PERINEURAL INVASION – MARKER OF AGGRESSIVENESS IN PROSTATE CANCER

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Introduction. Prostate cancer is one of the most common malignant neoplasms in men, characterized by a heterogeneous biological evolution, from indolent forms to aggressive phenotypes with increased invasive and metastatic potential. Perineural invasion (PNI) is considered a morphological marker of tumor aggressiveness, being associated with extraprostatic extension, advanced pathological staging and increased risk of post-therapeutic recurrence. The presence of PNI reflects the ability of tumor cells to use nervous structures as a dissemination route, facilitating local progression and regional extension. This study evaluates the prognostic value of perineural invasion, analyzing its correlations with relevant morphological and clinicopathological parameters. The results support the importance of integrating PNI into routine histopathological evaluation and risk stratification, contributing to a more accurate prognostic estimate and to the optimization of individualized therapeutic decisions.

Material and Methods. The study included 70 cases of prostatic acinar adenocarcinoma diagnosed at the Oncological Institute of the Republic of Moldova. The mean age of the patients was 67 ± 6.8 years (median 68). All cases were histopathologically evaluated by two independent pathologists, on sections stained with hematoxylin-eosin, in order to confirm the diagnosis and evaluate the morphological parameters of interest. Statistical analysis included the determination of central tendency indicators (mean, median) and the evaluation of correlations using the Spearman coefficient (rs). The statistical significance threshold was set at $p < 0.05$.

Results. PNI was identified in 65 cases (92.9%). Correlation analysis revealed positive statistical associations between the presence of PNI and lymphovascular invasion (rs=0.21, p=0.04), as well as lymphocytic infiltrate (rs=0.21, p=0.04). Also, the incidence of PNI increased with the pathological tumor stage (rs = 0.27; p = 0.01) and Gleason score (rs = 0.54; p = 0.001), the latter correlation indicating a moderate association in intensity. The presence of signs of chronic prostatitis correlated negatively with PNI (rs = - 0.21; p = 0.04). No statistically significant associations were identified between PNI and patient age (rs = 0.11; p = 0.19), number of affected lobes (rs = - 0.10; p = 0.29), capsule invasion (rs = 0.14; p = 0.12), cellular atypia (rs = 0.11; p = 0.19), lymph node metastases (rs = 0.11; p = 0.20), as well as the development of hyalinosis (rs = 0.13, p = 0.14), lipid degeneration (rs = - 0.17, p = 0.07) and sinus histiocytosis (rs = -0.01, p = 0.47) in lymph nodes.

Conclusions. Prostate cancer has a significant metastatic potential, and perineural invasion contributes to loco-regional disease progression by facilitating tumor extension along neural structures. This tendency becomes more pronounced as tumor aggressiveness increases and is frequently correlated with the presence of lymphocytic infiltrate, as well as lymphovascular invasion.

Keywords: prostate cancer, acinar adenocarcinoma, perineural invasion.