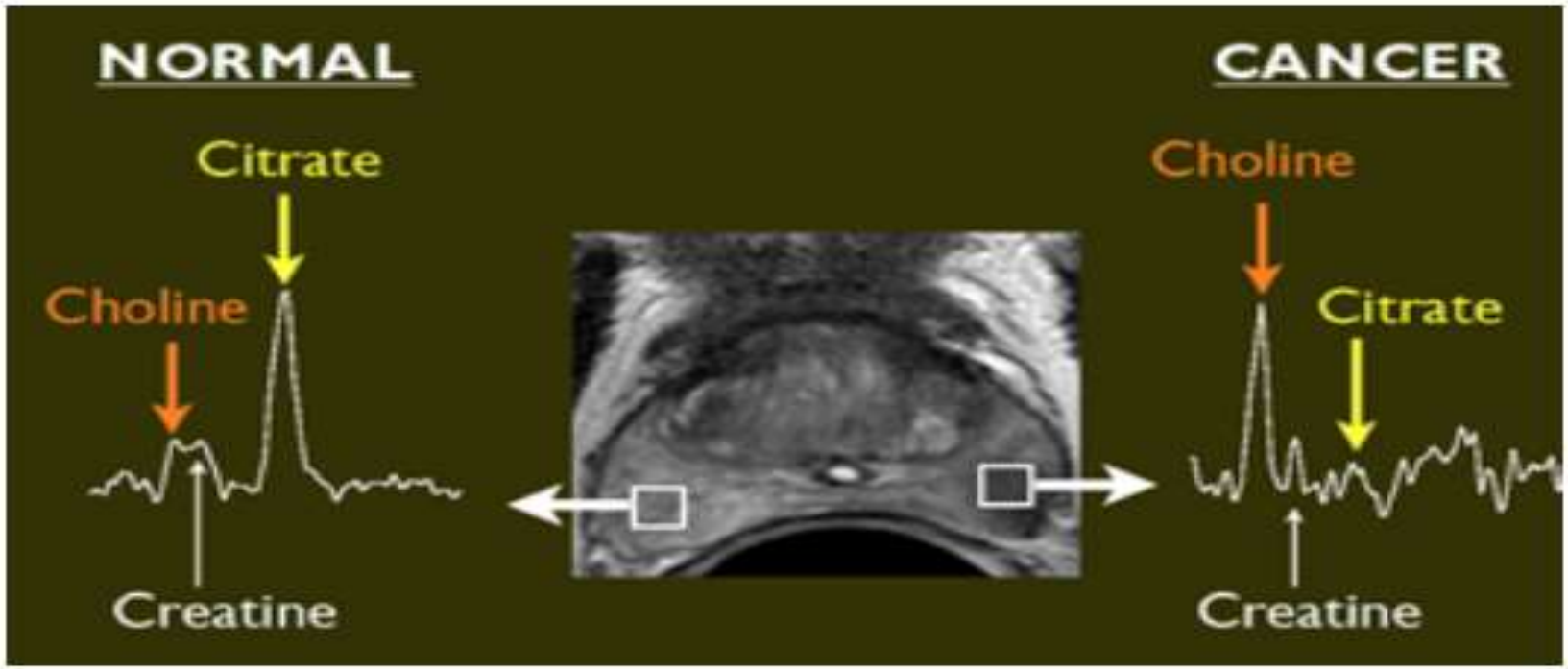
INTERPRETATION OF SEMINAL VESCICLE INVOLVEMENT

The spoiled grape sign



Signs of tumor extension to the seminal vesicles on T2weighted images, identified by arrowheads. The key is to find hypointense areas replacing the usual hyperintense seminal vesicle, promoting wall thickening and obliterating their lumina, with either a diffuse (A) or focal (B) appearance.

Interpretation of MRS prostate



- Dominant MRS peak in normal prostate is citrate (δ = 2.6 ppm)
- Small peaks from choline, creatine, and polyamines also seen
- In cancer, citrate and polyamines decrease while choline increases

In MRS imaging of prostate cancer, specific metabolic markers are examined, particularly the levels of choline, creatine, and citrate. Typically:

1. **Choline**: Increased in cancerous prostate tissue due to cell membrane turnover.
2. **Citrate**: Decreased in malignant tissue as opposed to healthy tissue.
3. **Creatine**: Remains relatively stable but serves as a reference in assessing choline and citrate levels.

T stage based on mpMRI PELVIS

- TX – Primary tumor cannot be assessed
- T0 – No evidence of primary tumor
- T1 – Clinically apparent tumor that is not palpable
- T1a – Tumor incidental histologic finding in 5% or less of tissue resected
- T1b – Tumor incidental histologic finding in more than 5% of tissue resected
- T1c – Tumor identified by needle biopsy found in one or both sides, but not palpable
- T2 – Tum
- T2a – Tu
- T2b – Tumor involve smore than one-half of one side but not both sides
- T2c – Tumor involves both sides
- T3 – Extraprostatic tumor that is not fixed or does not invade adjacent structures
- T3a – Extraprostatic extension (unilateral or bilateral)
- T3b – Tumor invades seminal vesicles
- T4 – Tumor is fixed or invades adjacent structures other than seminal vesicles such as external sphincter, rectum, bladder, elevators muscles, and/or pelvic wall

Multiparametric MRI is the standard and should be asked before biopsy

Dr. Ram Vinayak

Q-6

ROLE OF PSMA PET /BONE SCAN

Do we really need PSMA PET ?

- What evidence says?

PET CT better than CT + Bone Scan combined

EUROPEAN UROLOGY 86 (2024) 148–163

Recommendations	Strength rating
Any risk group staging	
Use prebiopsy magnetic resonance imaging for local staging information.	
Low-risk localised disease	
Do not use additional imaging for staging purposes.	
Intermediate-risk disease	
For patients with International Society of Urological Pathology grade group 3 disease, include at least cross-sectional abdominopelvic imaging and a bone scan for metastatic screening.	Weak
Perform PSMA PET/CT if available to increase accuracy.	Weak
High-risk localised disease/locally advanced disease	
Perform metastatic screening using PSMA PET/CT if available and at least cross-sectional abdominopelvic imaging and a bone scan.	Strong

1. SOFT TISSUE
2. NODE

EAU-EANM-ESTRO-ESUR-ISUP-SIOG Guidelines on Prostate Cancer—2024 Update. Part I: Screening, Diagnosis, and Local Treatment with Curative Intent

BONE SCAN VS PSMA

Comparison of Bone Scan vs. PSMA PET

Feature	Bone Scan	PSMA PET
Sensitivity	70%-90%	85%-95% or higher
Specificity	50%-75%	>90% (more accurate than bone scan)
Detection Scope	Primarily bone metastases	Bone and soft tissue metastases
False Positives	Higher due to benign bone conditions	Lower, more specific to prostate cancer
Clinical Use	Routine in high-risk prostate cancer	Emerging for advanced, recurrent, or metastatic prostate cancer
Stage of Detection	More useful for later-stage metastases	Can detect metastases at earlier stages
Limitations	Less effective for soft tissue metastases	Requires access to specialized facilities

Conclusion

- **Bone Scans** are still widely used, especially for detecting bone metastases in prostate cancer. However, they have limitations in specificity and cannot reliably detect soft tissue metastases.
- **PSMA PET** is superior in terms of both sensitivity and specificity, particularly for detecting metastatic lesions in both **bone** and **soft tissue**. It is increasingly preferred for high-risk, recurrent, or metastatic prostate cancer, offering more accurate staging and detection.

For the best diagnostic approach, many clinicians combine these imaging modalities based on the clinical context, as they provide complementary information about prostate cancer metastasis.

Klaassen Z, et al. (2021). "Comparison of PSMA PET/CT with conventional imaging modalities in prostate cancer: A systematic review and meta-analysis." *Journal of Nuclear Medicine*.

Rib lesion in PSMA

BJU Int. 2020 Sep;126(3):396-401. doi: 10.1111/bju.15152. Epub 2020 Jul 28.

Solitary rib lesions showing prostate-specific membrane antigen (PSMA) uptake in pre-treatment staging ^{68}Ga-PSMA-11 positron emission tomography scans for men with prostate cancer: benign or malignant?

Michael Y Chen [1 2], Anthony Franklin [1 2], John Yaxley [1 2], Troy Gianduzzo [1 2], Rhiannon McBean [1], David Wong [1], Annaleis Tatkovic [1], Louise McEwan [1], James Walters [1], Boon Kua [1]

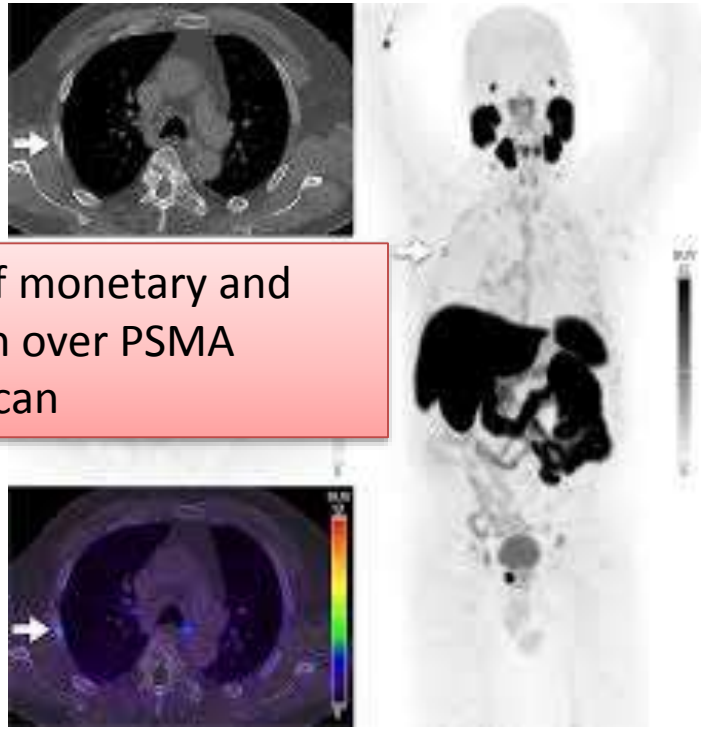
Affiliations + expand

PMID: 32592330 DOI: 10

Multiparametric MRI is the standard, if monetary and availability issue consider bone scan over PSMA
I prefer PSMA over bone scan

Conclusion

To our knowledge, this is the first cohort study of men with PSMA avid solitary rib lesions on pre-treatment ^{68}Ga-PSMA PET/CT staging scans for prostate cancer. Our results indicate that the vast majority of these lesions have low intensity uptake and are benign. Intervention to confirm this is not usually required.



Dr. Aakriti Bhardwaj

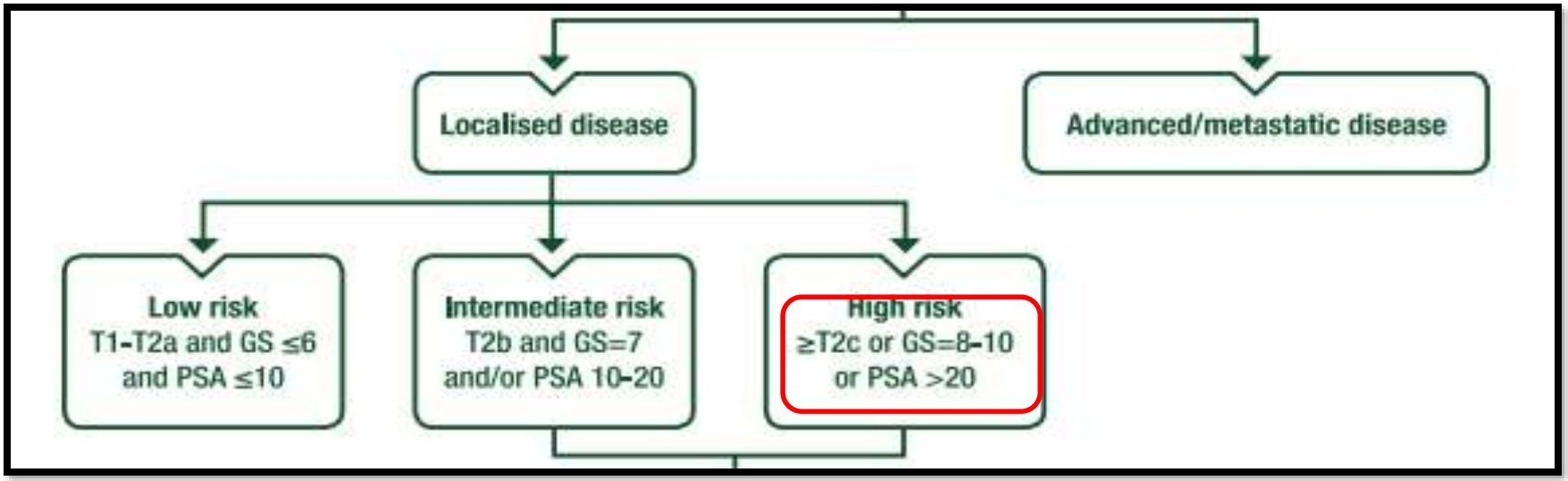
Q-7

Risk stratification?

Risk Stratification - GPS SCORE

- G- GLEASON GARDE
- P- PSA VALUE
- S- STAGE

D'Amico risk classification



Risk category	Low	Intermediate	High
Gleason score	3 + 3 = 6	3 + 4 = 7	4 + 4 = 8
		4 + 3 = 7	3 + 5 = 8
			5 + 3 = 8
			4 + 5 = 9
			5 + 4 = 9
			5 + 5 = 10
PSA (ng/ml)	<10	10-20	>20
Clinical T stage (based on rectal exam)	No/small nodule (T1-2a)	Medium nodule (T2b)	Large nodule (>T2c)

Risk Stratification- NCCN

Risk Group	Clinical/Pathologic Features (Staging, ST-1)		
Very low[j]	Has all of the following: • cT1c • Grade Group 1 • PSA <10 ng/mL		ancer in
Low[j]	• Grade Group 1 • PSA <10 ng/mL		w risk:
Intermediate[j]	Has all of the following: • No high-risk group features • No very-high-risk group features • Has one or more intermediate risk factors (IRFs): ▸ cT2b–cT2c ▸ Grade Group 2 or 3 ▸ PSA 10–20 ng/mL	Favorable intermediate	Has all of the following: • 1 IRF • Grade Group 1 or 2 • <50% biopsy cores positive (eg, <6 of 12 cores)[l]
		Unfavorable intermediate	Has one or more of the following: • 2 or 3 IRFs • Grade Group 3 • ≥ 50% biopsy cores positive (eg, ≥ 6 of 12 cores)[l]
High	Has no very-high-risk features and has exactly one high-risk feature: • cT3a OR • Grade Group 4 or Grade Group 5 OR • PSA >20 ng/mL		
Very high	Has at least one of the following: • cT3b–cT4 • Primary Gleason pattern 5 • 2 or 3 high-risk features • >4 cores with Grade Group 4 or 5		

D'Amaico is still preferable over NCCN but more stratification
We need NCCN

Dr. Rabia Suzanne Angiras

Q-8

Estimating the nodal involvement?

YALE FORMULA PREDICTS BETTER THAN ROACH FOR LYMPH NODE

- ✓ **YALE FORMULA**
- ✓ **For prediction of %LN+ risk is→ [GS – 5] [PSA/3 + 1.5 T]**
- ✓ **Where T = 0, 1, and 2 for cT1c, cT2a, and cT2b/cT2c.**

The YF performed better than the RF and was best at differentiating

- (GS-5) [PSA/3+1.5T]
- (7-5)[12/3+1.5X2]=14%

Many investigator … d lymph node (LN) involvement. One … h formula (RF), which defines the risk of … SA])2/3 + (Gleason – 6))10). There has been significant stage migration in prostate cancer over the past decade since the creation of the RF. To provide clinicians with a practical approach to estimating LN risk that was developed from a population-based sample of patients who reflect the vast majority of patients diagnosed in the modern PSA era, and whose care reflects current patterns of care, we developed and validated a new predictive formula using the SEER database. A fast, accurate, and easy-to-use formula would be helpful in discussing LN risk with patients and in the conceptualization of LN risk for future clinical trials.

JAMES B. YU/ IJROBP/2011

27th AUGUST 2018/PROSTATE

Dr. Akella Sai Srividya

Q-9

Estimating the extra capsular involvement?

ROACH FORMULA STILL HOLDS GOOD IN PROSTATE CANCER

1. Ser
   Cu
2. Lyn
   Cu
3. Ext

40%.

