Mimickers of prostate cancer in needle biopsies.

Gregor Mikuz (Austria)

Mimicry is related to camouflage, in which a species resembles its surroundings or is otherwise difficult to detect. (Wikipedia)

Ctenomorphodes chronus
The diagnosis of prostatic adenocarcinoma, especially when present in small amounts, is often challenging. Before making a diagnosis of carcinoma, it is prudent for the pathologist to consider the various benign patterns and processes that can simulate prostatic adenocarcinoma. *A useful method of classifying benign mimickers is in relationship to the major growth patterns depicted in the classical Gleason diagram.*
I = small and large glands
II = cribriform pattern
IV = fused glands and solid pattern

Modified after Srigley J; Mod Pathol 2004; 27:328-48
Small gland pattern: seminal vesicle

Atypia increasing with the age and stronger than in acinar carcinoma.

Golden-brown lipofuscin pigment in cytoplasm, however, the amount is variable.
Small gland pattern: Cowper’s glands

- PAS positivity variable
- PAS-D positive
- HMWK positive
- PSA positivity variable
- MSA positive - myoepithelia

Diagnosis of Cowper's glands on prostate needle biopsy.
In our experience Cowper’s glands are mostly found in biopsies performed for the detection of a local recurrence in the anastomosis area after prostatectomy.
Do not confuse Cowper’s glands with mucinous metaplasia

Mucin-secreting cells are found in the foci of sclerotic atrophy, transitional cell metaplasia, basal cell hyperplasia and nodular hyperplasia. The cells stain intensely with PAS, mucicarmine, and alcian blue. The cells are nonreactive for PSA.
Small gland pattern: atrophy
A Working Group Classification of Focal Prostate Atrophy Lesions

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BE CAREFULL with the architecture
Atrophy/Hyperplasia post-atrophy 16-24% Biopsy, 4% TUR mimickers
Postatrophic hyperplasia & PIA (proliferative inflammatory atypia)

• Common even in young men aged 19-29 year
• Idiopathic or caused by inflammation, ischemia ...and toxic substances?
• In my experience the main cause of wrong cancer diagnoses!
Atrophy with infiltrative growth
Atrophy after antiandrogeine therapy
Atrophy + carcinoma
Atrophic-like carcinoma
Assessment of aberrations on chromosome 8 in prostatic atrophy

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8q24 gain

% of nuclei

control normal atrophy PIN cancer

8p22 loss

% of nuclei

control normal glands atrophy PIN cancer
Editorial

Prostate Carcinoma: Atrophy or Not Atrophy
That is the Question

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Does atrophy play a role in the development of PCa? Very cautiously we would venture to say that there is ample evidence for the genetic instability of the cells in the atrophic areas of the prostate. (The mention of atrophic lesions [PIA, PA etc], especially in pathologic reports of needle biopsies, is not mandatory, because no treatment is recommended now.) The genetic aberrations differ in quantity but not in quality from those found in PCa. The disarrangement of the genomes makes the cells of the atrophic areas vulnerable and sensitive to other injuries, which actually can lead to cancer.
Prostate infarction with squamous metaplasia and atipia
Small gland pattern: nephrogenic adenoma

2/134 (1.5%) located in the prostate  (urinary bladder 68.6% !)

Lopez JI et al.,Virchows Arch (2013) 463:819–825
Small gland pattern: basal cell hyperplasia

Basal cell hyperplasia: an unusual diagnostic dilemma on prostate needle biopsies

Gregory A. Hosler MD, PhD\textsuperscript{a}, Jonathan I. Epstein MD\textsuperscript{a,b,c,}\textasteriskcentered

*Human Pathology (2005) 36, 480–485
Basal cell hyperplasia
Small gland pattern: *sclerosing adenosis*

Mostly located in the transitional zone therefore encountered in 2% of TUR material.
Small gland pattern: veromontanum mucosal gland hyperplasia

Extremely rare in Bx but present in 14% of radical prostatectomies.
Small gland pattern: atypical adenomatous hyperplasia

Transitional zone lesion:
up to 20% TUR
33% radical prostatectomies
Bx rare
Cribiform pattern: **clear cell cribriform hyperplasia**

The distinction of cribriform hyperplasia from cribriform carcinoma is based on the ‘low power’ nodularity, cellular stroma, presence of basal cells and lack of significant cytologic atypia.
Cribiform pattern: high grade PIN
High grade PIN but...
Be on guard ...!!!

Pseudo HG PIN carcinoma

Intraductal carcinoma
Fused gland and solid pattern: paraganglion

Paraganglionic tissue may be encountered within prostatic and periprostatic tissue.

*When a Gleason grade 3 tumor is encountered and accompanying paraganglionic tissue is interpreted as Gleason grade 4 tumor, the resultant score would be inaccurately recorded as 7 instead of the correct score of 6.*
Fused gland and solid pattern: **xantomatous prostatitis**

Foamy cell PCa does not show any nuclear atypia!
Fused gland and solid pattern: malakoplakia
May involve prostate, usually associated with bladder disease. Represents a peculiar form of tissue reaction to bacterial infection, mostly gram negative bacterias (E.coli, Klebsiella pneumonia). May resemble carcinoma on ultrasound.
Fused gland and solid pattern: non specific granulomatous prostatitis
Fused gland and solid pattern: **intraprostatic urothelial carcinoma**
## 3120 needle biopsies

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<tr>
<td><strong>PROSTATE CARCINOMAS</strong></td>
<td>1361</td>
<td>1137</td>
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<tr>
<td>Percentage all biopsies</td>
<td>(43.6%)</td>
<td>(36.4%)</td>
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<tr>
<td><strong>SUSPICIOUS GLANDS</strong></td>
<td>109</td>
<td>46</td>
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<tr>
<td>Percentage all biopsies</td>
<td>(3.5%)</td>
<td>(1.5%)</td>
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*Courtesy of Prof. Ferran Algaba, Barcelona*
BLENIGN

MALIGNANT

Strict
criteria

Ancillary
methods

Prudence
The Carniola region has no more beautiful places and surroundings, than this one, an image of paradise.
(Baptism on the Savica, France Prešern, 1835)