WS3-2**Key issues in prostate needle biopsy interpretation**

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Pathological diagnosis of prostate cancer is obtained from transrectal ultrasound guided needle biopsies. Diagnoses can be divided into non-neoplastic and neoplastic findings. In terms of non-neoplastic findings, the diagnosis of "prostatitis" is not a histopathological one but is best made clinically. For the pathologist it is recommended to describe that the prostate contains moderate to severe chronic and or acute inflammation. In addition, it is usually not possible to render a diagnosis of BPH (benign prostatic hyperplasia) on prostate needle biopsy, especially on non-transition zone biopsies. For totally normal appearing tissues we do not use the term BPH, but prefer "benign prostatic tissue". Some benign disorders may be misdiagnosed as carcinoma: adenosis or atypical adenomatous hyperplasia; different types of atrophy which are quite common and can be extensive. In terms of carcinoma, needle biopsies help to predict the grade and stage of disease. Pertinent information

obtained from needle biopsies is the Gleason score, the number of cores positive for cancer, the extent of each biopsy involved, and whether there is peri-neural invasion. Other potential additions that may be useful in the future include assessment of various molecular markers. Most of these are still in the experimental phase now, and do not yet aid in clinical decision making. Problems with needle biopsy focus on the diagnosis of atypical glands suspicious for carcinoma and for the diagnosis of high grade PIN. Immunohistochemical staining for basal cells and alpha methyl acyl coA racemase can aid in difficult cases. Blind needle biopsies often grossly underestimate disease. As in vivo imaging gets more and more sophisticated we anticipate an improvement in the ability to direct needle biopsies to suspicious foci.

WS3-3**Genetic alterations in cancer and cancer-related lesions in the human prostate**

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Prostatic intraepithelial neoplasia (PIN) has been identified as a precursor of prostatic cancer (Pca). Recently, some kind of atrophic lesions like postatrophic hyperplasia (PAH) and proliferative inflammatory atrophy (PIA) have attracted the attentions of pathologists because there are sometimes proliferating cells in those atrophic lesions.

We have analyzed the extent and zonal distribution of PIN lesions in the resected prostate specimen. We have also compared the genetic alterations detected in the cancer and PIN in terms of p53 mutations or shortening of the CAG repeat length within the androgen receptor gene by means of laser captured microdissection technique. Immunohistochemical study and analysis of genetic alterations were also performed for PAH lesions.

High grade PIN (HGPIN) showed the similar extent and zonal distribution as Pca. Immunohistochemical analysis for proliferative activity demonstrated that PAH has intermediate activity between BPH and HGPIN. Mutations in the p53 gene were detected in Pca lesions with the frequency of 20–30%. HGPIN and PAH showed lower frequency rate of p53 mutations. Moreover, HGPIN lesions in the peripheral zone showed higher frequency rate of p53 mutation than those in transition zone. On the other hand, BPH or normal lesions showed no mutation in the p53 gene. In situ shortening of the CAG repeat length in the AR gene was detected in Pca, HGPIN and PAH but not in normal or BPH lesion. Interestingly, this shortening was detected only in CAG repeat but not in GGC repeat of AR gene. The length of BAT-25 and BAT-26 (effective markers for microsatellite instability) was identical among all lesions in the same case suggesting that this shortening of the CAG repeat is not the result of microsatellite instability.

All these data suggest that PAH as well as HGPIN might be a possible precursor for Pca.