ROACH F
SURG

XTENT OF
RGET

The beauty
predict risk of d
organ confined
treated and radi

te cancer to
ent, and non-
ll to surgically
t risk of failing

Mark roach/ Cance

2018/PROSTATE

SEMINAL VESCICLE INVOLVEMENT

- PSA+([GS-6]X10)
- 12+([7-6]X10)=22%

LYMPHNODAL INVOLVEMENT

Theese estimations prevent unnecessary surgeries and dual treatment

- 4X12+([7-6]X10)=13%

ECE INVOLVEMENT

- 1.5PSA+([GS-3]X10)
- 1.5X12+([7-3]X10)=58%

Dr. M Bhargava Krishna

Q-10

Treatment options?

Shared Decision Making

- URO ONCO
- MED ONCO
- RAD ONCO
- ONCO PATH
- RADIOLOGISTS
- NUCLEAR MEDICINE

Algorithm

Table 1. Stage-matched therapeutic strategies

Localised disease	Low risk	Active surveillance Brachytherapy RP Radical RT
	Intermediate risk	RP Radical RT ± neoadjuvant ADT Brachytherapy Active surveillance
	High risk	Long-term ADT + radical RT ± neoadjuvant docetaxel RP + pelvic lymphadenectomy

Management Options

1. EBRT + ADT
2. E
3. RP + ePLND

All treatment options should be discussed in MDT and with the patient and let the patient take the decision

Dr. Megha Monani

Q-11

Role Of Active Surveillance?

Active surveillance

Aspect	Active Surveillance	Observation
Definition	Regular monitoring with the intention to delay treatment until signs of progression.	Monitoring without immediate intent to treat unless symptoms develop.
Primary Candidates	Men with low-risk prostate cancer (e.g., Gleason score ≤6, low PSA levels).	Men with limited life expectancy or those unlikely to benefit from intervention.
Goal	To delay or avoid treatment side effects while still controlling cancer progression if needed.	To avoid treatment entirely unless symptomatic progression occurs.
Monitoring Methods	PSA tests, digital rectal exams (DRE), prostate biopsies, and imaging (e.g., MRI).	Less frequent monitoring, typically focusing on symptom development.
Frequency of Monitoring	Every 3-6 months initially; frequency may decrease if stable.	Varies; often less intensive than active surveillance.
Trigger for Intervention	Indications of progression, such as increase in PSA, worsening Gleason score, or imaging findings.	Symptoms or evidence of metastatic disease.
Common Treatments Upon Progression	Surgery, radiation, hormone therapy.	Palliative care or symptom management.
Risk of Over-Treatment	Lower than immediate treatment; moderate due to possible eventual need for intervention.	Low, as no treatment is provided unless symptoms arise.
Quality of Life Impact	Generally high due to avoidance of immediate treatment side effects.	Generally high; avoids side effects of treatment entirely.
Suitability for Younger Patients	Often recommended for younger patients with low-risk disease and long life expectancy.	Generally reserved for older patients or those with significant comorbidities.

Trails in active surveillance in IR prostate cancer

Study/Guideline	Focus	Key Findings	Reference
ENACT Trial	Enzalutamide vs. AS in low- and intermediate-risk prostate cancer	Enzalutamide delayed disease progression compared to AS.	JAMA Oncology
National Cancer Database Study	Trends in AS utilization from 2010 to 2020	Increased adoption of AS in intermediate-risk prostate cancer over time.	JAMA Network Open
Systematic Reviews	Outcomes of AS in intermediate-risk prostate cancer	Varying rates of treatment-free survival and metastasis-free survival; highlights need for careful patient selection.	European Urology Oncology
AUA/ASTRO Guidelines (2022)	Recommendations for AS in prostate cancer	AS is an option for favorable intermediate-risk cases; emphasizes individualized patient assessment.	AUA Guidelines

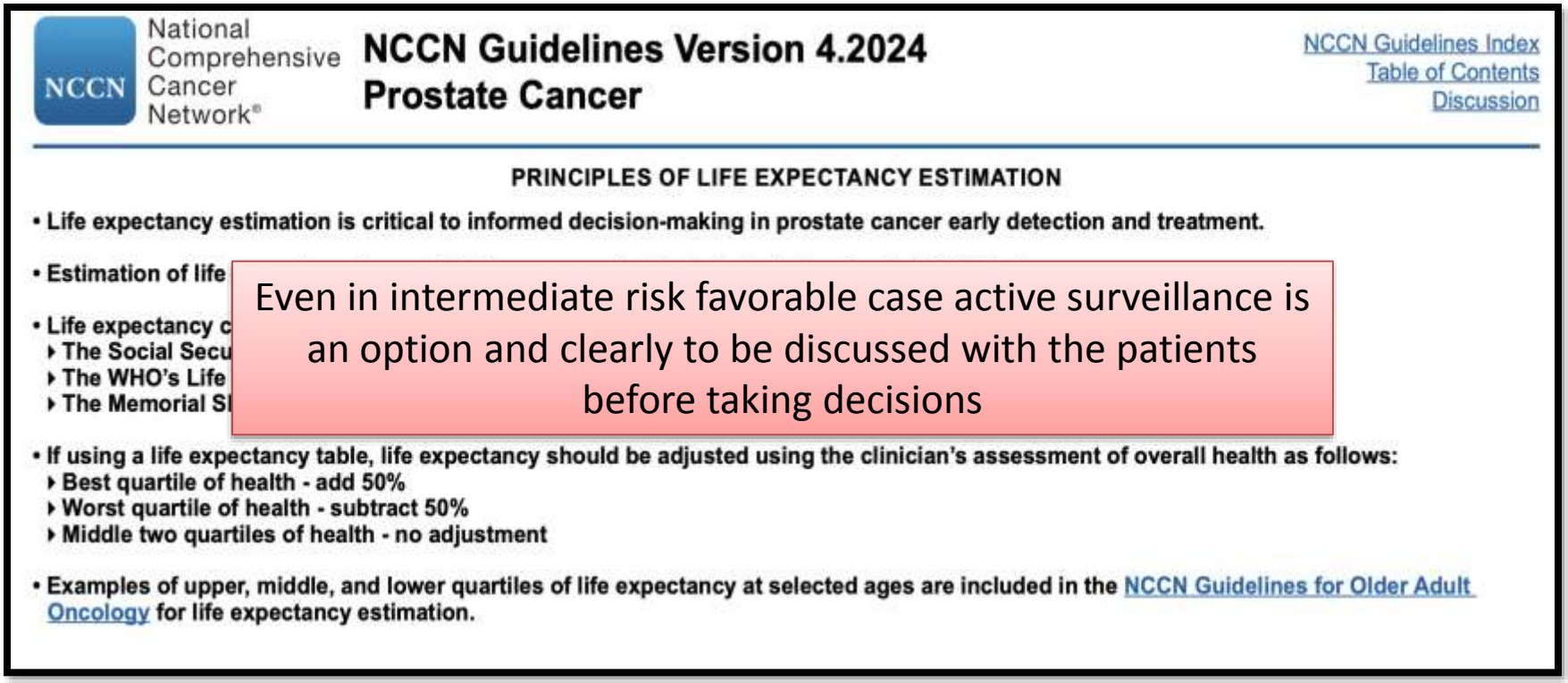
EAU-EANM-ESTRO-ESUR-SIOG Guidelines

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology

Intermediate-risk disease		
Active surveillance	Offer AS to highly selected patients (<10% Gleason pattern 4) accepting the potential increased risk of further metastases	Weak
Radical prostatectomy	Offer RP to patients with intermediate-risk disease and life expectancy of >10 yr	Strong
	Offer nerve-sparing surgery to patients with a low risk of extracapsular disease	Strong
Extended pelvic lymph node dissection	Perform an ePLND in intermediate-risk patients if the estimated risk for positive lymph nodes exceeds 5%	Strong
Radiotherapeutic treatment	Offer LDR brachytherapy to selected patients: patients without a previous TURP, with a good IPSS, and with a prostate volume of <50 ml	Strong
	For EBRT, use a total dose of 76–78 Gy or moderate hypofractionation (60 Gy/20 fx in 4 wk or 70 Gy/28 fx in 6 wk), in combination with short-term neoadjuvant plus concomitant ADT (4–6 mo)	Strong
	In patients not willing to undergo ADT, use an escalated dose of EBRT (76–80 Gy) or a combination with brachytherapy	Weak

Evaluating life expectancy and health status



National Comprehensive Cancer Network®

NCCN Guidelines Version 4.2024
Prostate Cancer

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PRINCIPLES OF LIFE EXPECTANCY ESTIMATION

- **Life expectancy estimation is critical to informed decision-making in prostate cancer early detection and treatment.**
- **Estimation of life**
- **Life expectancy c**
  - **The Social Secu**
  - **The WHO's Life**
  - **The Memorial Sl**
- **If using a life expectancy table, life expectancy should be adjusted using the clinician's assessment of overall health as follows:**
  - **Best quartile of health - add 50%**
  - **Worst quartile of health - subtract 50%**
  - **Middle two quartiles of health - no adjustment**
- **Examples of upper, middle, and lower quartiles of life expectancy at selected ages are included in the NCCN Guidelines for Older Adult Oncology for life expectancy estimation.**

Even in intermediate risk favorable case active surveillance is an option and clearly to be discussed with the patients before taking decisions

Scenario-1

Choosing → NAHT f/b Radiation

Dr. Ram Vinayak

Q-12

Choosing the surgical vs. medical hormone ablation?

Surgical Castration vs. Medical Castration

Aspect	Surgical Castration	Medical Castration
Definition	Removal of testes (orchiectomy) to reduce testosterone permanently	Use of medications (GnRH agonists/antagonists) to suppress testosterone
Procedure	Surgery, often under local or general anesthesia	Regular injections or implants
Dur		one returns atment
Onset of Effect	Immediate drop in testosterone	Takes several weeks to lower testosterone levels
Side Effects - Immediate	Hot flashes, fatigue, decreased libido	Hot flashes, fatigue, decreased libido
Side Effects - Long-term	Bone density loss, muscle loss, emotional changes (depression, anxiety)	Mood swings, weight gain, increased risk of diabetes and cardiovascular issues
Additional Risks	Infection, bleeding, scarring at surgery site	Injection site reactions

Surgical castration should be reserved for poor and non responding and castration sensitive metatstatic issues

Dr. Aakriti Bhardwaj

Q-13

Choosing antagonist vs. agonist hormonal ablation?

MEDICAL HORMONAL ABLATION OPTIONS

- GnRH ANALOGUE
  - **GnRH Agonists (e.g., Leuprolide)**
- GnRH ANATAGONIST- INJECTABLE
  - **Degarelix**
- GnRH ANATAGONIST- ORAL
  - **Relugolix** (Oral GnRH Antagonist)

Antagonist vs. agonist hormonal ablation

Aspect	Androgen Agonists	Androgen Antagonists
Mechanism of Action	Stimulates GnRH receptors, causing an initial testosterone surge, then suppresses testosterone due to receptor down regulation	Directly blocks GnRH receptors, leading to immediate testosterone suppression
Testosterone Flare	Causes an initial surge ('flare') that can worsen symptoms initially	No testosterone flare, safer for high-risk patients
Onset of Act		testosterone
Examples		
Use in Advanced Disease	Used with anti-androgens initially to control flare if needed	Preferred due to lack of flare and faster action
Side Effects	Hot flashes, fatigue, bone loss, metabolic changes	Similar side effects; may cause more injection-site reactions
Administration	Long-acting depot injections every 1–6 months	Typically requires more frequent dosing
Cost Considerations	Often more affordable, especially for long-term treatment	Can be more expensive and vary by healthcare system

Antagonists preferred over agonists for no tumor flare ,less cardiac morbidity and faster testosterone recovery but costly and needs frequent administration

Antagonist vs. Agonist

hormonal ablation A Metaanalysis

Systematic Review and Meta-Analysis

Medicine

OPEN

A meta-analysis and systematic review of randomized controlled trials with degarelix versus gonadotropin-releasing hormone agonists for advanced prostate cancer

Alessandro Sciarra[a,*], Andrea Fasulo[b], Antonio Ciardi[c], Elisa Petrangeli[d], Alessandro Gentilucci (PhD)[a], Martina Maggi[a], Michele Innocenzi[a], Federico Pierella[a], Vincenzo Gentile[a], Stefano Salciccia[a], Susanna Cattarino (PhD)[a]

Abstract

Our aim was to systematically evaluate the benefits of degarelix as antagonist versus agonists of gonadotropin-releasing hormones (GnRH) for the treatment of advanced prostate cancer (PC). This comparison was performed either in terms of biochemical or oncological or safety profiles. To this end we, carried out a systematic review and meta-analysis of the literature.

We selected only studies directly and prospectively analyzing the two treatments in the same population (randomized phase III studies). We followed the Preferred Reporting Items for Systematic Reviews and meta-analyses process for reporting studies.

After we eliminated studies according to the exclusion criteria, 9 publications were considered relevant to this review. These articles described 5 clinical trials that were eligible for inclusion. The follow-up duration in all trials did not exceed 364 days. This meta-analysis and review comprised a total of 1719 men, 1061 randomized to degarelix versus 658 to GnRH agonists treatment for advanced PC. Oncological results were evaluated only in 1 trial (CS21:408 cases) and they were not the primary endpoints of the study. Treatment emerging adverse events were reported in 61.4% and 58.8% of patients in the degarelix and GnRH agonists group, respectively (odds ratio, OR = 1.17; 95% confidence interval, 95% CI: 0.78–1.77, $P > 0.1$). Treatment related severe cardiovascular side effects were reported (trial CS21-30-35) in 1.6% and 3.6% of patients in the degarelix and GnRH agonists group, respectively (OR = 0.55, 95% CI: 0.26–1.14, $P > 0.1$).

Our analysis evidences relevant limitations in particular for the comparative evaluation of the efficacy and the oncological results related to degarelix.

Abbreviations: ADT = Androgen deprivation therapy; CAB = Complete androgen blockade; CRPC = castrate resistant PC; GnRH = gonadotropin- releasing hormones; PC = prostate cancer; QUADAS = Quality Assessment of Diagnostic Accuracy Studies.

Keywords: degarelix, hormone therapy, metastatic stage, prostate neoplasm

Degarelix (GnRH Antagonist) VS. GnRH Agonists (e.g.Leuprolide)

Aspect	Degarelix (GnRH Antagonist)	GnRH Agonists (e.g., Leuprolide)
Testosterone Suppression	Rapid suppression without initial surge, achieving castration levels within 28 days in 97% of cases	Slower suppression with initial surge, reaching castration levels in 45% of cases within 28 days
PSA Progression-Free Survival	Higher rate of progression-free survival, especially in metastatic cases and patients with high baseline PSA	Lower rate of PSA progression-free survival, especially in high-risk groups
Overall Survival	Slight improvement, with a 97.4% survival rate at 12 months	95.1% survival rate at 12 months
Cardiovascular Safety	Lower incidence of severe cardiovascular events (1.6%)	Higher incidence of severe cardiovascular events (3.6%)
Injection-Site Reactions	Higher incidence (49%), commonly mild to moderate	Very low incidence (0.6%)
Lower Urinary Tract Symptoms (LUTS)	Greater reduction in LUTS, showing significant improvement in IPSS scores	Less improvement in LUTS, with lower reduction in IPSS scores
Prostate Volume Reduction	Similar to GnRH agonists, achieving around 38% reduction after 90 days	Similar to degarelix, with around 34% reduction after 90 days
Quality of Life (QoL)	Improved quality of life, with faster initial PSA reduction; significant improvement in symptoms and QoL measures	Similar QoL improvement but at a slower rate in PSA reduction
Dropout Rate Due to Adverse Events	Comparable and low dropout rate (5.5%)	Comparable and low dropout rate (4.4%)
Primary Endpoints Evaluated	Biochemical profiles like testosterone and PSA levels	Similar endpoints, with some focus on testosterone and PSA levels
Use in High-Risk Groups	Preferred in cases needing rapid suppression to avoid testosterone surge effects	Less suitable for patients at high risk of complications from initial testosterone surge

Relugolix (Oral GnRH Antagonist)

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 4, 2020 VOL. 382 NO. 23

Oral Relugolix for Androgen-Deprivation Therapy in Advanced Prostate Cancer

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ABSTRACT

Relugolix (Oral GnRH Antagonist)

Aspect	Relugolix (Oral GnRH Antagonist)	Leuprolide (Injectable GnRH Agonist)
Primary Endpoint	96.7% of patients maintained castrate levels through 48 weeks	88.8% of patients maintained castrate levels through 48 weeks
Testosterone Suppression Onset	Rapid; 56% of patients achieved castrate levels by day 4	Slower; 0% achieved castrate levels by day 4
Testosterone Recovery	Faster recovery after treatment cessation	Slower recovery after treatment cessation
Cardiovas		cardiovascular
Common Side Effects	Hot flashes, mild-to-moderate diarrhea (higher rate than leuprolide)	Hot flashes, lower rate of diarrhea
Administration	Oral, once daily	Injection every 3 months
Overall Conclusion	Superior in sustained testosterone suppression and cardiovascular safety	Effective but associated with higher cardiovascular risk

Very good option , less cost, less frequent hospital visit
Per oral and convinient

Dr. Rabia Suzanne Angiras

Q-14

How many months of hormonal therapy?

