



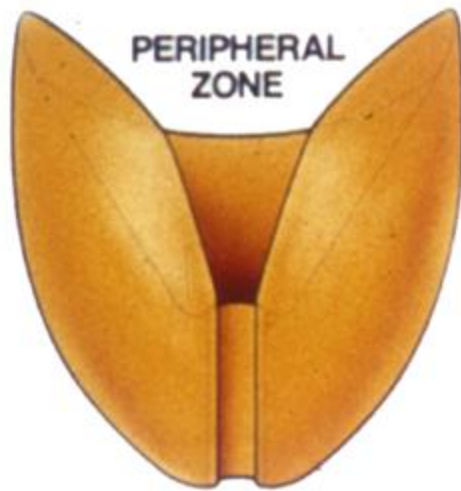
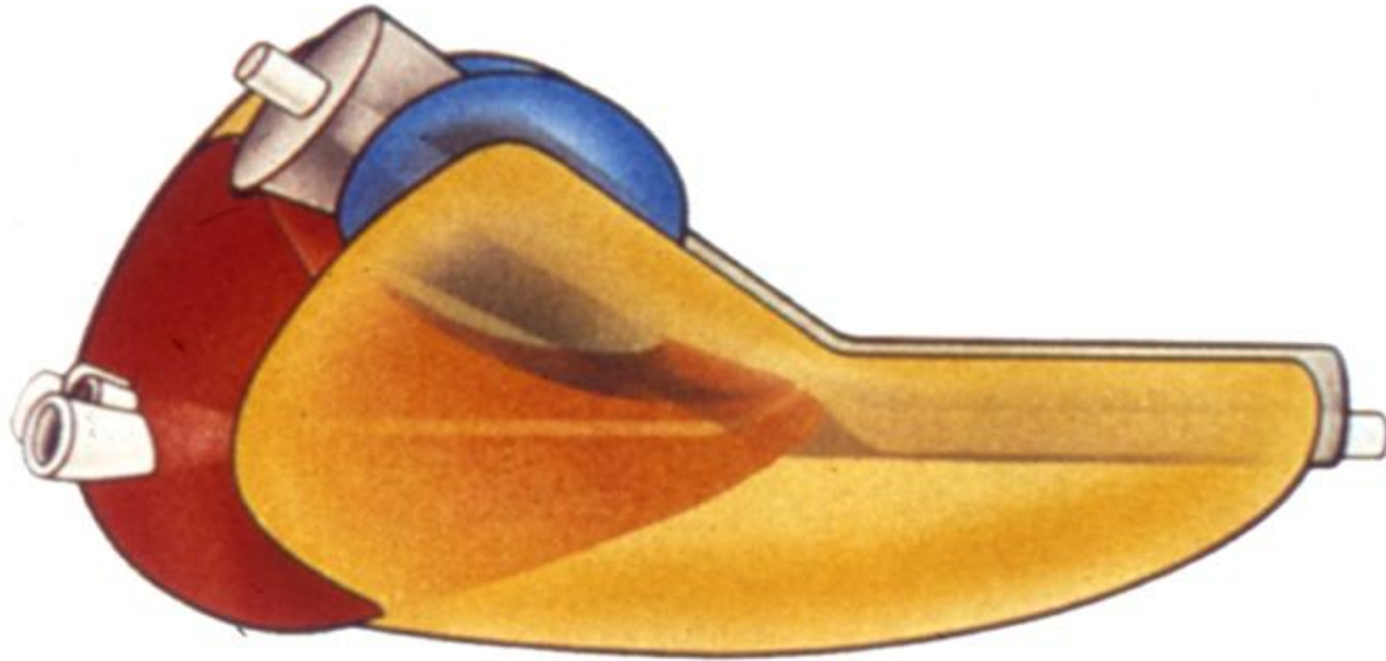
The Gross Handling of Radical Prostatectomy Specimens: Pitfalls and How to Avoid Them

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AAPA 2026 Annual Conference
Phoenix AZ

LEARNING OBJECTIVES

- Review current CAP protocols for staging/reporting of prostate cancer
- Recognize the common challenges in the gross examination of prostates
- Interpret common problematic grossing scenarios and how to handle them
- Illustrate common and rare entities, focusing on gross/microscopic correlation

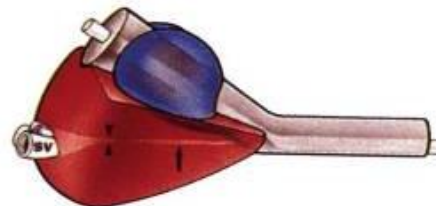


A

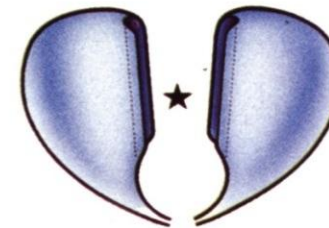
CENTRAL ZONE



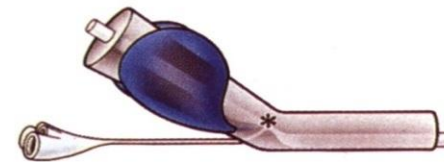
a.



TRANSITION ZONE



a.





**Protocol for the Examination of Radical Prostatectomy
Specimens From Patients With Carcinoma of the Prostate Gland**

Extraprostatic Extension (EPE) (Note [F](#))

- ☐ Not identified
- ☐ Present, focal
- ☐ Present, nonfocal
- ☐ Cannot be determined: _____

+Location of Extraprostatic Extension (select all that apply)

- ☐ Right apical
- ☐ Right bladder neck
- ☐ Right anterior
- ☐ Right lateral
- ☐ Right posterolateral (neurovascular bundle)
- ☐ Right posterior
- ☐ Left apical
- ☐ Left bladder neck
- ☐ Left anterior
- ☐ Left lateral
- ☐ Left posterolateral (neurovascular bundle)
- ☐ Left posterior
- ☐ Other (specify): _____
- ☐ Cannot be determined: _____

Urinary Bladder Neck Invasion (Note [G](#))

- ☐ Not identified
- ☐ Present
- ☐ Cannot be determined: _____

Seminal Vesicle Invasion (Note [H](#))

- ☐ Not identified
- ☐ Present, right
- ☐ Present, left
- ☐ Present, bilateral
- ☐ Present, laterality cannot be determined
- ☐ No seminal vesicle present (Note [H](#))

MARGINS (Note [K](#))

Margin Status

- ☐ Cannot be assessed: _____
- ☐ All margins negative for invasive carcinoma
- ☐ Invasive carcinoma present at margin

+Linear Length of Margin(s) Involved by Carcinoma

- ☐ Specify exact length in Millimeters (mm): _____ mm
- ☐ Less than 3 mm (limited)
- ☐ Greater than or equal to 3 mm (non-limited)
- ☐ Cannot be determined (explain): _____

+Focality of Margin Involvement

- ☐ Unifocal
- ☐ Multifocal

Margin(s) Involved by Invasive Carcinoma (select all that apply)

- ☐ Right apical
- ☐ Right bladder neck
- ☐ Right anterior
- ☐ Right lateral
- ☐ Right posterolateral (neurovascular bundle)
- ☐ Right posterior
- ☐ Left apical
- ☐ Left bladder neck
- ☐ Left anterior
- ☐ Left lateral
- ☐ Left posterolateral (neurovascular bundle)

REGIONAL LYMPH NODES

Regional Lymph Node Status

- ☐ Not applicable (no regional lymph nodes submitted or found)
- ☐ Regional lymph nodes present
 - ☐ All regional lymph nodes negative for tumor
 - ☐ Tumor present in regional lymph node(s)

GROSSING

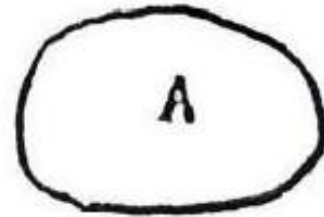
- No standard method for tissue submission
- Most efficient method = maximum information in fewest sections
 - Index tumor: highest GS, stage-determining, margins
- Complete embedding ideal (not cost effective, often not necessary)
- Depends on location of gross tumor

We must “balance the extra expense and time involved ...against the risk of missing important prognostic parameters...”

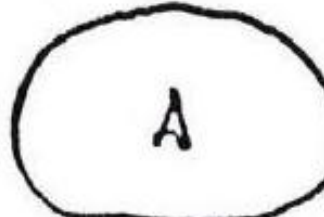
Apex

R

1



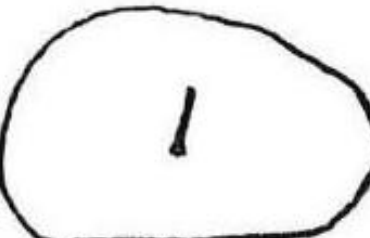
2



3



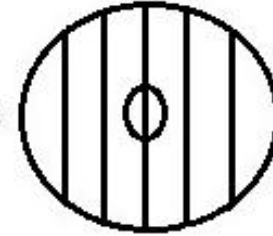
4



A

R

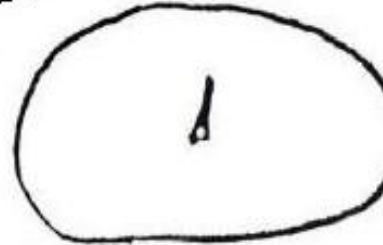
L



P

L

5



6



7



8



Bladder neck margin

Insertion of SVs

Base

Ink Code:

Green-anterior

Blue-right

Red-left

Black-posterior

Alternate color (blue/orange): to indicate inadvertent incision (not a true margin)

Prostate

Age

Clinical
history

- On active surveillance?
- Family history?

Prior
pathology

- Treated?
 - Radiation
 - Hormones
 - HIFU
- Prior testosterone therapy? (D/C this will mimic ADT)

INTEGRATED DIAGNOSIS

Anatomic
location

- PZ
- TZ
- Anterior

Histology
+- IHC

- Acinar/ductal
- Intraductal
- Cribriform

MR
impression

- PiRADS
- Clinical staging

** New prognostic tests

- Decipher
- Oncotype DX
- Prolaris
- Natera

MR Prostate without and with IV Contrast

Lesion # 1

Size: 0.5cm, 0.08cc

Zone: Peripheral zone

Location: Right posterior lateral at midgland. (4/19)

Lesion # 2

Size: 0.7cm, 0.11cc

Zone: Peripheral zone

Location: Left posterior medial at midgland. (4/16)

IMPRESSION:

PIRADS 4- High (clinically significant cancer is likely to be present).

1. 0.5 cm PI-RADS 4 lesion in the right peripheral zone at the mid gland without extraprostatic extension.
2. 0.7 cm PIRADS 3 lesion in the left posterior peripheral zone at the mid gland without extraprostatic extension.

Lesion # 1

Size: 1.6cm, 0.9cc, unchanged

Zone: Transition zone

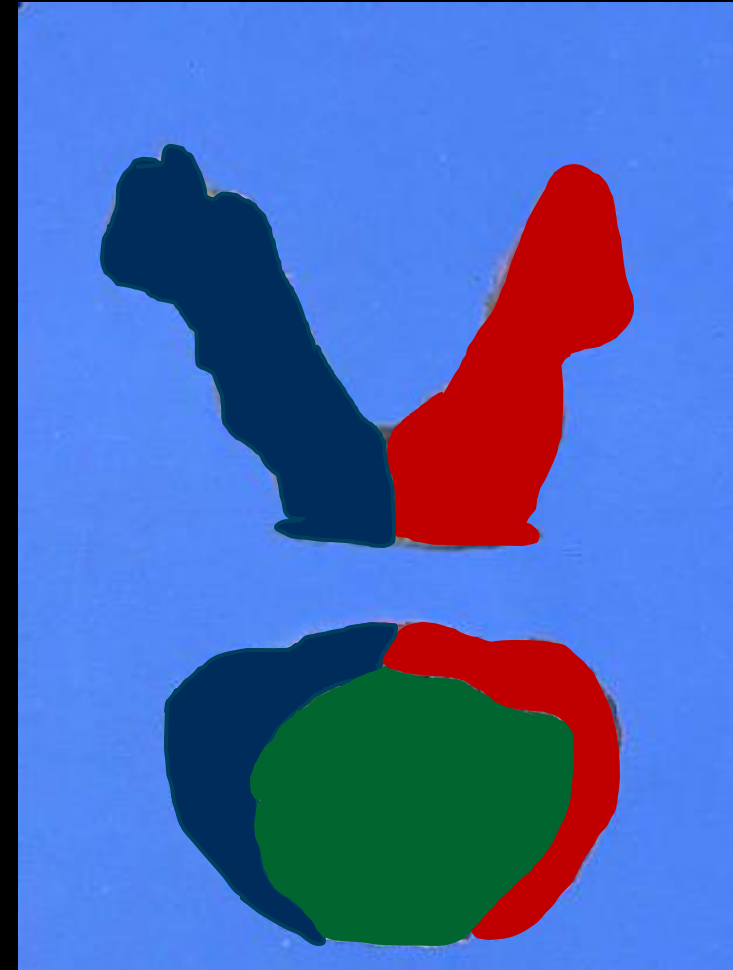
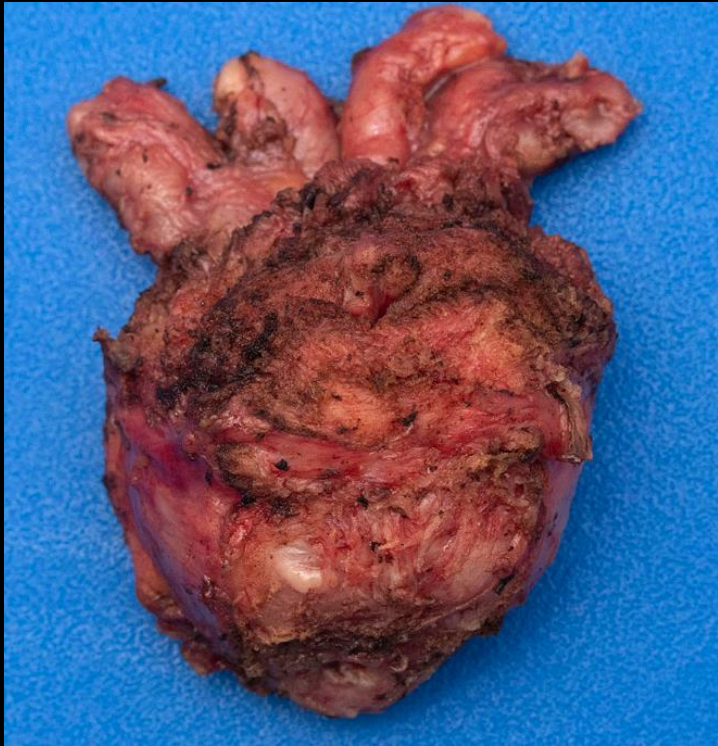
Location: Right anterior at midgland. (4/25)

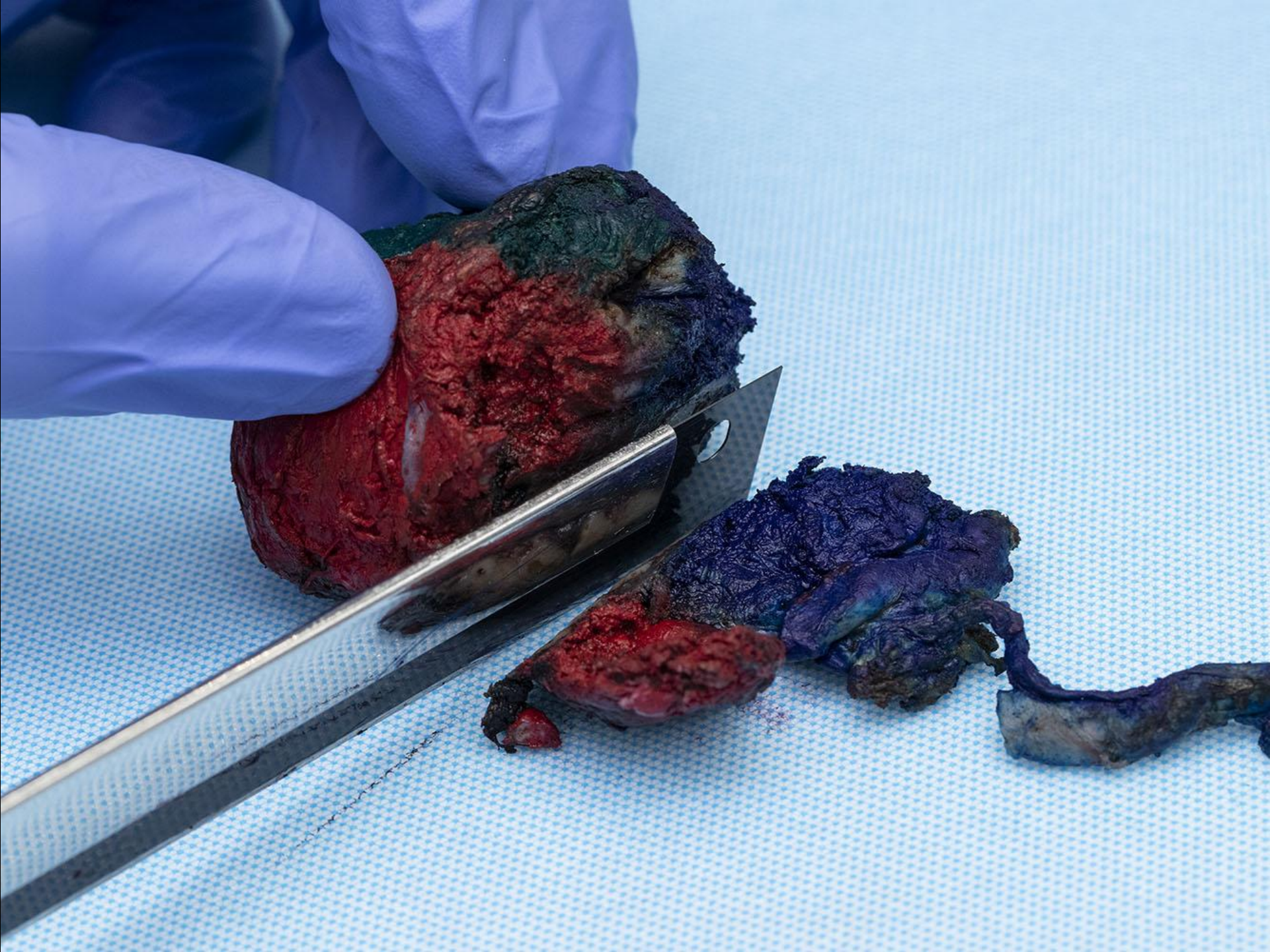
IMPRESSION:

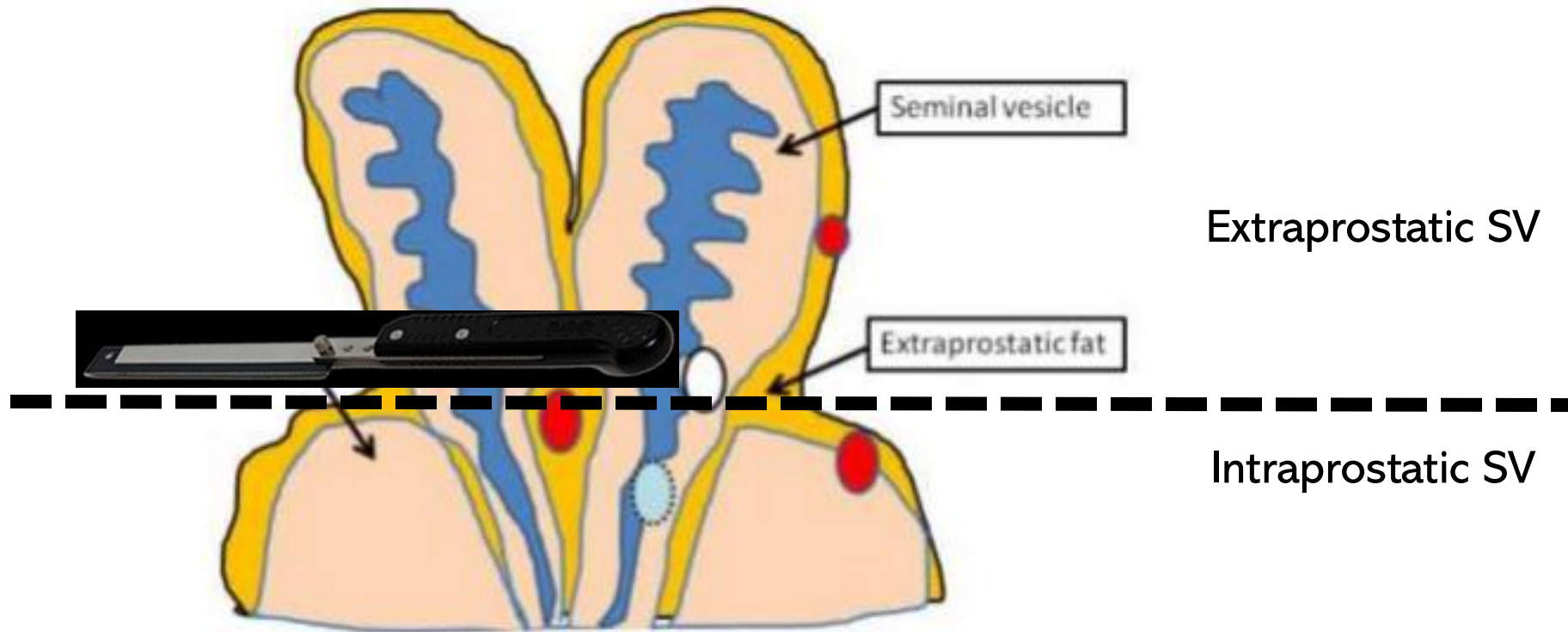
PIRADS 5- Very high (clinically significant cancer is highly likely to be present).

1. Unchanged size of a 1.6 cm PI-RADS 5 observation in the right anterior transition zone at mid gland.

[illegible]

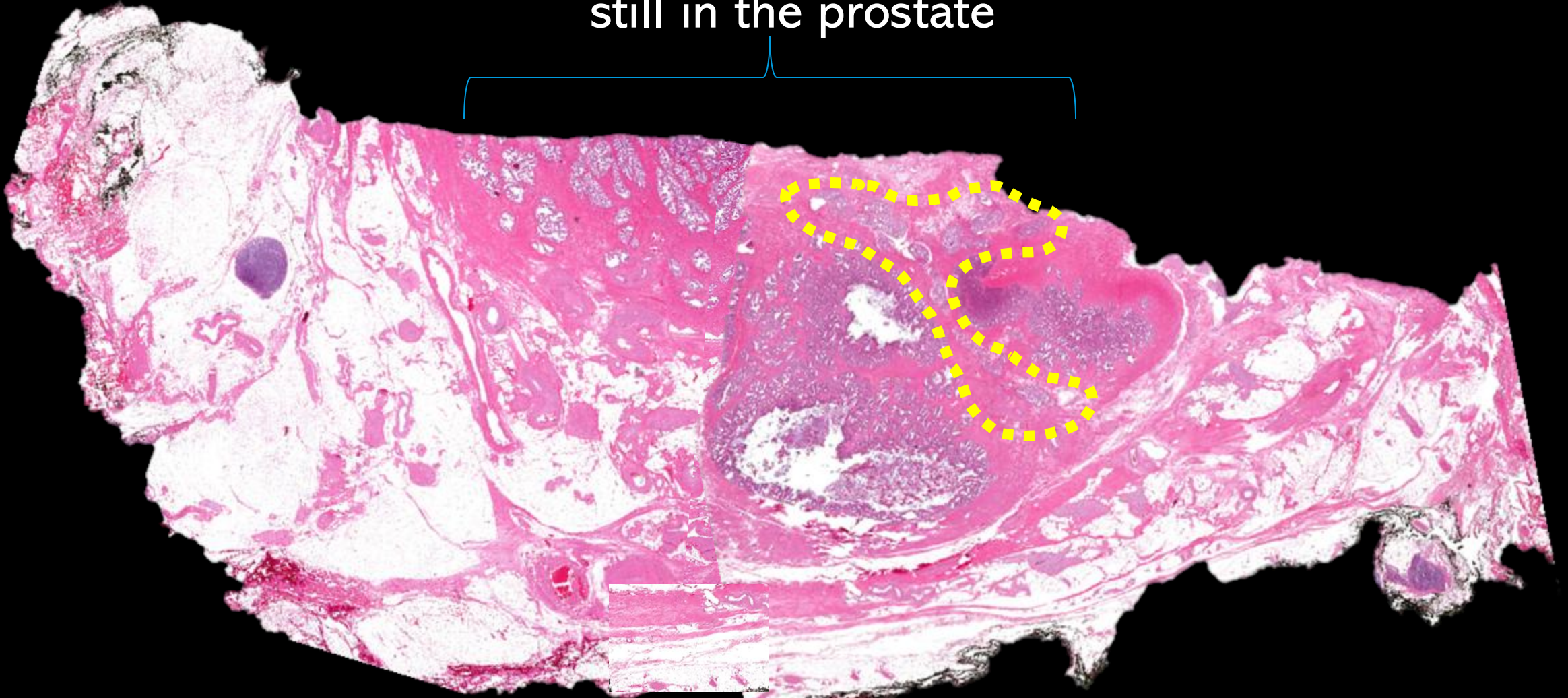






- Amputate at the junction, as close to the base as possible without incising the prostate
- Minimizes the likelihood of including the intraprostatic SV but does not completely eliminate it

