

Case # 4

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Clinical history: A 63 year-old man presented with elevated serum PSA of 6.0 ng/ml in August 2005. His PSAs ranged from 4.0 ng/ml to 5.0 ng/ml over prior two years. Fourteen needle core biopsies were performed in an outside hospital in June 2005 with a diagnosis of "prostate carcinoma, Gleason score 7". Prostate triple immunostains were performed on needle core slides and showed that atypical glands were positive for AMACR and negative for CK 34 β E12 and p63. The patient was referred to City of Hope in August 2005 for surgery. Laparoscopic radical prostatectomy was performed at City of Hope

Pathologic findings: Prostate weighted 99.5 grams. The entire prostate was submitted for histologic examination. Thirteen of sixty-five H&E sections (20%) had atypical glands (volume of involvement 5-10%) that were identical to those seen in prostate core biopsy.

Atypical glands:

- Small acini or nests
- Present at the peripheral zone of prostate and at multiple peripheral margins
- Single layer of luminal cells
- Pink luminal secretion and gland dilatation
- Focally infiltrating pattern

Atypical cells:

- Minimal nuclear atypia
- Occasional centrally placed small nucleoli
- No mitotic figures

Immunohistochemistry:

- Positive: AMACR, CK 34 β E12 (focal), keratin 7 and CD10 (focal)
- Negative: p63, PAS, PAcP, calretinin, and RCC

Differential diagnoses:

Prostate adenocarcinoma, Gleason score 3+4=7: The Differential diagnosis of small atypical glands in prostate stroma with single cell lining and presence of nucleoli should always include prostate adenocarcinoma.

Findings favor adenocarcinoma: Small atypical glands, single layer of luminal cells, presence of nucleoli, focal infiltrating pattern, AMACR+, P63-

Findings against adenocarcinoma: Peripheral location, no stromal reaction, PSA-/PAcP-, CK 34 β E12+

Atrophic glands/postatrophic hyperplasia:

Findings favor atrophy: Small atypical glands, presence of nucleoli, infiltrating pattern, CK 34 β E12+

Findings against atrophy: Peripheral location, PSA-/PacP-, AMACR+

Atypical adenomatous hyperplasia/atypical small acinar proliferation (ADH/ASAP):

Findings favor ADH/ASAP: Small atypical glands, AMACR+, CK 34 β E12+

Findings against ADH/ASAP: Infiltrating pattern, single layer of luminal cells, PSA-/PacP-, P63-

Sclerosing adenosis (SA):

Findings favor SA: Small atypical glands, infiltrating pattern, CK 34 β E12+

Findings against SA: Single layer of luminal cells, AMACR+, PSA-/PacP-
P63-

Nephrogenic adenoma (NA):

- Benign, tumor like lesions within the urothelial mucosa of the urinary tract
- Most are found in bladder
- Other locations: pelvic urothelium, ureter, and urethra
- Tissue origins: metaplasia, hamartoma, and renal tubule implantation
- Immunohistochemistry:
 - o Positive: AMACR, CD10, RCC, calretinin
 - o Negative: CK 34 β E12, P63⁻, PSA

Findings favor NA: Small atypical glands, single layer of luminal cells, AMACR+, CD10+, PSA-/PacP-

Findings against NA: Peripheral location, RCC⁻, CK 34 β E12⁺

Mesonephric remnant (hyperplasia):

- Rarely identified (0.6%), about 0.1- 0.7 cm. in diameter
- Closely spaced acini arranged in lobules or infiltrating between muscle bundles (periphery) or prostate acini
- Single layer of cuboidal cells with scant amount of eosinophilic cytoplasm, finely dispersed chromatin, and small round punctuate nucleoli
- Sometimes with tubular dilation, epithelial tufting and micropapillary formation
- Occasionally undergo hyperplasia
- May demonstrate perineural spread and extraprostatic extension
- No stromal desmoplastic or inflammatory response
- Dense eosinophilic luminal secretion
- No mitotic figures
- Immunohistochemistry:
 - o Positive: AMACR; keratin 34 β E12, keratin 7,
 - o Negative: PAS, PacP, P63, CD10, RCC

Findings favor mesonephric remnant hyperplasia: Diffuse peripheral location (size >1.0 cm.), single layer of luminal cells, AMACR+, CK34βE12+, PAS-/PACp-

Summary of immunohistochemical features of benign mimickers of prostate adenocarcinoma

Lesions	Cell layers	PSA	AMACR	CK 903	P63	CD10
Atrophy	2	+	-	+	+	-
AAH & ASAP	2	+	+/-	+(f)	+(f)	-
Sclerosing adenosis	2	+	-	+	+	-
Nephrogenic adenoma	1	-	+	-	-	+
Mesonephric remnant	1	-	+	+	-	+/-
Current case	1	-	+	+	-	+
Adenocarcinoma	1	+	+	-	-	-