OPTIMAL DURATION OF HORMONAL THERAPY

Guideline	Risk Category	Duration of ADT	Notes
NCCN	Intermediate-Risk	4–6 months	For unfavorable intermediate-risk prostate cancer in conjunction with radiotherapy.
NCCN	High-Risk	18–36	Long-term ADT combined with radiotherapy improves
ESMO	Risk		vorable intermediate-risk features.
ESMO	High-Risk	24–36 months	Long-term ADT in combination with radiotherapy recommended for improved survival.

Including pre radiotherapy NAHT and adjuvant 6month to one year

This table summarizes the NCCN and ESMO recommendations for the duration of hormonal therapy in prostate cancer radiotherapy based on risk categories.

Dr. Akella Sai Srividya

Q-16

Choice of radiation?

At least IGRT

ESTRO ACROP RECOMMENDATIONS ON PROSTATE IGRT

1. IGRT for prostate cancer needs to be based on the position of the prostate itself, IGRT based on bony anatomy is considered inadequate for prostate only treatments
2. IGRT to account for interfractional prostate movement for conventionally fractionated and moderately hypofractionated EBRT as a minimum standard must be based on either fiducial markers or CT-based approaches with soft-tissue matching. A combination of fiducial markers with CT-based approaches is preferred.
3. While US is a viable option for prostate IGRT, for now it must be considered less accurate compared to visualization of implanted fi
4. Daily on-line c ended in case of hypofractionat
5. For a treatmen he position of the prostate. IGRT then be enlarged compared to th
6. A distended re
7. Bowel regimens enemas) are not recommended as routine practice. However, for patients with a high degree of intrafractional motion, they may be indicated
8. Bladder filling protocols have no clear effect on positioning stability of the prostate, but may ensure a dosimetric advantage in terms of bladder and bowel sparing as they move the bowel and parts of the bladder out of the high-dose volume
9. Monitoring and ideally tracking of intrafraction motion of the prostate may be considered for extreme hypofractionation
10. Margins for the three most popular IGRT scenarios have been suggested as examples in Table 3. Centers should however make an effort to estimate the residual error in their own institution and derive safe margins from these estimates

1. Conventional
2. Hypofractionation
3. SBRT

Pirus Ghadjar/ Radiotherapy and Oncology/2019

29th MAY 2020/PROSTATE

ONCOLOGY EDUCATIVE CARTOON/SLIDE -BY DR KANHU CHARAN PATRO, IMAGES & DATA- GOOGLE

Can we hypofractionate?

Study	cases	Eligibility	HR%	Study design	Oncological Outcomes	Side effects
Pollack et al 2013	303	Any risk	33	76 Gy/38 vs 70.2Gy/26 All received ADT Superiority design	5 yr BCDF outcomes 21.4 vs 23.3% (p-0.745)	No significant toxicity
Hoffmann et al 2018	222	Any risk	1	75.6 Gy/42 vs 72 Gy/30#, 1/4th received ADT,	8-yr Failure Rates 15.4 vs 10.5% (p-0.39)	No significant difference in Grd /3 GI/GU Late Toxicity
HYPRO 201				Superiority design		e grade >2 GI ity in HF arm
CHHiP 2019	3216	Any risk	12	74 Gy/37 vs 60/20 vs 57/19, All pts had 3-6 months ADT except LR, Non-inferiority design	5 yr BCFS 88.3 VS 90.6 VS 85.9%, 60/20 was non-inferior to 74/37	No significant diff. in cumulative incidence of toxicities and PROMs
Arcagneli et al 2019	168	HR	100	80 Gy/40 vs 62 Gy/20#, all patients had 9 months ADT, Superiority design	10 yr BCFS was 65% vs 72% (p-0.148)	No significant differences in clinically assessed late grade 2 GI/GU tox

The NCCN and joint guidelines suggest moderate hypofractionated radiotherapy as a standard of care in patients with all risk categories

HYPOFRACTIONATION-HYPRO TRIAL -PROSTATE

T1B–T4 N_X–M_X–PROSTATE CANCER

MEDIAN FOLLOW-UP WAS 60 MONTHS

THE DUTCH CANCER SOCIETY.

39 #s of 2 Gy IN 8 WKS

820 patients

Vs.

HYPOFRACTIONATION WITH 19#s OF 3·4 Gy
6·5 WEEKS (3 #S /WK)

TREATMENT FAILURE-SAME
80 (20%) IN THE HYPOF# ARM
89 (22%) IN THE CONVENTIONAL ARM

LATE GENITOURINARY & GASTROINTESTINAL TOXICITY
HYPOFRACTIONATION WAS NON-INFERIOR WHEN COMPARED WITH STANDARD #

LUCA INCROCCI /LANCET ONCOLOGY/2016

30TH JULY 2016/PROSTATE

ONCOLOGY EDUCATIVE CARTOON SLIDE -BY DR KANHU CHARAN PATRO, IMAGES FROM GOOGLE

HYPOFRACTIONATION-CHHIP TRIAL -PROSTATE

60 Gy IN 20 FRACTIONS

Vs

74 Gy IN 37 FRACTIONS

MEDIAN FOLLOW-UP WAS 62·4 MONTHS

BIOCHEMICAL OR CLINICAL FAILURE FREE AT 5 YR
88·3% IN THE 74 Gy GROUP
90·6% IN THE 60 Gy GROUP

LONG-TERM SIDE-EFFECTS WERE SIMILAR IN THE HYPOFRACTIONATED GROUPS COMPARED WITH THE CONVENTIONAL GROUP

RECOMMENDED AS A NEW STANDARD OF CARE FOR EXTERNAL-BEAM RADIOTHERAPY OF LOCALISED PROSTATE CANCER

DAVID DEARNALEY/LANCET ONCOLOGY/2016

31ST JULY 2016/PROSTATE

ONCOLOGY EDUCATIVE CARTOON SLIDE -BY DR KANHU CHARAN PATRO, IMAGES FROM GOOGLE

WHY SBRT FOR PROSATE CANCER?

1. Low alpha/beta ratio of 1.5-1.8 (CHHiP trial and Perez and Brady)
2. If the alpha/beta for dose-limiting normal tissue is less than that of the tumor, larger fraction sizes preferentially kill the tumor compared to normal tissue
3. Increased patient convenience
4. Increased access for underserved patient populations (long commute etc)
5. More cost-effective than other EBRT fractionation schedules
6. NCCN 2020: very low, low, favorable intermediate, unfavorable intermediate, high, very high-risk prostate cancer and low volume M1 disease
7. ASTRO, ASCO and AUA 2018: low and intermediate risk disease
8. 2020 COVID19 pandemic recommendation: 5- to 7- fraction SBRT is preferred for localized prostate cancer that requires treatment
9. HYPO-RT-PC trial
    1. SBRT (42.7 Gy in 7 fractions) vs conventional fractionation (78 Gy in 39 fractions) with no ADT
10. PRIME TRIAL
    1. SBRT: 36.25Gy in 5 fractions over 7–10 days; (node-positive disease - 25Gy in five fractions) versus moderate hypofractionation: 68Gy in 25 fractions over 5 weeks; (node-positive disease – 50Gy in 25 fractions
11. PACE B TRAIL
    1. SBRT (36.25 Gy in 5 fractions with a concomitant boost to 40 Gy) vs conventionally fractionated or moderately hypofractionated EBRT (78 Gy in 39 fractions or 62 Gy in 20 fractions) with no ADT
12. NRG GU005
    1. Stereotactic Body Radiation Therapy or Intensity Modulated Radiation Therapy in Treating Patients With Stage IIA-B Prostate Cancer
13. HEAT-Radiation Hypofractionation Via Extended Versus Accelerated Therapy
    1. 70.2 Gy in 26 fractions vs 36.25 Gy in 5 fractions in Low and intermediate risk disease included

EUA GUIDELINE UPDATES

21st SEP 2021/PROSTATE

Radiotherapy- EBRT

National Comprehensive Cancer Network®

NCCN Guidelines Version 4.2024
Prostate Cancer

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PRINCIPLES OF RADIATION THERAPY

Table 1: Below are examples of regimens that have shown acceptable efficacy and toxicity. The optimal regimen for an individual patient warrants evaluation of comorbid conditions, voiding symptoms and toxicity of therapy. Additional fractionation schemes may be used as long as sound oncologic principles and appropriate estimate of BED are considered.
See PROS-3, PROS-4, PROS-5, PROS-6, PROS-7, PROS-8, PROS-13, and PROS-I for other recommendations, including recommendations for neoadjuvant/concomitant/adjuvant ADT.

Regimen	Preferred Dose/Fractionation	NCCN Risk Group (✓ indicates an appropriate regimen option if RT is given)					
		Very Low and Low	Favorable Intermediate	Unfavorable Intermediate	High and Very High	Regional N1[e]	Low Metastatic Burden M1[e]
EBRT							
Moderate Hypofractionation[c]	3 Gy x 20 fx 2.7 Gy x 26 fx 2.5 Gy x 28 fx	✓	✓	✓	✓	✓	
	2.75 Gy x 20 fx						✓
Conventional Fractionation[c]	1.8–2 Gy x 37–45 fx	✓	✓	✓	✓	✓	
	2.2 Gy x 35 fx + micro-boost[d] to MRI-dominant lesion to up to 95 Gy (fractions up to 2.7 Gy)		✓	✓	✓		
SBRT Ultra-Hypofractionation	9.5 Gy x 4 fx 7.25–8 Gy x 5 fx[c] 6.1 Gy x 7 fx[c]	✓	✓	✓	✓		
	6 Gy x 6 fx[c]						✓

POP RT TRIAL

Prostate-Only Versus Whole-Pelvic Radiation Therapy in High-Risk and Very High-Risk Prostate Cancer (POP-RT): Outcomes From Phase III Randomized Controlled Trial

Here is a summarized table of the POP-RT trial results:

Any form either conventional/hypofractionation /SBRT
If high risk add nodal RT

Outcome			
Biochemical [illegible] (BFFS)			[illegible]ally Significant
Disease-Free Survival (DFS)	77.2%	89.5%	Statistically Significant
Metastasis-Free Survival (MFS)	89.2%	95.9%	Statistically Significant
Overall Survival (OS)	90.8%	92.5%	Not Significant
Late Genitourinary Toxicity	8.9%	20.0%	Increased in WPRT

This table highlights the improved disease control outcomes with WPRT but also points to an increased risk of late genitourinary toxicity. The data underscores the importance of balancing benefits with potential side effects when selecting treatment strategies.

Dr. M Bhargava Krishna

Q-16
INTEGRATION OF BRACHYTHERAPY?

Brachytherapy boost-ASCENDE-RT

Here is the summary of the **ASCENDE-RT trial** in tabular format:

Category	Details
Trial Name	ASCENDE-RT
Study Objective	Compare LDR brachytherapy boost + ADT + EBRT vs. dose-escalated EBRT + ADT for intermediate/high-risk prostate cancer.
Participants	398 men with intermediate- or high-risk localized prostate cancer
Interventions	- **LDR-PB Arm**: ADT + pelvic EBRT (46 Gy in 23 fractions) + LDR brachytherapy boost (115 Gy Iodine-125) - **DE-EBRT Arm**: ADT + pelvic EBRT (46 Gy in 23 fractions) + additional 32 Gy in 16 fractions to prostate
Biochemical Progression-Free Survival (bPFS)	- **LDR-PB Arm**: 85% at 10 years - **DE-EBRT Arm**: 67% at 10 years
Overall Survival (OS)	- **LDR-PB Arm**: 80% at 10 years - **DE-EBRT Arm**: 75% at 10 years
Distant Metastasis-Free Survival	- **LDR-PB Arm**: 88% at 10 years - **DE-EBRT Arm**: 86% at 10 years
Toxicity (Late Grade 3 GU)	Higher in the LDR-PB group compared to DE-EBRT group
Conclusion	LDR brachytherapy boost improves biochemical control but with increased late urinary tox ↓ .

NCCN Recommendations

Regimen	Preferred Dose/Fractionation	NCCN Risk Group (✓ indicates an appropriate regimen option if RT is given)				
		Very Low and Low	Favorable Intermediate	Unfavorable Intermediate	High and Very High	Regional N1[e]
EBRT						
Moderate Hypofractionation[c]	3 Gy x 20 fx 2.7 Gy x 26 fx 2.5 Gy x 28 fx	✓	✓	✓	✓	✓
	2.75 Gy x 20 fx					
Conventional Fractionation[c]	1.8–2 Gy x 37–45 fx	✓	✓	✓	✓	✓
	2.2 Gy x 35 fx + micro-boost[d] to MRI-dominant lesion to up to 95 Gy					
SBRT Ultra-Hypofractionation	7.25–8 Gy x 5 fx[c] 6.1 Gy x 7 fx[c]	✓	✓			
	[illegible]					
Brachytherapy Monotherapy						
LDR Iodine 125[c] Palladium 103[c] Cesium 131	145 Gy[c] 125 Gy[c] 115 Gy	✓	✓			
HDR Iridium-192	13.5 Gy x 2 implants 9.5 Gy BID x 2 implants	✓	✓			
Boost Brachytherapy or SBRT with EBRT (combined with 1.8 Gy x 25-28 fx or 2.5 Gy x 15 fx)						
LDR Iodine 125[c] Palladium 103 Cesium 131	110–115 Gy 90–100 Gy 85 Gy			✓	✓	
HDR Iridium-192	15 Gy x 1 fx[c] 10.75 Gy x 2 fx			✓	✓	
EBRT + SBRT Boost	9.5 Gy x 2 fx for SBRT boost			✓	✓	

Please consider brachy boost if expertise and resource is available

Dr. Megha Monani

Q-17

Expected complications in radiotherapy?

Toxicity evaluation

- Sexual
- Urinary
- Bowel

Discuss the adverse events

Table 12 – Guidelines for quality of life in men undergoing local treatments.

Recommendations	Strength rating
Advise patients eligible for active surveilla equivale prostatectomy or external beam radiotherapy	Strong
Discuss the negative impact of surgery on urinary and sexual function, as well as the negative impact of radiotherapy on bowel function with patients	Strong
Advise patients treated with brachytherapy about the negative impact on irritative urinary symptomatology at 1 yr but not after 5 yr	Weak

Please discuss the acute and chronic complications in detail with the patients about radiotherapy and brachytherapy

Dr. Ram Vinayak

Q-18

IMAGE FUSION

IMAGING PROTOCOL

SUPINE WITH KNEE REST

DESIRABLE FULL COMFORTABLE BLADDER

EMPTY RECTUM

AXIAL CECT [Arterial and delayed phase-10 min]

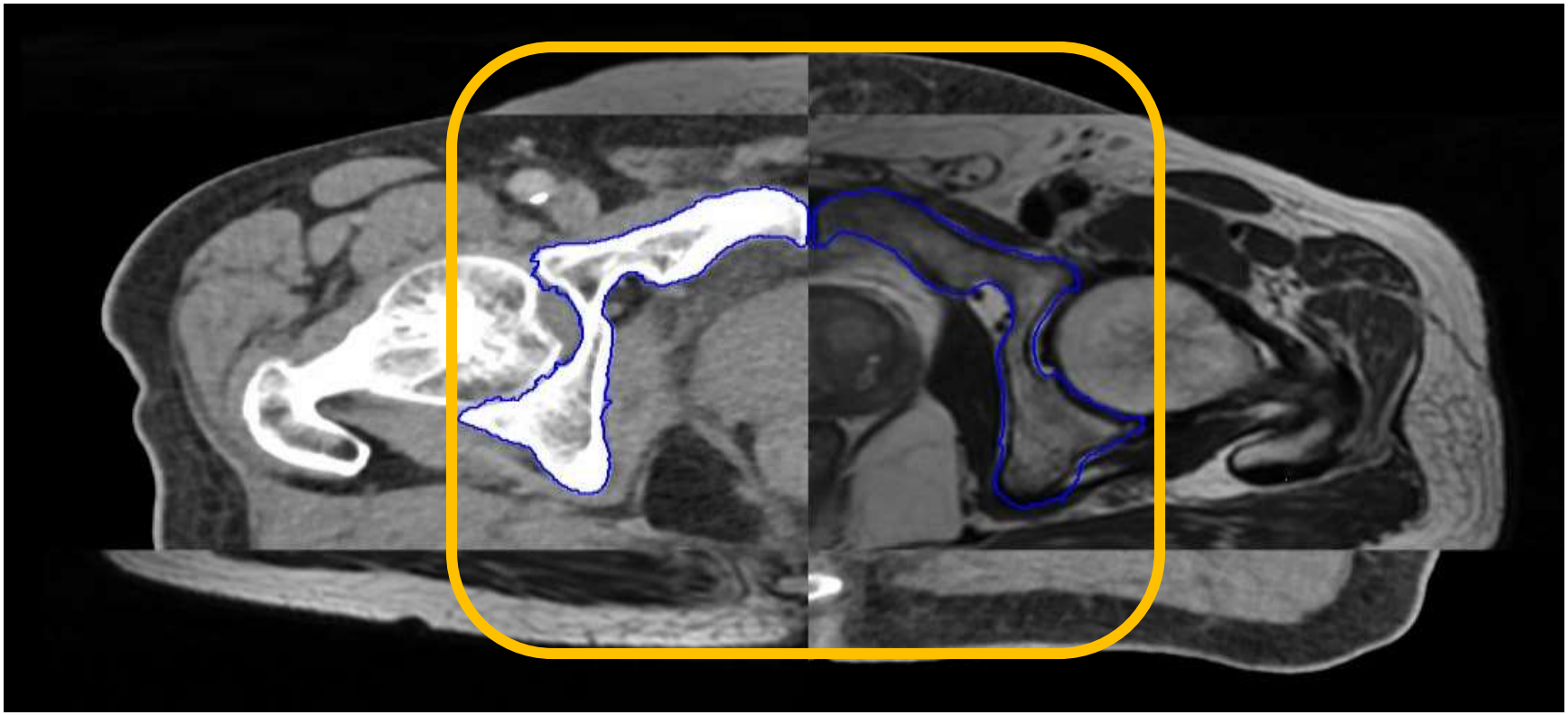
T2 MRI 3 PLANE [A/C/S]