Normal central zone=
still in the prostate

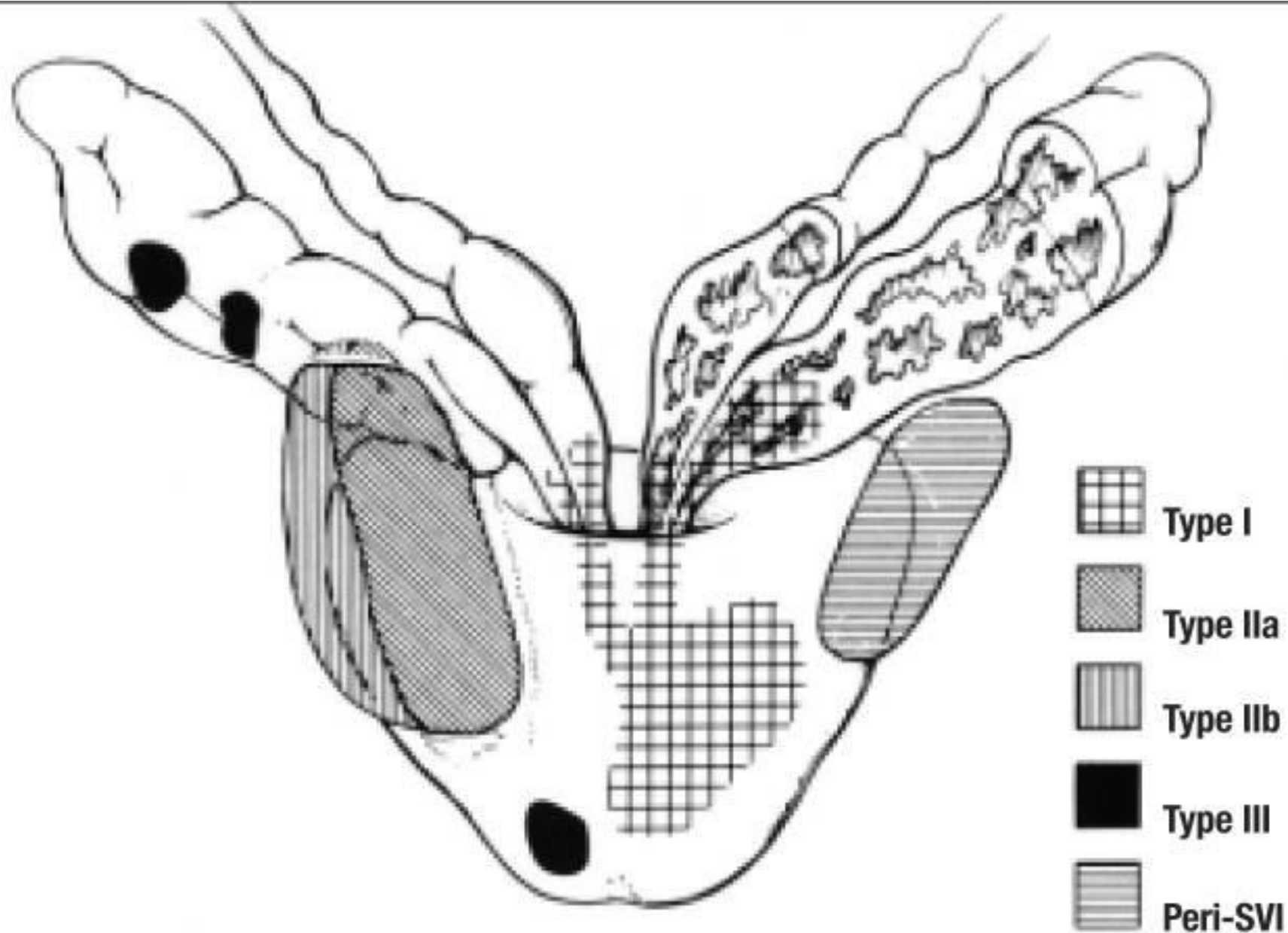


Tumor involving intraprostatic portion of the SV
Insufficient for pT3b

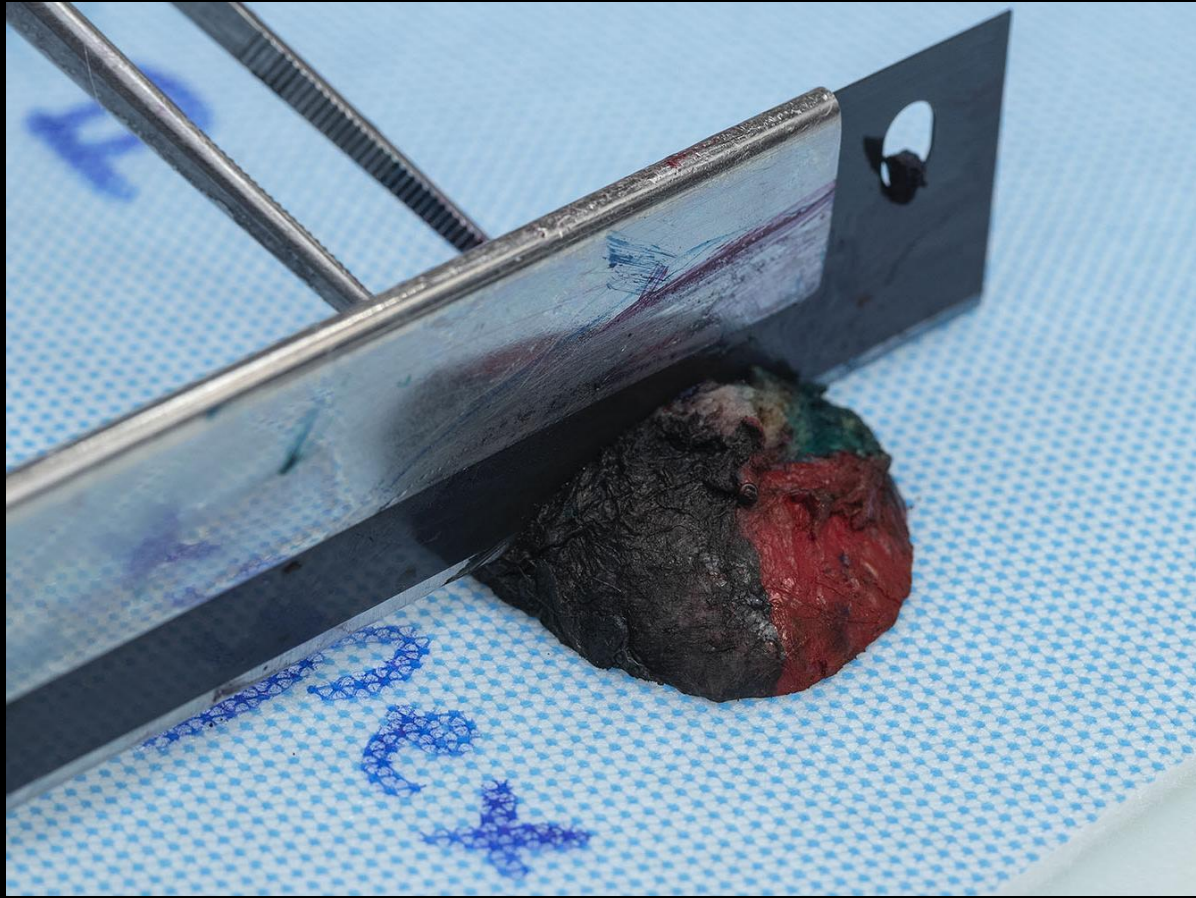


Tumor invading extraprostatic portion of the SV = pT3b

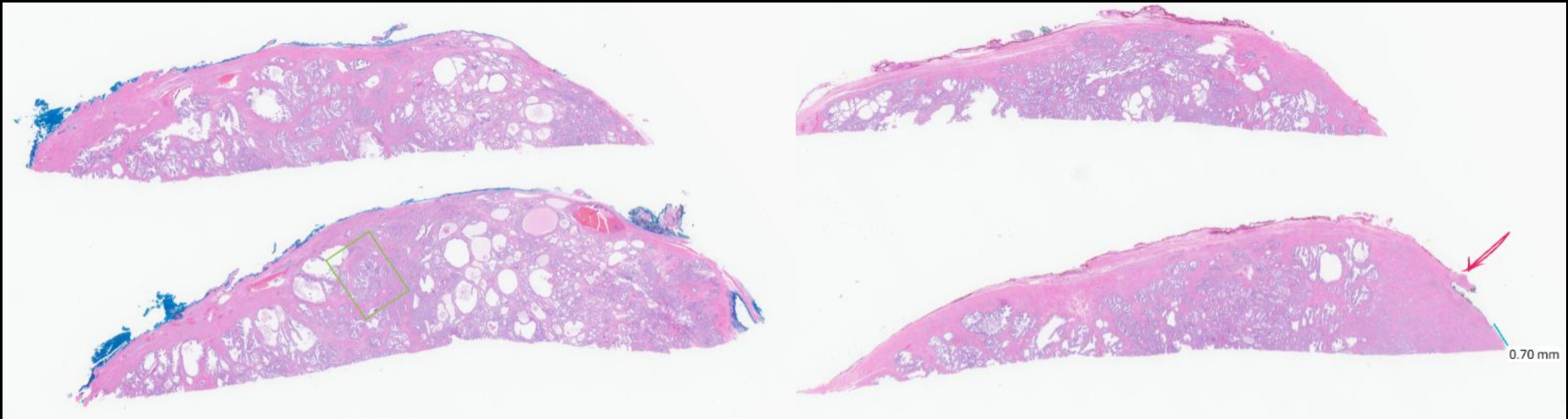
Mechanisms of Seminal Vesicle Invasion

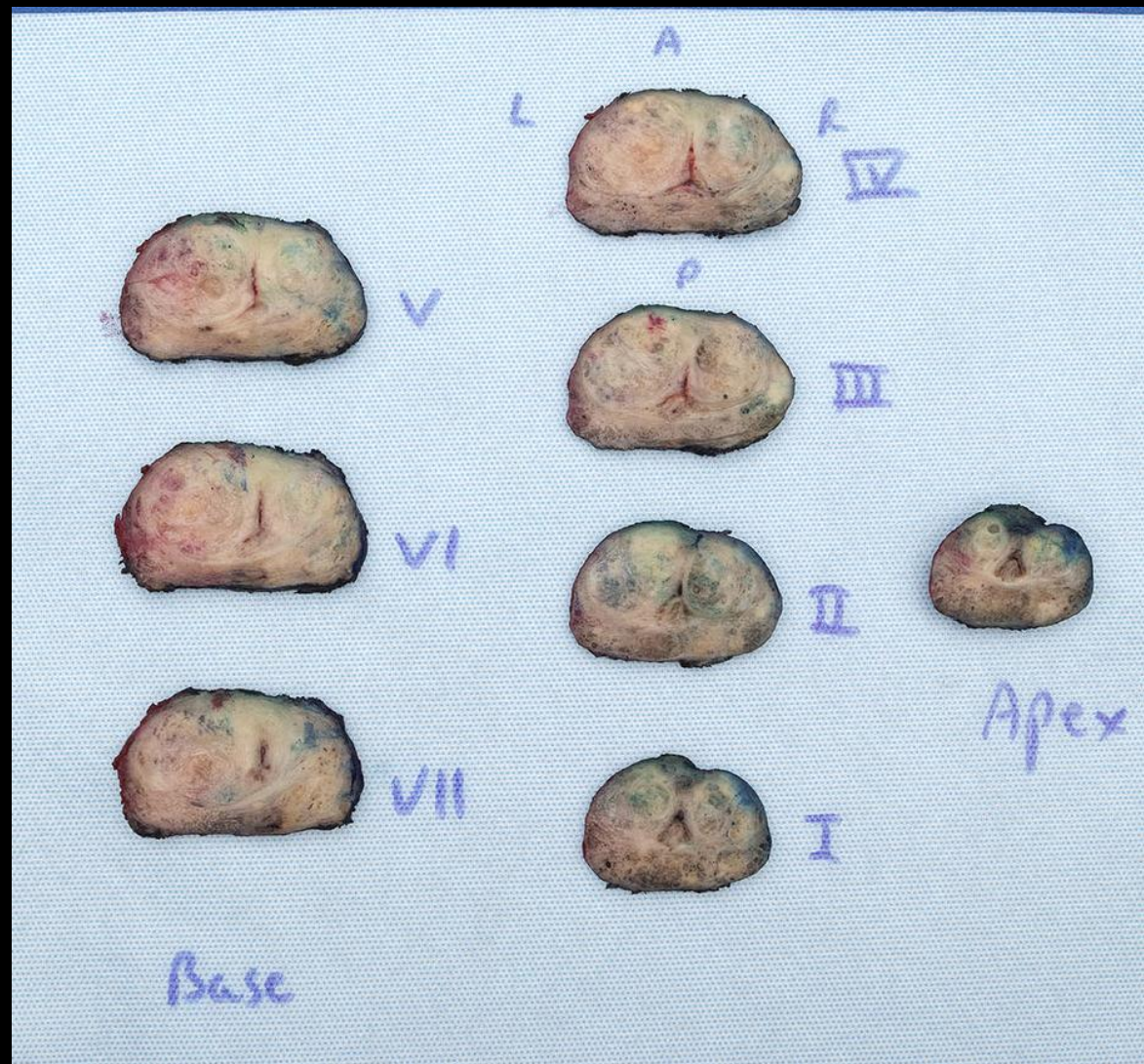


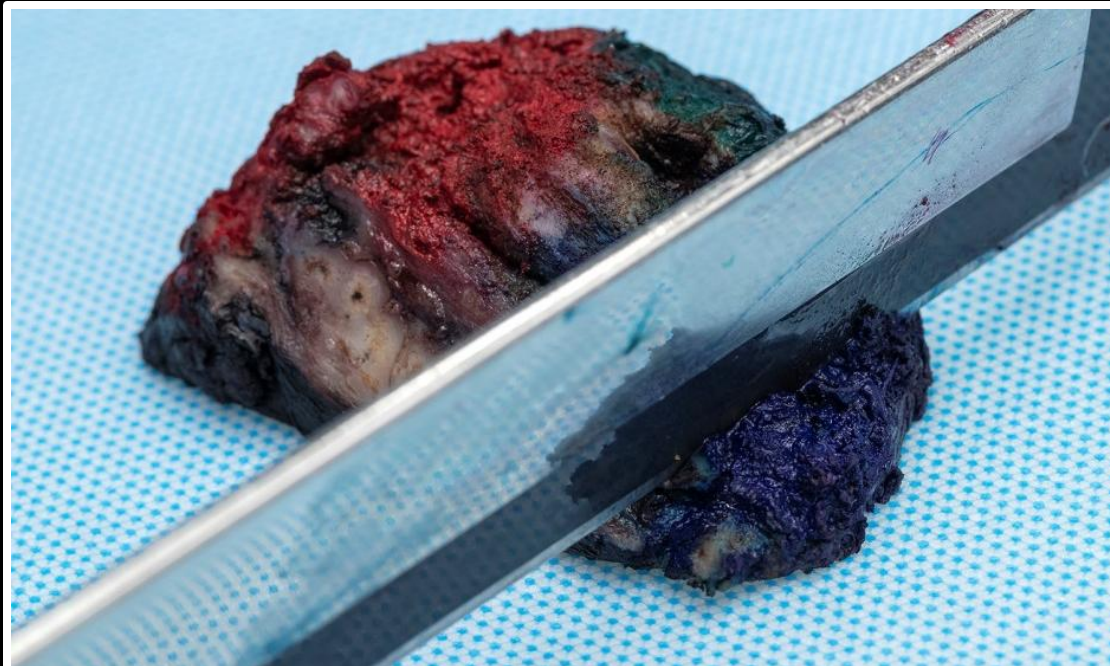




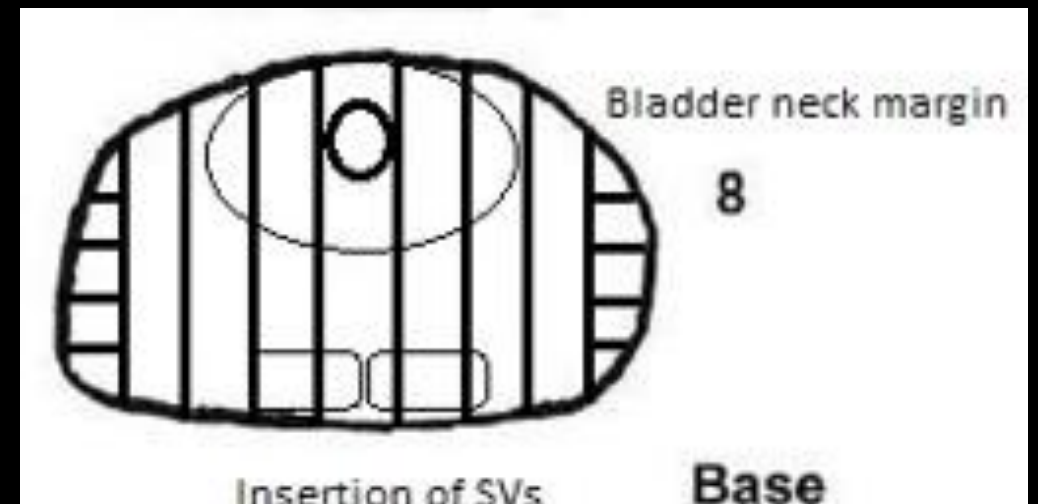
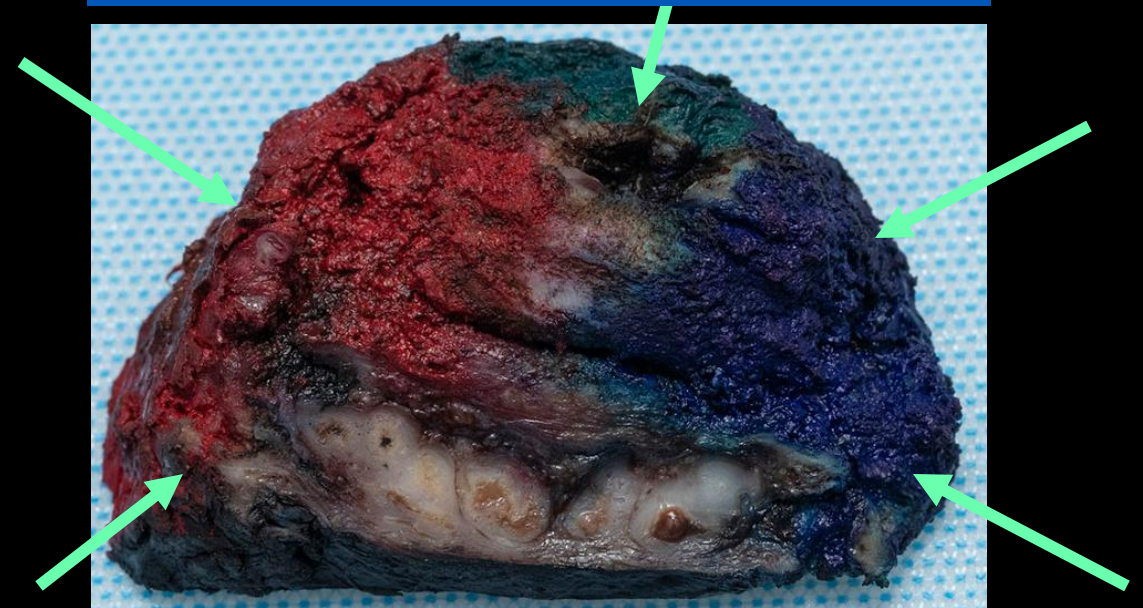
Apex margins

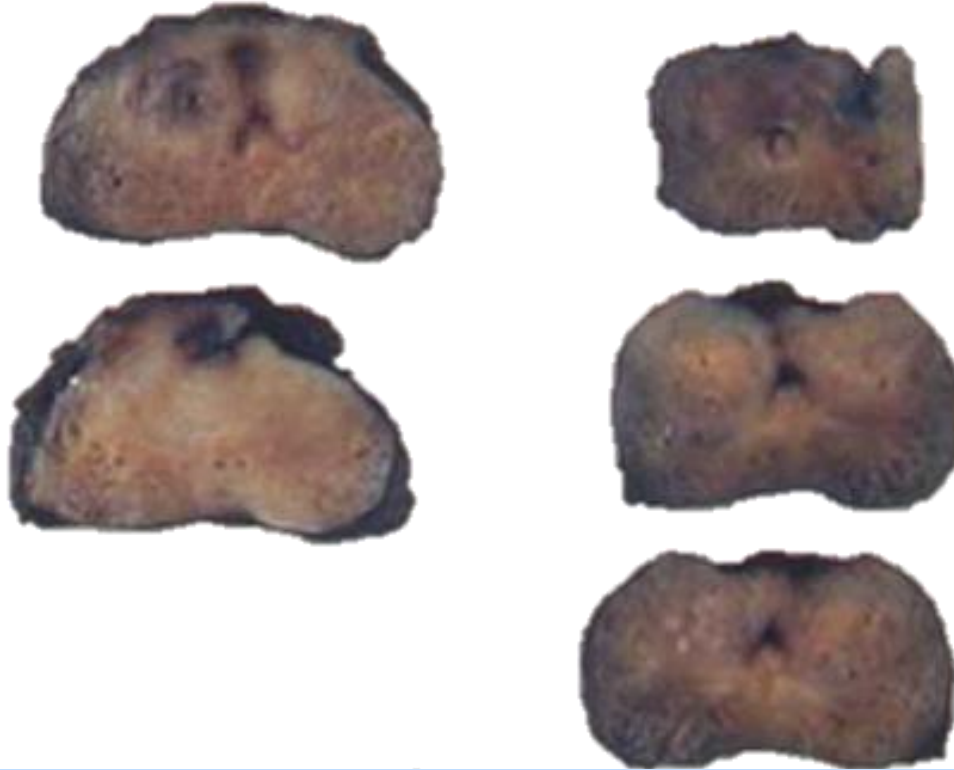
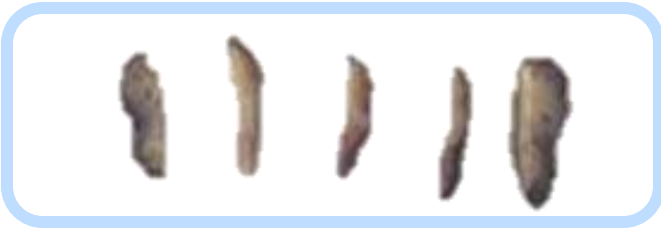






- Entire base is a margin
- Common site of EPE





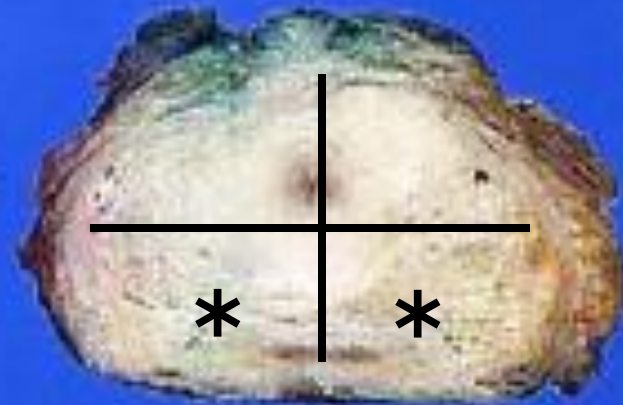
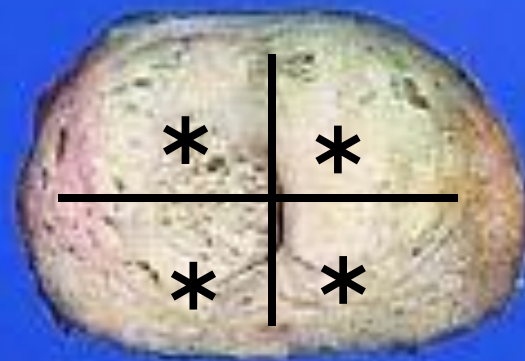
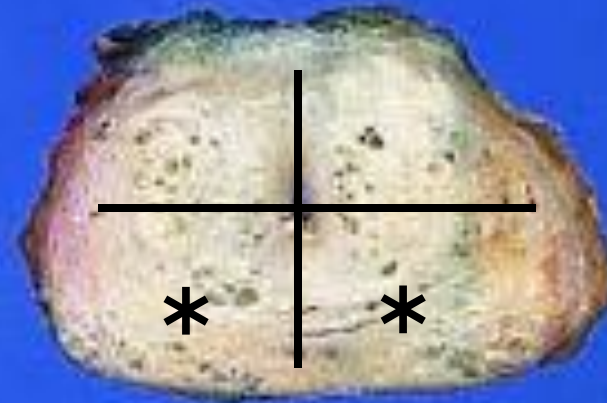
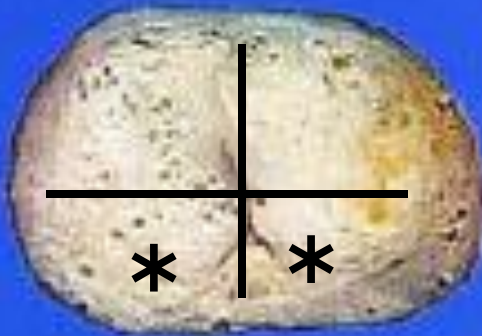
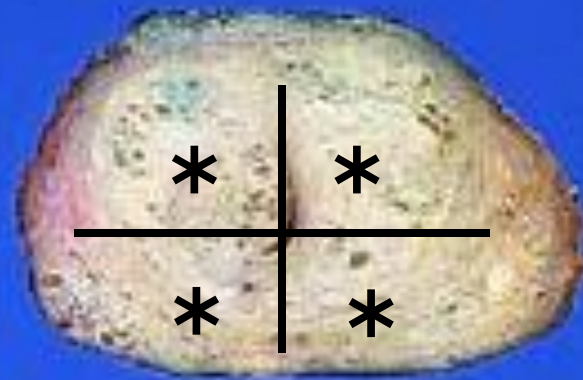
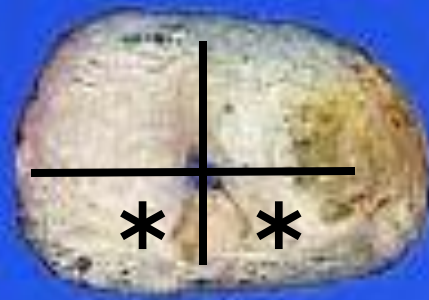
Apex and bladder neck margins

