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Diagnostic Patterns and Immunohistochemical Stain Usage in Extended Core Prostate Biopsies: Comparisons Between Genitourinary and Non-Genitourinary Pathologists

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Background: Ancillary immunohistochemical (IPOX) stains are useful in clarifying diagnostically challenging pathologic specimens. In diagnostic workup of prostate needle biopsies, stains for basal cells and -methylacyl coenzyme A racemase (AMACR) are routinely used to support or refute the diagnosis of prostate cancer. Although useful, these stains add cost and must be used judiciously. There is a lack of firm guidelines establishing the proper utilization of IPOX studies in prostate pathology. Therefore, differences in patterns of stain use and diagnoses may exist, related to expertise of the pathologist.

Objectives: The purpose of this study was to compare patterns of diagnoses and IPOX stain use in extended core prostate biopsies between genitourinary (GU) and non-genitourinary (non-GU) pathologists in the University of Massachusetts Medical Center Pathology department.

Methods: By computer search of medical records, consecutive extended core prostate biopsies (6+ cores) from years 2006-2011 were identified. Using Current Procedural Terminology (CPT) billing data, the number of cores and number of IPOX stains were retrieved. Prostate biopsy diagnoses were recorded. Pathologists who diagnosed prostate biopsies meeting computer search criteria were divided into two groups based on expertise: genitourinary and non-genitourinary. Differences in the patterns of IPOX use and diagnoses between the two groups were analyzed.

Results: GU pathologists diagnose significantly higher rates of prostate cancer and atypical small acinar proliferation and significantly lower rates of high-grade prostatic intra-epithelial neoplasia. Both groups order IPOX stains less as the percentage of Gleason score 4 disease increases in moderately differentiated cancers and as extent of disease increases. The average rate of IPOX use is not significantly different in the two groups. However, GU pathologists order IPOX stains significantly less in cancer cases and more in HGPIN cases. Finally, the variability in rate of IPOX usage is higher in the non-GU group.

Conclusion: Significant differences exist in patterns of IPOX usage between GU and non-GU pathologists. The results suggest the need for guidelines and continuing education focused on this issue to standardize practice, an intervention likely to improve quality of diagnoses and to reduce unnecessary costs.

ABSTRACT

Diagnostic Patterns and Immunohistochemical Stain Usage in Extended Core Prostate Biopsies: Comparisons Between Genitourinary and Non-Genitourinary Pathologists

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RESULTS

Table 1. Summary of all cases.

\[
\text{Diagnosis} \quad \text{GU} \quad \text{Non-GU} \quad \text{p-value}
\]

- Benign 591 (42.8%) 535 (47.94%) 0.01
- HGPIN 62 (4.7%) 84 (12.0%) 0.000
- ISAP 116 (8.6%) 118 (14.0%) 0.000
- Cancer 405 (43.8%) 399 (55.8%) 0.000

Total 1381 116

- GU pathologists diagnose significantly higher rates of prostate cancer and atypical small acinar proliferation.
- GU pathologists diagnose significantly lower rates of high-grade prostatic intra-epithelial neoplasia.
- Both groups of pathologists order IPOX stains less as extent of disease increases.

Table 2. Distribution of Gleason grades of cancer cases.

\[
\text{Highest Gleason Score of Cancer} \quad \text{3+3=6} \quad \text{4+3=7} \quad \text{8,9,10} \quad \text{No Gr} \quad \text{PNI} \quad \text{Total}
\]

\[
\text{GU} \quad 276 (45.6%) \quad 139 (23.0%) \quad 85 (14.1%) \quad 102 (16.9%) \quad 3 (0.5%) \quad 0.86 (30.7%) \quad 605
\]

\[
\text{Non-GU} \quad 98 (49.6%) \quad 92 (23.1%) \quad 113 (28.6%) \quad 114 (0.0%) \quad 21 (30.3%) \quad 599
\]

\[
\text{p-value} \quad 0.22 \quad 1 \quad 0.78 \quad 0.25 \quad 0.028 \quad 0.94
\]

- There are no significant differences in the distribution of the Gleason scores or rate of perineural invasion in cancer cases between the two groups of pathologists.

Table 3. Distribution of extent of disease in cancer cases. Unilateral Disease, Focal = one positive core 10% or less involvement. Unilateral disease, One Core, non-focal = one positive core greater than 10% involvement. Unilateral disease, Multiple Cores = Multiple ipsilateral positive cores. Bilateral Disease, Focal = Bilateral positive cores (One side or both sides with only one positive core). Bilateral Disease, Multiple Cores = Multiple contralateral positive cores/bilateral.

\[
\text{Extent of disease} \quad \text{Focal} \quad \text{One Core, non-focal} \quad \text{Multiple Cores} \quad \text{Focal} \quad \text{Multiple Cores} \quad \text{Total}
\]

\[
\text{GU} \quad 92 (15.2%) \quad 56 (9.3%) \quad 95 (32.2%) \quad 123 (20.3%) \quad 189 (30.3%) \quad 605
\]

\[
\text{Non-GU} \quad 92 (15.2%) \quad 61 (10.3%) \quad 130 (26.2%) \quad 89 (22.3%) \quad 77 (19.3%) \quad 605
\]

\[
\text{p-value} \quad 0.93 \quad 0.59 \quad 0.95 \quad 0.48 \quad 0.18
\]

- There are no significant differences in the distribution of extent of disease in cancer cases between the two groups of pathologists.

REFERENCES