NOWOTWORY Journal of Oncology • 2003 • volume 53
Number 2• 169–170

Letters to the Editor • Listy do redakcji

Prostate secretory granules as a diagnostic aid in detecting small foci of prostatic *adenocarcinoma*

Ziarenka wydzielnicze gruczołu krokowego jako pomoc przy wykrywaniu niewielkich ognisk *adenocarcinoma prostate*

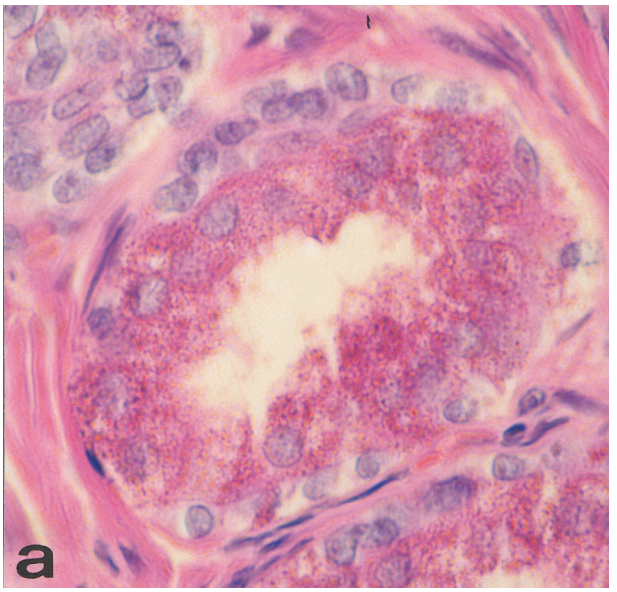
Sir,

While collecting references for the review article on neuroendocrine differentiation in prostate cancer published in this journal [1] we have encountered several papers written by prominent American pathologists on a simple technical modification particularly useful in the study of needle biopsy. Since any improvement facilitating prostate cancer detection deserves attention we would like to present a short summary of these papers.

According to Cohen et al. [2, 3], fixation of prostate epithelium in 3-5% glutaraldehyde preserves myriads of small granules, which intensely stain with eosin. This strongly contrasts with cytoplasmic clarity of secretory epithelium routinely preserved in formaldehyde (Fig. 1 a,b). The granules, called prostate secretory granules (PSGs), have strong affinity for eosin, while from the remaining cytoplasm eosin can be eluted with ethanol or by prolonged rinsing in water. Electron microscopic observations disclosed that the granules have some 900-1000 nm in diameter, are surrounded by a membrane and contain electron-dense material. They almost completely fill the apical parts of cells, while they are less numerous in the basal region. Immunocytochemical studies demonstrated the presence of prostate specific antigen (PSA) and prostatic acid phosphatase in the granules. In an earlier study from another laboratory prostatic granules were also found to contain zinc [4]. After formaldehyde fixation the granules became fragmented, their content was lost and the cytoplasm became amphiphilic.

Normal prostate epithelium cells secrete PGSs with a portion of apical cell membrane (apocrine secretion). Detached fragments of cytoplasm and granules undergo condensation in the lumen of the gland forming acidophilic bodies deposited on the surface of corpora amylacea [5].

In a material consisting of 138 samples of malignant prostate needle biopsy sets, each representing 6 to 13 cores, 80% of carcinomas and 63% of high grade



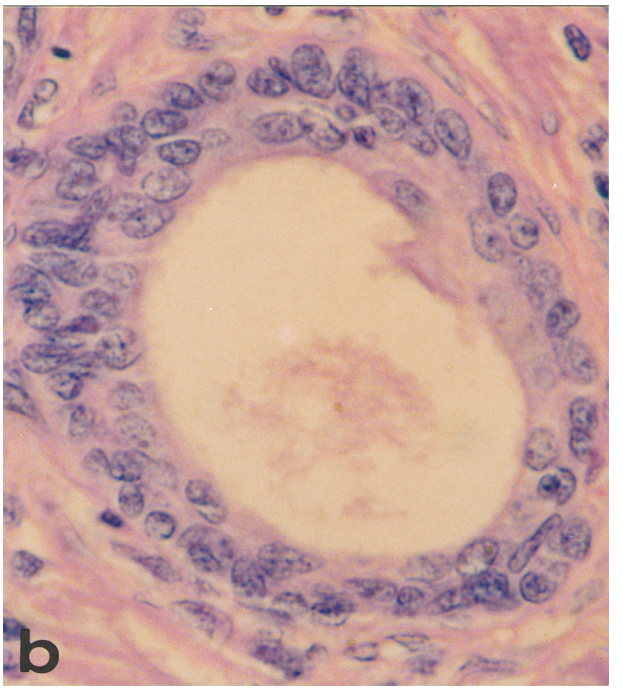


Fig. 1 a, b. Prostate epithelium from hyperplastic gland. (a) Fixation in 3% glutaraldehyde. Cytoplasm of epithelial cells is filled with bright red secretory granules. (b) Fixation in 4% formaldehyde. Cytoplasm of epithelial cells does not contain secretory granules. Hematoxylin-eosin. Magn.x 880.

dysplasias were markedly depleted of PSGs. This contrast between benign and malignant epithelium was especially prominent in small carcinoma foci greatly assisting in cancer recognition [2].

Fixation in glutaraldehyde may hamper immunocytochemical procedures. Detection of various prostate antigens, such as chromogranin A, vimentin or S100, was, however, fully possible after antigen retrieval by enzyme or heat treatment [6]. Thus, in conclusion, fixation in glutaraldehyde aids diagnosis and does not interfere with the demonstration of prostate carcinoma antigens.

Prof. dr hab. med. Stanisław Moskalewski
Katedra i Zakład Histologii i Embriologii
Dr n. med. Dorota Biernacka-Wawrzonek
Mgr Alicja Tomaszewska
Zakład Anatomii Patologicznej
Akademii Medycznej w Warszawie,
Chałubińskiego 5, 02-004 Warszawa
E-mail – smosk@ib.amwaw.edu.pl

References

1. Moskalewski S, Biernacka-Wawrzonek D, Tomaszewska A. Komórki neuroendokrynowe w prawidłowym gruczole krokowym i zróżnicowanie neuroendokrynowe w *adenocarcinoma prostatae*. *Nowotwory J Oncol* 2002; 52: 413-21.
2. Cohen RJ, McNeal JE, Edgar SG, et al. Characterization of cytoplasmic secretory granules (PSGs), in prostatic epithelium and their transformation-induced loss in dysplasia and adenocarcinoma. *Hum Pathol* 1998; 29: 1488-94.
3. Cohen RJ, Beales MP, McNeal JE. Prostate secretory granules in normal and neoplastic prostate glands: A diagnostic aid to needle biopsy. *Hum Pathol* 2000; 31: 1515-9.
4. Okada K, Morita H, Arai R, et al. Ultrastructural localization of zinc in the hyperplastic prostatae. *Prostate* 1983; 4: 31-8.
5. Cohen RJ, McNeal JE, Redmond SL, et al. Luminal contents of benign and malignant prostatic glands: Correspondence to altered secretory mechanisms. *Hum Pathol* 2000; 31: 94-100.
6. Cohen RJ, Fischer G, McNeal JE. Immunostainings after glutaraldehyde-based tissue fixation. *Hum Pathol* 2001; 32: 242-3.