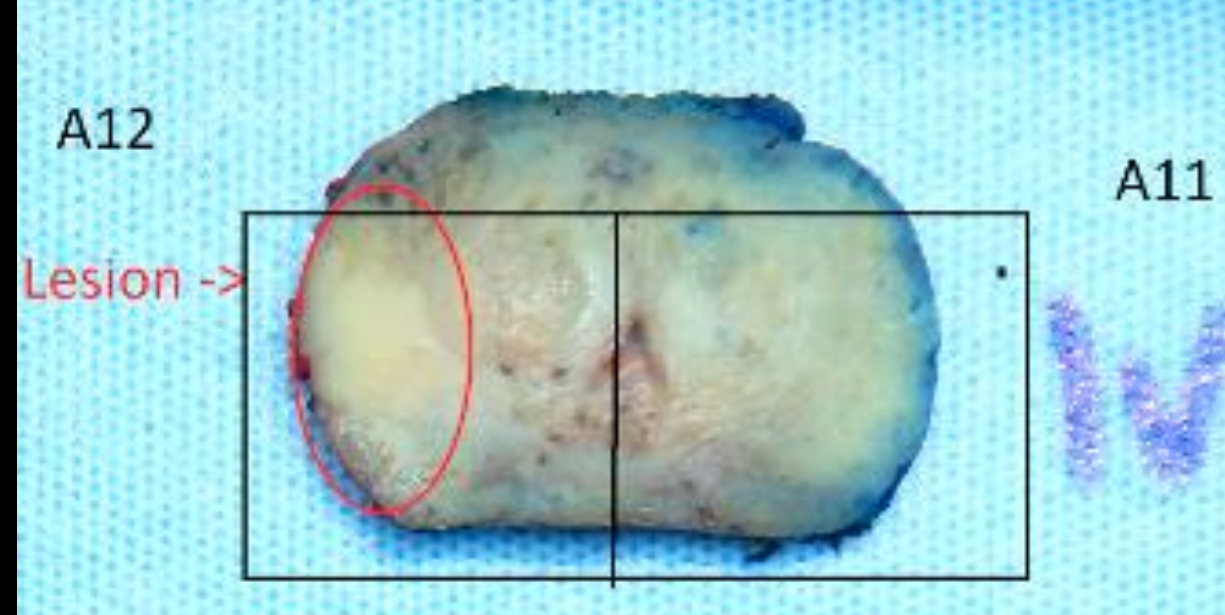
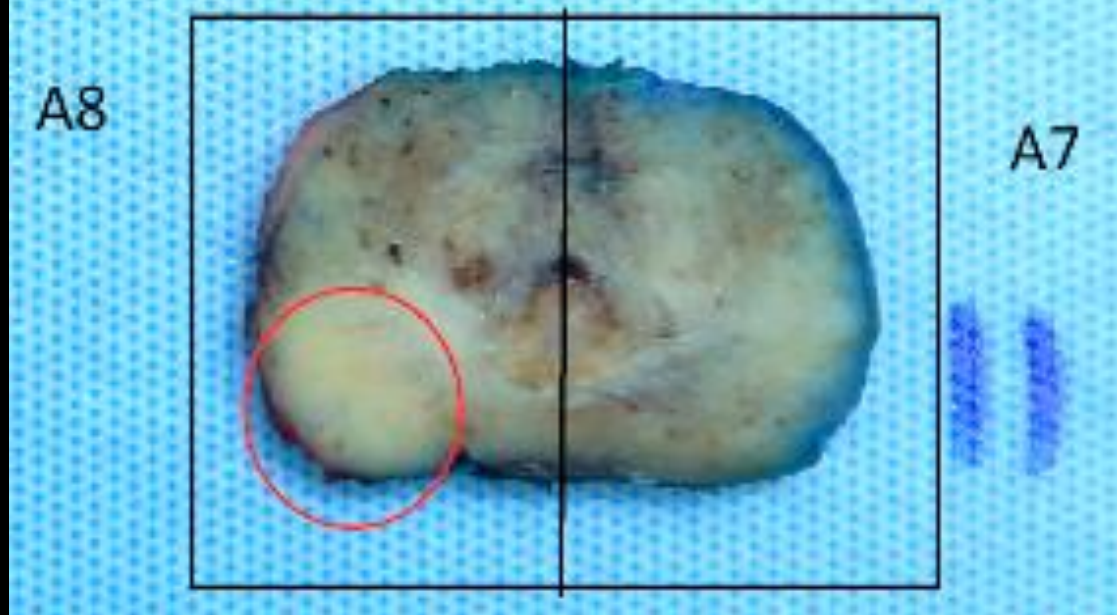
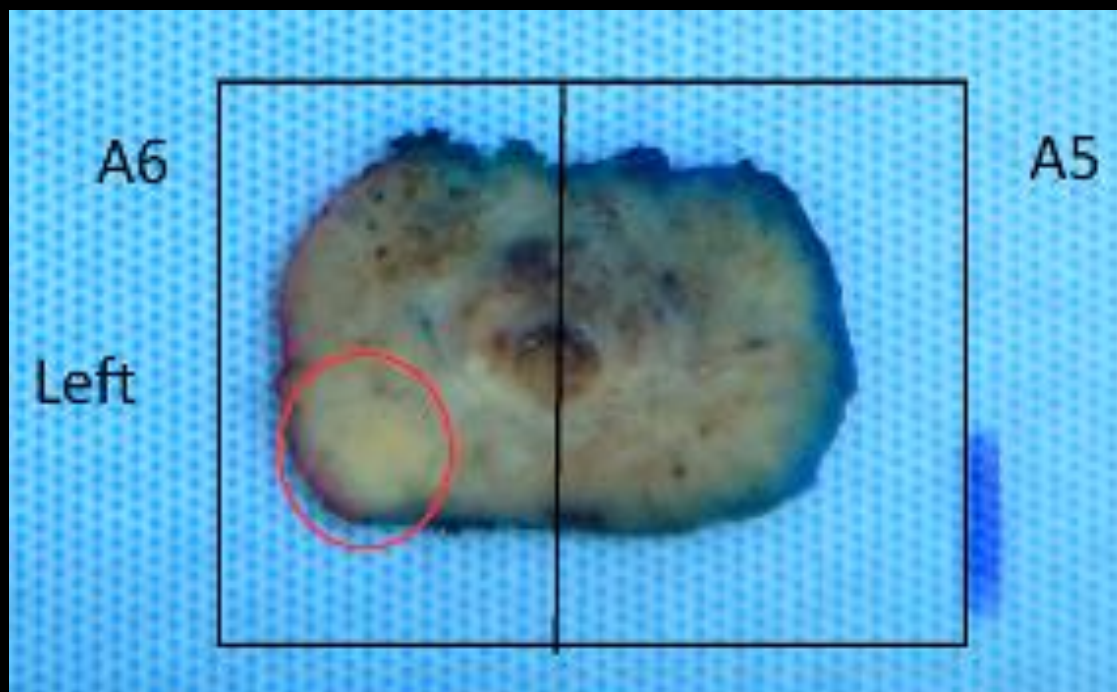
- Separate from the body of the prostate
- Sagittal slices produce tissue with uniform thickness
- Submit perpendicularly

RP Sampling Strategies

Method	GS >6	(+) margins	EPE	Mean slides
Total	100%	100%	100%	34
Alt P	83%	71%	62%	15
Alt P + A	94%	86%	75%	19
Alt P +/-A	89%	71%	69%	17
All P	92%	86%	84%	23
All P + B/L mid A (if large A tumor then rest of A)	98%	100%	96%	27
All P (if large then rest of ipsilat A)	94%	86%	91%	26

Sehdev et al. Human Pathology 32: 494. 2001



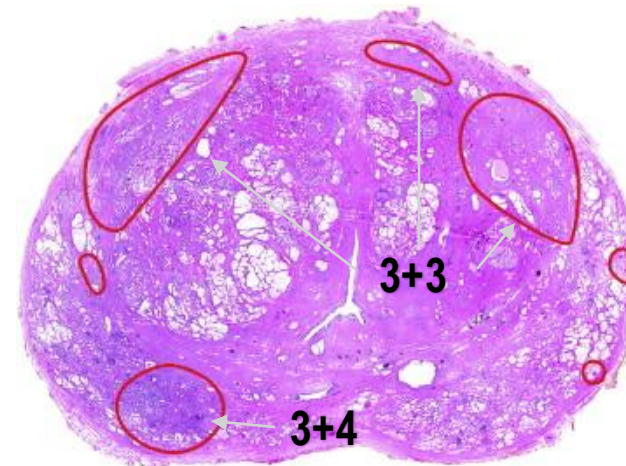
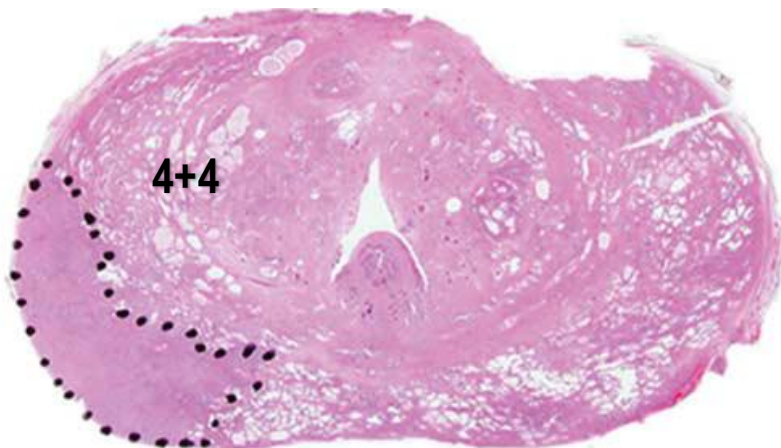


GROSSING: SUMMARY

- Great variability: no one “right” way
- Correlate with biopsy, radiology if possible
 - Was it focal or diffuse?
 - Was it anterior vs posterior?
 - PZ or TZ?
 - Was it treated?

RADICAL PROSTATECTOMY REPORTING

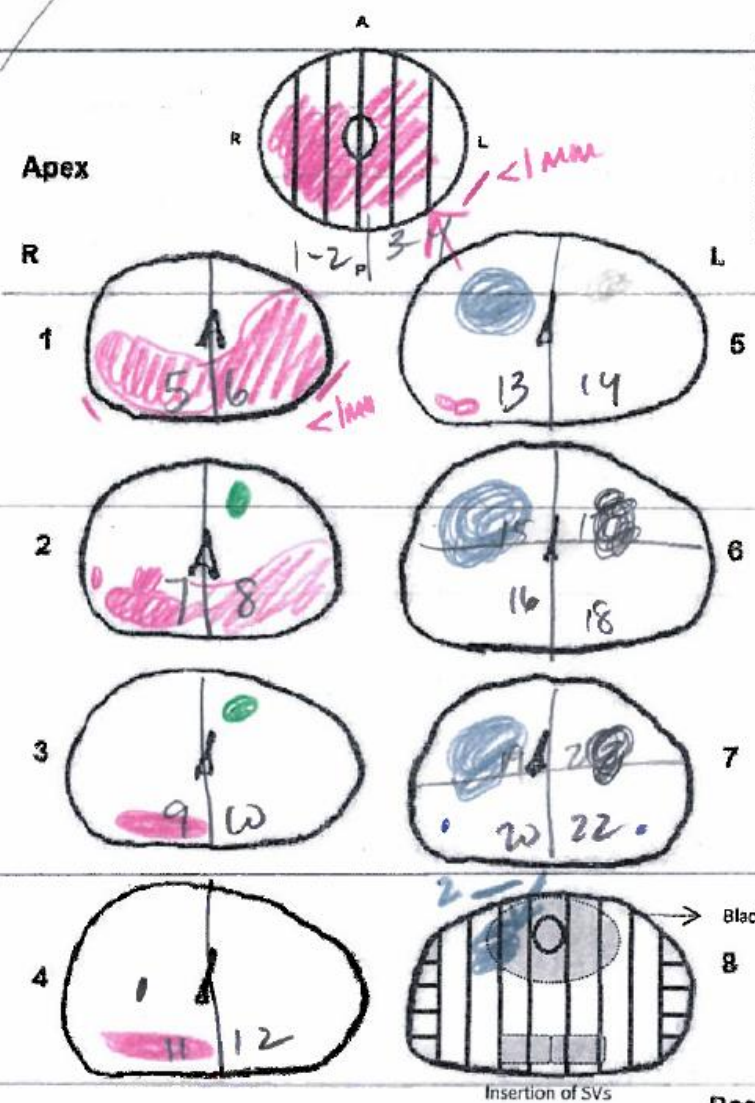
- Identify the index or “dominant” tumor
 - Largest tumor
 - Tumor with highest grade
 - Stage-determining tumor
- 1/3 cases do not conform to these parameters



Pre-op tx: none AD/Hormonal
 CTX/Hormonal Radiation
 HIFU Other

Biopsy: 3+3, 3+4
 MR: LPM @ A
 Gross Findings: Post @ A

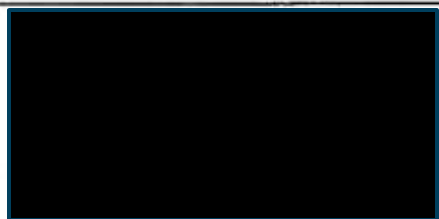
A4 - missing ink
 6 " 0
 7



Ink Code
 Green-anterior
 Blue-right
 Red-left
 Black-posterior
 Alternate color (orange)-inadvertent incision, not true margin
 Weight: 9g

RPLND: N Y #+LN/total _____
 PPLN: N Y #+LN/total _____
 MOR (mm): _____
 MOR (loc): _____
 EPE (mm): _____
 EPE (loc): _____
 SVI: R IP EP
 L IP EP

Cancer #	Location	Ductal	GS	%	Cribriform/IDS	Dimen. (cm)	Stage
1	R → L lat / PL / P PL @ A M	-	3+4	5	-1-	2.8 x 1.3	PT3
2	RT → RBW	-	3+4	5	-1-	1.2 x 0.8	PT3a
3	LT →	-	3+3		-1-	0.6 x 0.5	PT2



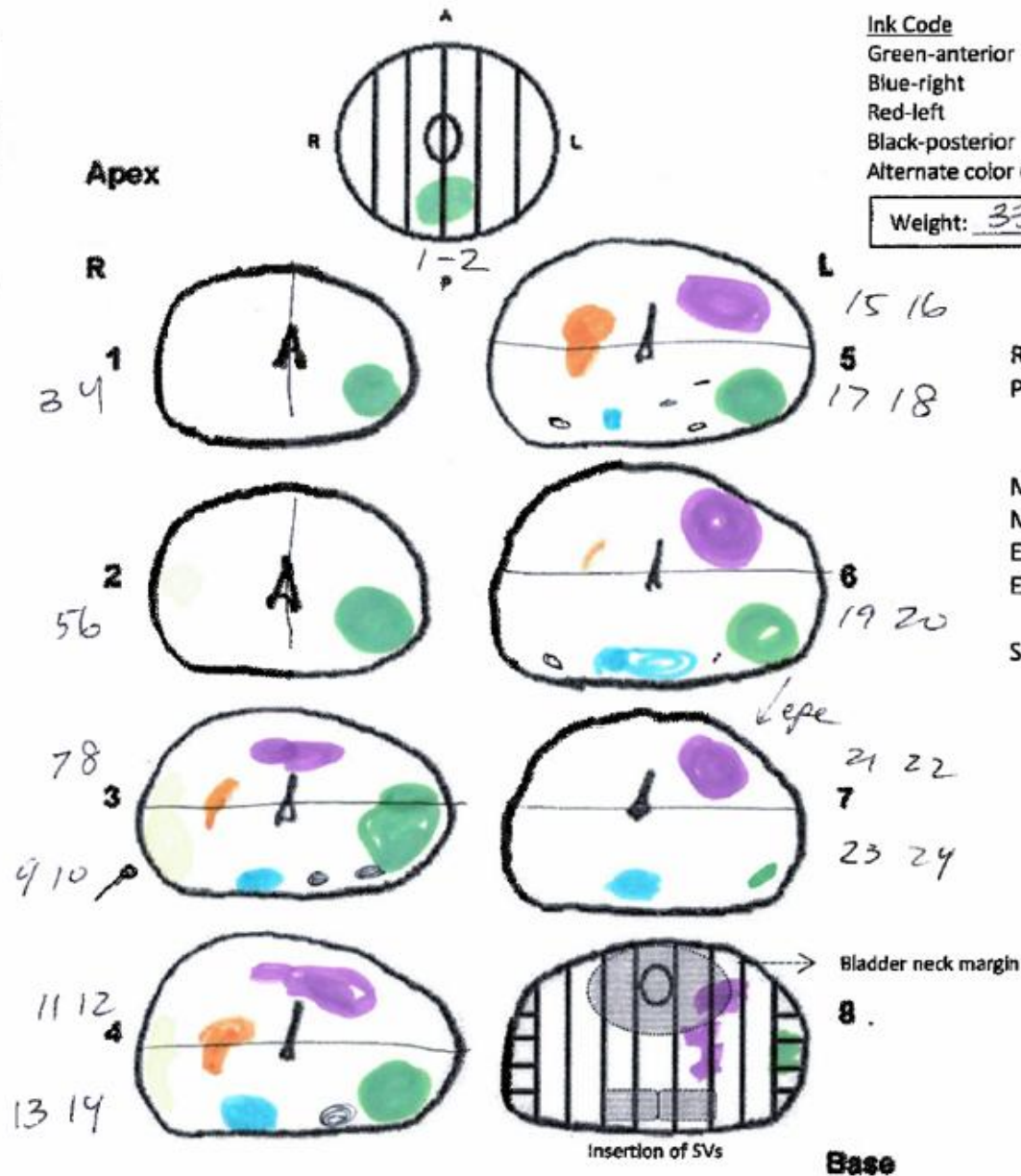
Pre-op tx: none AD/Hormonal
CTX/Hormonal Radiation
HIFU Other

Biopsy: 3+4 BIL

MR: LPLPZ (A+M)

Gross Findings: _____

LPL (1-4)
LAM (4-6)



Ink Code
Green-anterior
Blue-right
Red-left
Black-posterior
Alternate color (orange)-inadvertent incision, not true margin

Weight: 33g

RPLND: N Y #+LN/total _____

PPLN: N Y #+LN/total _____

MOR (mm): _____

MOR (loc): _____

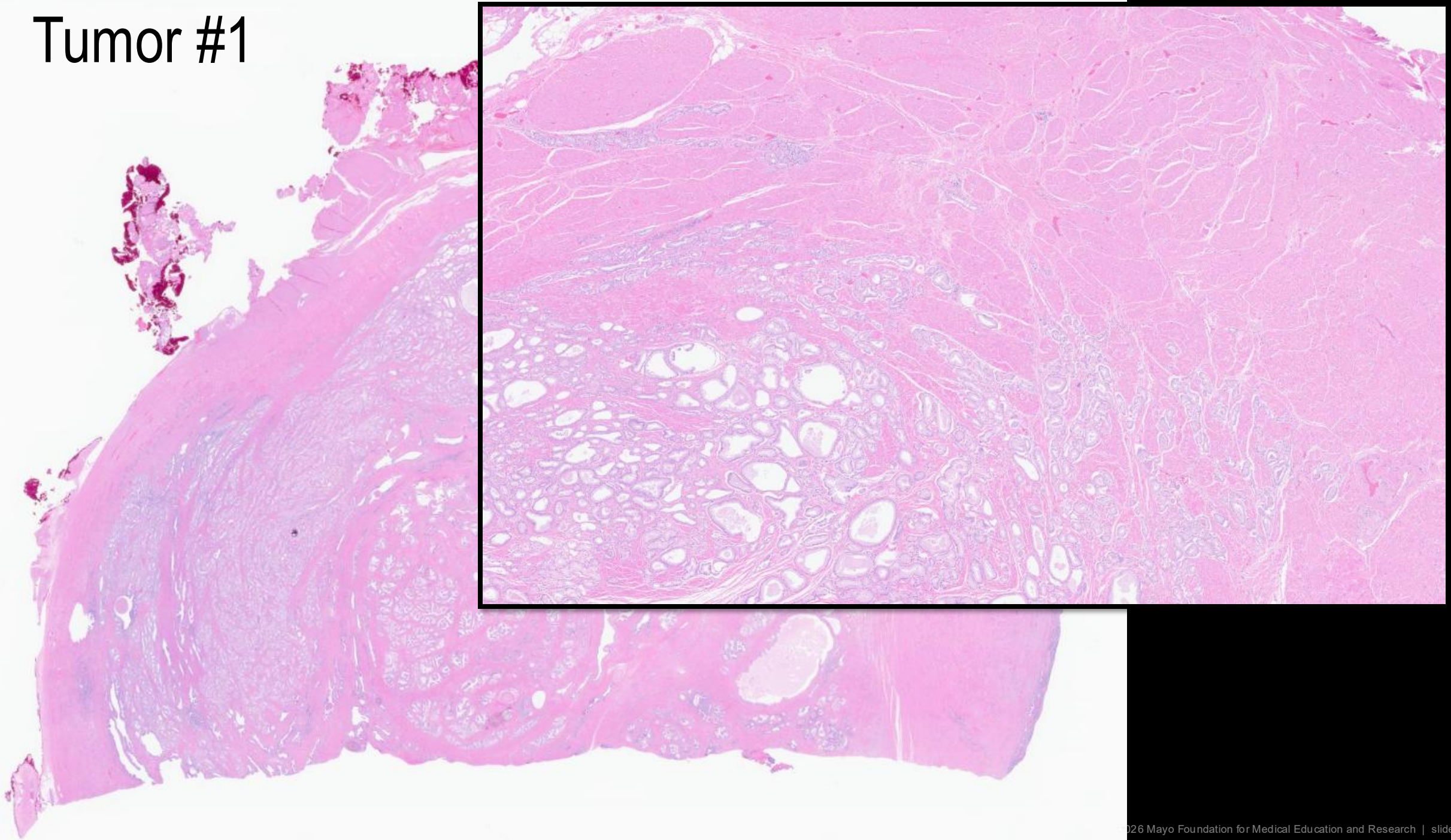
EPE (mm): _____

EPE (loc): _____

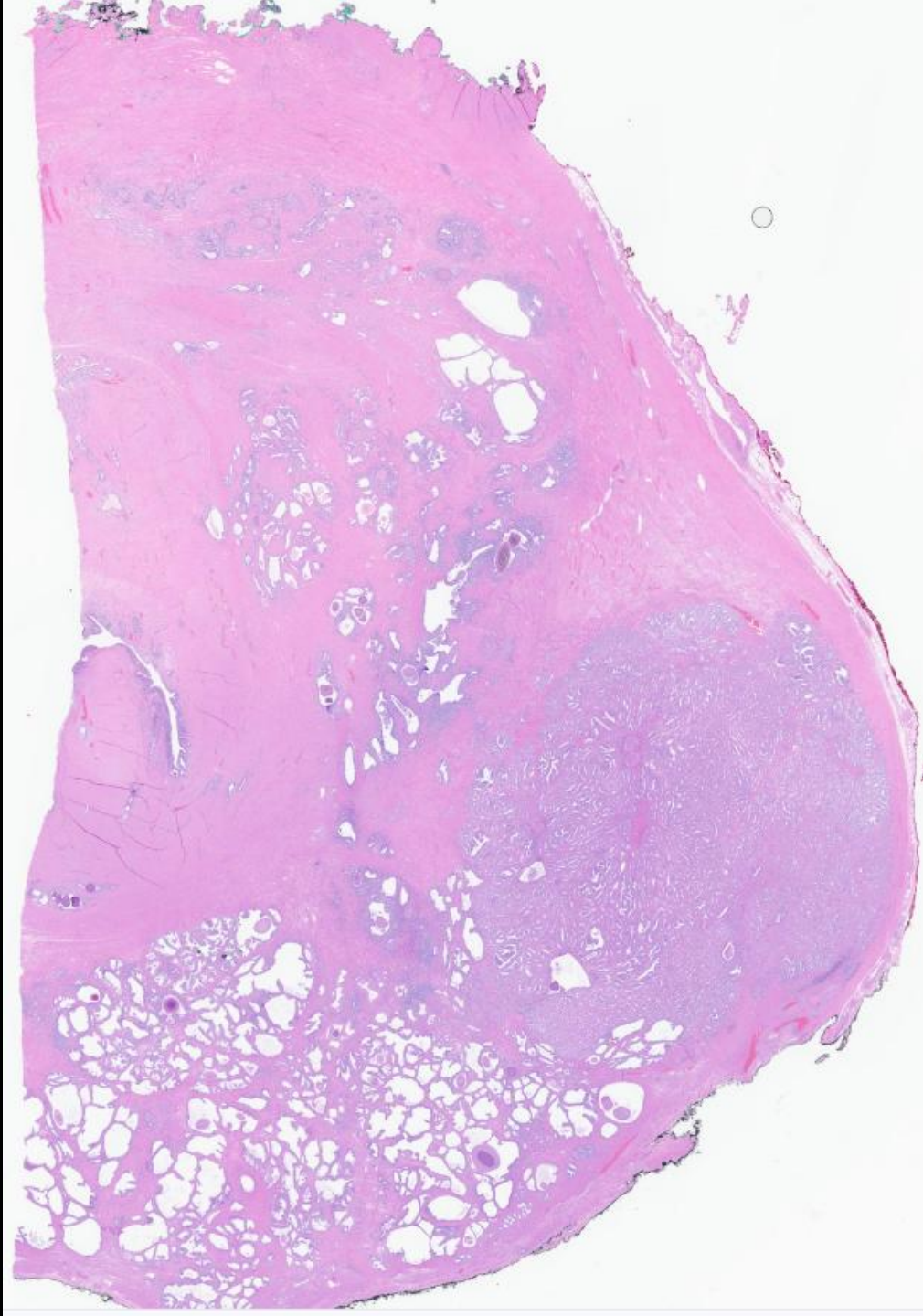
SVI: R IP EP
L IP EP

Cancer #	Location	GS	Cribriform/IDS	Dimen. (cm)	Stage
1	LTZ → LAPZ, LLPZ	3+4	—/—	1.6 x 1.0 cm	PT3a
2	LPLPZ	3+4	—/—	1.3 x 1.2	PT2