2-3 mm slice

UPPER BORDER OF KIDNEY TO MID THIGH

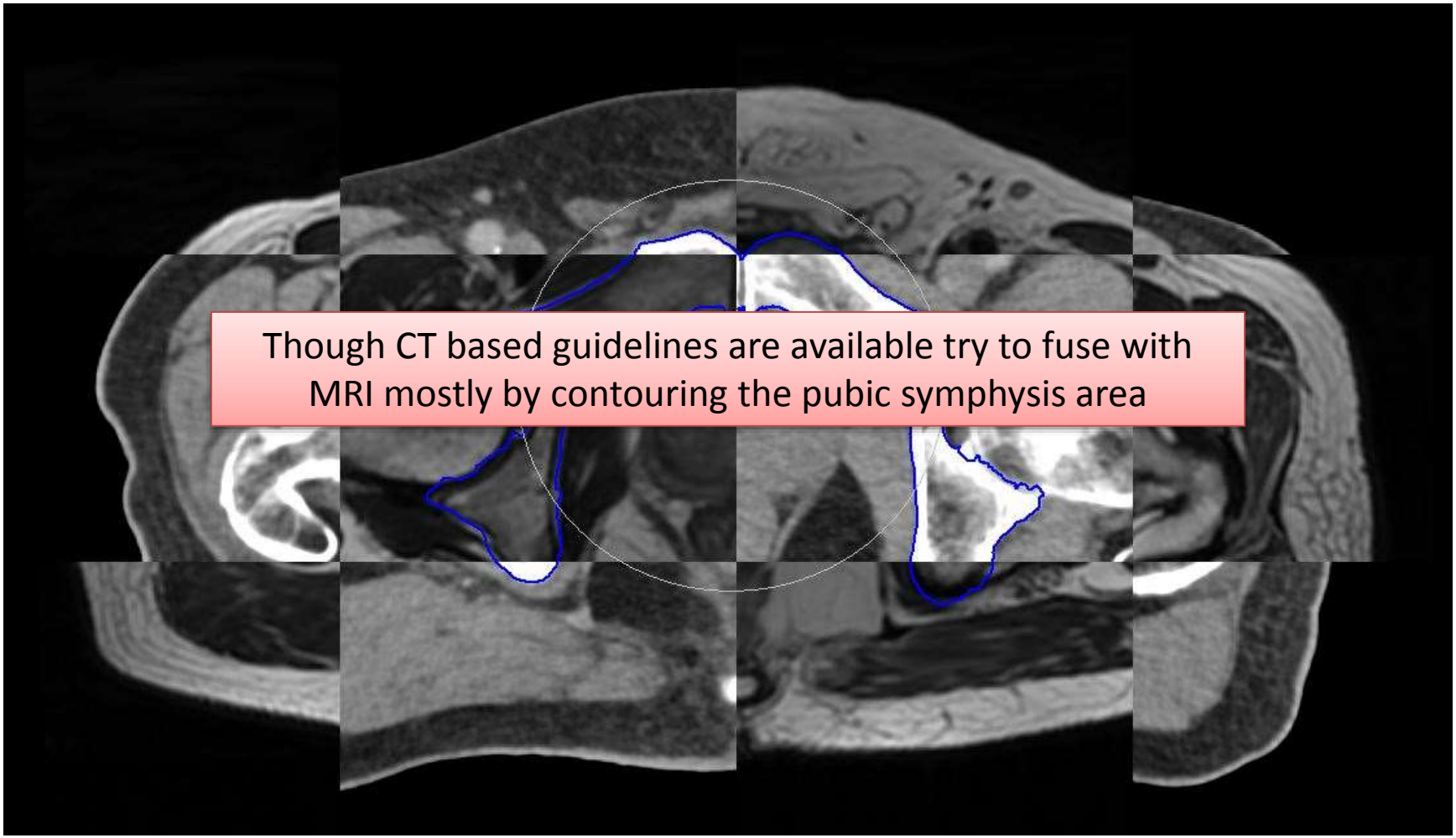
ANAL VERGE MARKER

DELINEATION OF ISCHIOPUBIS FOR FUSION



FUSE AROUND ONLY PROSTATE AREA

CT MR FUSION


Though CT based guidelines are available try to fuse with MRI mostly by contouring the pubic symphysis area

Dr. Aakriti Bhardwaj

Q-19

Target delineation?

ESTRO ACROP Guidelines
OAR & TARGET

Table 1
Overview of the recommendations for the delineation of the rectum and clinical target volume of the prostate and seminal vesicles.

		MRI based	CT-scan based		
Rectum		The delineation of the rectum starts at the recto-sigmoid junction, i.e. where the sigmoid colon becomes the rectum, and which usually takes the form of an acute angle The rectum contouring ends approximately 2 cm below the lowest prostate-apex contour Correct delineation of the rectum can be performed by visualization of the rectum in the sagittal plane. Delineation of the target volume is performed in the axial plane and reviewed in the sagittal and coronal planes. If there are inconsistencies or protrusions, adapt in order to obtain the typical inverted triangular shape of the prostate			
Apex		Butterfly-shaped structure, excluding the urethra and starting above the penile bulb and genito-urinary diaphragm	Starts approximately 1 cm above the upper border of the penile bulb (13)		
Mid prostate	Lateral border	Bounded by the musculus levator ani; at the level of the external urethral sphincter the levator ani muscle is thicker than at the level of the mid-prostate	After correct delineation of the rectum, the thickness of the musculus levator ani can be defined; the same thickness of the levator ani muscle defined at the level of the rectum can be extrapolated over the full length of the prostate. This forms the lateral border of the prostate		
	Anterior border	Exclude the retropubic space unless signs of invasion	Include the anterior fascia and exclude the fat area in front of the anterior fascia unless protrusion of the prostate is visible on CT		
	Posterior border	Anterior border of the rectum	Anterior border of the rectum		
Base		In continuity with the bladder, to be controlled in the sagittal and coronal view	In continuity with the bladder, easier to define when contrast is used, to be controlled in the sagittal an coronal view		
			Low risk	Intermediate risk	High risk
Seminal vesicles		Include the part of the seminal vesicles that is at risk for invasion and exclude the ductus deferens	No inclusion or inclusion of proximal 1.4 cm of the SV (in the axial plane) according to institutional policy	Inclusion of at least proximal 1.4 cm of the SV (in the axial plane)	Inclusion of at least proximal 2.2 cm of the SV (in the axial plane)
ECE		Include the area of suspicion of ECE; in the absence of ECE on MRI: no additional expansion	No expansion	Expansion of the prostate contour with 3 mm in the inferior, lateral, anterior and posterior direction with exclusion of the rectum contour in absence of suspicion of rectal wall invasion on digital rectal examination	

Abbreviations: MRI: magnetic resonance imaging; CT: computed tomography; ECE: extra capsular extension; SV: seminal vesicles.
Risk stratification:
1. *low risk* (PSA ≤ 10 ng/ml; biopsy Gleason score ≤6 (Grade group 1) and clinical stage ≤T2a and <50% of the biopsies involved.
2. *intermediate risk* (PSA > 10 and ≤20 ng/ml or Gleason score of 7 (Grade group 2 and 3) or clinical stage T2b).
3. *high risk* (PSA > 20 ng/ml or Gleason score ≥8 (Grade group 4 and 5) or clinical stage ≥T2c).

TARGET DELINEATION

- **CTV P**: according to ESTRO ACROP guidelines
- **CTV N**:
  - Contoured by giving a radial margin of 5 to 7mm around the common iliac, external iliac, internal iliac, presacral and the obturator vessels and editing from muscles and bones
  - Cranial extent of CTV nodes: at the level of L5–S1 vertebra
  - Caudal extent: at the level obturator nodes
- Seminal vesicle: 1.5cm when no involvement; entire SV if involved
- **PTV P & PTV N**:
  - 5mm to the CTV P (including SV) and CTV N.

