Colorectal Cancer (CRC) in Patients from Rural Maine: Correlation of Molecular Profiles with Clinical Outcome.

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Abstract
The National Comprehensive Cancer Network (NCCN) recommends molecular testing for BRAF, KRAS, NRAS gene mutations and microsatellite instability (MSI) in CRC. In this study, mutational findings were correlated with clinical outcome in CRC patients from rural Maine. Mutational profiles of 192 CRC patients diagnosed in 2017 and 2018 were analyzed by next-generation sequencing (NGS). Mutational analysis included BRAF (exon 15) and RAS family biomarkers (KRAS/NRAS exons 2-4). MSI testing was performed using the MSI Analysis System. SPSS was used to perform Chi-square and Kaplan-Meier (log rank) survival analysis.

Median age at diagnosis was 66 years (range 28-100), with 57% men. Stage III disease was most frequently encountered (29%). MSI and BRAF mutation were seen in 15% and 11% of cases, respectively, with the majority being right sided. MSI-H tumors tended to be lower, stage I cancers. The majority (66%) of BRAF mutated tumors were also MSI-H. Approximately a third of tumors were KRAS mutated and less commonly associated with a poorly differentiated pathology. NTRAS mutation was least common (3.4%) and associated with adverse outcome in stage 3 CRC patients. Median follow-up was 16 months, with 80% overall survival. Survival for low stages (1-2) was 100%, for stages 3 and 4 89% and 34%, respectively, with stage being a significant determinant of survival (p<0.001).

Conclusions
Results of clinical and overall molecular characteristics of patients from rural Maine were similar to those reported in the literature. Our future efforts will include analysis of the tumors from this dataset for additional mutations.