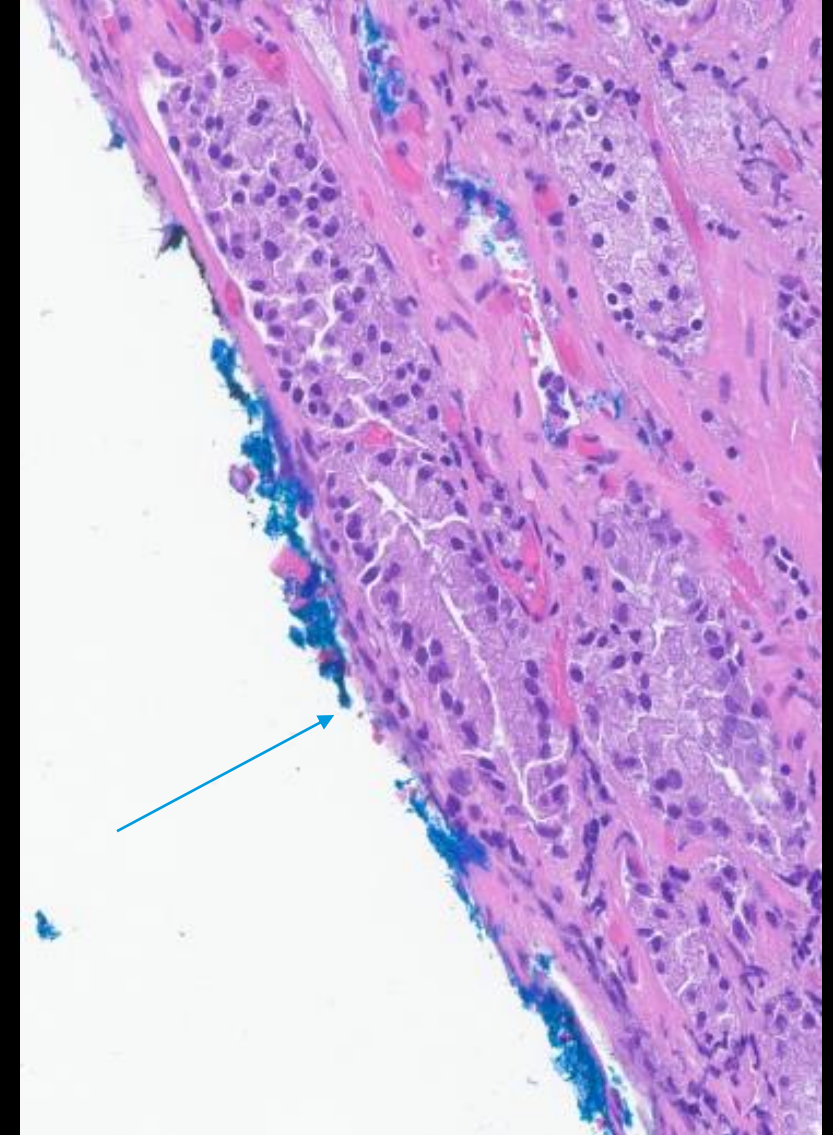
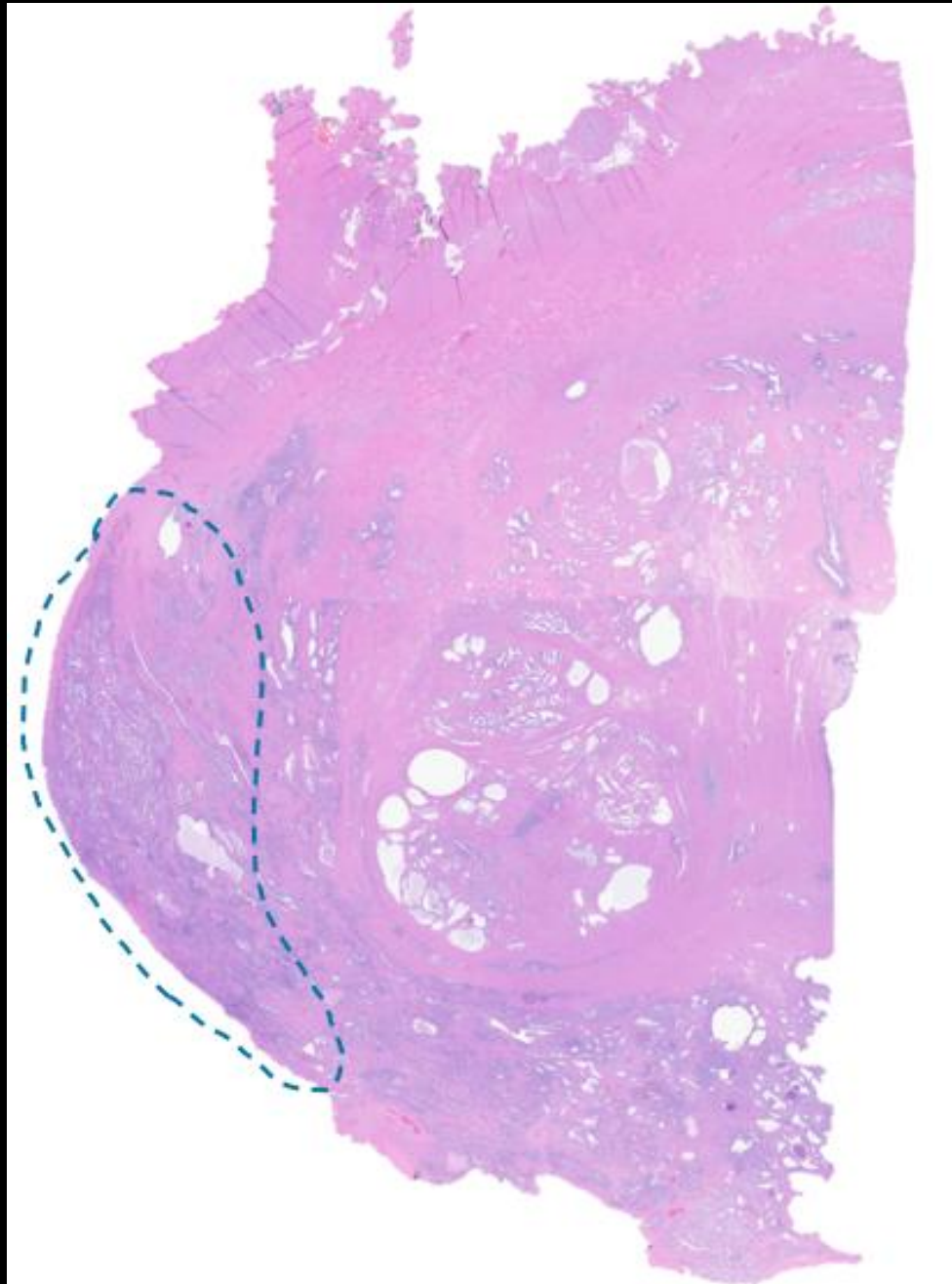
Tumor #1



Tumor #2



Tumor #3



FINAL DIAGNOSIS

A. Prostate and seminal vesicles:

Prostatic adenocarcinoma, Gleason score 7 (3+4), with focal invasion into left bladder neck; bladder neck margin, free of tumor. (See synoptic report)
Separate focus of a cauterized tumor focally extending to the peripheral margin.
Seminal vesicles, negative for tumor.

B. Bilateral pelvic lymph nodes:

Eight lymph nodes, negative for tumor (0/8).

SYNOPTIC REPORT: Prostate

Procedure: Radical prostatectomy and bilateral pelvic lymphadenectomy

Prostate Size: 33 g

Histologic Type: acinar (95%), ductal (5%)

Histologic Grade

Tumor #1 (stage determining): Gleason score 7 (3+4), grade group 2, Percent pattern 4: 5-10%.

Tumor #2 (second largest): Gleason score 7 (3+4) with 5% ductal features, grade group 2, Percent pattern 4: 5-10%.

Tumor #3 (cauterized tumor extends to the margin): Gleason score 7 (3+4), grade group 2, Percent pattern 4: 5%.

Intraductal Carcinoma (IDC): not identified

Cribriform Glands: not identified

Treatment Effect: not applicable

Tumor Quantitation: The tumor is bilateral and multifocal.

Tumor #1: Left transition zone with extension into the left anterior and left lateral peripheral zone, 1.6 x 1.0 cm.

Tumor #2: Left posterolateral peripheral zone, 1.3 x 1.2 cm.

Tumor #3: Right lateral peripheral zone, 0.7 x 0.4 cm.

Extraprostatic Extension: not identified

Urinary Bladder Neck Invasion: present, tumor #1, left side

Seminal Vesicle Invasion: not identified

Lymphovascular Invasion: not identified

Margins: cauterized tumor #3 extends to the margin (0.2 cm) and is surrounded by a dense chronic inflammatory infiltrate

Regional Lymph Nodes Status: All Regional Lymph Nodes Negative for Tumor

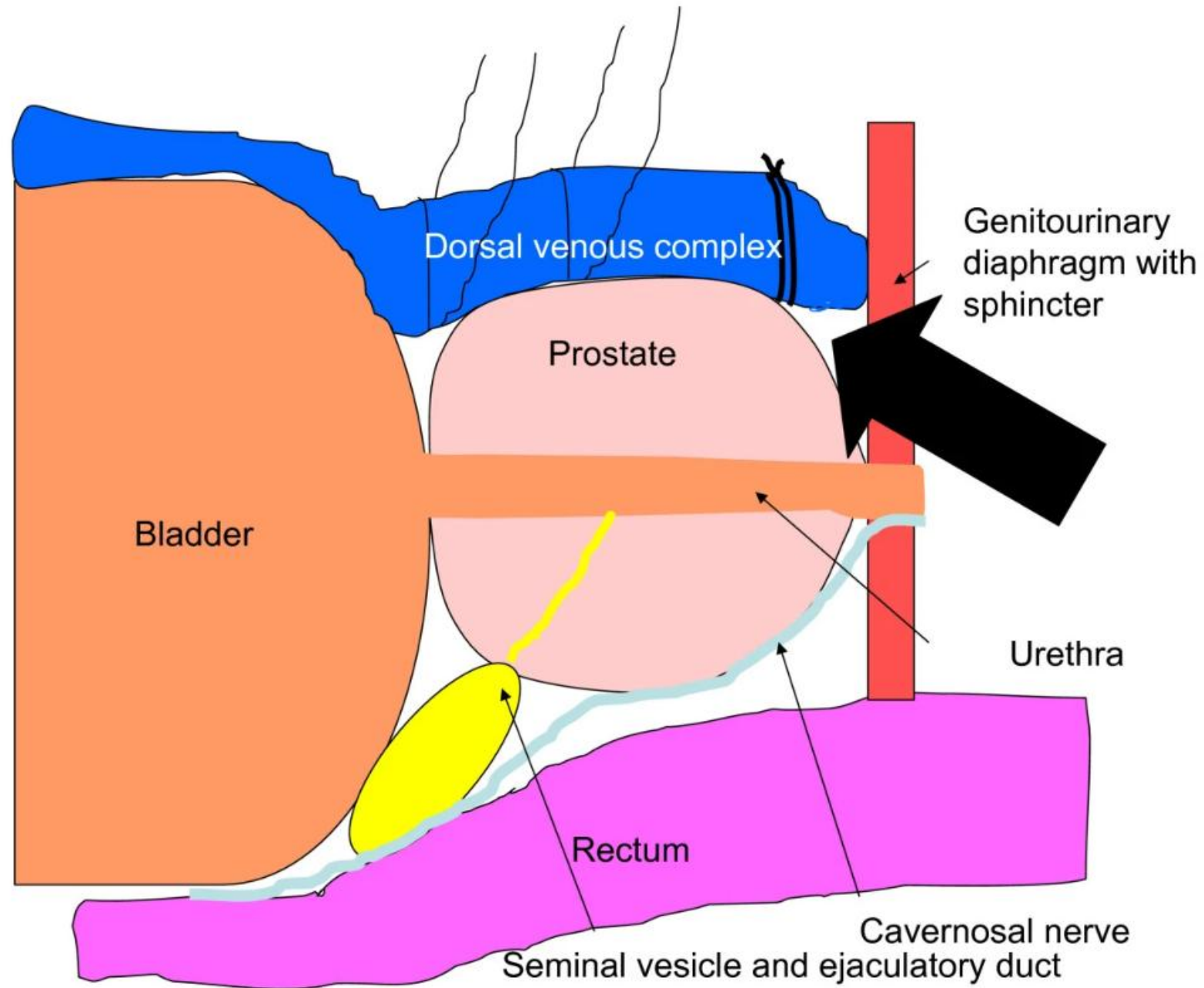
Number of Lymph Nodes Examined: 8

Additional Pathologic Findings: none

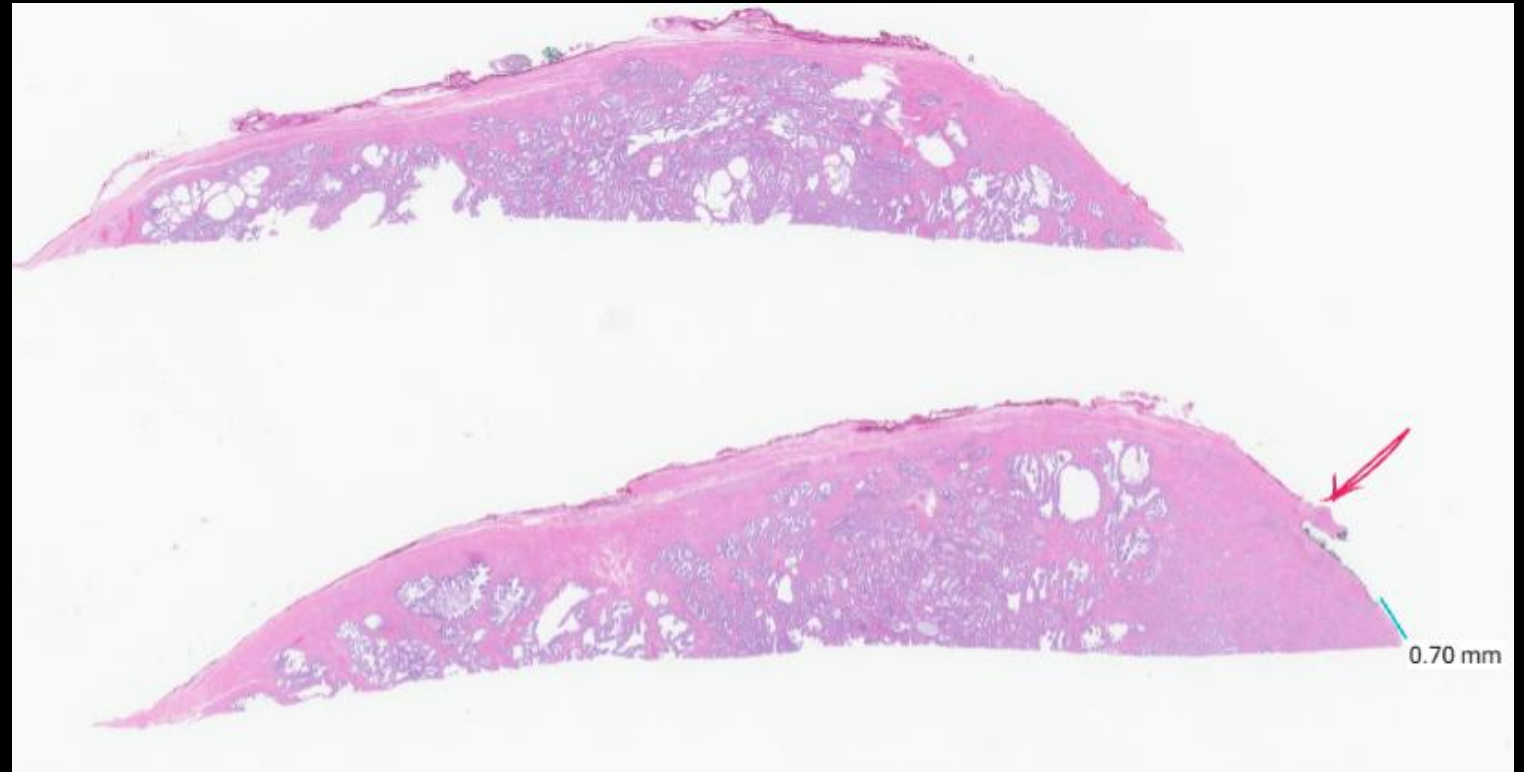
Block containing malignancy suitable for further testing: A10, A22

Pathologic Staging (AJCC, 8th edition): pT3a, pN0

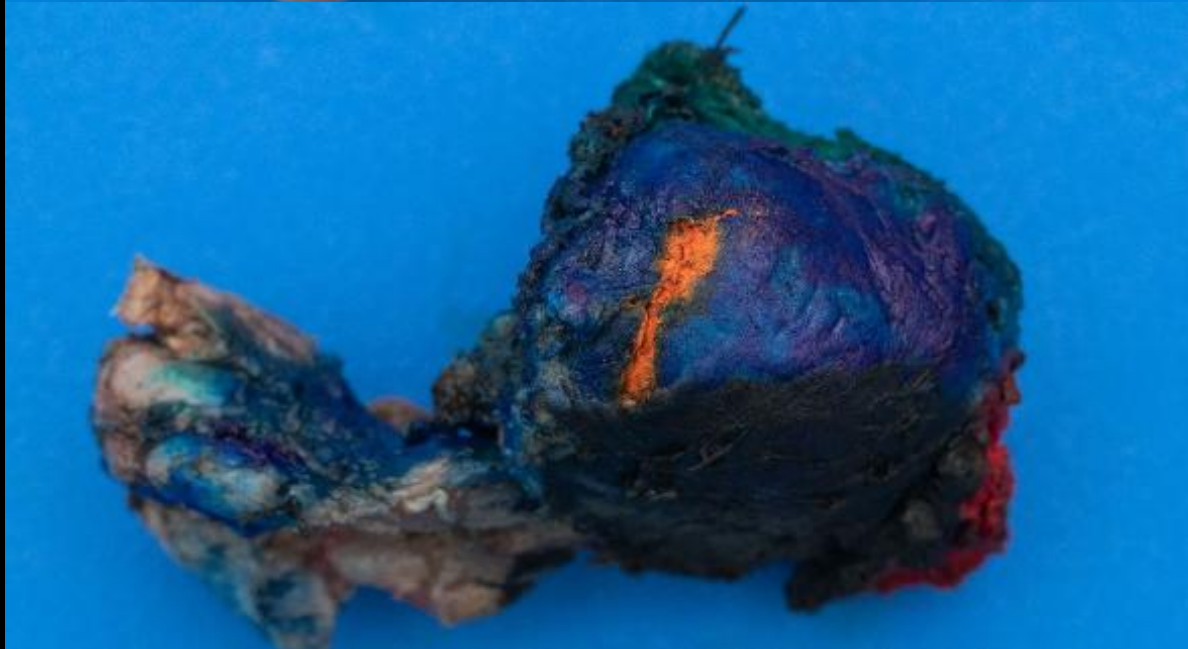
MARGINS



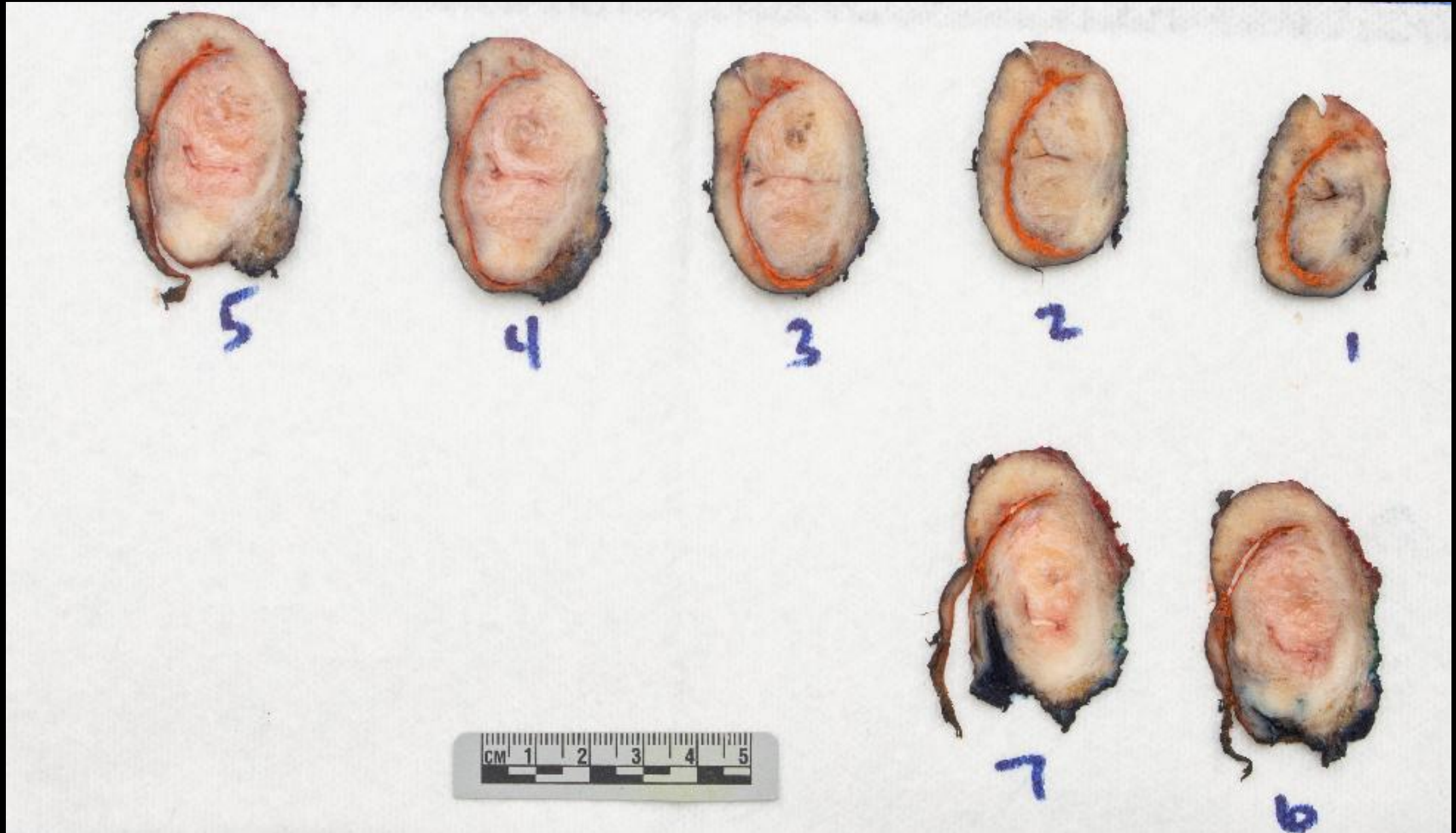
APEX MARGINS

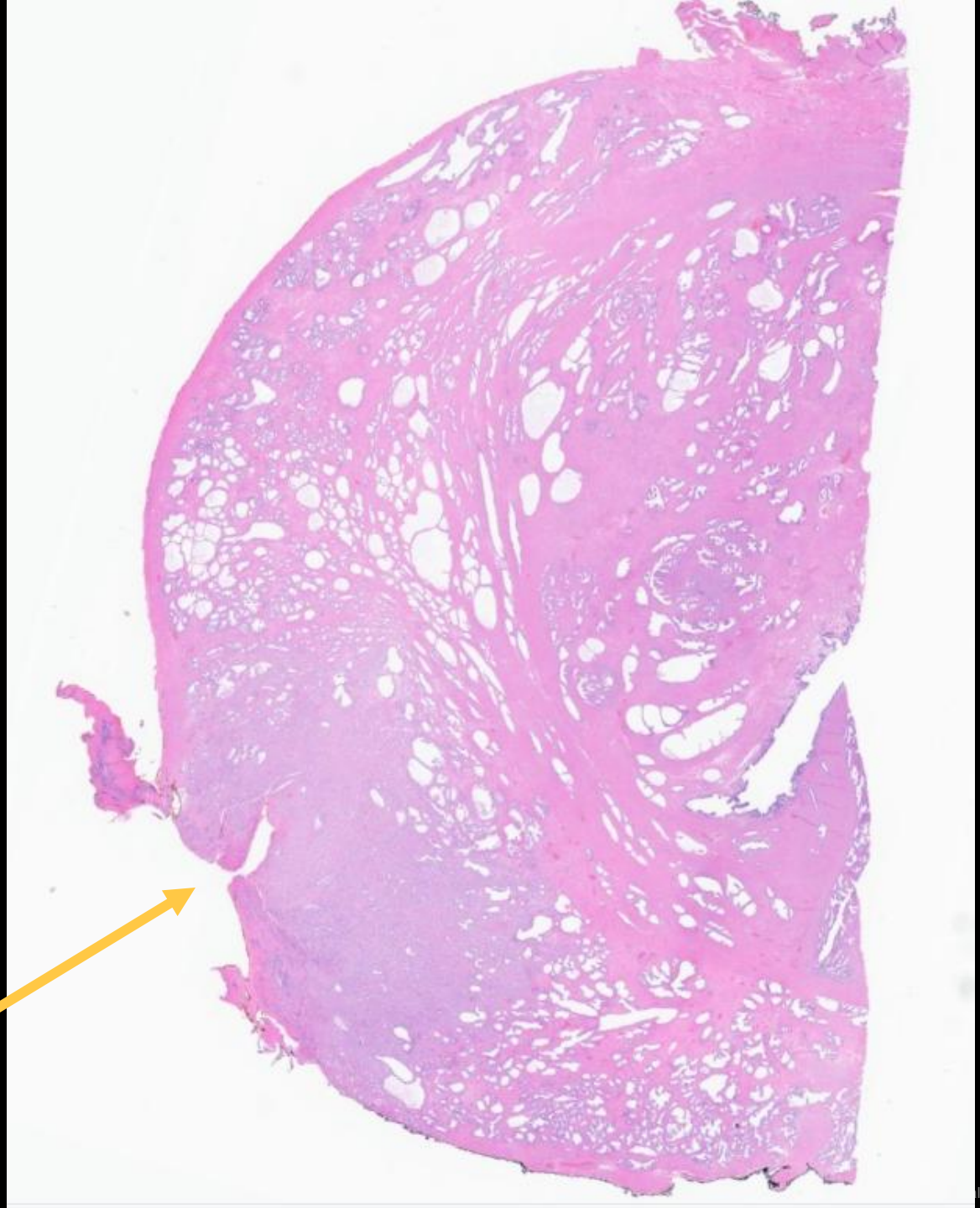
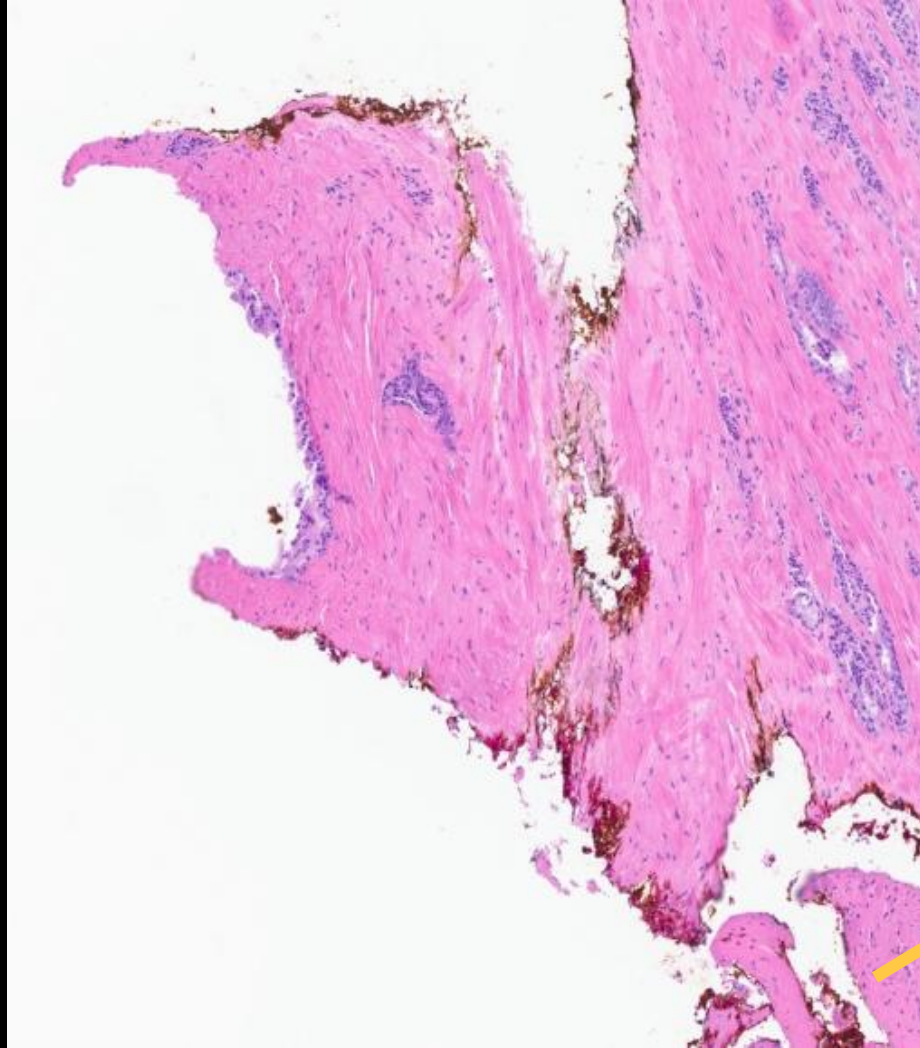