OAR DELINEATION

- Bladder
- Rectum
- Bowel bag
- Penile bulb
- Head of femur

EXCLUDE ABCDEF FROM PROSTATE

A

- ANI-LEVATOR ANI

B

- BULB-PENILE BULB,
- BLADDER BASE

C

- CANAL-ANO RECTAL CANAL

D

- DIAPHRAGM-GENITOURINARY DIAPHRAGM
- DEFERENT DUCT

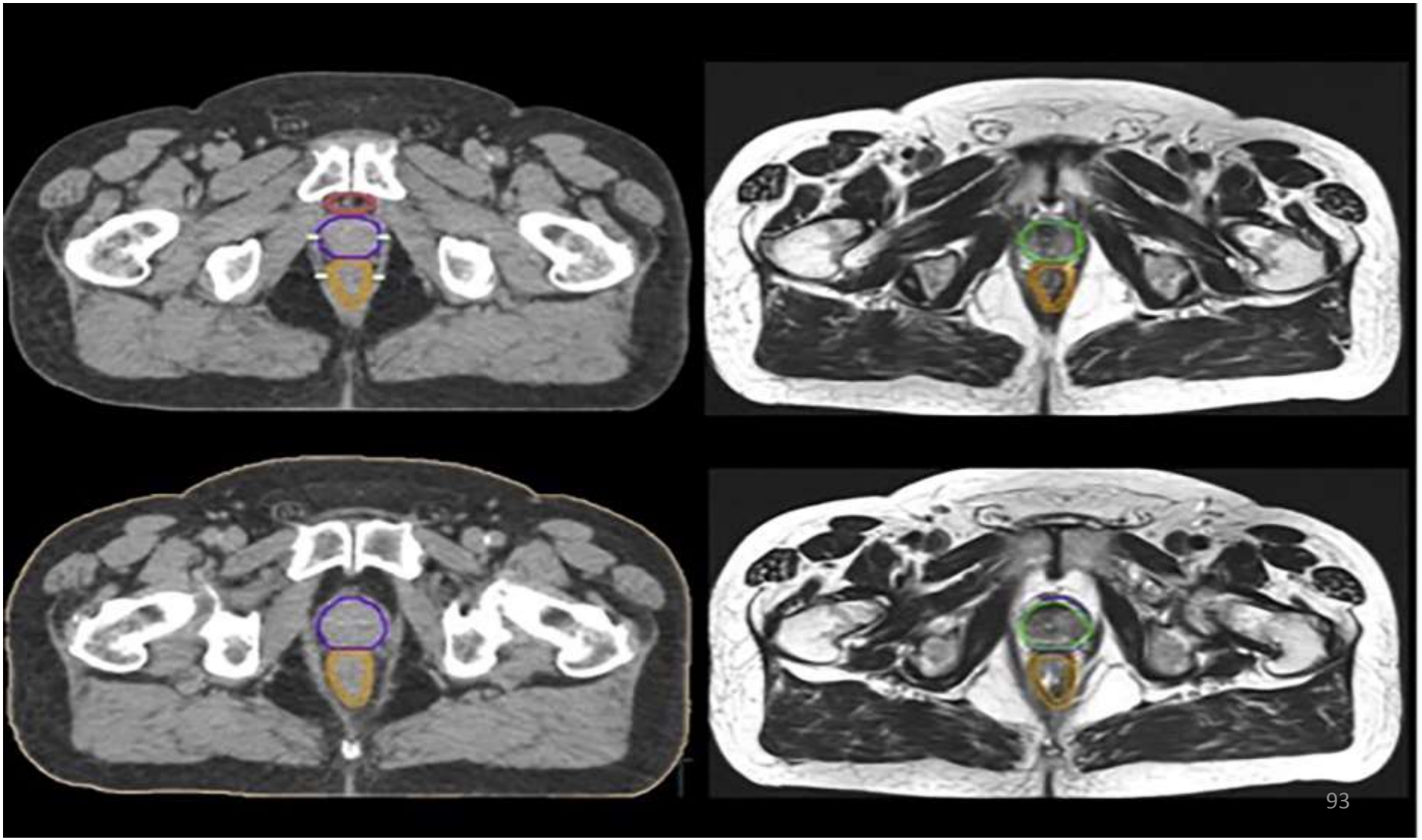
E-EXTRA STRUCTURES LIKE

- NEUROVASCULAR BUNDLE
- URETHRA
- VENOUS PLEXUS OF SANTORINI

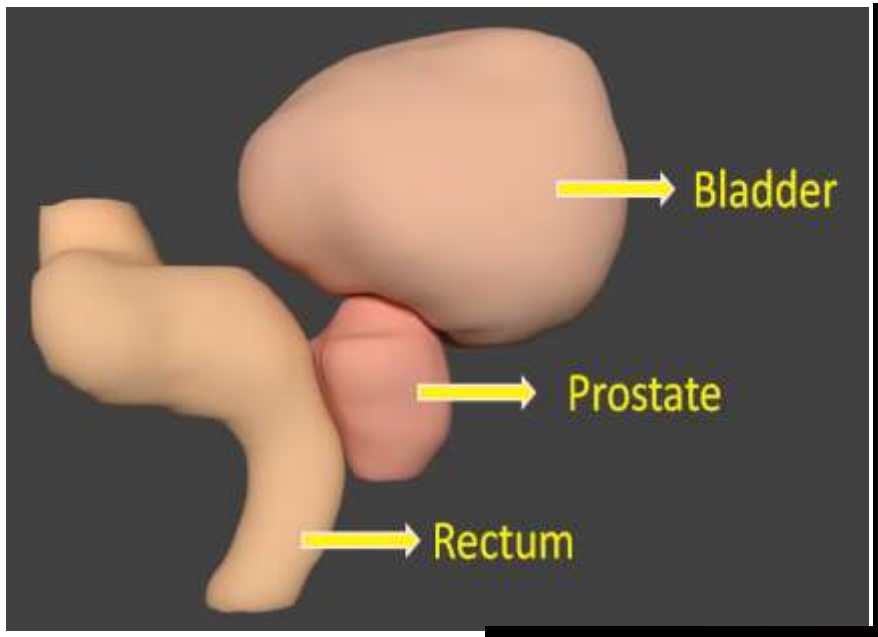
F-FIBROMUSCULAR STROMA

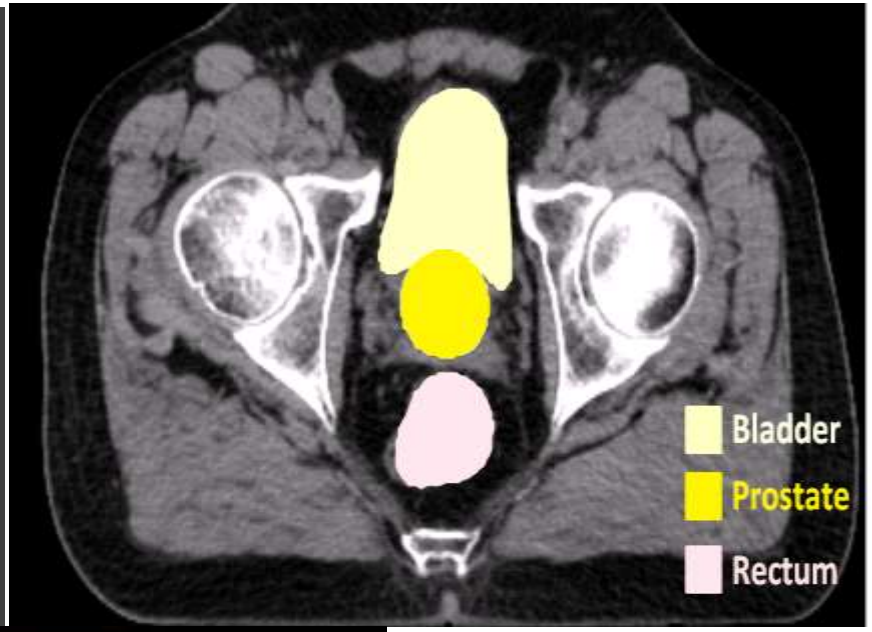
- Fibromuscular stroma

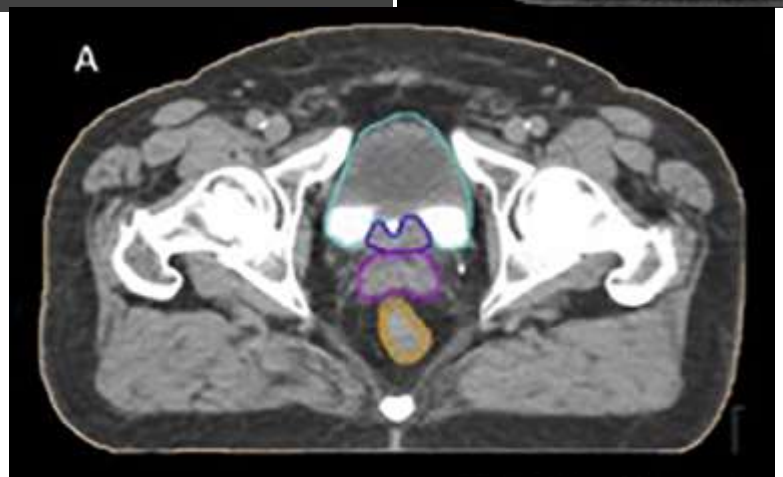
Exclude from Levator Ani



Exclude from B**ladder base**

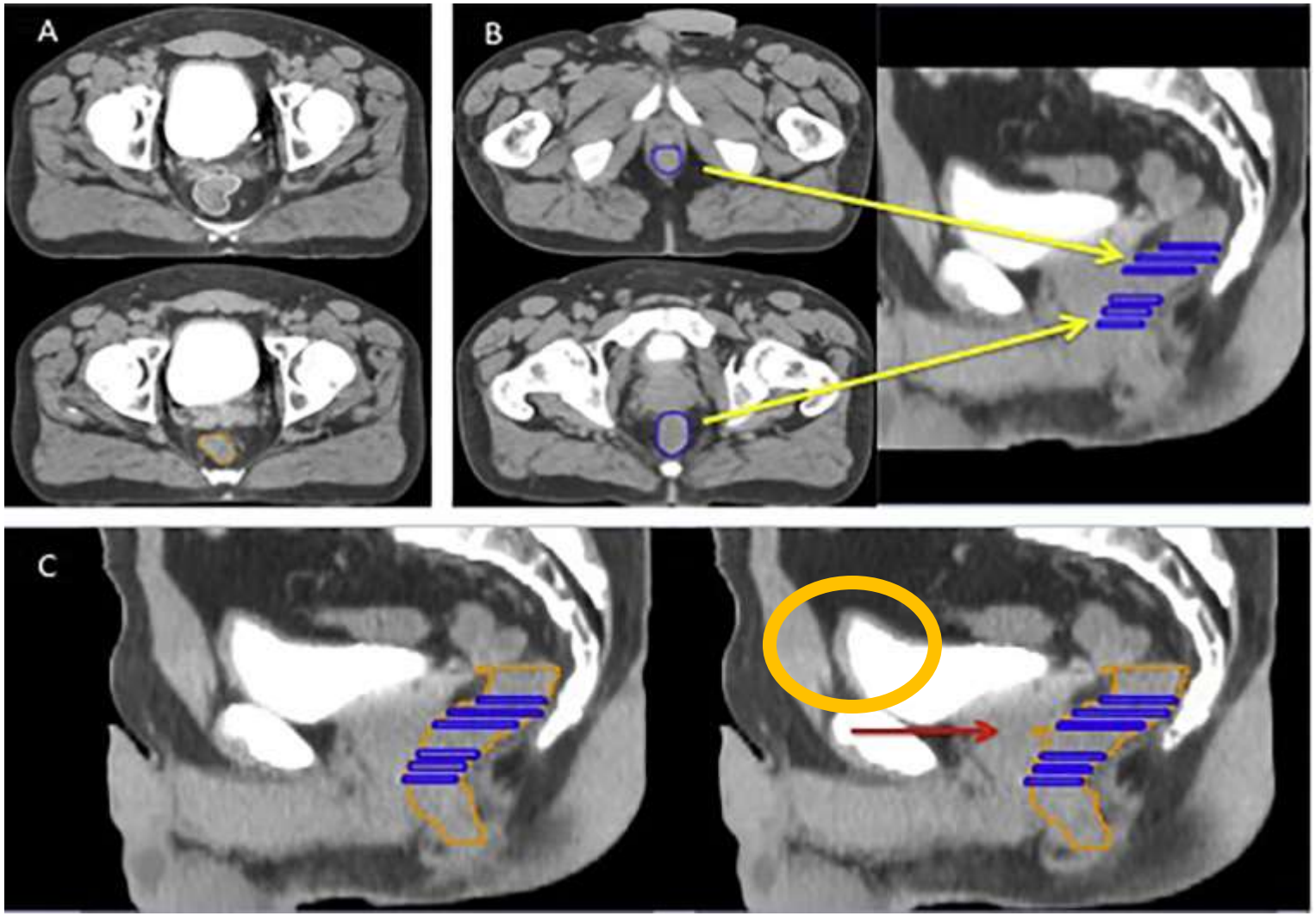




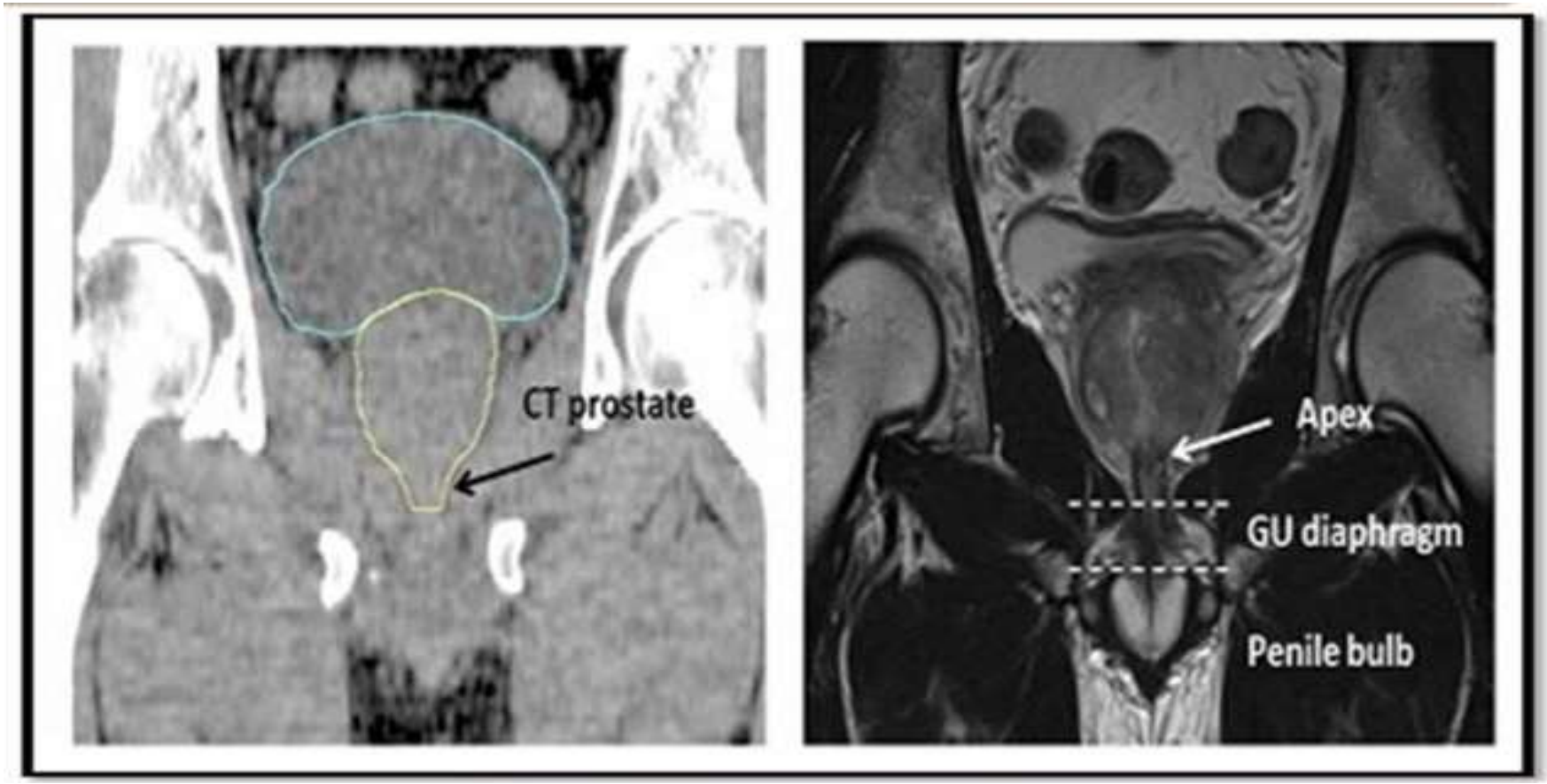


Exclude from anal canal

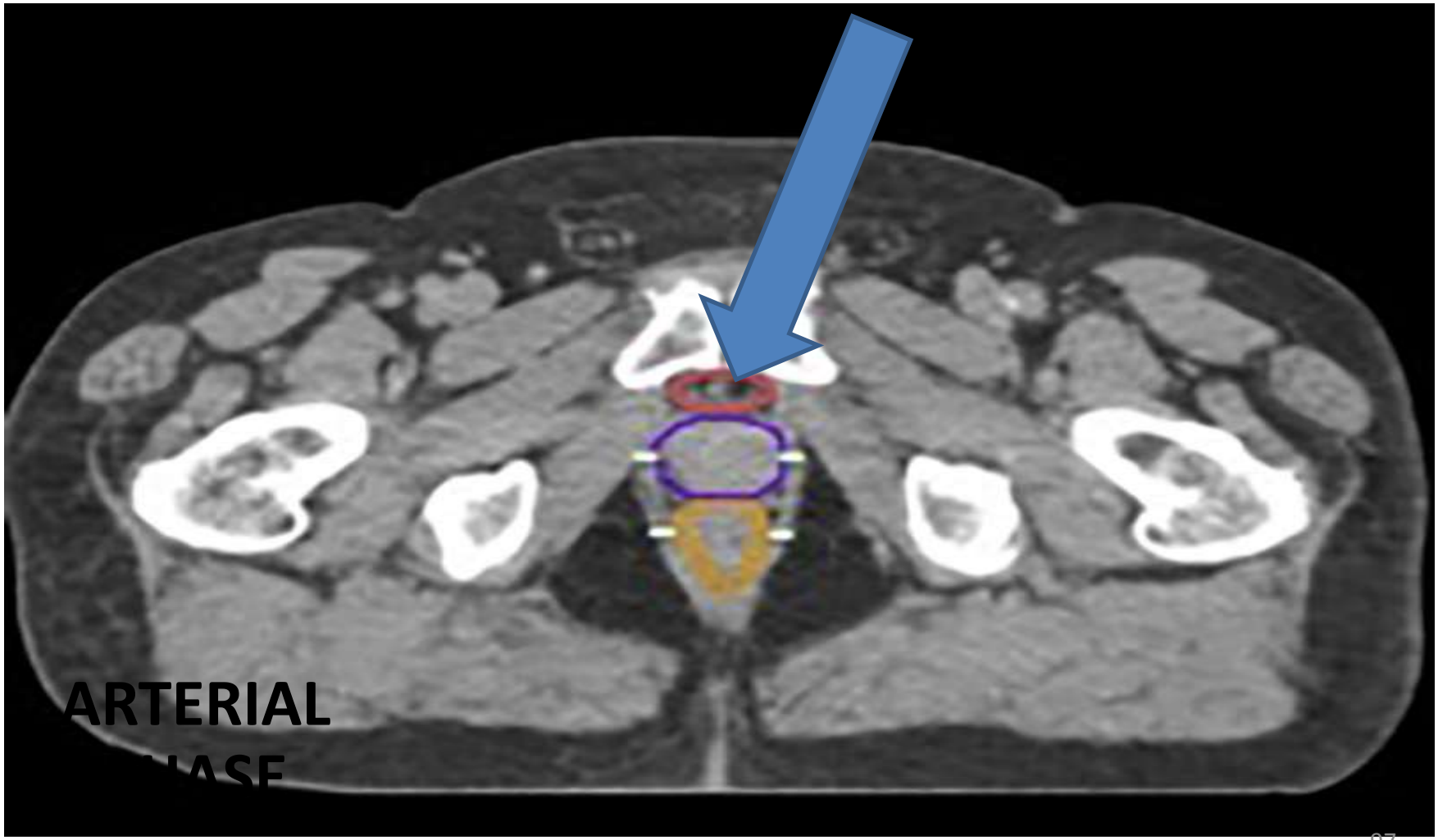
Contouring help-structure- Boolean



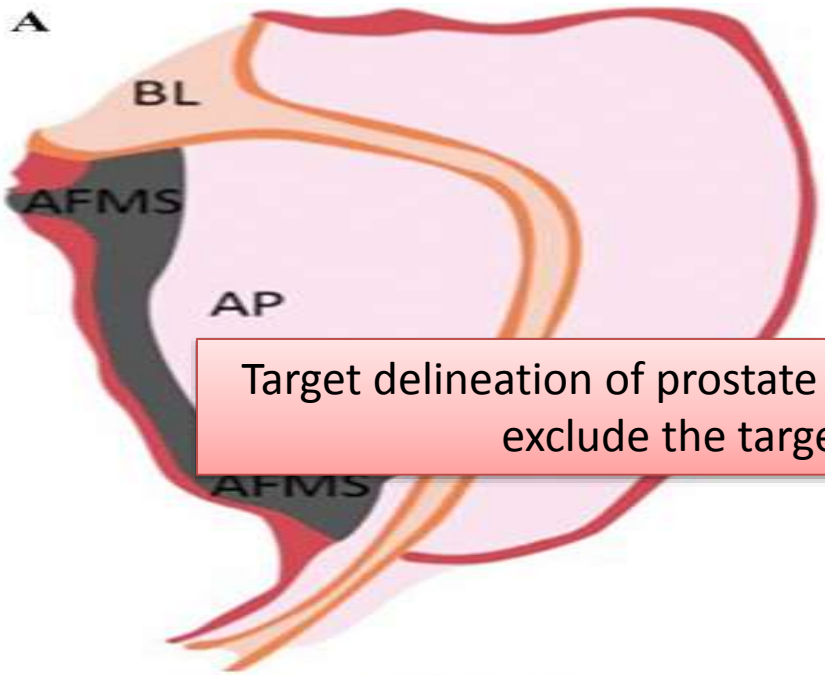
Exclude from diaphragm

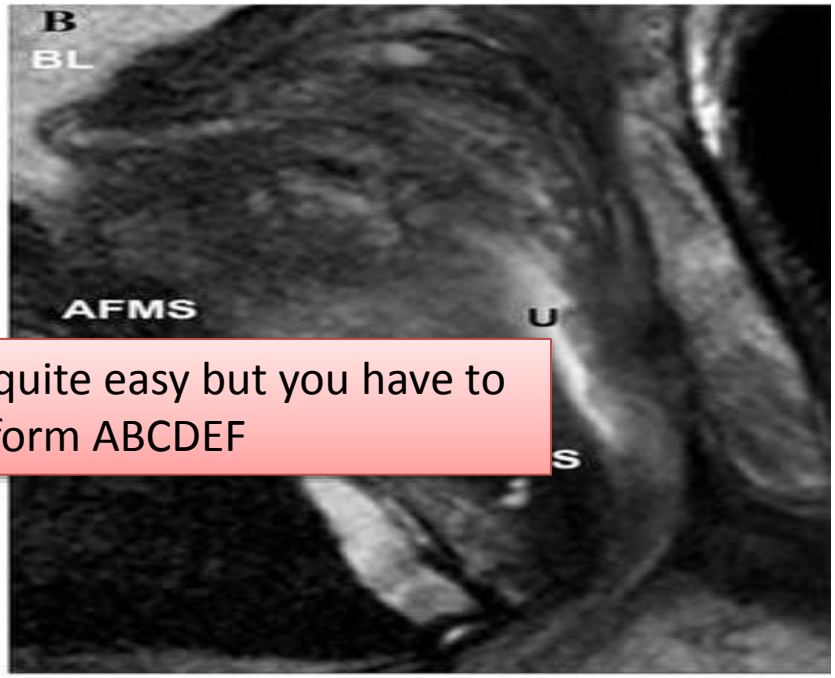


Exclude from VENOUS PLEXUS OF SANTORINI

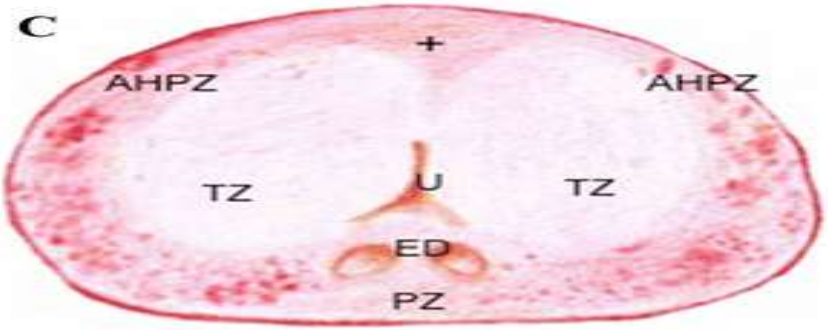


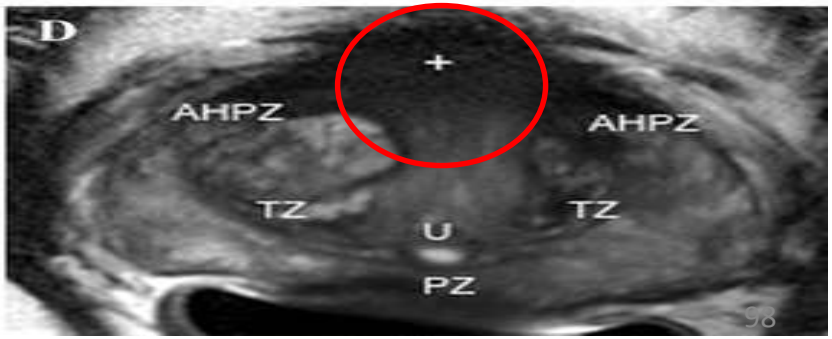
Exclude from FIBROMUSCULAR STROMA





Target delineation of prostate is quite easy but you have to exclude the target form ABCDEF





