Urothelial Carcinoma and the Prostate

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Outline

• Review of whole slide image

• Differential diagnosis

• Staging implications
A 62 year old man was diagnosed with muscle-invasive urothelial carcinoma following workup of hematuria. He underwent a radical cystoprostatectomy. The following findings were noted in the prostate on pathology review. How would this case be staged?
Prostate gland
Involvement of the prostate by urothelial carcinoma

- May occur via spread from in situ carcinoma in the prostatic urethra, transmural extension from the bladder, or hematogeneous spread of a bladder carcinoma
  - Staging implications

- Differential diagnosis includes ductal adenocarcinoma (for in situ disease) and pleomorphic prostate carcinoma (for invasive disease)
  - Most problematic on biopsy sampling
Urothelial carcinoma involving the prostate

• Most problematic on needle biopsy

• Often has both an intraductal (colonization by CIS from the urethral lining) and invasive component

• Atypia well beyond that seen in prostate cancer in general

• Haphazard pattern is helpful in recognizing the lesion

• Immunostains will show carcinoma is positive for p63 and HMWCK; negative for PSA
Pleomorphic giant cell adenocarcinoma

- Markedly atypical cells with pleomorphic nuclei

- Due to profound atypia, often raises the ddx of urothelial carcinoma involving the prostate

- PSA positive and often associated with a background conventional adenocarcinoma

- Associated with generally poor outcomes, although the number of cases reported is very low
Ductal adenocarcinoma

- “Prostatic duct adenocarcinoma; endometrioid carcinoma”
- Cribriform pattern showing papillary fronds with fibrovascular cores
- Slit-like lumens
- Tall, columnar nuclei often with +/- prominent nucleoli
- May be identified as an exophytic lesion in the urethra
- Negative basal cell markers
- Outcomes are similar to 4+4=8
- Differential diagnosis: Cribriform HGPIN
Staging of urothelial carcinoma in the prostate

- Historically, any urothelial carcinoma in the prostate was considered pT4 disease (changed with 2010 AJCC criteria)

- However, the biology associated with full transmural invasion from the bladder *versus* colonization of ducts with CIS and subsequent invasion is likely different
  - Also, CIS is often multifocal – likely dual bladder and prostate involvement can represent multiple sites of disease

- Current paradigms use different staging models depending on origin of the invasive urothelial carcinoma

- Prostatectomy may be performed for extensive intraductal involvement or invasion into the stroma
Urothelial carcinoma originating in the bladder

FIGURE 45.1. Extent of primary bladder cancer.
Urothelial carcinoma originating in the prostatic urethra
In situ disease in the prostatic urethra: pTa/pTis pu
Invasion of urethral subepithelial connective tissue: pT1
Intraductal spread into the prostate glands: pTis pd
Stromal invasion into the prostate: pT2
pT3 and pT4 disease

pT3: Tumor invades bladder neck, beyond prostate capsule, corpus cavernosum

pT4: Tumor invades other organs, such as bladder
Validation of 2010 AJCC criteria

Validation of new AJCC exclusion criteria for subepithelial prostatic stromal invasion from pT4a bladder urothelial carcinoma.
Patel AR¹, Cohn JA, Abd El Latif A, Miocinovic R, Steinberg GD, Paner GP, Hansel DE.

PURPOSE: Determine difference in survival between subepithelial prostatic stromal invasion and transmural pT4a disease

MATERIALS AND METHODS: A retrospective, multi-institutional cohort of cystectomy cases with subepithelial prostatic stromal invasion from the University of Chicago and Cleveland Clinic were compared to a cohort with transmural pT4a disease. Patients were excluded from the final cohort if variant bladder cancer histology, pT3 bladder disease or extraprostatic extension of urothelial carcinoma were identified. The primary end points were cancer specific and overall survival.

RESULTS: Patients with subepithelial prostatic stromal invasion had lower rates of lymph node involvement than those with transmural pT4a disease (14.6% vs 61.2%, p <0.001) and lower rates of positive surgical margins (18.7% vs 61.2%, p <0.001). When comparing subepithelial prostatic stromal invasion and transmural pT4a groups, overall survival was 64.0 vs 9.8 months and median cancer specific survival was not achieved vs 16.5 months, respectively (p <0.001).

CONCLUSIONS: Subepithelial prostatic stromal invasion from urothelial carcinoma has more favorable outcomes compared to transmural pT4a disease.
Conclusions

- Care should be taken to identify the primary site of origin of urothelial carcinoma involving the prostate
  - In situ lesions of the prostate may suggest urethral staging most appropriate
  - Lack of pT3 disease in the bladder would make direct extension into the prostate less likely

- In the case of a superficial lesion, be sure to rule out ductal adenocarcinoma, as the appearance may be similar to urothelial carcinoma
  - Treatments are radically different