CAPSULAR INCISION

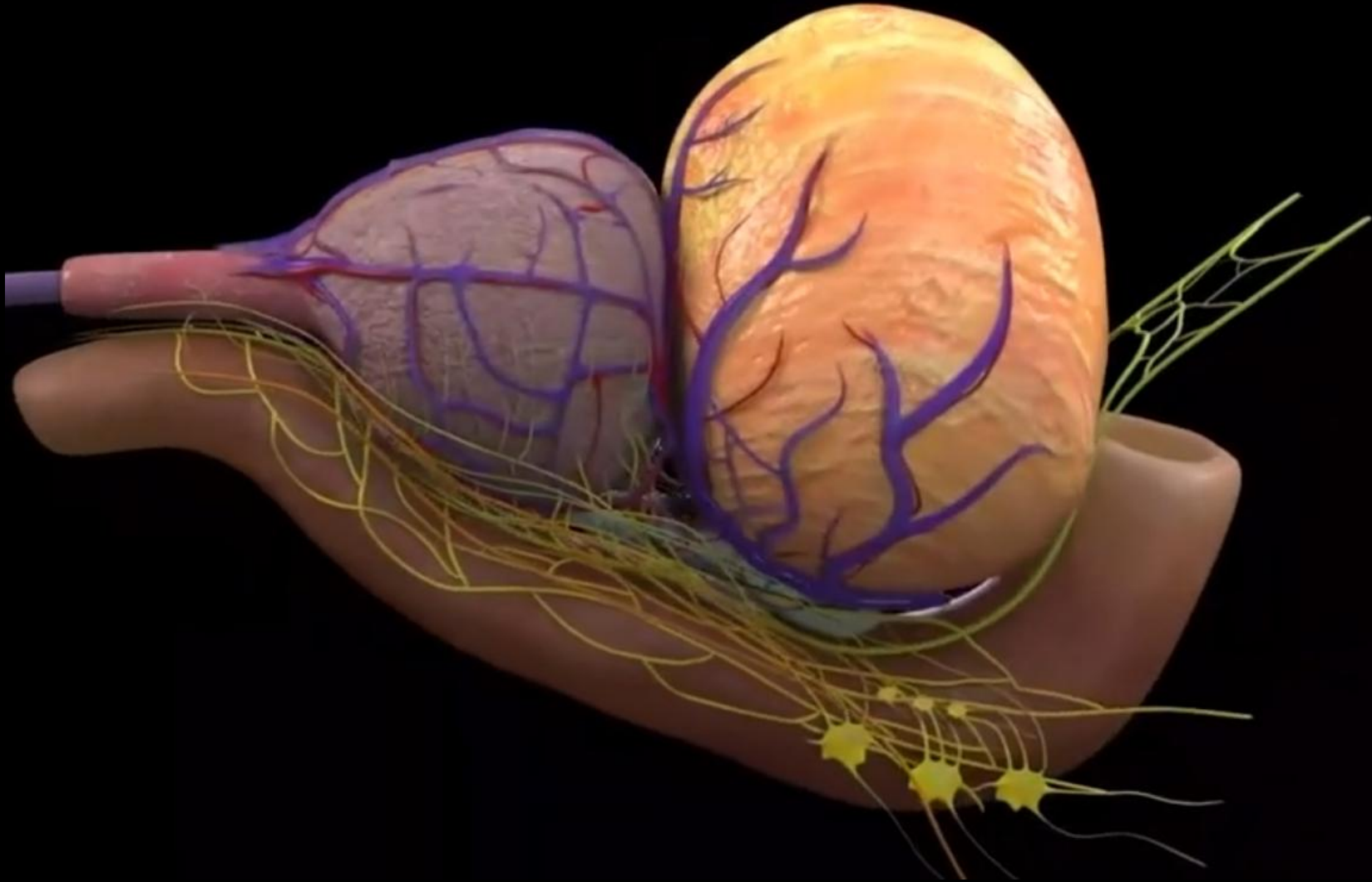


CAPSULAR INCISION





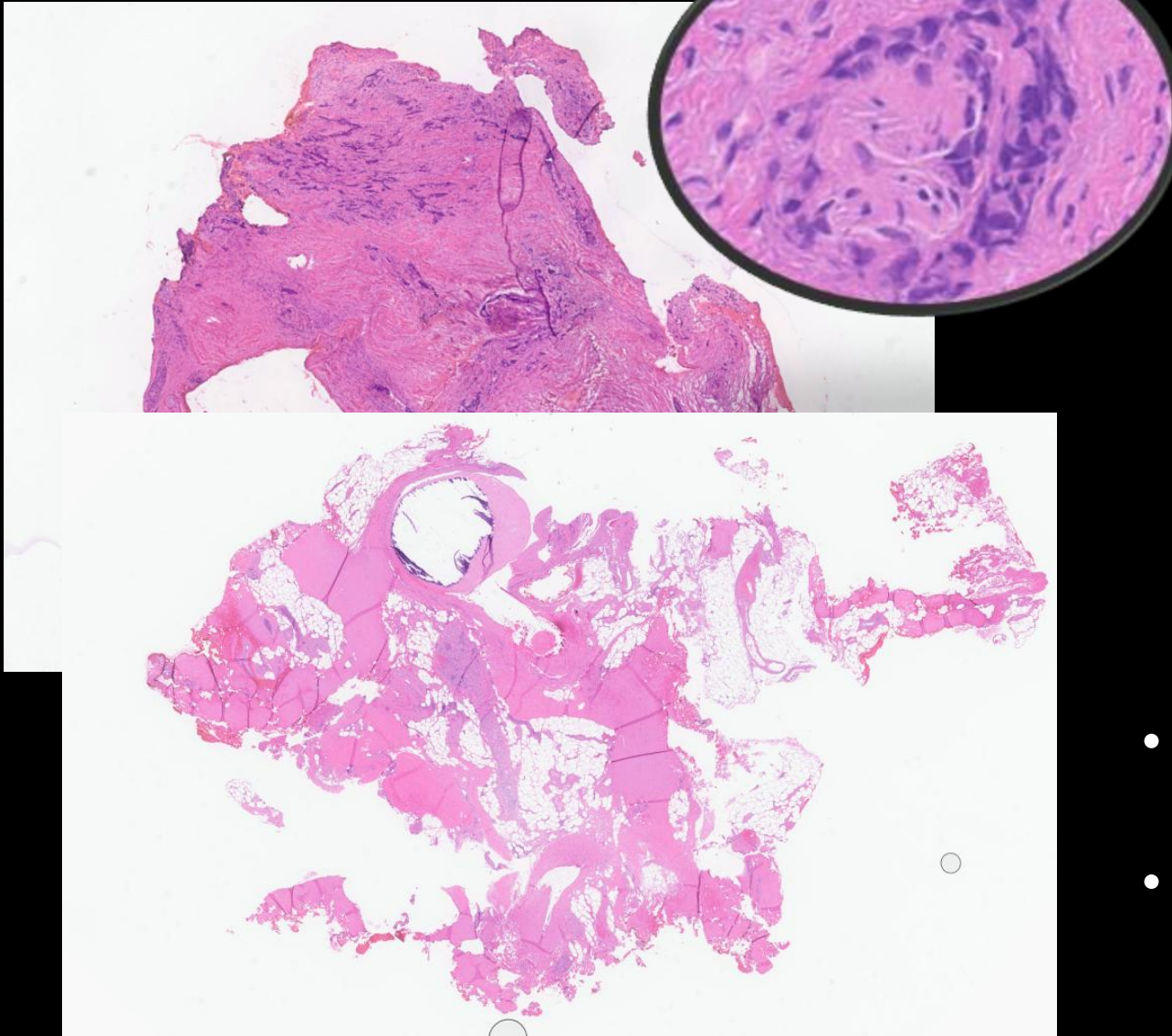
NEUROVASCULAR BUNDLE



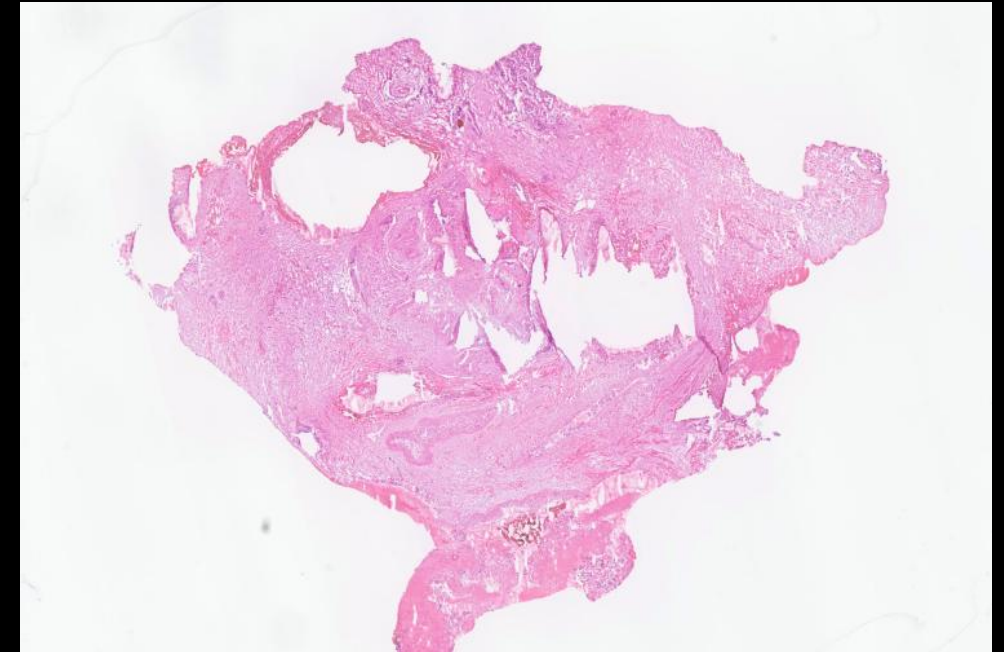
FROZEN SECTIONS

- Done for orientation or margin evaluation
- Margins cannot be felt laparoscopically
- Usually submitted as separate specimens
- Freeze everything

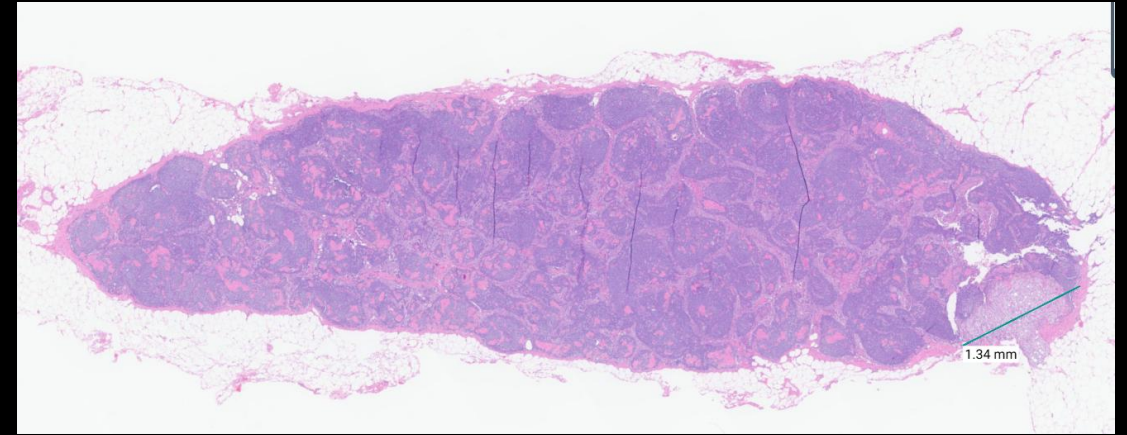
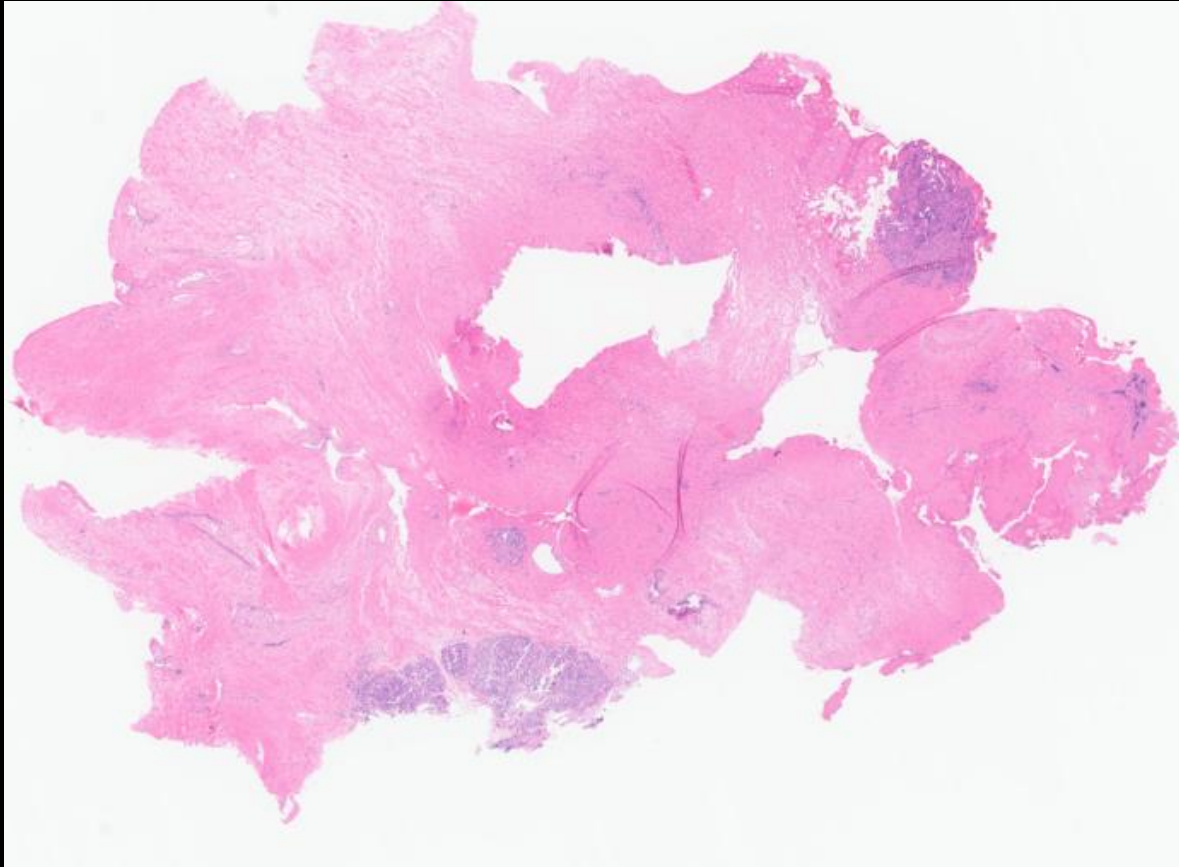
Right NVB



Left NVB

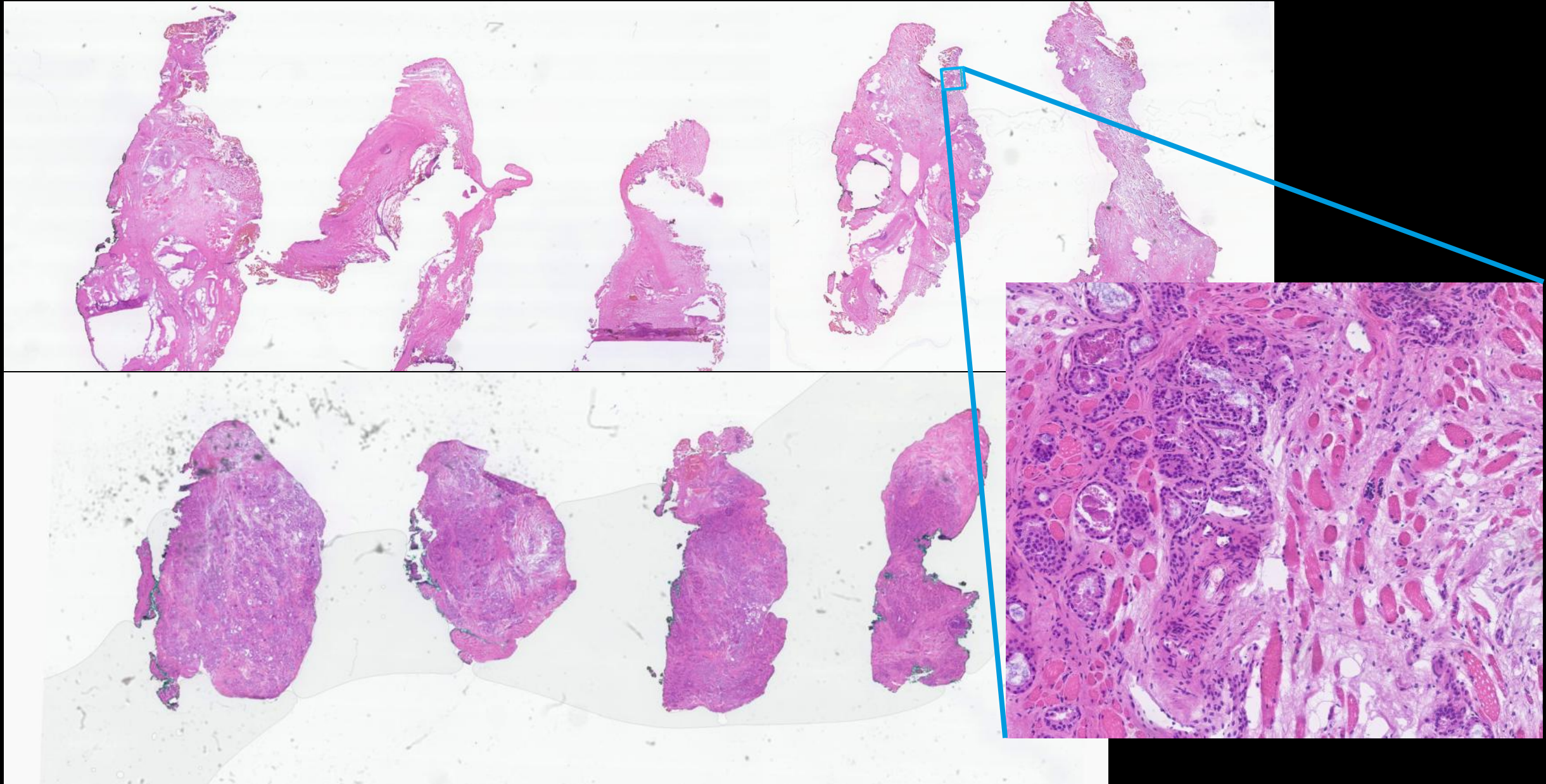


- Posted as bilateral nerve-sparing RARP
- Converted to right modified nerve-sparing RARP

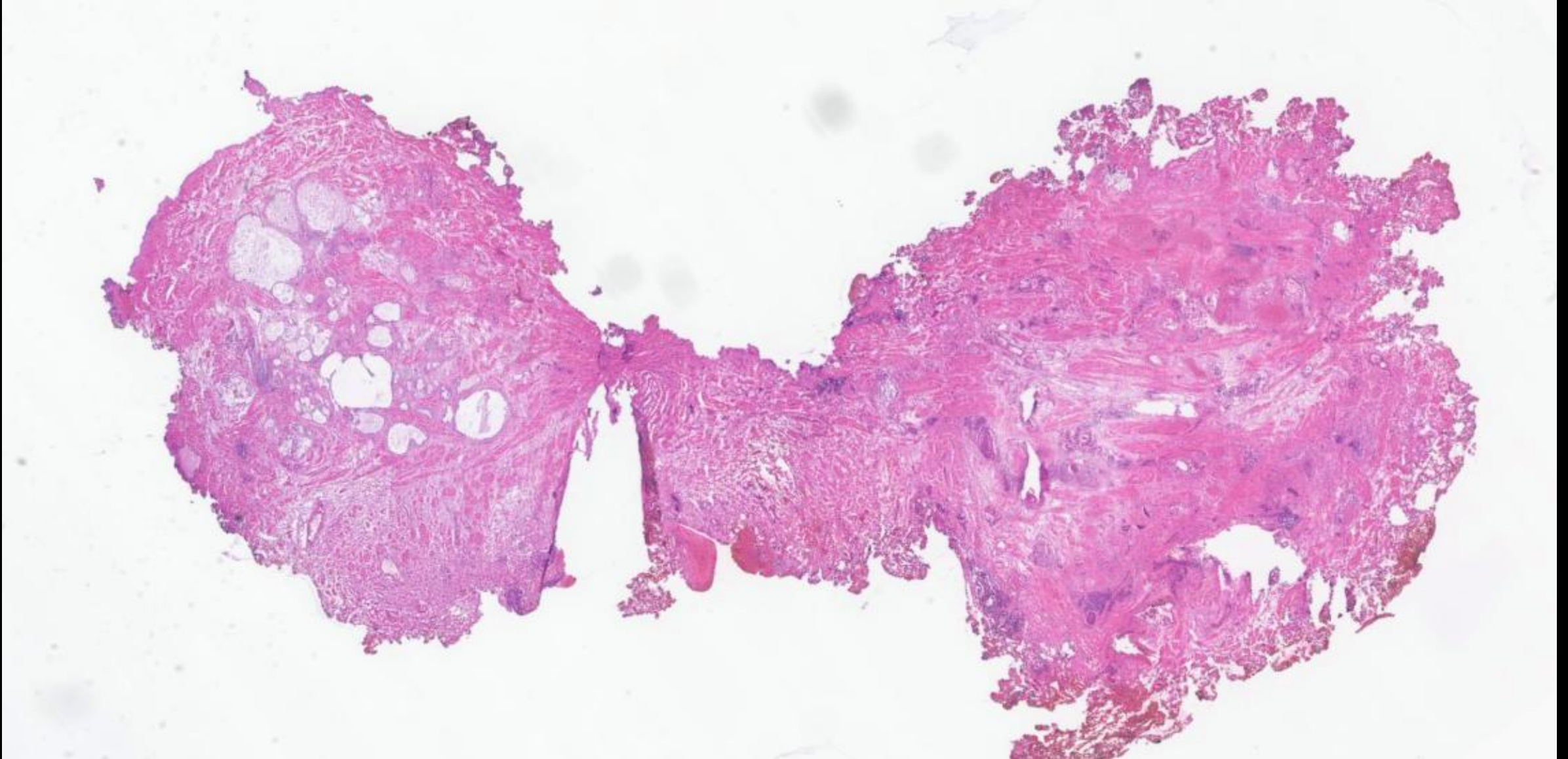


- 51 yo, high grade, high risk
- RARP + B/L PLND
 - Nerve-sparing on R
 - Non-nerve sparing on L
- Discussed real risk of impotence
- Intraop: Suspicious RNVB frozen x3
- LNVB + large portion of RNVB taken
- Gleason 8 (4+4) with bilateral EPE

48yo, anterior apex tumor. Anterior urethral margin for FS



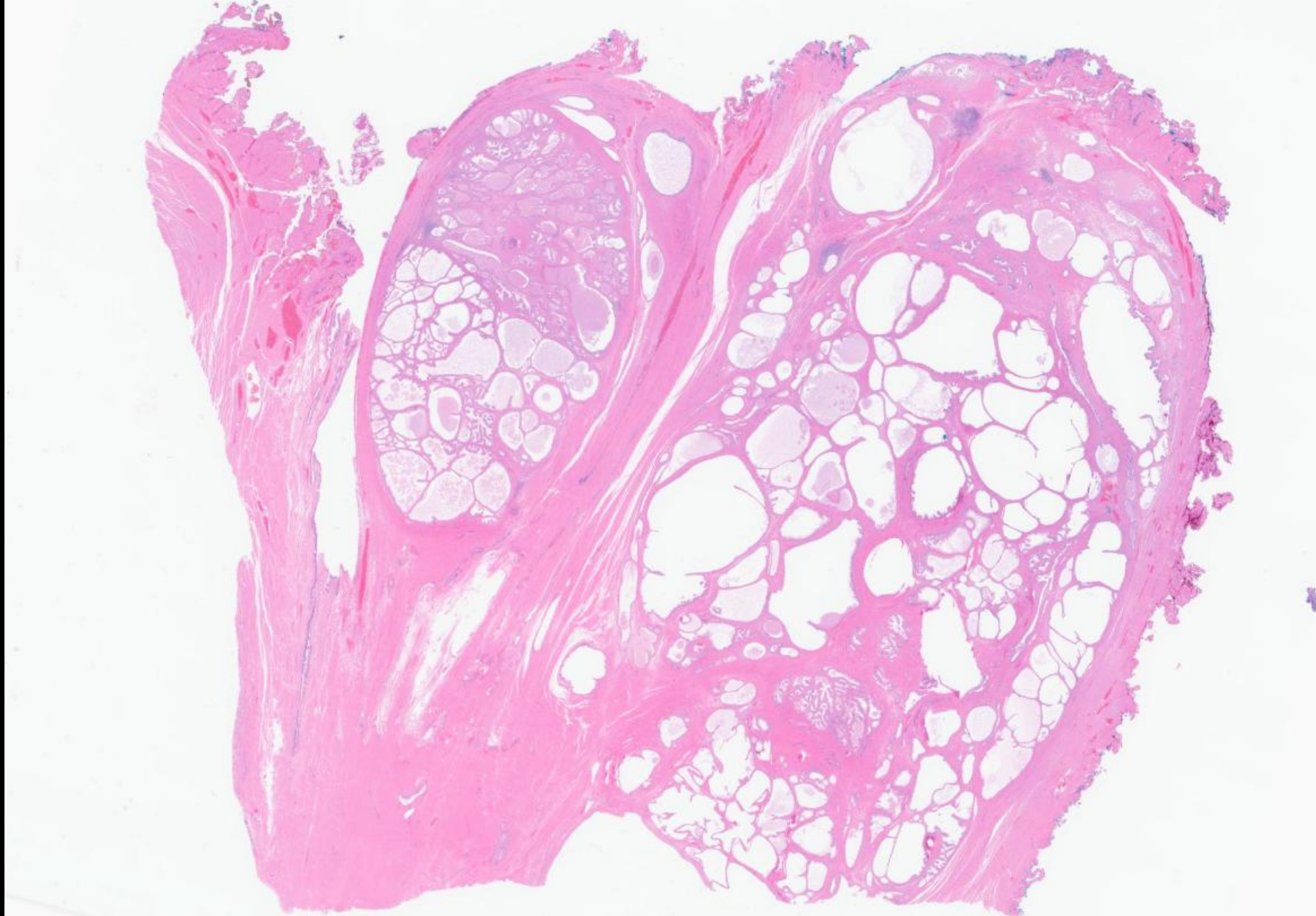
71yo, bladder neck margin for FS. Large median lobe encountered.