Dr. Rabia Suzanne Angiras

Q-20

How to counter the surgeon?

TO BE DISCUSSED

- Cost
- Complication
- Continuation of treatment
- Casualness of treatment
- Conflict mental

Surgery VS Radiotherapy

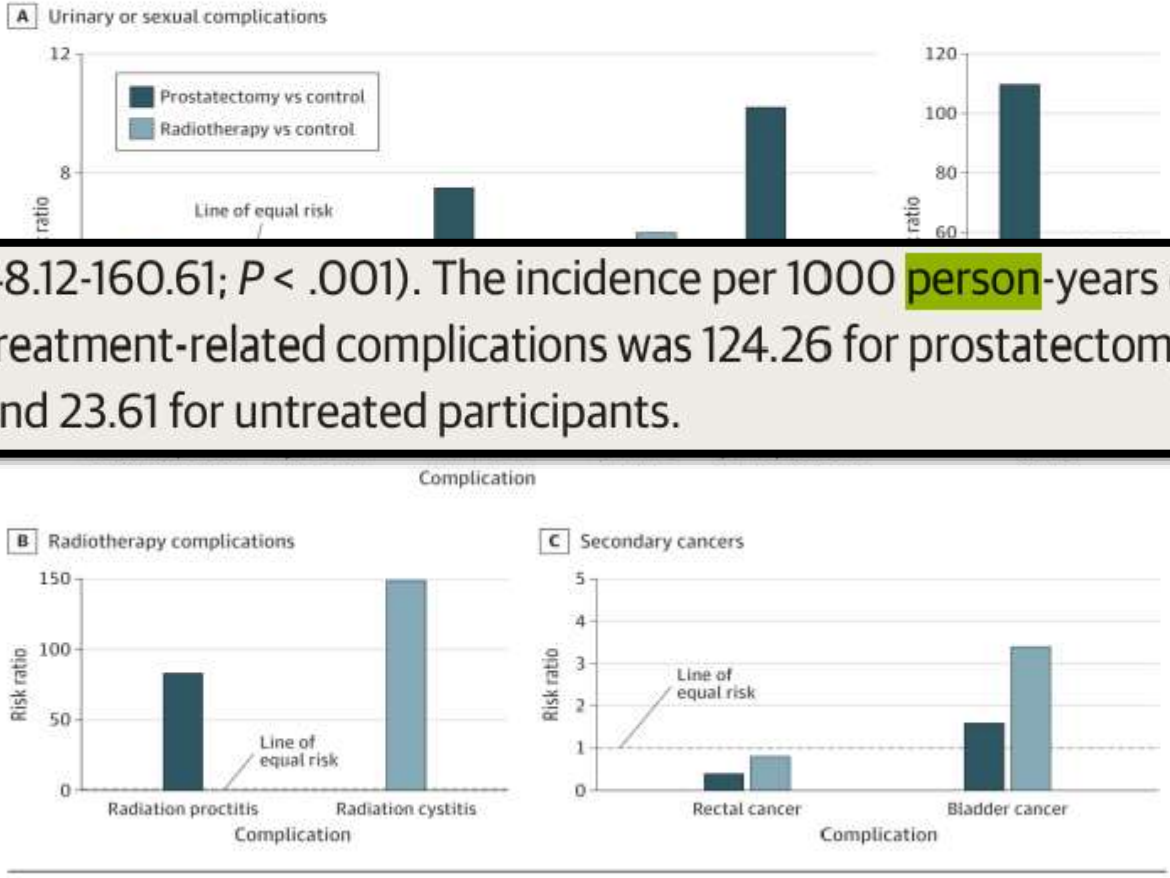
Aspect	Radiotherapy	Surgery
Procedure Type	Non-invasive, external (e.g., EBRT, brachytherapy)	Invasive, prostatectomy (removal of prostate gland)
Eligibility	Suitable for various stages, especially localized and advanced cases	Usually preferred for localized prostate cancer
Treatment Duration	Several weeks (EBRT), single or multiple sessions (brachytherapy)	Single surgical procedure with recovery period
Hospital Stay	Often outpatient or short stay (if brachytherapy)	Typically requires hospitalization
Recovery Time	Minimal downtime, gradual recovery	Several weeks for full recovery
Side Effects	Fatigue, urinary symptoms, bowel issues, erectile dysfunction (varies by type)	Urinary incontinence, erectile dysfunction, potential for infection
Impact on Sexual Function	Moderate risk of erectile dysfunction	Higher risk, especially with nerve damage
Effectiveness in Local Control	High efficacy in localized cancer, lower recurrence	Effective for local control, low recurrence in early stages
Suitability for Older Patients	Often preferred for older patients due to non-invasiveness	Less preferred for older patients due to surgical risks
Risk of Secondary Cancer	Small risk with radiation exposure	No radiation risk, but surgical risks involved
Post-Treatment Monitoring	Regular PSA tests and imaging as needed	Regular PSA tests and potential imaging
Combination with Hormone Therapy	Often combined with hormone therapy for advanced cases	Sometimes combined but less common
Pros	Non-invasive, outpatient, good control for localized and advanced cases	Definitive treatment for localized cancer, rapid PSA reduction
Cons	Requires several sessions, possible late side effects	Invasive with recovery time, surgical risks

JAMA Oncology | Original Investigation

Long-Term Adverse Effects and Complications After Prostate Cancer Treatment

Joseph M. Unger, PhD; Cathee Till, MS; Catherine M. Tangen, DrPH; Dawn L. Hershman, MD; Phyllis J. Goodman, MS; Michael LeBlanc, PhD; William E. Barlow, PhD; Riha Vaidya, PhD; Lori M. Minasian, MD; Howard L. Parnes, MD; Ian M. Thompson Jr, MD

Figure 3. Comparison of 12-Year Risk Ratios Between Prostatectomy- and Radiotherapy-Treated Participants and Untreated Controls



For each category, the line of equal risk, indicating no difference between groups in risk, is shown. For urinary or sexual complications, the axis is interrupted to accommodate the large risk ratio. AUS indicates artificial urinary sphincter.

48.12-160.61; *P* < .001). The incidence per 1000 person-years of any 1 of the 10 treatment-related complications was 124.26 for prostatectomy, 62.15 for radiotherapy, and 23.61 for untreated participants.

Recommendations of the EAU regarding the indication of radical RADIOTHERAPY in the different risk groups (source : EAU guidelines 2020)

Recommendations for External Beam Radiation therapy (EBRT) or Hormonoradiotherapy (HRT)	Strength rating
EAU guidelines for the treatment of low-risk disease (LR)	
Offer low-dose rate brachytherapy to patients with low-risk PCa, without a previous transurethral resection of the prostate, with a good International Prostatic Symptom Score and a prostate volume < 50 mL.	Strong
Use intensity-modulated radiation therapy with a total dose of 74-80 Gy or moderate hypofractionation (60 Gy/20 fx in 4 weeks or 70 Gy/28 fx in 6 weeks), without androgen deprivation therapy.	Strong
EAU guidelines for the treatment of intermediate-risk disease (IR)	
Offer low-dose rate brachytherapy to selected patient. Patients without a previous transurethral resection of the prostate, with a good International Prostatic Symptom Score and a prostate volume < 50 mL.	Strong
For external-beam radiation therapy (EBRT), use a total dose of 76-78 Gy or moderate hypofractionation (60 Gy/20 fx in 4 weeks or 70 Gy/28 fx in 6 weeks), in combination with short-term neoadjuvant plus concomitant androgen deprivation therapy (ADT) (4 to 6 months).	Strong
In patients not willing to undergo ADT, use an escalated dose of EBRT (76-80 Gy) or a combination with brachytherapy.	Weak
EAU guidelines for the treatment of high-risk disease (HR)	
In patients with high-risk localised disease, use external-beam radiation therapy (EBRT) with 76-78 Gy in combination with long-term androgen deprivation therapy (ADT) (2 to 3 years).	Strong
In patients with high-risk localised disease, use EBRT with brachytherapy boost (either highdose rate or low-dose rate), in combination with long-term ADT (2 to 3 years).	Weak

Recommendations of the EAU regarding the indication of radical prostatectomy in the different risk groups (source : EAU guidelines 2020)

Recommendations for radical prostatectomy	Strength rating
EAU guidelines for the treatment of low-risk disease (LR)	
Active treatment	
Offer surgery and radiotherapy as alternative to AS to patients suitable for such treatments and who accept a trade-off between toxicity and prevention of disease progression.	Weak
EAU guidelines for the treatment of intermediate-risk disease (IR)	
Radical prostatectomy (RP)	
Offer RP to patients with intermediate-risk disease and a life expectancy of > 10 years.	Strong
Offer nerve-sparing surgery to patients with a low risk of extracapsular disease.	Strong
EAU guidelines for the treatment of high-risk disease (HR)	
Radical prostatectomy (RP)	
Offer RP to selected patients with high-risk localised PCa, as part of potential multi-modal therapy.	Strong

Metanalysis – Sx vs RT

Heesterman et al. BMC Cancer (2023) 23:198
https://doi.org/10.1186/s12885-023-10842-1

BMC Cancer

RESEARCH Open Access

Radical prostatectomy versus external beam radiotherapy with androgen deprivation therapy for high-risk prostate cancer: a systematic review

Berdine L. Heesterman[1], Katja K. H. Aben[1,2*], Igle Jan de Jong[3], Floris J. Pos[4] and Olga L. van der Heijden[1]

JAMA Network Open

Original Investigation | Urology

Biochemical Recurrence and Risk of Mortality Following Radiotherapy or Radical Prostatectomy

Ugo Giovanni Falagario, MD; Ahmad Abbadi, MD, MMedSc; Sebastiaan Remmers, MSc; Lars Björnebo, MD, MSc; Darko Bogdanovic, MD, BBA; Alberto Martini, MD; Alexander Valdman, MD, PhD; Giuseppe Carrieri, MD; Mani Menon, MD; Olof Akre, MD, PhD; Martin Eklund, PhD; Tobias Nordström, MD, PhD; Henrik Grönberg, MD, PhD; Anna Lantz, MD, PhD; Peter Wiklund, MD, PhD

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 27, 2023 VOL. 388 NO. 17

Fifteen-Year Outcomes after Monitor or Radiotherapy for Prostate C

F.C. Hamdy, J.L. Donovan, J.A. Lane, C. Metcalfe, M. Davis, E.L. Turner, R.M. Martin, J.R. Oxley, R.J. Bryant, P. Bollina, A. Doble, A. Doherty, D. Gillatt, V. Gnanapragasam, H. Kynaston, A. Paul, E. Paez, P. Powell, D.J. Rosario, E. Rowe, M. Mason, J. Donovan, N.J. Williams, J. Staffurth, and D.E. Neal, for the ProtecT

Original Article

Long-Term Survival After Radical Prostatectomy Versus External-Beam Radiotherapy for Patients With High-Risk Prostate Cancer

Stephen A. Boorjian, MD[1]; R. Jeffrey Karnes, MD[1]; Rosalia Viterbo, MD[2]; Laureano J. Rangel, MS[3]; Eric J. Bergstralh, PhD[3]; Eric M. Horwitz, MD[4]; Michael L. Blute, MD[1]; and Mark K. Buyyounouski, MD, MS[4]

EUROPEAN UROLOGY OPEN SCIENCE 26 (2021) 55–63

available at www.sciencedirect.com
journal homepage: www.eu-openscience.europeanurology.com

eau European Association of Urology

Prostate Cancer

Comparative Survival Outcomes of High-risk Prostate Cancer Treated with Radical Prostatectomy or Definitive Radiotherapy Regimens

Kirsti Aas[a,b,*], *Viktor Berge*[b,f], *Tor Åge Myklebust*[c,d,†], *Sophie Dorothea Fosså*[c,e,f,†]

[a] Department of Surgery, Vestre Viken Hospital Trust, Drammen, Norway; [b] Department of Urology, Oslo University Hospital, Oslo, Norway; [c] Cancer Registry of Norway, Oslo, Norway; [d] Research and Innovation, Møre and Romsdal Hospital Trust, Møre og Romsdal, Norway; [e] Department of Oncology, Oslo University Hospital, Oslo, Norway; [f] University of Oslo, Oslo, Norway

Diaper cost for urinary symptoms

Duration, cost, complications are more with surgery

40 x 250 x 10 =

100000

Cost of SBRT- 99000

SBRT- 5 days treatment

PAC EVALUATION- 5 days

Scenario -2- SURGEON DID THE SURGERY

Surgery principles

- Achieve complete removal of the prostate gland along with the cancerous tissue.
- Ensure no residual cancer cells are left at the surgical margins. clips
- Seminal vesicles.
- Lymphadenectomy
- Precise dissection to avoid damage to the urethra and surrounding structures that contribute to urinary continence.
- Preserve the neurovascular bundles (cavernous nerves) responsible for erectile function if cancer has not invaded these structures.

Dr. Akella Sai Srividya

Q-21

What are the expected complications of surgery

Discuss the adverse events

Table 12 – Guidelines for quality of life in men undergoing local treatments.

Recommendations	Strength rating
Advise patients eligible for active surveilla… equivalent, for up to 5 yr, to radical prostatectomy or external beam radiotherapy	Strong
Discuss the negative impact of surgery on urinary and sexual function, as well as the negative impact of radiotherapy on bowel function with patients	Strong
Advise patients treated with brachytherapy about the negative impact on irritative urinary symptomatology at 1 yr but not after 5 yr	Weak

Urinary and sexual problems are more with surgery

Dr. M Bhargava Krishna

Q-22

WHAT ARE THE EXPECTED LINES IN PATHOLOGICAL REPORT?

PATHOLOGICAL REPORT

- Location in both lobes
- Capsular involvement
- Gleason score all sites
- Nodal involvement
- Seminal vascular involvement
- Margin
  - Vas
  - Urethral
- Histology type

Dr. Megha Monani

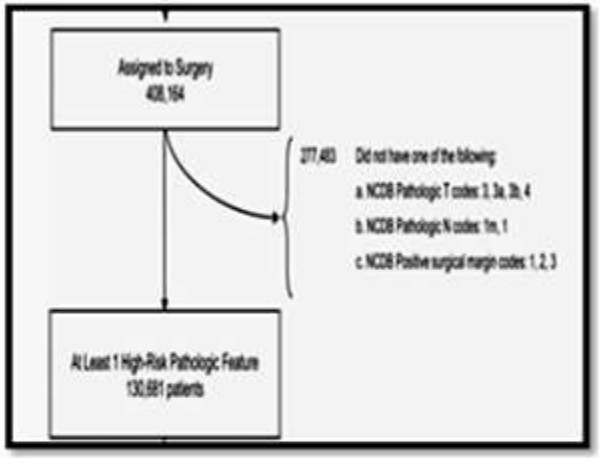
Q-23

Is there any need of post op radiotherapy?

