Factors Associated with Upgrading on Re-Biopsy in Active Surveillance in a Regional Multi-Institutional Cohort: Data from the PURC

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Introduction:
Active surveillance (AS) is increasingly utilized for management of prostate cancer (PCa) across all demographics. However, candidate selection criteria vary greatly based on provider and institution. The ideal AS candidate is one with low risk PCa that is likely to remain indolent and stable, but risk factors for grade progression are still poorly understood. We aimed to study factors associated with upgrading on re-biopsy in patients enrolled in AS.

Methods:
Within PURC, a prospective quality improvement collaborative of diverse academic and community urology practices in Pennsylvania & New Jersey, we identified all men enrolled in AS from 2015-2018 after first biopsy. We analyzed differences in pathologic grading between the first and second biopsy and factors associated with upgrading at the second biopsy. Subsequently, we ran a sub analysis on patients with only 1 positive core on initial biopsy.

Results:
We identified 477 patients enrolled in AS for PCa who underwent 2 biopsies from 2015-2018. 346 (72.5%) patients who underwent a re-biopsy had a second positive biopsy. Higher PSA, Gleason score, number of positive cores, and family history were associated with a positive second biopsy ($p<0.05$). When analyzing pathology results of the positive second biopsy, 243 (70%) patients had a concordant or lower grade, and 103 (29.8%) patients were upgraded. Higher Gleason score, International Society of Urological Pathology (ISUP) Grade Group, number of positive cores, and positive family history were associated with upgrading ($p<0.05$). On multivariable regression analysis, none of these factors were predictive of upgrading. 113 patients had only 1 positive core on initial biopsy. These were sub classified into 2 groups, those who had <50% or >50% tissue involved. No differences were noted in rates of positive second biopsy or upgrading between these groups (97% vs 92%, $p=0.18$).

Conclusion:
Of 346 patients with a second positive biopsy, 29.8% were upgraded at their confirmatory biopsy. Higher Gleason score, International Society of Urological Pathology (ISUP) Grade Group, number of positive cores, and positive family history were all significantly associated with upgrading. Percent of core involved in those with a single positive core did not influence of likelihood of upgrading. These associations may be taken into consideration upon shared-decision making for PCa treatment.

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