Median lobe

71yo, bladder neck margin for FS. Large median lobe encountered.



PELVIC LYMPH NODES

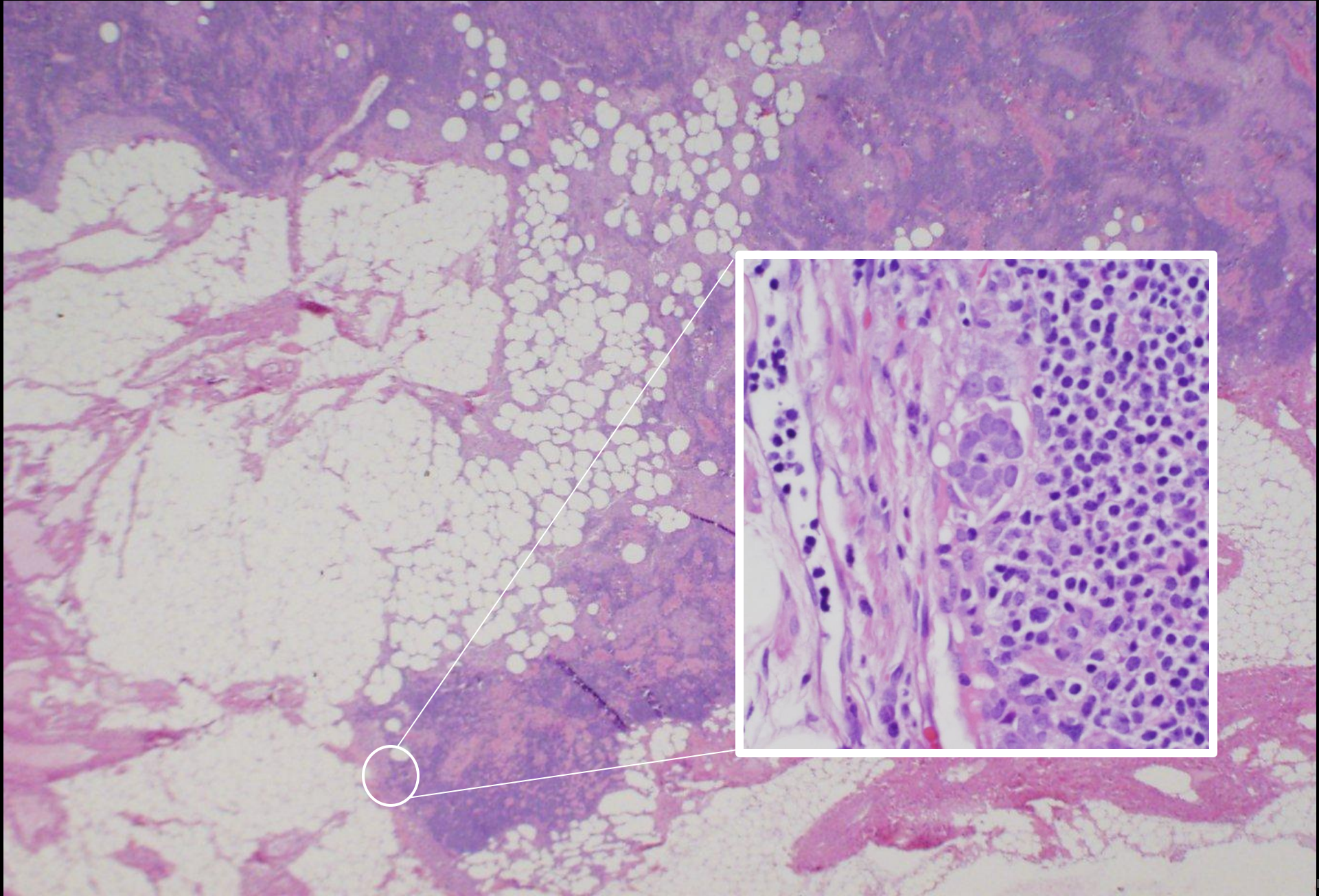
- Routine pelvic lymph node dissection is not necessary
- Frozen section of nodes also unnecessary
 - Not predictive of BCR
 - Probably no more predictive of biology than standard nomogram
- Freezing lymph nodes is technically challenging
 - Large, fatty, sclerotic, calcified
- May be appropriate in individual cases

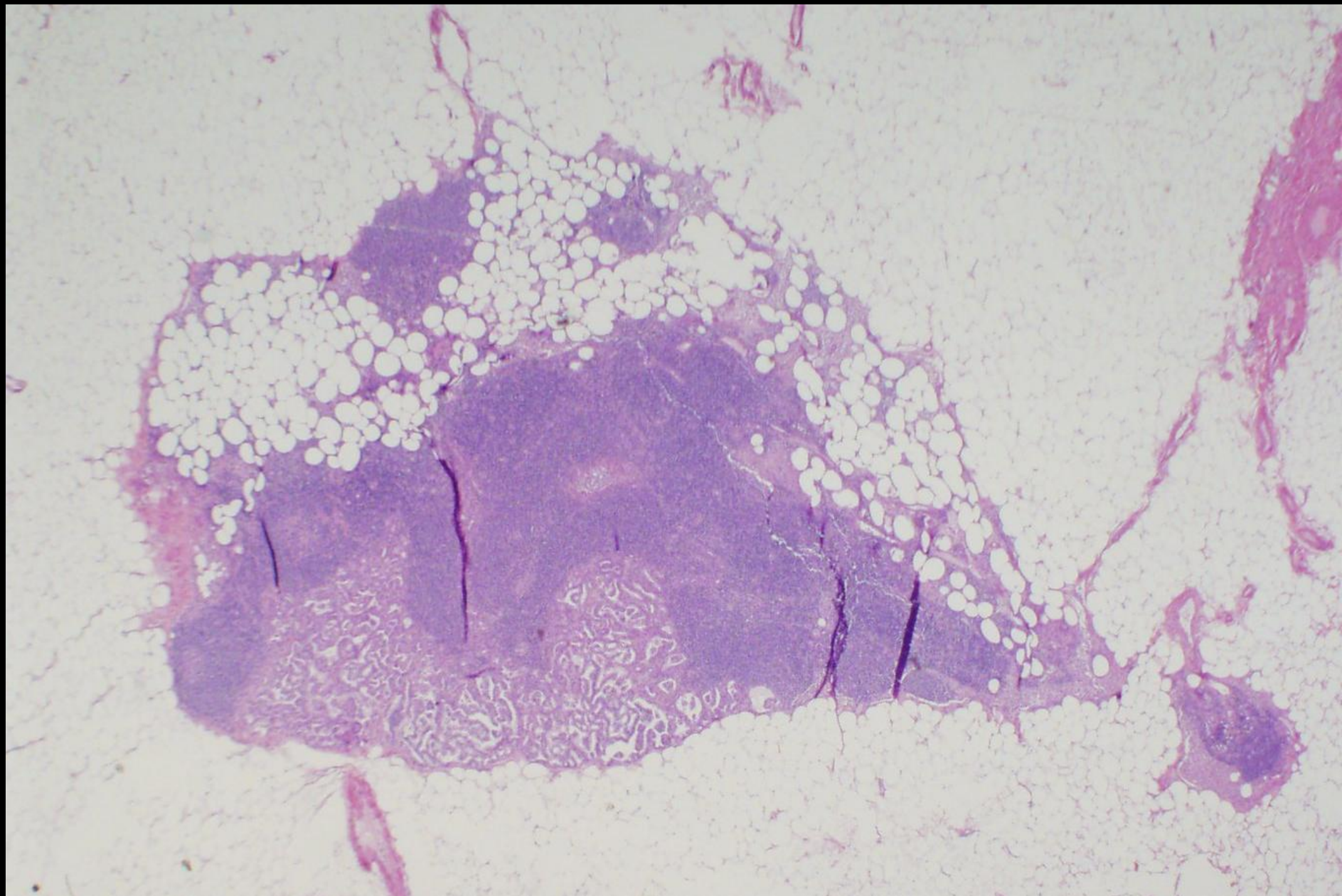
LYMPH NODE PITFALLS

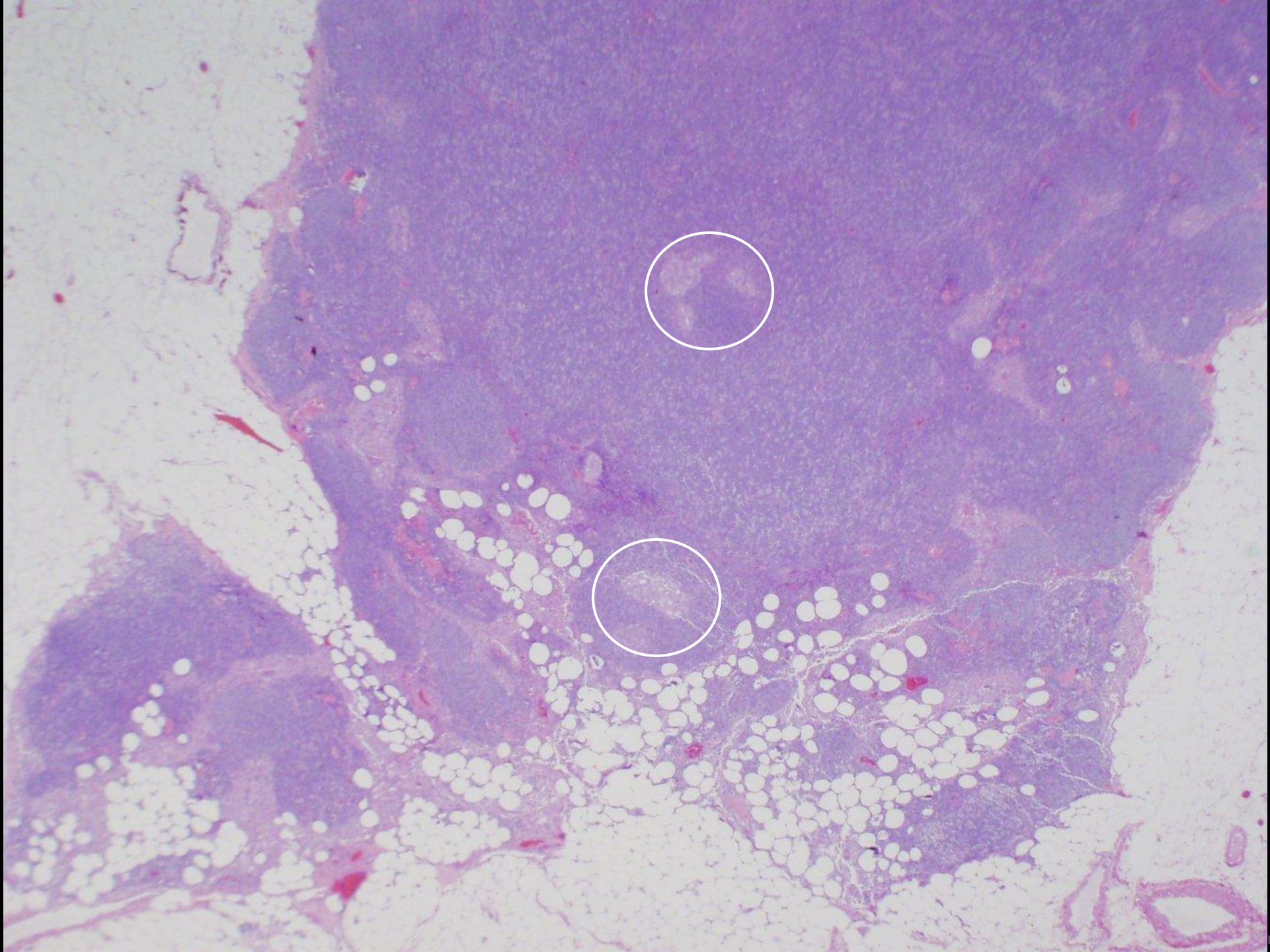


- Nodes are large and fatty
- Tiny tumor foci (rule vs exception)
- Can be involved by other pathologic processes
 - Sinus histiocytosis
 - Arthroplasty effect
 - Lymphoma
 - Sarcoidosis
 - BCG effect

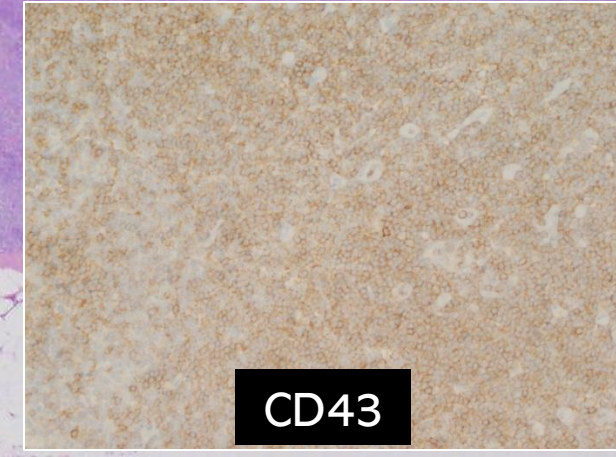
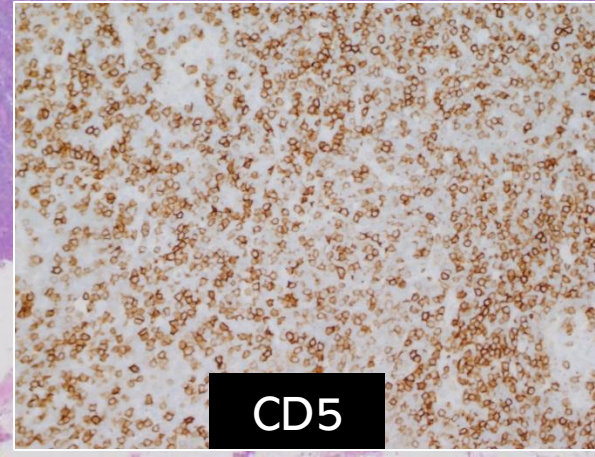
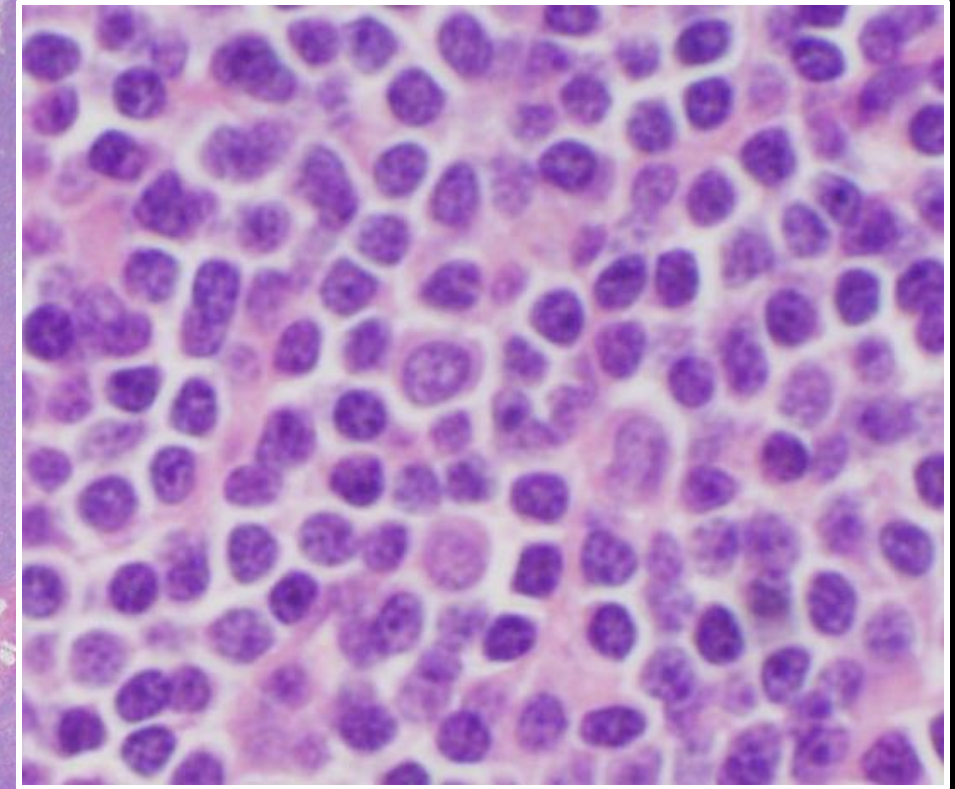
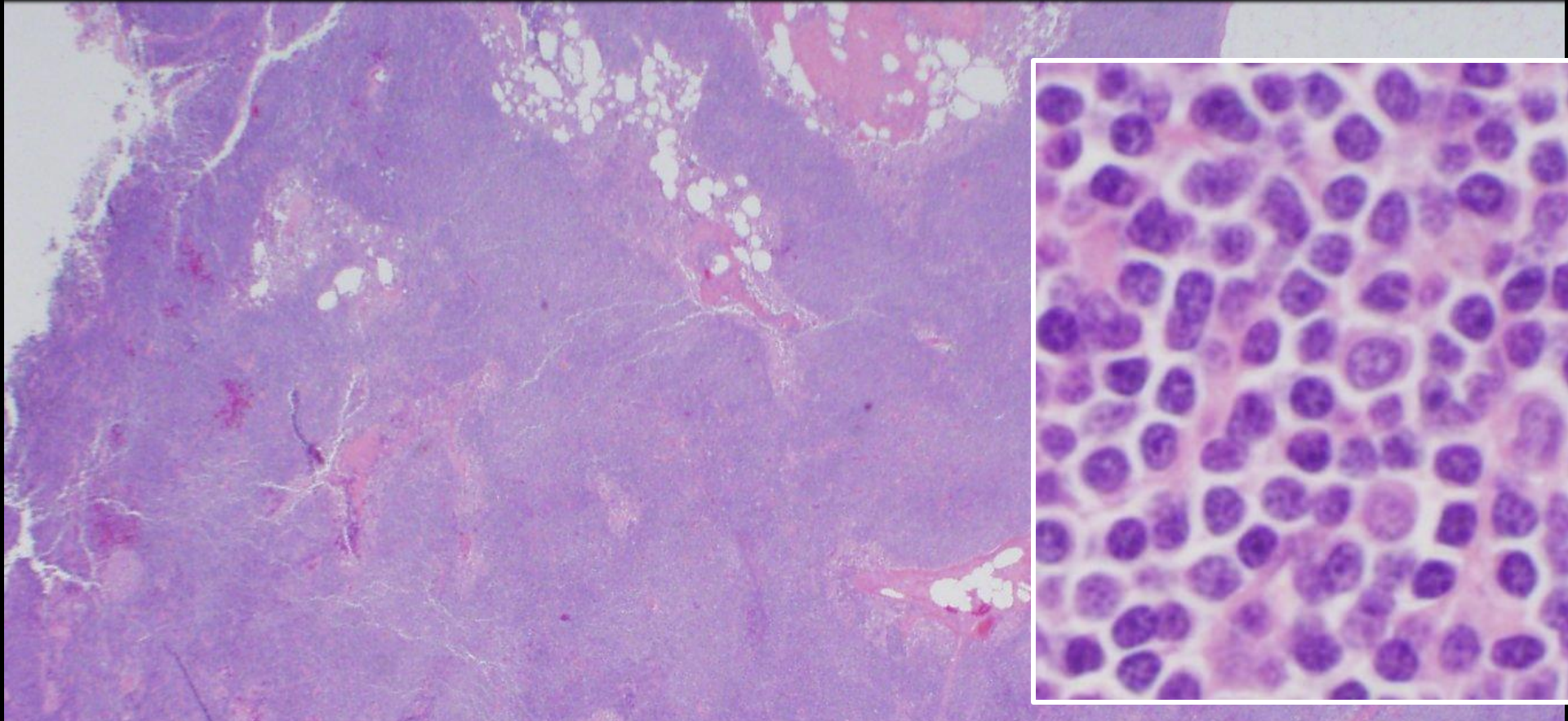
Typical metastatic prostate cancer



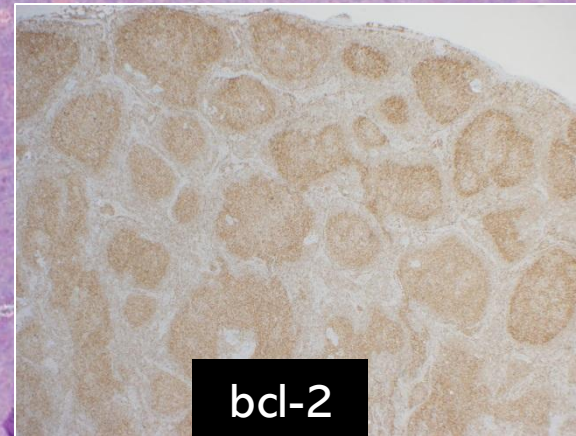
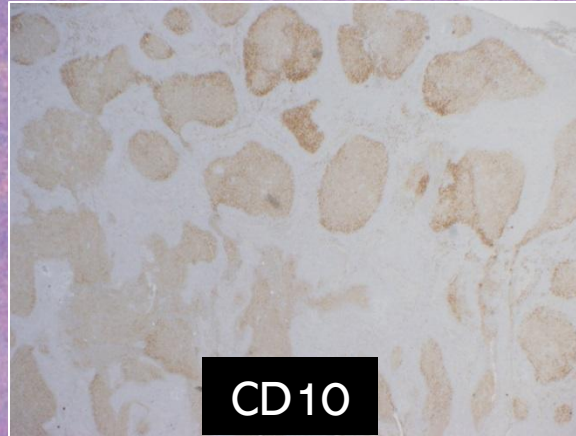
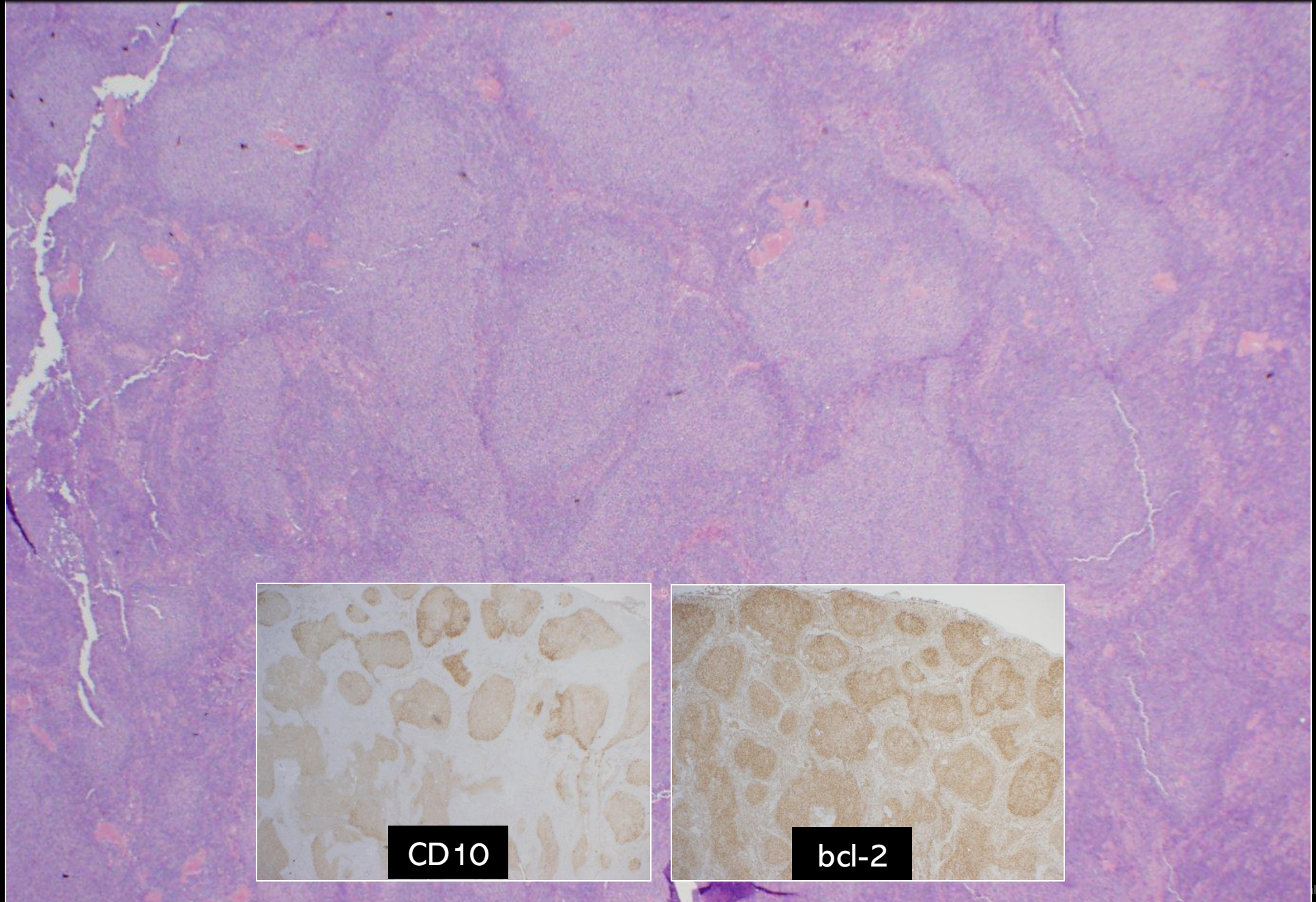




Chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL)

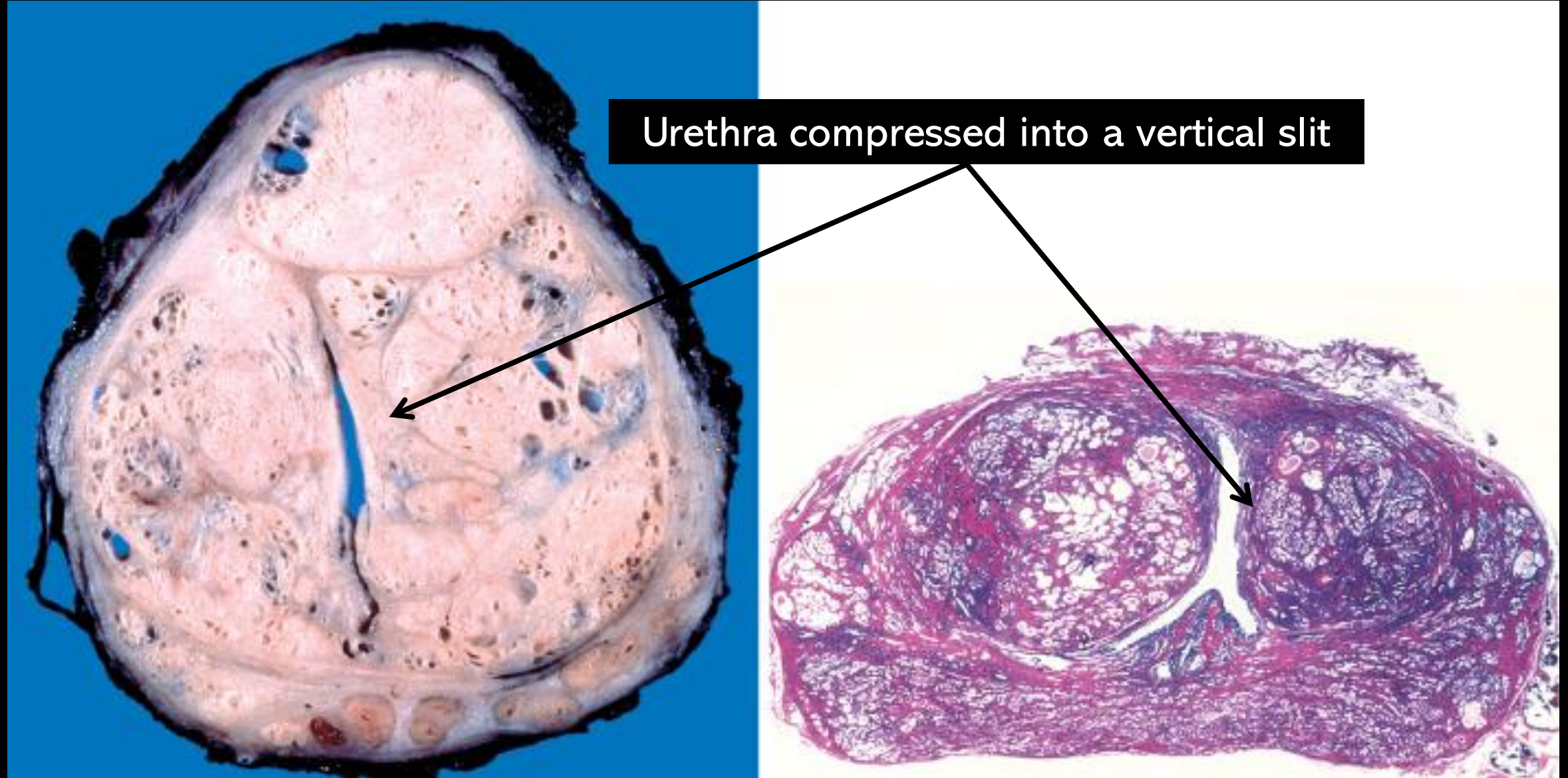


Follicular lymphoma

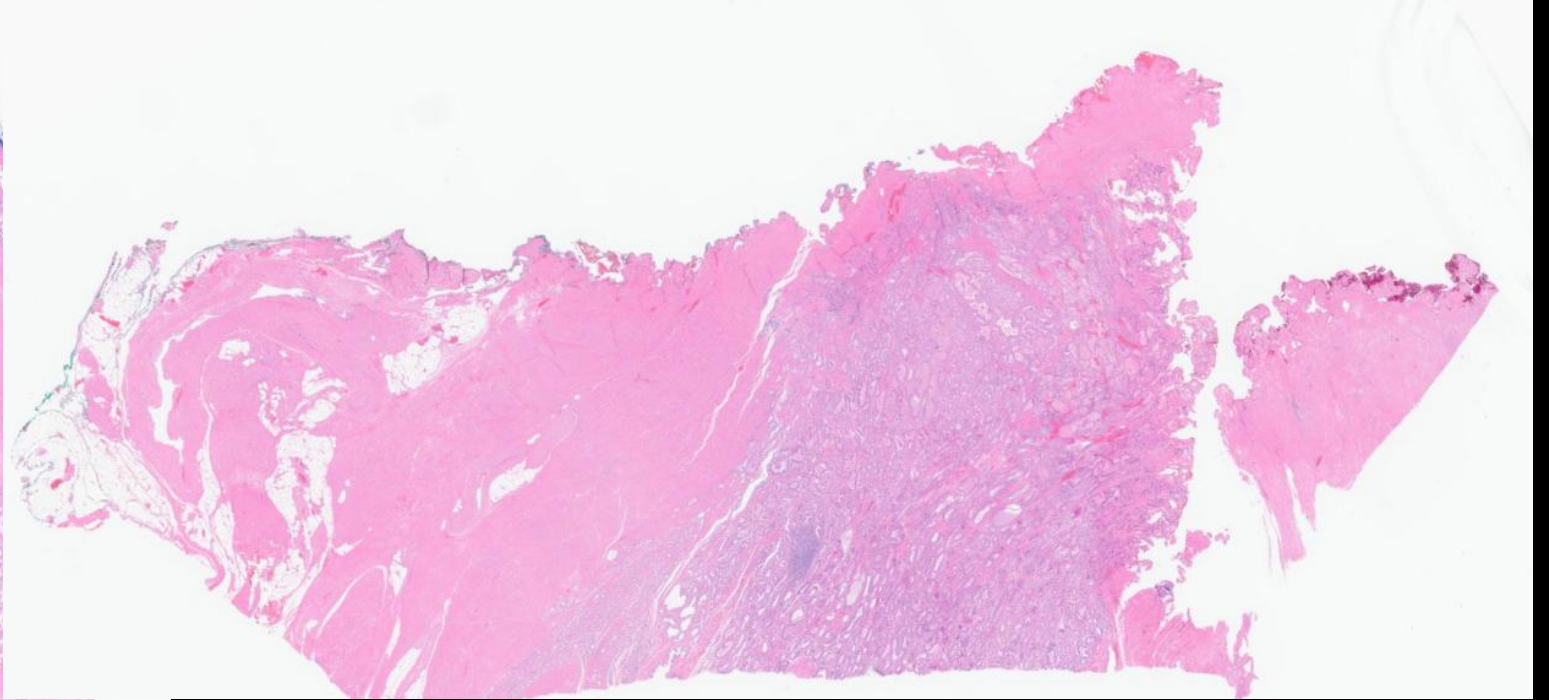
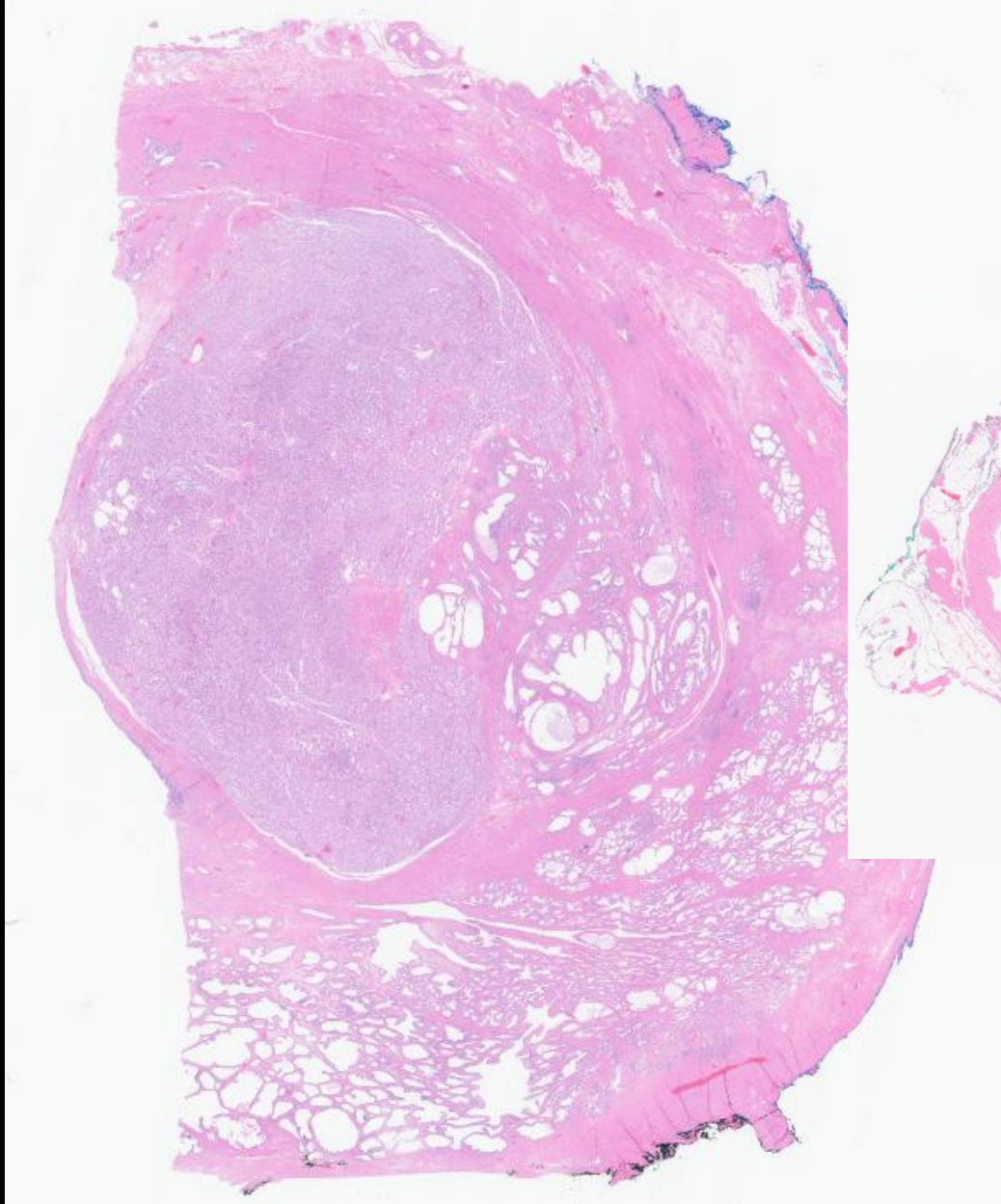


GROSS IMPRESSIONS

Case 1



70yo, right anterior TZ lesion → invading bladder neck



Case 2

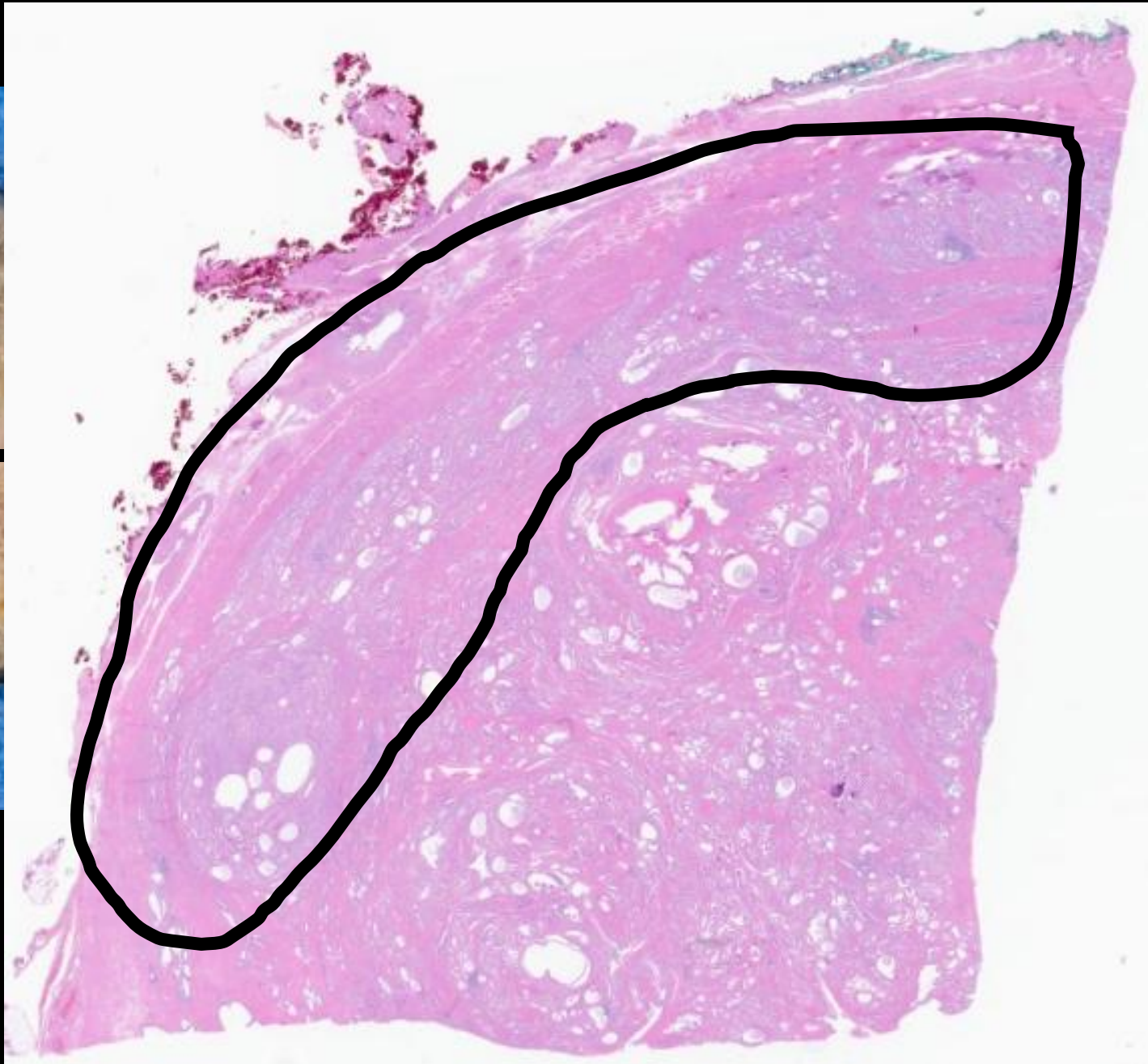
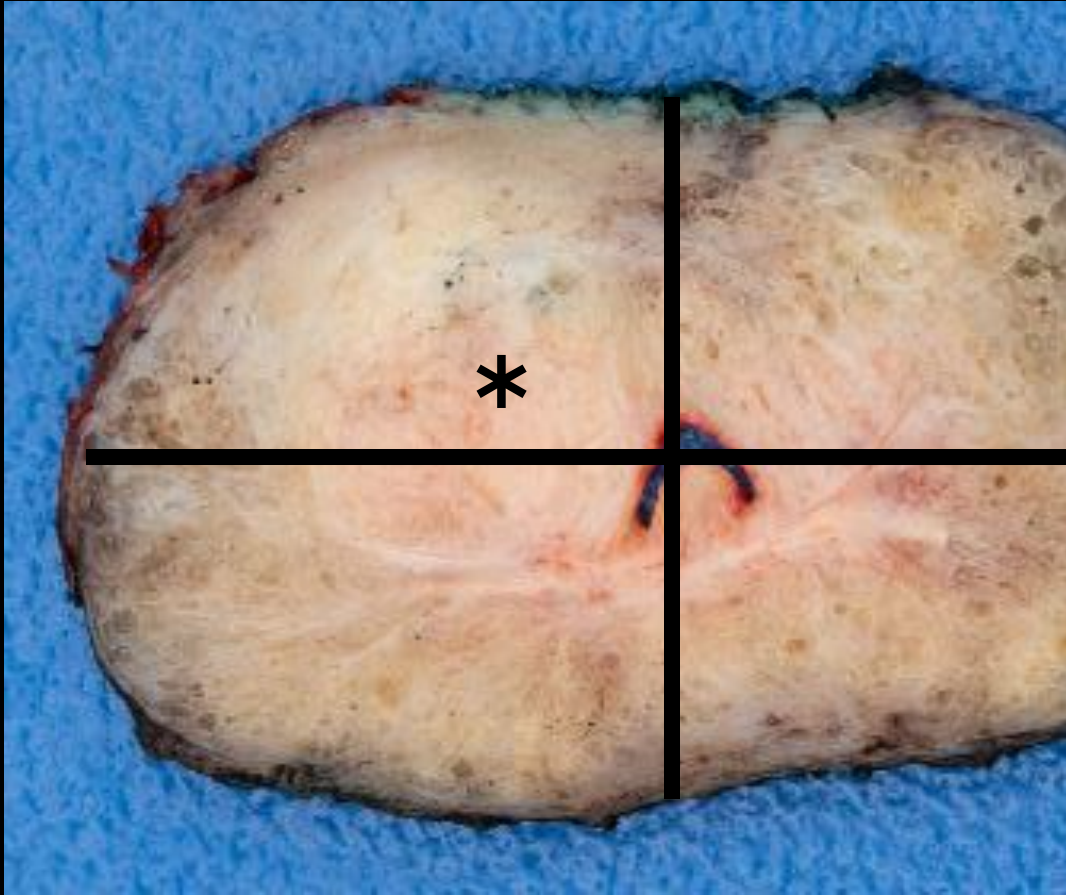


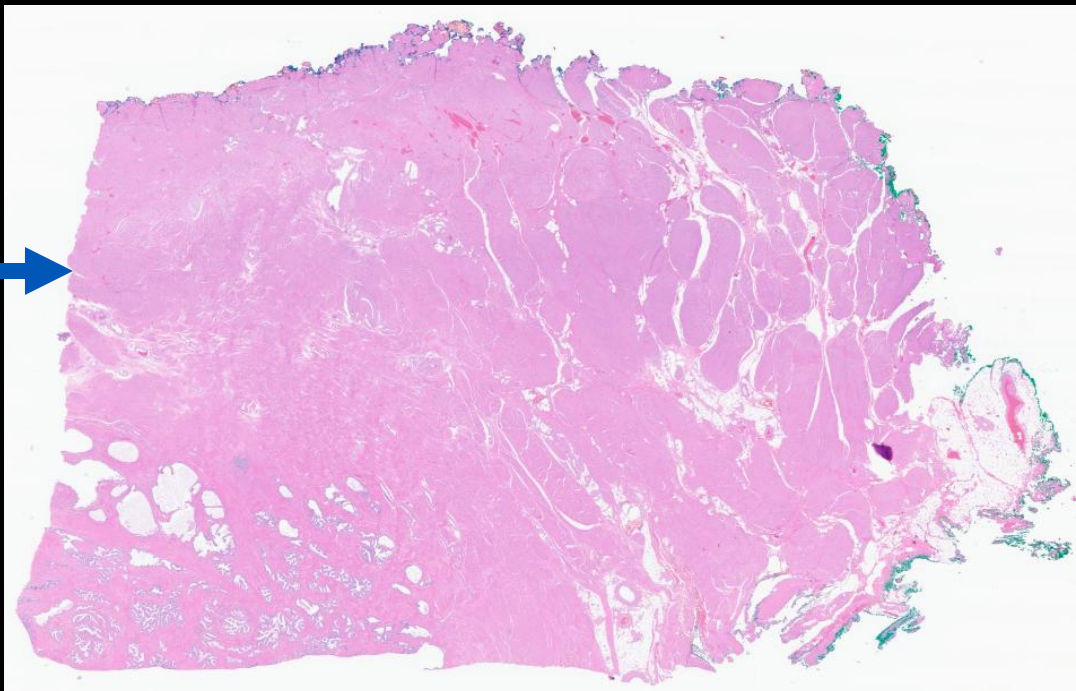
MR: Left anterior PZ, PI-RADS 3

Gross: Suspicious area left anterolateral.
?Bladder neck involvement, possible margin



Case 2





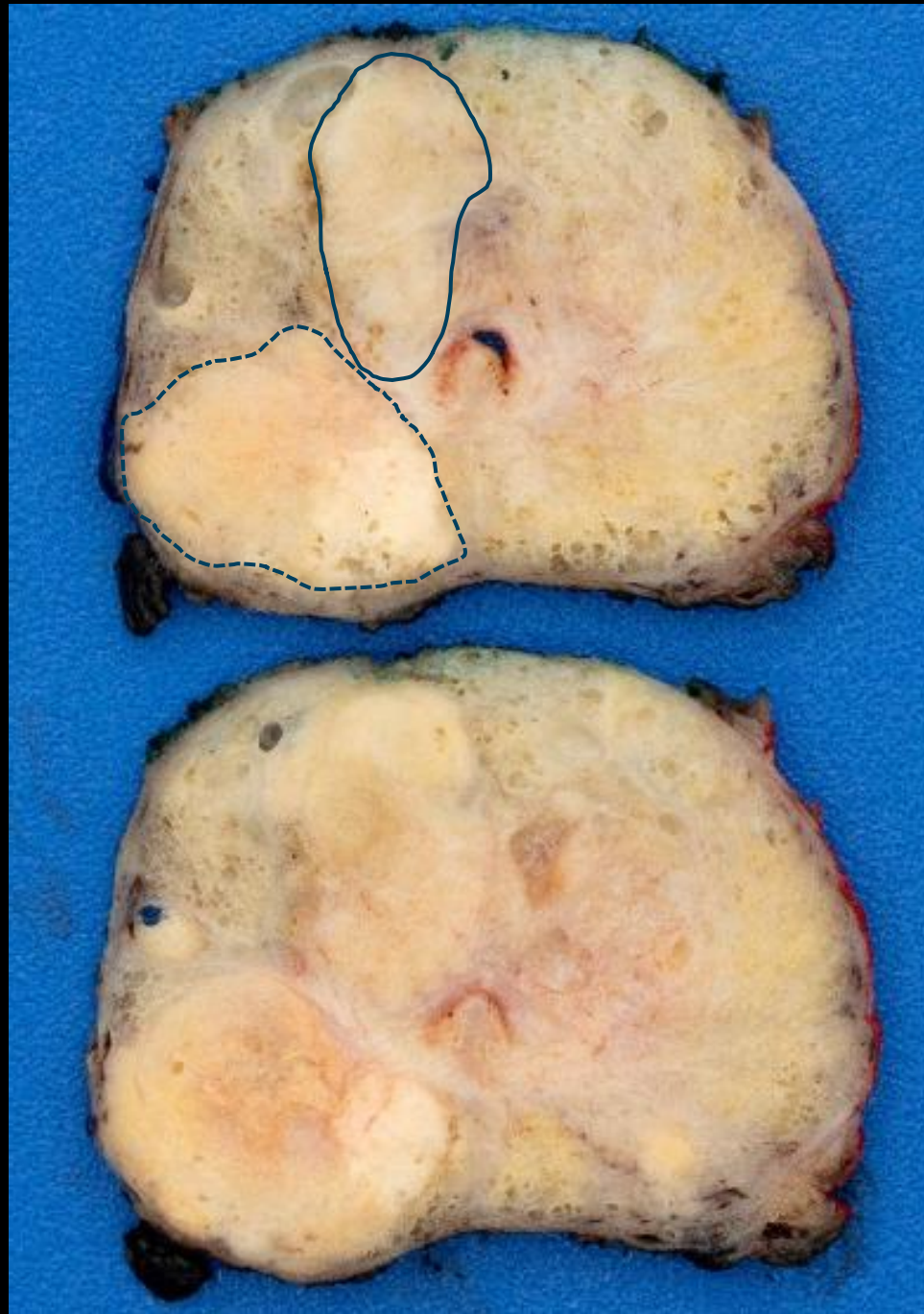
Benign



Tumor
invading
bladder
neck

Final path: 3+4, pT3a

Case 3



MR:

#1: Right PLPZ, PI-RADS 5
EPE

#2: Right TZ, PI-RADS 5

Final path:

- All 1 tumor
- Gleason 9 (4+5)
- Acinar + ductal types
- Focal EPE (pT3a)

Case 4

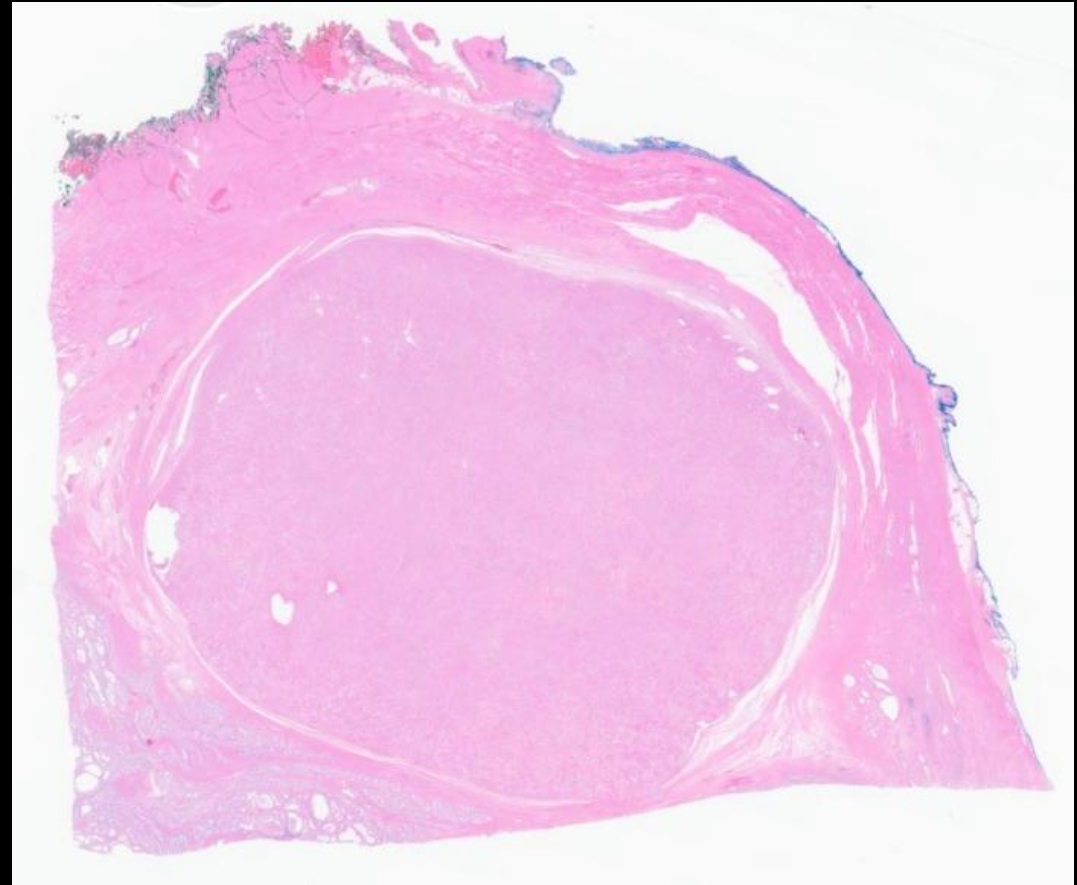


MR: RPL PZ, marked decrease in size, s/o therapy response

Gross: Firm yellow lesion, slices 1-5. Soft nodules in adjacent fat.