HOW TO AVOID VENOMOUS REPORT?

ACCORDING TO NATIONAL CANCER DATABASE [NCDB} ONE THIRD OF THE PROSTATIC SPECIMEN HAVING ONE OF THESE RISK FACTORS

VENOM	
V	Vesicle positive[seminal]
E	Extarcapsular extension
N	Nodal positive
O	Oblivious persistent antigen
M	Margin positive



1. **Using nomograms**
2. **Using formulas like ROACH, YALE formula to calculate the risk of the involvement of SV, node, extra capsular extension**
3. **Evaluating the MRI before surgery**
4. **Multidisciplinary approach**

Anusha Kalbasi/CANCER/2014

25th AUGUST 2018/PROSTATE

EAU-EANM-ESTRO-ESUR-SIOG Guidelines

Adjuvant treatment after radical prostatectomy		
	Do not prescribe adjuvant ADT in pN0 patients	Strong
	Offer adjuvant EBRT to the surgical field for highly selected patients	Strong
	Discuss three management options with patients with pN + disease after an ePLND, based on nodal involvement characteristics:	Weak
	1 Offer adjuvant ADT	
	2 Offer adjuvant ADT with additional RT	
	3 Offer observation (expectant management) to a patient after ePLND and ≤2 nodes with microscopic involvement, and a PSA value of <0.1 ng/mL and absence of extranodal extension	

POST OP PROSTATE - NEED OF RT?

MAYO CLINIC SCORING SYSTEM

TABLE 4. *Score algorithm*

	Score
Pathological tumor stage:	
T2 Or T3a	0
T3b	1
Gleason score:	
1–6	0
7	1
8–10	2
Pre-RT PSA:	
Less than 0.5	0
0.5–1.0	1
Greater than 1.0	2

These scores are added together to obtain a total score from 0 to 5.

Points -5y BCR	
0-1	69%
2	53%
3	26%
4-5	6%

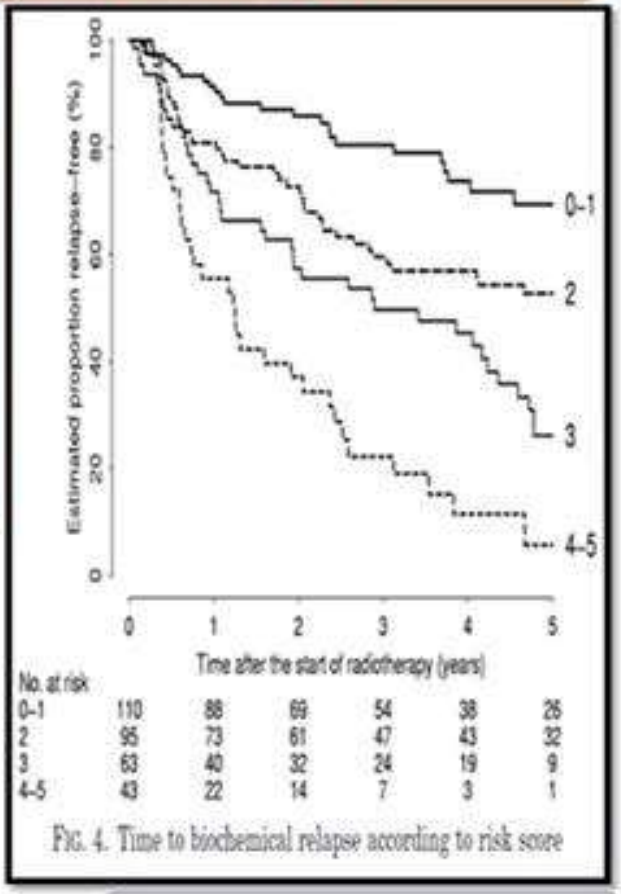


FIG. 4. Time to biochemical relapse according to risk score

MAYO CLINIC WEBSITE

17th JULY 2018/PROSTATE

ONCOLOGY EDUCATIVE CARTOON/SLIDE -BY DR KANHU CHARAN PATRO, IMAGES & DATA- GOOGLE

CAPRA-S SCORE FOR POST OP PROSTATE

CAncer of the **P**rostate **R**isk **A**ssessment Post-Surgical CAPRA-S

Variable	Level	Points
Pre-op PSA	0.00 to 6.00	0
	6.01 to 10.00	1
	10.01 to 20.00	2
	> 20.00	3
Path. Gleason	≤ 3 + 3 = 6	0
	3 + 4 = 7	1
	4 + 3 = 7	2
	≥ 4 + 4 = 8	3
Margins	Negative	0
	Positive	2
ECE	No	0
	Yes	2
SVI	No	0
	Yes	2
LNI	No	0
	Yes	1

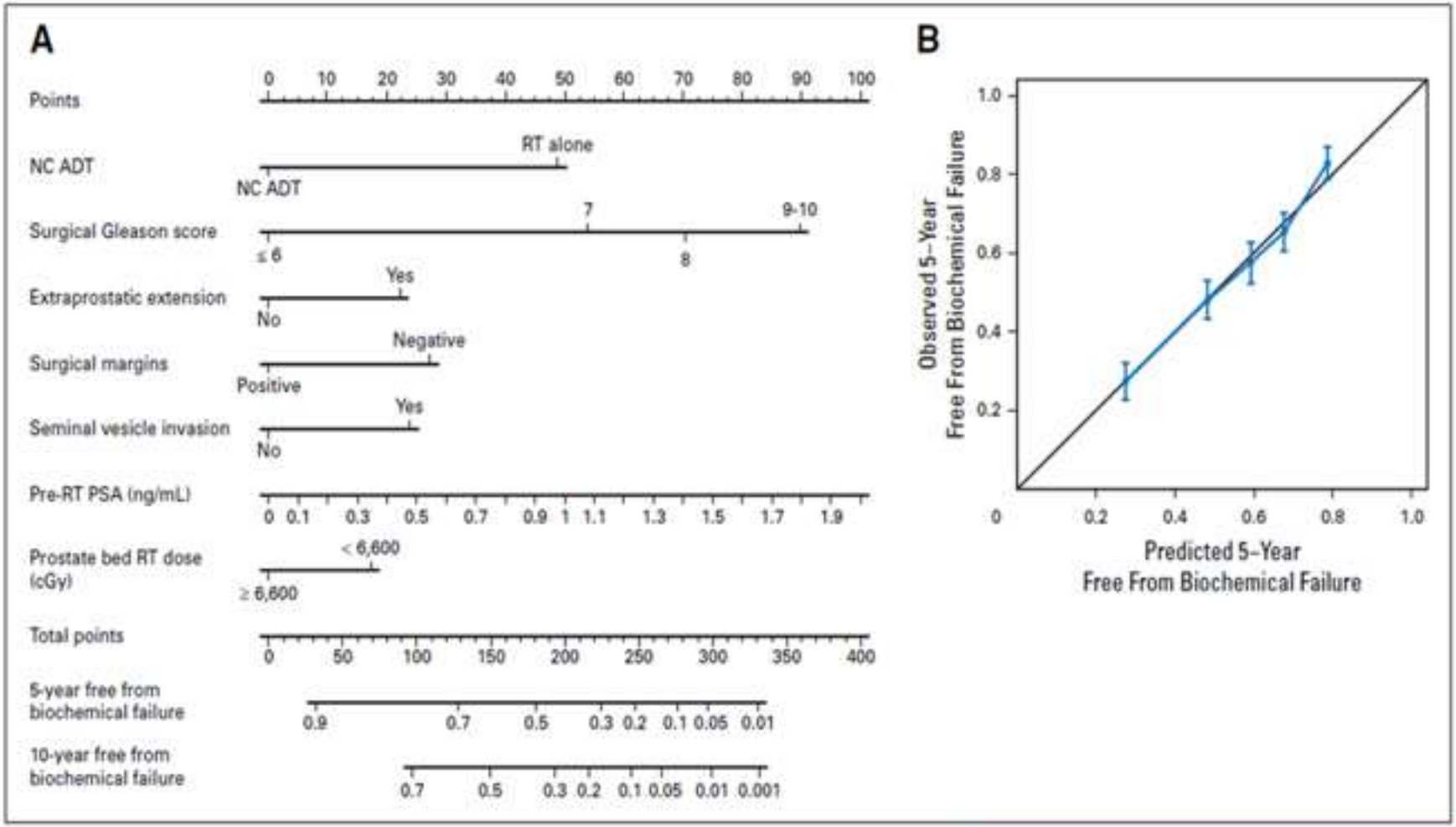
- CAPRA-S 0-2 low risk
- CAPRA-S 3-5 Intermediate risk
- CAPRA-S >5 High risk

Cooperberg 2011 Cancer

COOPERBERG/2011/CANCER

21st NOV 2020/PROSTATE

THE STEPHENSON NOMOGRAM FOR PROSTATE



Rahul D. Tendulkar/JCO/2016

25th NOV 2020/PROSTATE

ONCOLOGY EDUCATIVE CARTOON/SLIDE -BY DR KANHU CHARAN PATRO, IMAGES & DATA- GOOGLE

Decipher score

Aspect	Details
Purpose	Predicts the risk of metastasis and disease progression after radical prostatectomy.
Technology	Genomic test analyzing the activity of 22 prostate cancer-related genes.
Score Range	0 to 1
Risk Categories	- Low Risk: < 0.45 - Intermediate Risk: 0.45–0.6 - High Risk: > 0.6
Clinical Applications	- Guides post-operative treatment decisions. - Helps identify patients who may benefit from additional treatments, such as radiation or hormone therapy.
Low-Risk Implications	Suggests low risk of metastasis, potentially avoiding aggressive treatments.
High-Risk Implications	Indicates high risk of progression; may recommend salvage radiotherapy and/or hormone therapy.
Validation	Proven in clinical studies, including JAMA Oncology, to predict metastasis and cancer-specific mortality.
Guideline Recommendations	Included in NCCN guidelines for post-prostatectomy management. - High-risk scores (>0.6) may warrant early or salvage radiation and hormone therapy.

Risk predictor biomarker tests

Molecular biomarker prognostic assays commercially available for use in males with clinically localized prostate cancer

Test(s)	Company	List price* (USD)	Sample requirement	Clinical utility/intended use	Comments
Decipher Biopsy and Decipher Postoperative	Decipher Biosciences (formally Genome Dx)	$5150	FFPE tissue from prostate biopsy, or	Categorize patients into low/high risk to stratify patients to surveillance versus treatment (and intensity of treatment)	Evaluates mRNA expression levels of 22 genes from FFPE tissue; generates score from 0 to 1.0
			Prostate tissue after RP	Postprostatectomy for patients with adverse pathologic features to guide whether surveillance, adjuvant therapy, or salvage therapy may be warranted	
Oncotype Dx GPS	Genomic Health	$4520	Tumor tissue from original biopsy in neutral buffered formalin; prostatectomy specimens not accepted	Biopsy-based likelihood of adverse pathologic features (grade group ≥3 or extracapsular extension); identify those who may benefit from surveillance versus treatment	GPS ranges from 0 to 100 based on mRNA expression of 17 genes across 4 pathways
Prolaris Biopsy and Prolaris Postprostatectomy	Myriad Genetic Laboratories	$3900	FFPE tissue from prostate tumor biopsy or prostatectomy specimens	Aggressiveness of cancer; provides a 10-year risk of metastasis after definitive therapy, and disease-specific mortality under conservative management	mRNA expression of cell-cycle progression genes is used to calculate the score; clinical factors are subsequently added for risk assessment
ProMark, Proteomic Prognostic test for prostate cancer	MetaMark	$3900	Requires tissue collected with patented biopsy kit available from MetaMark	Uses automated image recognition technology to determine the likelihood of grade group ≥2 or stage ≥T3b	Expression of 8 proteins; uses automated image recognition technology to generate a score from 1 to 100 indicating the aggressiveness of prostate cancer

FFPE: formalin fixed, paraffin embedded; RP: radical prostatectomy; mRNA: messenger RNA; GPS: Genomic Prostate Score.

ARTISTIC METAANLYSIS

Aspect	Details
Objective	To compare the efficacy of adjuvant radiotherapy (aRT) with early salvage radiotherapy (eSRT) in men post-radical prostatectomy.
Trials Included	RADICALS-RT, GETUG-AFU 17, RAVES
Population	Men with localized prostate cancer who had undergone radical prostatectomy
Primary Outcome	Progression-free survival (PFS)
Adjuvant Radiotherapy (aRT)	rise
Early Salvage Radiotherapy (eSRT)	Radiotherapy given after a PSA rise indicating potential recurrence
Key Findings	No significant difference in PFS between aRT and eSRT groups
Implication	eSRT is a viable option, potentially reducing overtreatment and radiotherapy side effects
Recommendation	eSRT should be considered over aRT for patients, allowing delayed treatment until needed
Clinical Impact	Supports individualized treatment approach; fewer patients may need immediate postoperative radiotherapy

Yes there is a indication with all adverse pathological pictures but in high risk scores

Dr. Ram Vinayak

Q-24

When to start post op RT?

Timing of post OP RT

National Comprehensive Cancer Network®

NCCN Guidelines Version 4.2024
Prostate Cancer

NCCN Guidelines Index
Table of Contents
Discussion

PRINCIPLES OF RADIATION THERAPY

Radiotherapy for Recurrent Prostate Cancer After Definitive Radiotherapy:
See Principles of Local Secondary Post-Recurrence Therapy (PROS-K)

Post-Prostatectomy Radiation Therapy

- The panel recommends use of nomograms and consideration of age and comorbidities, clinical and pathologic information, PSA levels, PSADT, and 22-gene GC molecular assay to individualize treatment discussion.
- Postoperative radiotherapy should be instituted in patients with sufficient life expectancy when an undetectable PSA becomes subsequently detectable and increases on t… persistently detectable after R… pretreatment PSA is low and P… as reviewed:
  - Historically, indications for a… data include pT3a disease, p… involvement, regardless of P… within 1 year after RP and after operative side effects have improved/ stabilized.
  - Currently, for most patients, institution of early postoperative…

Please wait after surgery till urinary problems to resolve and early salvage is better than adjuvant RT

- Use of ADT: Selection for ADT addition to postoperative RT continues to evolve based on clinicopathologic, patient-specific, and GC based selection factors. Patients with high 22-gene GC scores (GC >0.6) should be strongly considered for the addition of ADT to EBRT, particularly when the opportunity for early EBRT has been missed. Data for ADT use in patients with rising PSA after prostatectomy without metastases or pathologic lymph node involvement is detailed:
  - EBRT with 2 years of 150 mg/day of bicalutamide demonstrated improved …rsus radiation … of RTOG … …ovement … …ults of … …G 9601 … …ess benefit … …than those with a high GC score.[8,9]
  - EBRT with 6 months of ADT (LHRH agonist) improved biochemical or clinical progression at 5 years on a prospective randomized trial (GETUG-16) versus

as reviewed:

- Historically, indications for adjuvant RT based on randomized trial data include pT3a disease, positive margin(s), or seminal vesicle involvement, regardless of PSA status. Adjuvant RT is usually given within 1 year after RP and after operative side effects have improved/ stabilized.

References PROS-I 8 of 8

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Continued

Deciding SRT after radical prostatectomy

- Following RP, patients should have their serum PSA level monitored
- With salvage RT recommended in the event of PSA failure.
- Adjuvant postoperative RT after RP is not routinely recommended
- Salvage RT should start early (e.g. PSA <0.5 ng/ml)
- Concomitant ADT for 6 months or bicalutamide 150 mg daily for 2 years may be offered to men having salvage RT
- Men having SRT to the prostate bed may be offered pelvic nodal RT .

Dr. Aakriti Bhardwaj

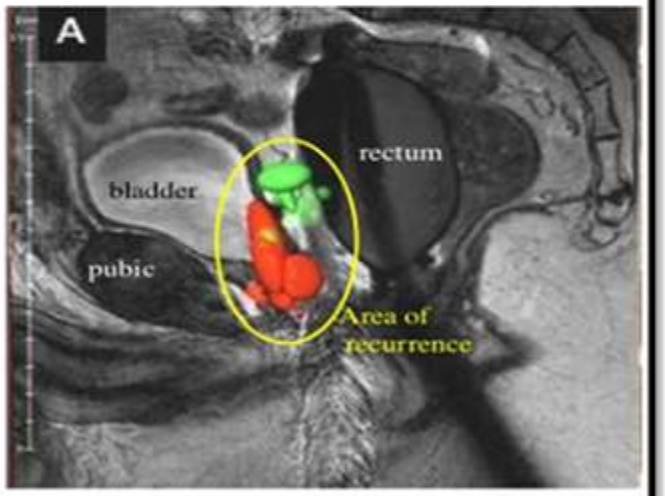
Q-25

TARGET DELINEATION IN post op RT?

WHAT AMENDS RT IN POST OP PROSTATE?

- ✓ NO CLEAR DATA AVAILABLE
- ✓ DOSE SHOULD BE 64 TO 72 Gy
- ✓ MARGIN POSITIVE PATIENTS GET BENEFIT MOST.
- ✓ START RADIOTHERAPY AFTER COMPLICATIONS IMPROVED WITH IN 1YR OF SURGERY
- ✓ EARLY STARTING OR LATE STARTING WILL BE CLEARED AFTER THE DATA FROM RADICALS AND RAVES STUDY
- ✓ IN SALVAGE SETTING 2 YEARS OF BICLUTAMIDE [RTOG 9601] OR 6 MONTHS [GETUG -16] OF ADT WITH RADIOTHERAPY IN SALVAGE SETTING IMPROVES OS AND METASTSTIC FREE SURVIVAL.
- ✓ TARGET VOLUME SHOULD BE –[BED /PELVIS] -PHYSICIANS DECISION
- ✓ PSMA PET SCANS BETTER FOR RAISING PSA
- ✓ TREATMENT IS MORE EFFECTIVE WHEN PSA AND PSADT ARE LOW

A	ADJUVANT RT
M	MARGIN POSITIVE
E	EXTRACAPSULAR INVOLVEMENT
N	NODAL POSITIVITY
D	DETECTABLE PSA-POST OP
S	SEMINAL VESICLE POSITIVE



NCCN 2018

9th JULY 2018/PROSTATE

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Review Article

ESTRO ACROP guideline on prostate bed delineation for postoperative radiotherapy in prostate cancer

Alan Dal Pra[a,b,*], Piet Dirix[c], Vincent Khoo[d], Christian Carrie[e], Cesare Cozzarini[f], Valérie Fonteyne[g], Pirus Ghadjar[h], Alfonso Gomez-Iturriaga[i], Valeria Panebianco[j], Almudena Zapatero[k], Alberto Bossi[l], Thomas Wiegel[m]

POST OP PROSTATE CONTOURING

Below the superior edge of the symphysis pubis		Comments
Anterior	Posterior edge of pubic bone	
Posterior	Anterior rectal wall	May need to be concave around lateral aspects
Inferior	8-12 mm below VUA	May include more if concern for apical margin. Can extend to slice above penile bulb if VUA not well visualized
Lateral	Levator ani muscles, obturator internus	

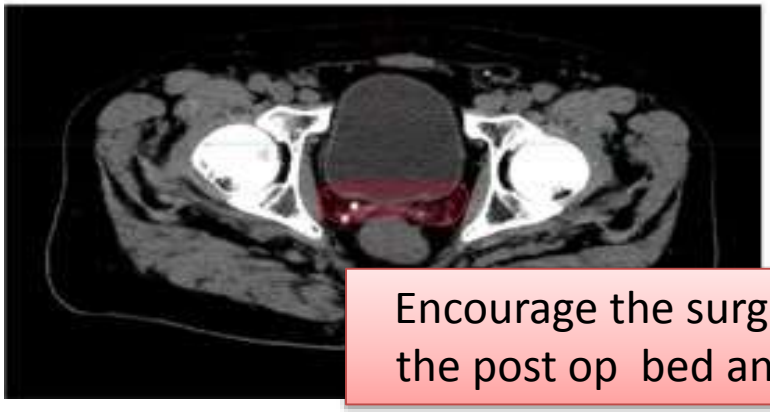
Above the superior edge of the symphysis pubis		
Anterior	Posterior 1-2cm of bladder wall	
Posterior	Mesorectal Fascia	
Superior	Level of cut end of vas deferens or 3-4cm above top of symphysis	Vas may retract postoperatively, Include seminal vesicle remnants if pathologically involved
Lateral	Sacrorectogenitopubic fascia	If concern about extraprostatic disease at base may extend to obturator internus

Michalski,/IJROBP/2019

27th AUGUST 2019/PROSTATE

Pics for your reference

a)



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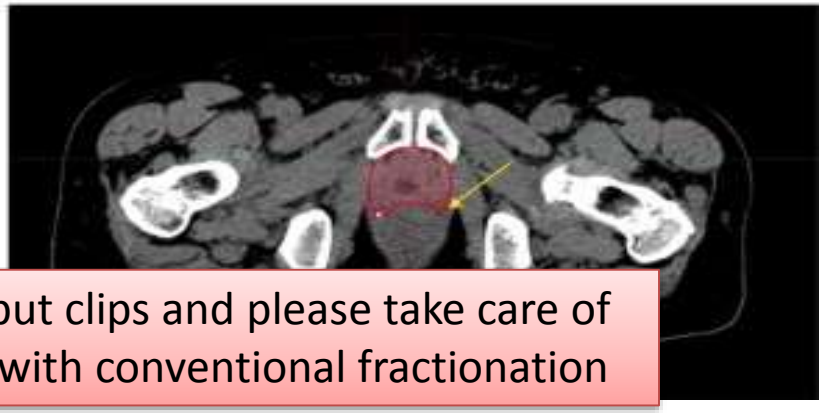
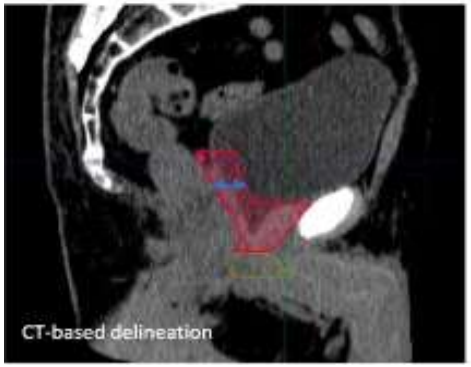


Encourage the surgeon to put clips and please take care of the post op bed and treat with conventional fractionation

a)



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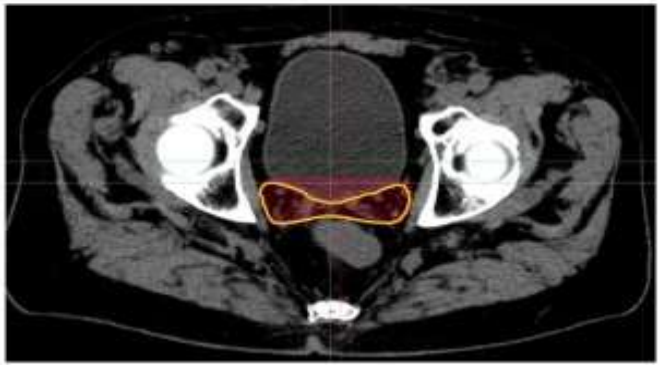

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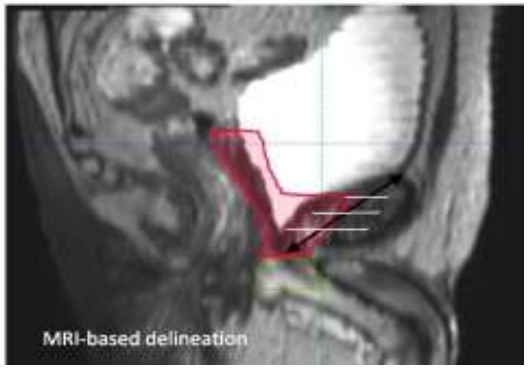


Dr. Rabia Suzanne Angiras

Q-26

Definition of biochemical failure?

Defining Biochemical Recurrence

INITIAL THERAPY	PSA VALUES
Radical Prostatectomy After nadir	PSA level of 0.2 ng/ml or more After 2 consecutive tests
Radiation Therapy or Brachytherapy After nadir with or without HT	PSA rise of 2 ng/ml or more above post Radiation nadir PSA

THE DATE OF FAILURE BE DETERMINED "AT CALL" (NOT BACKDATED)

MACK ROACH III/2016/RED

27th SEPTEMBER 2016/PROSTATE

ONCOLOGY EDUCATIVE CARTOON SLIDE -BY DR KANHU CHARAN PATRO, IMAGES FROM GOOGLE

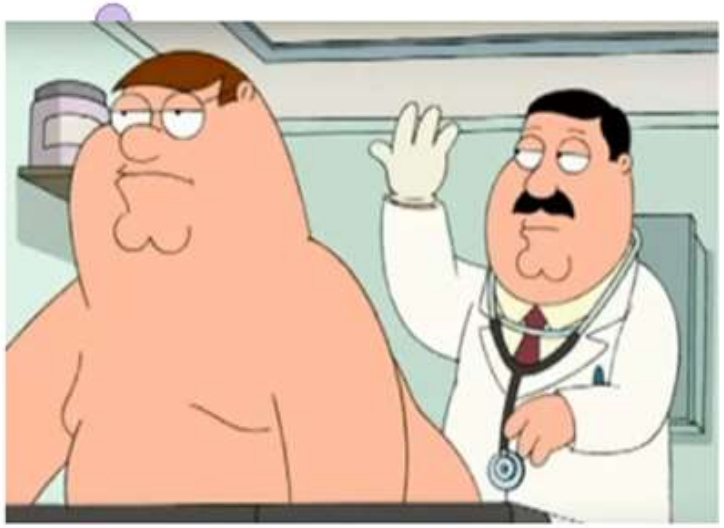
Dr. Akella Sai Srividya

Q-27

IS DRE needed to do during follow up?

IS DRE ESSENTIAL AFTER RADICAL RADIOTHERAPY FOR PROSTATE CANCER DURING FOLLOW UP?

DOCTOR , I WANT A SECOND OPINION BEFORE DIGITAL RECTAL EXAMINATION



ESMO- Routine DRE after local therapy is not required for asymptomatic patients while the PSA remains controlled

DRE failed to detect any local recurrences in the absence of a rising PSA. The lowest serum PSA concentration at the *time* of clinically detectable local recurrence was 1.7 ng/ml.

No need to be sad ...

Doneux A /Clin Oncol (R Coll Radiol)./2005

29th JUNE 2019/PROSTATE

Dr. M Bhargava Krishna

Q-28

Following up?

Follow up after radiotherapy

Follow-Up Aspect	Details
PSA Monitoring	1. Frequency: Every 3–6 months (first few years), then annually if stable. 2. Interpretation: Gradual PSA decline expected; steady rise may indicate recurrence. 3. PSA Nadir: Lowest PSA achieved post-treatment; recurrence may be indicated by nadir + 2 ng/mL.
Clinical Evaluation	1. Physical Exams: Periodic exams, including digital rectal exams (DRE), to monitor local changes. 2. Symptom Assessment: Patients report new symptoms, especially urinary or bowel changes, pain.
Imaging Studies	1. Routine Imaging: Not typically required unless PSA levels rise or signs of recurrence are present. 2. Types of Imaging: MRI, CT, bone scan, or PET if metastasis suspected.
Management of Side Effects	1. Acute vs. Late Effects: Acute within 90 days; late effects may appear months or years later. 2. Urinary Symptoms: Incontinence, urgency; managed with medications or pelvic floor exercises. 3. Gastrointestinal Symptoms: Rectal bleeding, urgency; managed with diet, medications, or medical intervention. 4. Sexual Dysfunction: ED common post-radiotherapy; treated with medications, counseling, or devices.
Psychosocial Support	Mental Health: Addressing emotional wellbeing, as treatment impacts mental health. Support Services: Support groups, counseling, or lifestyle interventions for quality of life.

Follow up after radical prostatectomy

Follow-Up Aspect	Details
PSA Monitoring	1. Frequency: Every 3–6 months (first 1–2 years), then annually if undetectable. 2. Interpretation: PSA levels should be undetectable; a detectable or rising PSA may indicate recurrence.
Clinical Evaluation	1. Physical Exams: Regular exams to monitor recovery and detect health changes. 2. Symptom Assessment: Patients report new symptoms, particularly urinary or bowel changes.
Imaging Studies	1. Routine Imaging: Not typically needed unless PSA levels rise. 2. Types of Imaging: MRI, CT, bone scan, or PET if recurrence suspected.
Management of Side Effects	1. Urinary Incontinence: Managed with pelvic floor exercises, medications, or, if needed, surgery. 2. Erectile Dysfunction: Managed with medications, devices, or penile implants if necessary. 3. Other Complications: Possible lymphedema or hernia; managed based on severity.
Psychosocial Support	1. Mental Health: Support for psychological impacts of surgery and quality-of-life changes. 2. Support Services: Counseling, support groups, lifestyle modifications.

Dr. Megha Monani

Q-29

ROLE OF SCREENING AND GENETICALLY TESTING?

SCREENING PRINCIPLE

- Population-based PSA screening of men for prostate cancer reduces prostate cancer mortality at the expense of over diagnosis and overtreatment and is not recommended [I, C].
- Early PSA testing (baseline PSA followed by risk-adapted follow-up)
  - Can be offered to men >50 years
  - Men >45 years with a family history of prostate cancer,
  - African- Americans >45 years
  - BRCA1/2 carriers >40 years
- Testing for prostate cancer in asymptomatic men should not be done in men with a life expectancy <10 years

Recommendation from various groups

Table 4. Prostate cancer screening guidelines

Organization	AUA[119]	ACS[120]	USPSTF[121]
When to begin screening	PSA test should be given to well-informed men ≥ 40 years with a life expectancy of >10 years. A DRE should accompany the PSA test	Men should have a discussion with their doctor about screening starting at 50 years for average risk, 45 years for high risk*, and 40 years for very high risk† men	Insufficient evidence for screening men under 75 years
Frequency of screening	Frequency of test should be discussed with doctor and be based on the patient's individual risk factors such as race and family history	For those who are tested: PSA < 2.5 ng/ml should consider retesting biennially. PSA > 2.5 ng/ml should undergo annual testing. DRE is also optional	
When to stop screening		Men with a < 10-year life expectancy should not be tested	Men over 75 years should not be screened

AUA: American Urological Association; ACS: American Cancer Society; USPSTF: United States Preventive Services Task Force; DRE: digital rectal exam; PSA: prostate-specific antigen.

*African Americans and men who have a first-degree relative (father, brother, or son) diagnosed with prostate cancer at an early age (younger than age 65).

†Several first-degree relatives who had prostate cancer at earlier than 65 years.

Recommendation from various groups

COUNTRY/ORGANIZATION	AGE TO START SCREENING DISCUSSIONS	HIGH-RISK GROUP (AGE TO START)	RECOMMENDATIONS
American Cancer Society (USA)	50 for men at average risk and life expectancy of 10+ years	45 for high-risk men (African American, family history)	Informed discussion on benefits and risks of screening recommended.
U.S. Preventive Services Task Force (USA)	55-69 years (individual decision)	N/A	PSA-based screening is individual choice for 55-69 years; not recommended for men 70+.
NHS (United Kingdom)	No national screening program; men over 50 can request PSA test	N/A	Men can discuss PSA testing with GP; emphasis on informing about PSA test's limitations and risks.
NICE (United Kingdom)	No routine screening for asymptomatic men	N/A	Screening is not routinely recommended; men should be informed about risks and benefits before testing.
Urological Society of Australia and New Zealand (Australia)	50-69 years for average risk men	40-45 for high-risk men (family history of prostate cancer)	Encourages discussions on benefits and risks of PSA testing based on personal and family risk factors.
India	No national screening program; generally recommended from age 50 or for those with risk factors	N/A	Screening recommendations based on personal risk factors and healthcare provider discussions.

Genetic testing recommendation

Criteria	Details
High-Risk, Regional, or Metastatic Prostate Cancer	Recommended for men with advanced-stage prostate cancer to guide treatment strategies and assess prognosis.
Family History of Cancer	Suggested for individuals with a family history of prostate, breast, ovarian, pancreatic, or other cancers to assess hereditary risks.
Ashkenazi Jewish Ancestry	Advised due to a higher prevalence of BRCA1 and BRCA2 mutations, increasing cancer risk.
Known Family Mutation	Testing recommended if a pathogenic mutation (e.g., BRCA1, BRCA2, ATM) is identified in a family member to determine personal mutation status.
Genetic Counseling	Essential for interpreting test results, understanding implications for treatment, and identifying risks for family members.

Dr. Ram Vinayak

Q-30

ANY ROLE OF SURGEONS IN HANDLING PROSTATE CANCER ?

Prohibited area for surgeon

- Biopsy
  - Interventional radiologist
- TURP
  - Usually not needed
- Radical prostatectomy
  - It is a crime
- Recurrent after RT
  - Focal RERT/SBRT/Proton

Multidisciplinary approach- Preferred

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