Final path: PCa with ADT effect, nonfocal EPE (pT3a)

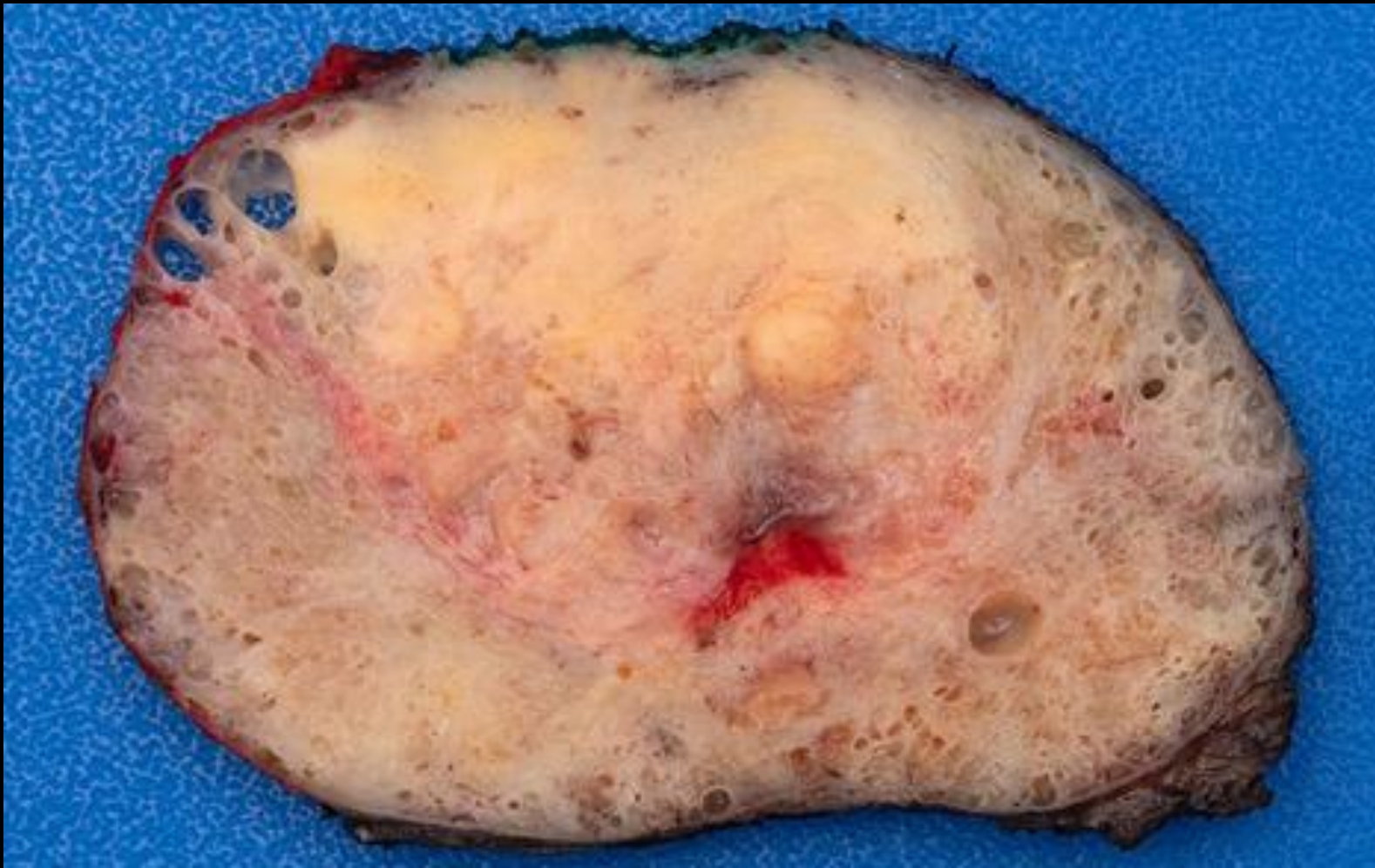
Case 5



Differential diagnosis

- BPH, AAH
- STUMP, stromal sarcoma
- Leiomyoma, leiomyosarcoma
- SFT, GIST

Case 6

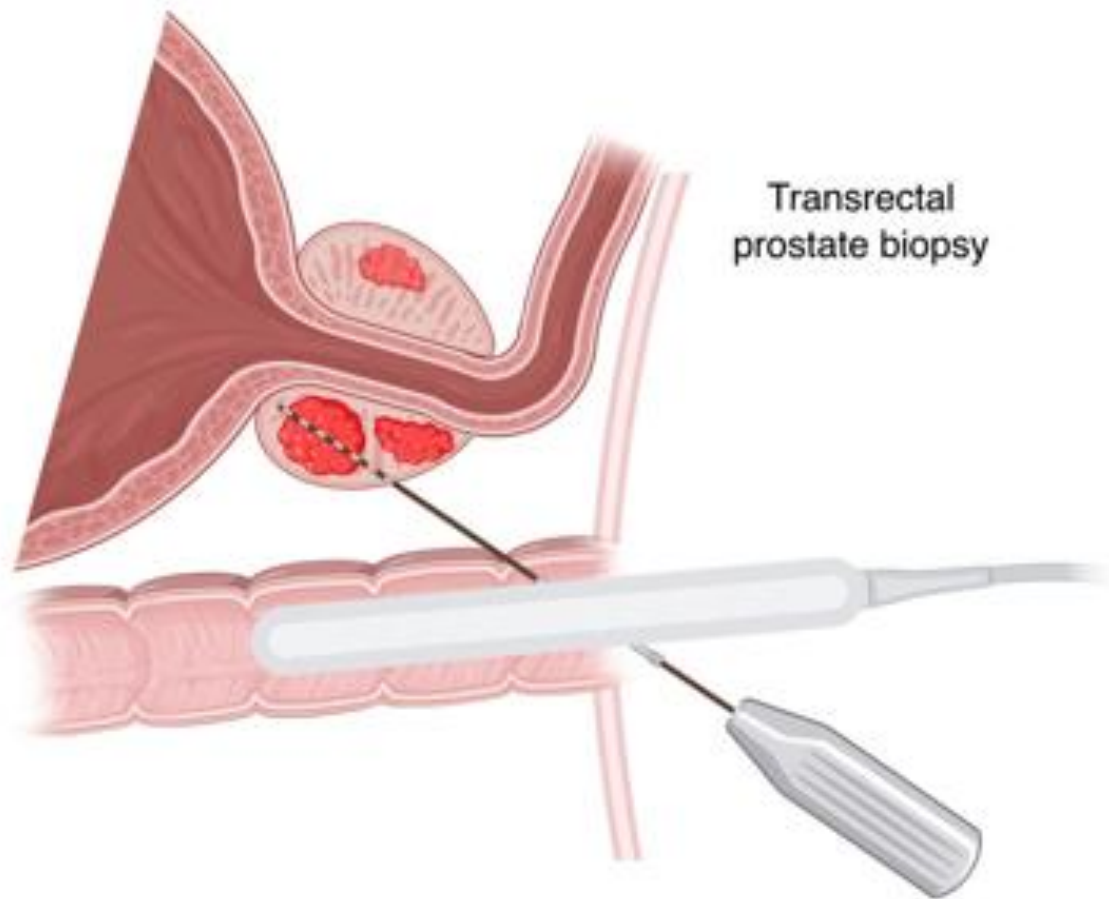


MR: Lesion in the midline anterior fibromuscular stroma/TZ, PI-RADS 4

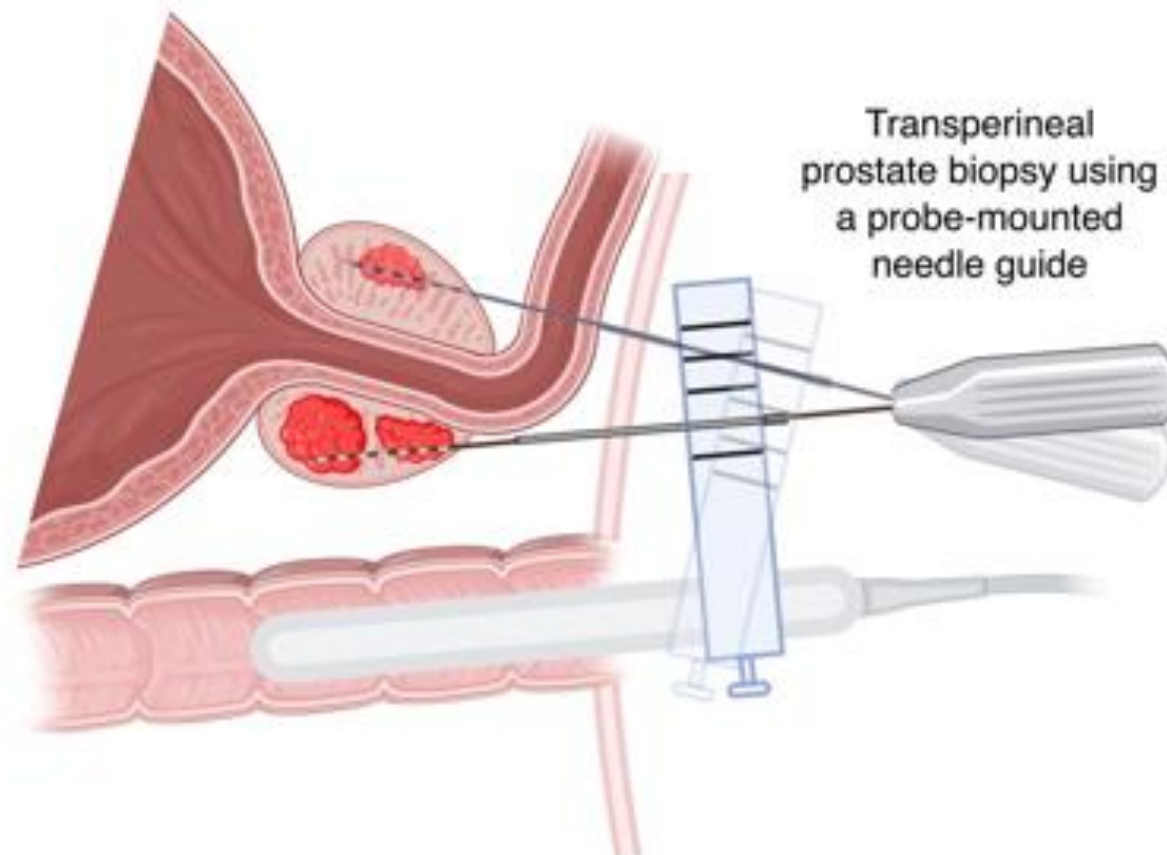
Gross: Yellow lesion in the anterior midline extending close to anterior margin

Final path: Gleason 9 (4+5), anterior PZ → bilateral TZ and bladder neck; pT3a, R1
(+) BN margin

Transrectal
prostate biopsy



Transperineal
prostate biopsy using
a probe-mounted
needle guide



Case 7

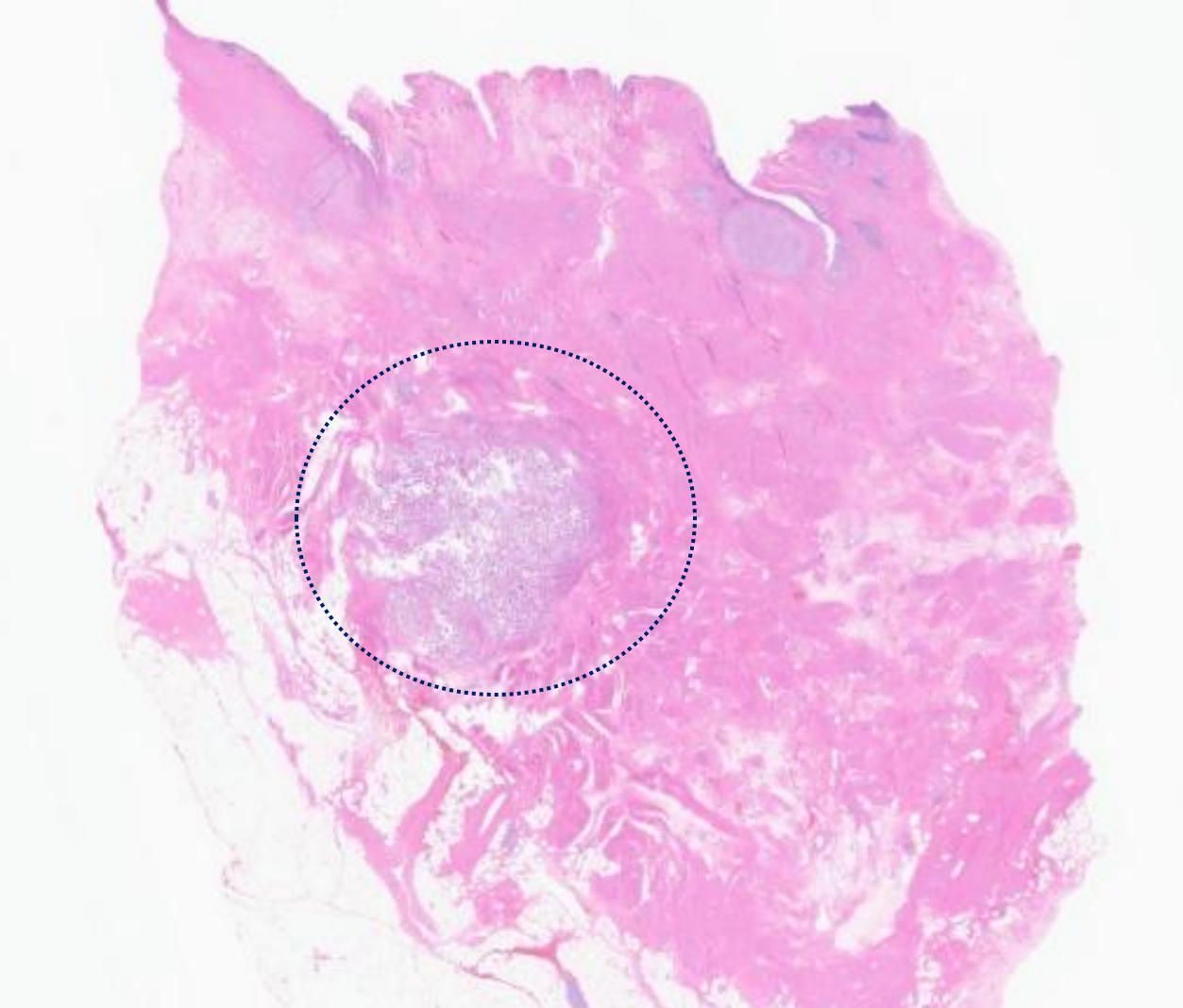


- Salvage prostatectomy, 15g
- HIFU 14 months prior; now with out-of-field recurrence
- Hollow cavity = ablation zone with pale-appearing urethra
 - Inflammation, possible fistula to pubic symphysis
- Final path: Gleason 9 (4+5), invasive into bladder neck; pT3a, R1 (BN)

77yo man, cystoprostatectomy

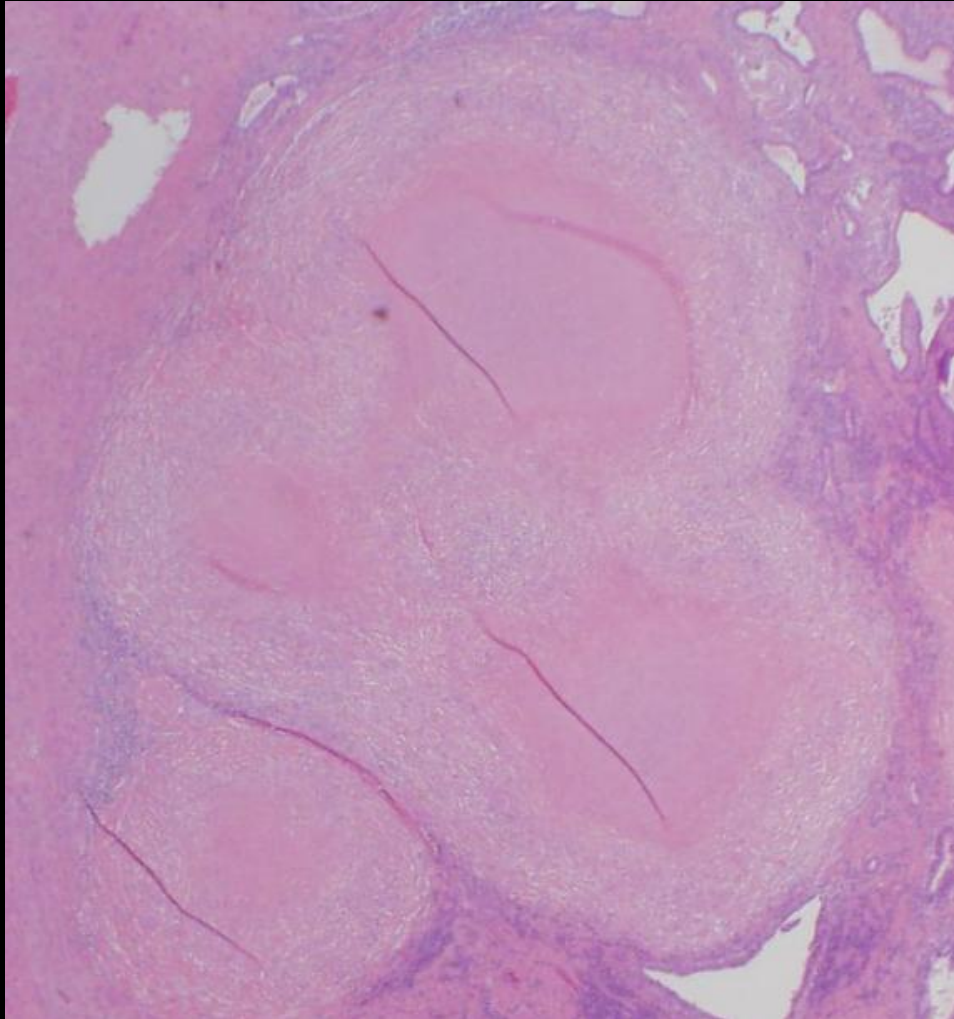
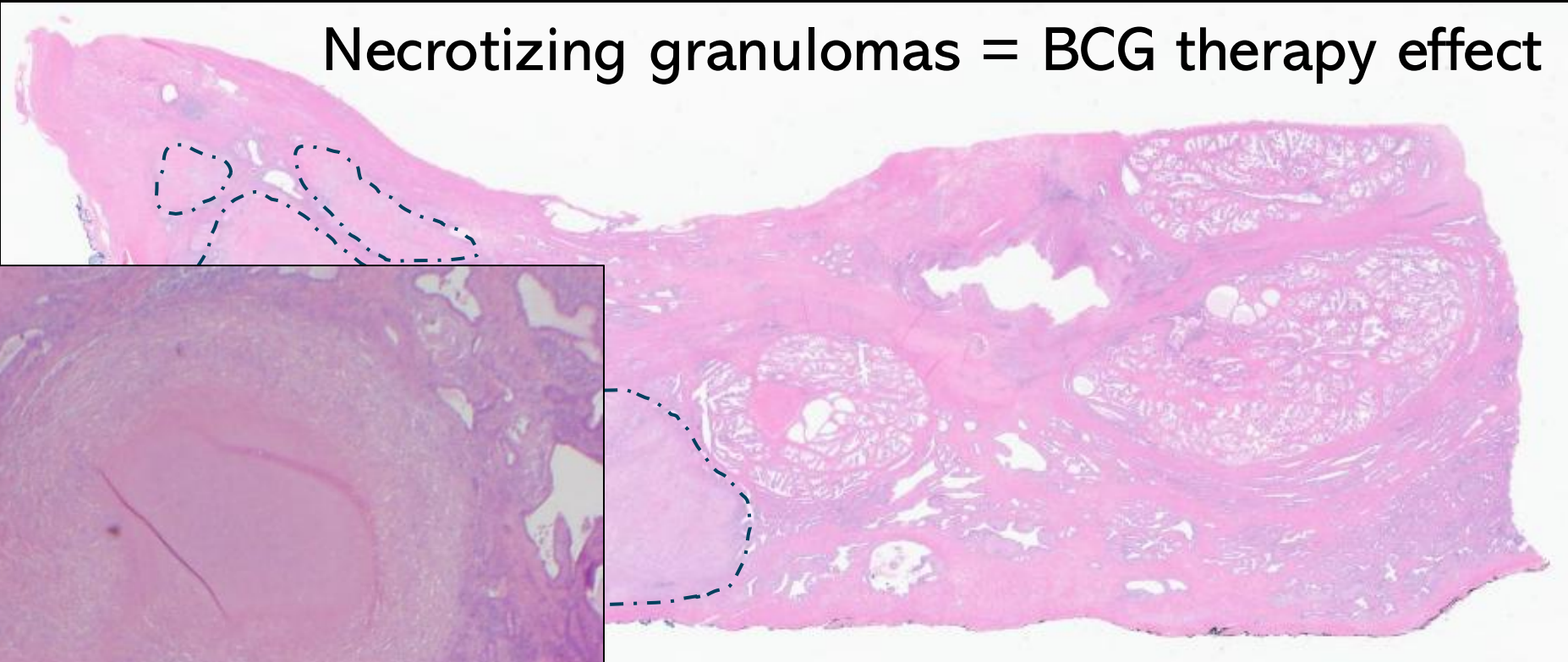


77yo man, cystoprostatectomy

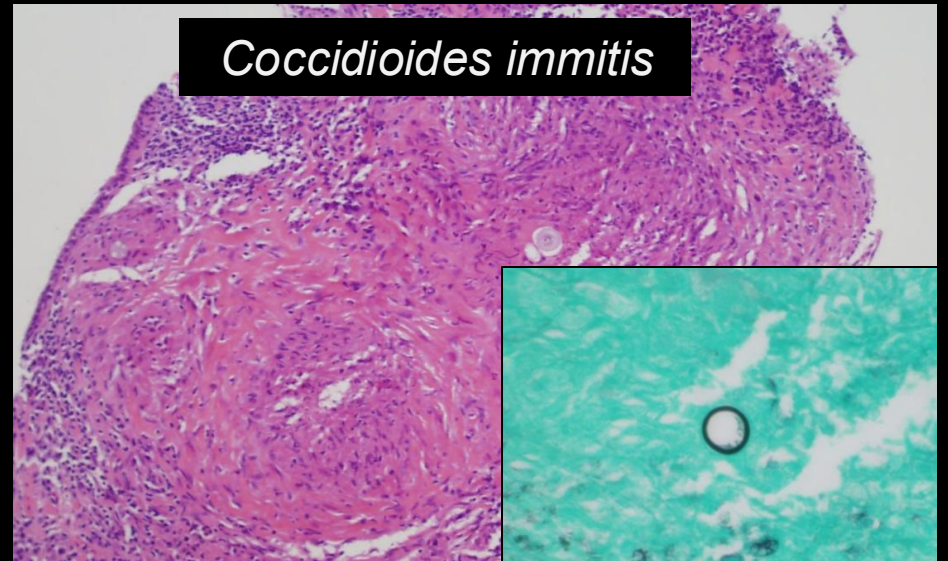


Residual invasive urothelial carcinoma,
micropapillary type (ypT2)

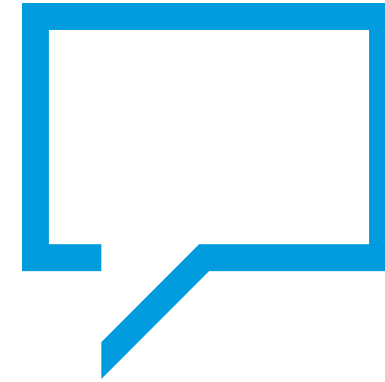
Necrotizing granulomas = BCG therapy effect



Coccidioides immitis



QUESTIONS ?



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